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Introduction

On behalf of the Online Learning Consortium (OLC) and our Editorial Board, I am once again pleased to invite you to enjoy a new issue of Online Learning, the official journal of OLC. In this edition readers will find original research from across the US and around the world. Issue 19-2 provides insights into Massive Open Online Courses in hybrid setting, large scale research investigating online learner outcomes, smaller scale case studies, and conceptual advances of some familiar constructs. Consistent with our mission, these investigations inquire into learning processes, pedagogical practice, and technology supports to better understand and promote quality in online environments.

In the first article of this issue Rebecca Griffiths, Christine Mulhern, and Richard Spies of Ithaka S+R and Matthew Chingos of the Brookings Institution provide an innovative approach to research in Massive Open Online Courses in their contribution titled “Adopting MOOCs on Campus: A Collaborative Effort to Test MOOCs on Campuses of the University System of Maryland”. In this piece the authors examine campus adoption of MOOC content in hybrid online environments, reporting on students outcomes and challenges to integrating elements of MOOCs in classroom course settings. This kind of research is a crucial next step in understanding how classroom educators can best use these materials, the potential for course enhancement through their use, the kinds of challenges we can expect, and how college classroom students react to MOOC content integration. Faculty adoption of MOOC materials holds promise in enhancing classroom coursework with lower cost yet high quality content and may promote additional investigation of online and blended learning among this crucial stakeholder group.

Recent research investigating faculty concerns about online learning indicate that many believe outcomes of online learning cannot be equivalent to classroom instruction. While numerous meta-analytic reviews of this question indicate no significant differences in outcomes between these modalities (e.g. Bernard et al 2004; Means, Toyama, Murphy, Bakia, & Jones, 2009; Zhao, Lei, Yan, Lai & Tan 2005) all such studies decry the methodological weakness of the distance-education/classroom-education comparative literature. Common concerns expressed by meta-analysis center around studies with small sample sizes that often focus on a single course, surveys of other small populations, lack of controls for initial differences between subject, or emphasizing measures of satisfaction rather than learning outcomes. The current issue contains a remedy to many of those concerns in the work of Joseph Cavanaugh and Stephen Jacquemin entitled “A Large Sample Comparison of Grade Based Student Learning Outcomes in Online vs. Face-to-Face Courses”. In this study the authors take pains to address methodological shortcomings identified in the literature with a dataset of 5,000 courses taught by over 100 faculty members over a period of ten academic terms. Multiple regression analysis was used to account for initial differences in student demographic and academic variables to generate a robust test for differences in learning outcomes attributable to course format. Net of initial differences outcomes between classroom and online courses varied by less than 0.07 GPA points on a 4 point scale. The primary influence on individual course grades was student GPA, not mode of instruction. Critical reviewers of the literature will find some solace here and should cite this methodologically rigorous study.

As online education becomes embedded across disciplines investigators are analyzing the development of course content and outcomes in increasingly specialized areas. For example, in this issue David Johnson and Chris Palmer investigate student experiences in classroom and online versions of numerous introductory linguistics course sections. As with many courses, teaching linguistics online can
bring its own special challenges and Johnson and Palmer outline these with regard to content, interaction, and the profiles of students who tended to enroll in each modality. Regarding the latter, the authors found that students in the online sections consistently had significantly lower GPAs and (perhaps consequently) lower outcomes on a range of measures than did their classroom counterparts. The authors include recommendations for addressing some of these challenges including pedagogical approaches that may be more supportive.

Recent developments in online learning research are reflected in more ambitious case-study investigations of longstanding constructs, for example social presence. An example of such a study can be seen in Aimee Whiteside’s multi-year examination of coded online transcripts, observations of face-to-face courses, and interviews with two cohorts of students in her investigation of social presence in a blended learning program. The result of the research is a new five-dimensional social presence model that includes Affective Association, Community Cohesion, Instructor Involvement, Interaction Intensity, and Knowledge and Experience. The work is supported with considerable data yet one imagines that other researchers in related areas (CoI for example) may want to understand subsequent phases of this research agenda. Will the authors address next the instructional roles and measure of online engagement and learning currently represented by constructs such as teaching presence and cognitive presence? We are anxious to see future research on these topics.

A second case-study in this issue examines the benefits of adding synchronous activities to an asynchronous online course. In their study of student achievement, sense of social community and sense of learning community Joann Olson and Fawn McCracken added weekly synchronous lectures in one section of their course. The two sections ran during the same term and used the same syllabus, assessments, asynchronous discussion questions, and grading scale. Using Adobe Connect sessions, the instructor delivered content and facilitated real-time discussions related to assignments, discussed PowerPoint presentations and requirements closely related to assignments, asked for input from students, and answered question through a chat feature. Despite the significant investment in time and effort they found no significant differences between the two sections on measures of academic achievement, sense of community, or course satisfaction. They conclude that incorporating synchronous activities requires careful consideration of the impact of this effort on student achievement, student experience, and institutional investment. While these results are suggestive rather than conclusive (e.g. the small sample size limits generalizability) more research regarding specific conditions under which synchronous interaction may have a positive impact seems warranted.

While Olsen and McCracken did not find an increased sense of community as a result of online synchronous instructional activity, Mariam Abdelmalak investigated the same construct with other interventions - various social media - and came to different results. In this research the author employed Twitter, Google Docs, Skype, blogs, and wikis throughout the course to enhance students’ sense of community. Confirming and extending Olsen and McCracken’s results documenting limited success with synchronous supports Abdelmalak’s study concluded that asynchronous tools such as Google Docs, wikis, blogs, and Twitter did provide students with a stronger sense of a learning community while synchronous tools such as Skype did not. Together these studies help extend our understanding of this familiar construct and point the way toward improved practice based on collaborative pedagogical strategies – asynchronous methods may be more effective in promoting learning community. However, we do need additional research with larger samples to improve generalizability to other contexts.
Further enhancing our understanding of rich technology use, Richard Ladyshewsky, Ronald Pettapiece contributed a paper titled Exploring Adult Learners Usage of Information Communication Technology during a Virtual Peer Coaching Students. Exploring in-depth a specific use of technologies for establishing purposeful connections to support peer-to-peer coaching and mentoring the authors document that student have difficulties selecting the appropriate technologies (including social media) and in using them effectively. These struggles had a negative impact of the class achieving the educational objectives set by the instructor. The authors conclude that students can benefit from having information on technology selection; tips on how to use the technology, and guidelines for virtual communication to ensure educational objectives are met. The authors sensibly argue that these considerations need to be integrated into course development and likely involve more training and preparation. Relative to the other case studies presented here there is a simple take-away. If the goal of social media and other technology use is to develop a sense of community known to support learning; students may need support to reach these agreed-upon outcomes.

A final example of more advanced approaches to familiar topics can be found in Chuck Dziuban’s study of student satisfaction in online courses. Arguing that satisfaction is not a unidimensional construct, but rather one in which ambivalence may be a defining attribute; the author attempts to identify latent elements of student satisfaction in the context of overall course evaluations. Examining survey data from nearly 1200 students Dziuban identifies three such constructs through factor analysis. The underlying factors include engaged learning, agency, and assessment. The author concludes that students are providing important messages about satisfaction in online coursework vis-a-vis implicit contracts that exist within them. Dziuban argues that the survey factors reflect the following implicit desires students want to communicate: “facilitate my learning”, “recognize my abilities and accomplishments” and “let me know where I stand”. When these elements of the implicit online course contract are unattended, dissatisfaction will likely follow. These results provide an elegant and parsimonious description of the student satisfaction construct that will be of great value to subsequent investigators.

Please read, discuss, and share these new studies and please also consider contributing to the scholarly dialogue supporting the future of Online Learning.

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SECTION I: Massive Open Online Course (MOOC) Research

Adopting MOOCs on Campus: A Collaborative Effort to Test MOOCs on Campuses of the University System of Maryland

Rebecca J. Griffiths, Matthew M. Chingos, Richard Spies, Christine Mulhern
Adopting MOOCs on Campus: A Collaborative Effort to Test MOOCs on Campuses of the University System of Maryland

Rebecca Griffiths, Christine Mulhern and Richard Spies

Ithaka S+R

Matthew Chingos

Brookings Institution

Abstract

To address the paucity of data on the use of MOOCs in “traditional” postsecondary institutions, Ithaka S+R and the University System of Maryland studied the feasibility of repurposing MOOCs for use in hybrid, credit-bearing courses. In this paper we will describe the design of a large-scale study undertaken to examine the use of MOOCs in fourteen campus-based courses, followed by two types of findings: First, we will share quantitative outcomes from students in hybrid sections, comparing students who took MOOCs with those who were taught in a traditional face-to-face manner; second, we will share qualitative findings on the opportunities and challenges presented by the use of MOOCs on campus. Finally, we will reflect on what would need to occur in order for these models to see widespread adoption in the future.

Introduction

When Massive Open Online Courses (MOOCs) first attracted widespread public attention in 2011, some predicted that they would disrupt higher education by replacing traditional classroom lectures or even entire institutions. However, as it became evident that these extreme proclamations were not going to become reality, some investigators turned to more subtle questions of how MOOC content might be incorporated into traditional degree programs and environments that serve mainstream American college students in order to improve student outcomes and/or reduce costs.
One of the key selling points of MOOCs is the large volumes of data they generate about learners, providing instructors with a better understanding of learner behavior and informing course design. However, these data only tell us about the people who take MOOCs, and evidence reported by edX indicates that most people who participate in MOOCs are not the same as those pursuing degrees in American colleges and universities (Ho et al., 2014). Thus, the learner data from MOOCs tells us little about how typical postsecondary students would fare in these courses.

Some MOOC creators and institutions have experimented with using MOOCs in their existing courses to replace or enhance the lecture material. MOOCs offer high-quality videos from some of the top professors and institutions worldwide, currently at no cost. Therefore, they could be seen as an alternative to creating one’s own lecture videos or as a way to convey knowledge on a subject beyond the instructor’s own expertise. That said, little is known about how instructors can actually incorporate these materials in their classes, the potential for them to improve the classes, the challenges they bring, and how students respond to them.

**Literature Review**

A case study from Vanderbilt University found a fairly positive response from students when a computer science MOOC from Stanford University was embedded in a graduate seminar (Bruff, Fisher, McEwen & Smith 2013). An experiment at San Jose State University found substantial gains in pass rates for students in sections using an engineering course from MITx compared to the traditional sections of the course (Ghadiri, 2014). However, some differences in the sections and limits on student background data lessen the weight of these findings. Many components of the course were modified in the sections using the MOOC, and students had the same amount of class time. Moreover, detailed analysis of the background characteristics is not available, so we cannot be sure that there were not significant differences in the baseline student populations. Another experiment at San Jose State University (SJSU) with Udacity and introductory math courses found mixed results. Pass rates in online sections were very low, but researchers attributed this at least in part to the targeted student population (Firmin, Schiorring, Whitmer, Willett & Sujitparapitaya, 2013). They found that students who were matriculated at SJSU were more likely to earn passing grades than nonmatriculated students. Overall, they concluded that the academically at-risk student population involved in this study fared better in face-to-face courses, but still found room for optimism about the potential of the online resources. While these studies provide insight into how MOOCs can be used and some of their impacts on students, each is about a very specific case with a set of qualifications that make it hard to generalize the results to other instructors and institutions that may be able to take advantage of MOOCs in the classroom.

There is some robust research on the use of other online learning materials for undergraduate students that suggests that these types of materials do not appear to harm student outcomes when used in hybrid formats, though certain subgroups of students may perform worse in fully online courses. Bowen, Chingos, Lack, and Nygren (2014) studied the use of Carnegie Mellon’s Open Learning Initiative Statistics course in hybrid undergraduate classes and found no significant difference between the hybrid and traditional sections in student pass rates and assessment scores, including for underrepresented minorities, students from low income families, and first-generation college students. Figlio, Rush and Yin (2013) found that student learning outcomes in a traditional lecture-style course were not significantly different than those for students who had access only to the online videos of the same lectures, but they did find that the online-only treatment had negative impacts for some subgroups of students (Hispanics, males, and lower achieving students).

Research focused on community college students and entirely online courses finds that students perform worse in online courses than face-to-face courses, and that the gap in performance between these two modes is larger for some underrepresented minorities, males, and students with lower levels of prior academic achievement (Jaggars, 2012; Johnson & Mejilla, 2014; Xu & Jaggars, 2013). It also finds that the performance gap between students in online and face-to-face courses varies by subject, with online courses having the most negative results in social science and professional studies courses (Xu & Jaggars,
Findings about the impact of online courses on progression toward an associate degree or transferring to a four-year institution are mixed. A review of the literature by Jaggars in 2012, as well as a report by Jaggars, Edgecombe, and Stacey (2013), suggests that online courses may hurt progression toward a degree; however, more recent work finds that taking online courses improves a student’s likelihood of earning an associate degree or transferring to a four-year institution (Johnson & Mejilla, 2014; Shea & Bidjerano, 2014). While these studies focus on different types of courses (online instead of hybrid) and different populations of students than our study, they point out important findings for disadvantaged students that deserve further exploration. Unfortunately, much of the online-learning research lacks careful comparisons of students in different course formats in order to determine the true effect of these materials (Means, Toyama, Murphy, Bakia & Jones, 2010).

Another important issue is what effect course design and implementation have on student outcomes. Jaggars and Xu (2013) developed an online course-quality rubric and explored the relationship between each quality area and student end-of-semester performance in 23 online courses at two community colleges. The results indicate that the quality of interpersonal interaction within a course relates positively and significantly to student grades. Additional analyses based on course observation and interview data suggest that frequent and effective student–instructor interaction creates an online environment that encourages students to commit themselves to the course and perform stronger academically. Again, this study pertains only to online courses; not hybrid formats.

In addition to understanding the impact on student outcomes it is also important to consider whether and how faculty members actually make use of online course materials. A study by Bacow, Bowen, Guthrie, Lack and Long (2012) provided insight into the barriers to adoption of online learning, benefits universities anticipate from these technologies and how they can be molded to fit institutions’ needs. The main findings were the need for open and shared data on student learning that can be generated from online learning technologies and the need for sustainable and customizable platforms for delivering online learning instruction. This study was conducted before the creation of MOOCs, but we find many of their findings directly relevant to our experiences with institutions and faculty.

Since millions of dollars continue to be invested in the development of MOOCs, producing hundreds if not thousands of high-quality online courses, we think it is important to understand how these courses might be able to benefit mainstream undergraduate students. In partnership with the University System of Maryland (USM), and with extensive cooperation from Coursera, a team of researchers at Ithaka S+R, a nonprofit research and advisory service focused on higher education, set out to learn more about potential uses of MOOCs in campus-based settings. The questions we wished to address included the following: How does the use of MOOCs in hybrid courses impact student outcomes? Can these materials be used by faculty members who did not create them? What kinds of implementation challenges arise, and how can they be overcome? How does use of these tools impact time to plan and teach a course?

This paper will describe the study design and data collection methods and then will move to findings in terms of student outcomes and student reactions. Finally, we will briefly discuss the implications of these findings and topics for further research.

**Method**

There were two main components to this mixed-methods study: a set of four side-by-side tests using MOOCs in introductory hybrid courses, and 10 case studies. (Three additional side-by-side tests using the Introductory Biology course from Carnegie Mellon’s Online Learning Initiative were also a part of the larger study, but we do not include them in these results so that we can focus our analysis on MOOCs.) For the side-by-side tests, we compared outcomes of students in hybrid sections using MOOCs with outcomes of students in traditionally taught sections of the same course. Students were not randomly assigned to different sections: we controlled for student background characteristics, including age, gender, race/ethnicity, year of study, SAT/ACT scores, parental education and family income when analyzing the outcomes (pass rates and common assessments). The case studies explored the use of MOOCs in a variety
of course formats, disciplines and divisions. For these we did not attempt to measure outcomes, as there was no baseline cohort for comparison.

**Procedures**

In order to recruit test cases, Ithaka S+R and USM staff presented the project at each campus to groups of faculty and administrators. We solicited “statements of interest” from faculty members, asking them to declare their interest in participating, identify a course on campus and a MOOC that might work in that context, and describe a goal or problem that might be addressed through use of the online content. These statements were vetted based on several criteria: whether the proposed use of the MOOC was substantial enough to illuminate the research questions, whether there was a compelling reason for the use of the MOOC, and whether we could obtain permission to use the desired MOOC. This required some back-and-forth with Coursera and its partners. Sixteen courses were selected to be part of the study, from an initial response of 30 statements of interest. Two of the courses were later eliminated from the study because we were not able to use the MOOCs upon which they relied.

It is important to note that our group of instructors was self-selected and probably more motivated to teach with online technologies than the average instructor. This selection of instructors may have led to more positive reviews of the experience as well as better outcomes than if the instructors (and courses) had been randomly chosen.

**Participants**

Fourteen faculty members who were interested in teaching with MOOCs were recruited from seven institutions across the USM, which included research universities, regional comprehensives, a metropolitan institution, and historically black universities. In all but one instance, Coursera set up local versions of MOOCs, which the USM faculty could customize to meet the needs of their courses and students. In four instances we set up side-by-side tests comparing outcomes of students in traditionally taught sections with those of students in hybrid sections using MOOCs. Three of these had reduced class time.

In addition, we conducted 10 case studies, in which faculty incorporated MOOCs into a variety of small, single-section courses. The tests covered a diverse range of disciplines, including math, statistics, computer science, communications, studio art, poetry, philosophy, nutrition, ancient Greek and Roman mythology, and introductory literature. Sizes ranged from six students up to 60. Instructors used MOOCs to replace some of the course content or enhance the existing course materials. One of these courses was entirely online, and in another students enrolled in the public offering of the MOOC and engaged in parallel seminar discussions and assessments at their own institutions. Several case studies involved first-year learning communities (linked courses that enroll the same cohorts of students and are intended to reinforce each other).

In total, there were 855 students involved in these tests, including 664 in side-by-side tests and 193 in case studies. We obtained background data for 836 students, and 562 completed final surveys (including those in control sections). We conducted interviews with 19 instructors, some of whom taught different sections of the same course. Tables 1 and 2 provide more details on the courses, students, formats, and outcome measures involved in both the side-by-side comparisons and the case studies.

**Data Collection**

For all tests we collected data on student backgrounds, enabling us to analyze survey responses for subgroups of students (such as first-year students). We also conducted student surveys in all tests as well as interviews with all instructors before the beginning of the term and after the conclusion in order to understand how they used the MOOCs in their courses, as well as their experiences and perspectives on what worked and did not work. Most of these data relate to the implementation challenges that arise in embedding MOOCs in campus-based courses. The interviews followed a standard set of questions, and we coded and tabulated categories of comments.
Table 1 Courses and Students Involved in Side-by-Side Comparisons

<table>
<thead>
<tr>
<th>Course</th>
<th>Number of treatment sections</th>
<th>Students in treatment sections</th>
<th>Students in control sections</th>
<th>Minutes per week treatment section met</th>
<th>Minutes per week control section met</th>
<th>Outcome measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics</td>
<td>2</td>
<td>64</td>
<td>64</td>
<td>150</td>
<td>150</td>
<td>Posttest; common final</td>
</tr>
<tr>
<td>Pre-calculus</td>
<td>2</td>
<td>55</td>
<td>67</td>
<td>120</td>
<td>220</td>
<td>Posttest; common final</td>
</tr>
<tr>
<td>Computer science</td>
<td>4</td>
<td>92</td>
<td>84</td>
<td>75–100</td>
<td>150</td>
<td>Common midterm</td>
</tr>
<tr>
<td>Communication</td>
<td>4</td>
<td>104</td>
<td>103</td>
<td>80</td>
<td>160</td>
<td>Posttest; common final</td>
</tr>
</tbody>
</table>

Table 2 Courses and Students Involved in Case Studies

<table>
<thead>
<tr>
<th>Course</th>
<th>Format notes</th>
<th>Number of sections</th>
<th>Number of students</th>
<th>Minutes per week they met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art</td>
<td>MOOC used for content portion</td>
<td>1</td>
<td>9</td>
<td>160</td>
</tr>
<tr>
<td>Poetry</td>
<td>Live public offering of the MOOC</td>
<td>1</td>
<td>11</td>
<td>150</td>
</tr>
<tr>
<td>Genetics</td>
<td>MOOC used to replace some lectures</td>
<td>1</td>
<td>60</td>
<td>75–150</td>
</tr>
<tr>
<td>Psychology learning community</td>
<td>MOOC used to replace some content in two courses</td>
<td>2 courses</td>
<td>24</td>
<td>250</td>
</tr>
<tr>
<td>Information technology</td>
<td>MOOC replaced middle third of the course</td>
<td>1</td>
<td>19</td>
<td>0 or 150 depending on week</td>
</tr>
<tr>
<td>Political science</td>
<td>Supplemental</td>
<td>1</td>
<td>11</td>
<td>150</td>
</tr>
<tr>
<td>English Learning Community A</td>
<td>MOOC used as a common experience across three courses</td>
<td>3 courses</td>
<td>17</td>
<td>210</td>
</tr>
<tr>
<td>Philosophy</td>
<td>Summer pilot, entirely online</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Literature</td>
<td>Two MOOCs used to provide greater insight into ancient mythology</td>
<td>1</td>
<td>17</td>
<td>150</td>
</tr>
<tr>
<td>English Learning Community B</td>
<td>MOOC used to provide context to the literature covered in class</td>
<td>1</td>
<td>19</td>
<td>150</td>
</tr>
</tbody>
</table>

Side-by-side Comparisons

Participating institutions provided administrative data related to academic preparation and demographic characteristics for all students in treatment and control groups. Students who consented to participate in the study were asked to complete surveys designed to solicit additional information about their backgrounds (e.g., parental education and family income), as well as interest in the course subject and their experiences in the course. Surveys were conducted in control sections as well as treatment sections. We allowed the institutions discretion over whether to offer small incentives to students for participation, and three tests chose to do so.

Due to the range of courses involved, we could not implement a uniform posttest. Instructors for each course determined what their students should learn and designed assessments according to those standards. We asked treatment and control group instructors to agree on common exams or at least a
significant subset of common questions on exams, and these are the primary outcome measures. One limitation is that these scores cannot be compared to a benchmark outside of the given university (or course) and are subject to the instructors’ discretion of what students should learn. A few instructors also mentioned that slight differences between content in the treatment and control groups may have influenced students’ scores (if some content on the assessments was covered more in one section than another) independent of how well students learned the content taught in their sections. We also obtained pass rates and grades, which can be subject to variations in grading standards among instructors. Although no single measure provides a perfect assessment of student performance, we believe that taken together these three measures provide a reasonable assessment of student performance.

Case Studies
We conducted 10 case studies using MOOCs in courses that did not allow for rigorous evaluation of learning outcomes due to smaller course enrollments. The purpose of the case studies was instead to deepen our understanding of the implementation process, to explore ways that MOOCs could be used to enhance teaching and learning in different types of courses, and to gain insight into student and instructor experiences in a larger set of instances. While instructors have views as to whether student learning benefitted from the use of MOOCs, we cannot compare them to a reference cohort; thus, we do not report passing rates or grades for these courses.

Findings
This section reports quantitative and qualitative findings from both the side-by-side comparisons and the case studies in order to present a more holistic picture. More detail on the findings and data analyses for each test type can be found in the complete report (Griffiths, Chingos, Mulhern, & Spies, 2014).

Student Learning Outcomes and Survey Responses
After controlling for SAT scores, cumulative GPA at the beginning of the semester, race/ethnicity, gender, parental income, and student age, differences between students in hybrid sections and those in traditionally taught sections were not statistically significant at the 10% level when averaged across the four side-by-side comparison courses (see Figure 1). In other words, the hybrid effect on student outcomes was not statistically different from zero. These outcomes are noteworthy in consideration of the fact that faculty members were teaching redesigned hybrid courses for the first time using new technology, and the fact that hybrid sections had an average of 103 minutes of face-to-face class time per week, compared to 166 minutes for traditionally taught sections. Moreover, we did not see evidence that academically at-risk subgroups of students performed consistently better or worse in hybrid sections, but rather a pattern of small positive and negative effects.

![Figure 1. Average posttest/exam scores and pass rates for hybrid versus traditional sections.](image-url)
On the other hand, Figure 2 shows that student ratings of the hybrid sections were significantly lower \((p < .05)\) in terms of overall satisfaction and how much they felt they had learned. The impact on their interest in the subject and how difficult they found the course was not statistically significant at the 10\% level. (These ratings are on a five-point scale.) Moreover, students agreed more with the statement “I learned what I needed to in the course primarily from my instructor” than with the statement “I learned what I needed to in the course primarily from Coursera,” with respective ratings of 3.7 versus 2.9 (5 means strongly agree while 1 means strongly disagree).

Student ratings of case study courses were somewhat higher, with average overall ratings of \(M = 3.5\) and \(M = 3.4\) for how much students felt they learned. We have no way to know whether these higher ratings reflect the success of these courses or the characteristics of courses involved in the different types of tests. On average, students gave lecture videos a score of \(M = 3.3\) for educational value, compared to \(M = 3.5\) for in-class activities. In side-by-side comparisons, these scores were \(M = 3.2\) versus \(M = 3.8\). In half the case studies, students gave higher ratings to the educational value of lecture videos relative to in-class activities, while in the other half we found the opposite responses.

Costs

One of the most important unanswered questions is whether and how online learning technologies can be used to reduce costs for institutions on a large scale. In this project we could not come close to addressing all the questions we would have liked to answer, but we were able to compile a baseline set of data for the time required to redesign and deliver a hybrid course using readily available online course materials. Faculty time spent on planning and teaching is one of the largest costs associated with a course, and we focused primarily on understanding how this time was spent and the impact of using online-learning platforms on amount of time spent.

Faculty members reported investing considerable time redesigning their courses with MOOCs. The time savings that some instructors found during the semester were offset by high up-front time requirements. For the nine instructors who submitted records of the time they spent working on the course, reports ranged from 34 to 248 hours spent on course planning, with a median of 58 and mean of 100 hours. This included time spent watching all the MOOC videos and reviewing assessments, figuring out how to put the pieces together, learning to use the platform, and actually setting up the online components of their courses. Since we did not have the opportunity to repeat the entire set of tests, we do not know how much time would be needed to plan and deliver these courses a second time. About a third of the participating faculty members thought they could save time in the future (see Figure 3).
A key unknown in future cost calculations is the license fee for MOOCs on Coursera. For the purpose of this study, Coursera’s partners gave permission to use their courses for free, and Coursera did not charge for its services in setting up and supporting local instances of the MOOCs. It is unlikely that these materials would continue to be available under these conditions.

Faculty Teaching Approaches and Interview Responses

Participating faculty members identified a number of opportunities for using the MOOC materials to enhance their courses. In all but one case, Coursera set up local instances of MOOCs, enabling instructors to tailor the selection and sequencing of course content, timing, and other elements to fit the needs of their courses. When asked what components of MOOCs they used in their courses, 13 faculty reported that they used multiple components, three faculty used the entire MOOC, and two used videos only.

None of the instructors relied solely upon assessments from the MOOCs, suggesting that these were the element of the MOOCs least well calibrated to the specific needs of each course. All instructors used videos, and several used the embedded quizzes within the videos to track whether students were engaging with the online content. A couple of the instructors required students to submit screenshots of their interactions with the Coursera website to show that they had completed assignments.

Opportunities for enhancement

Faculty partners identified six types of benefits for students in their hybrid courses using MOOCs. These included the following:

1. Replacing lectures. A pre-calculus instructor chose to use a MOOC in her class because she observed that teaching math at this level through lectures was not effective and she wanted to see whether assigning students to learn new concepts independently and using class time for active problem solving and group work would improve outcomes. In a similar vein, another instructor saw an opportunity to enhance an online introductory philosophy course with online lectures, as she did not have the time or resources to create these materials herself and felt that they would be highly beneficial for students. In both cases, MOOC videos delivered information in a manner similar to that of lectures but did not need to be created from scratch (though, as we saw, redesigning a course using a MOOC still took a lot of time).
2. **Augmenting or replacing secondary materials.** One professor used two MOOCs on ancient Greek and Roman mythology in place of textbooks and other secondary sources. Students in the study saved money because they did not need to purchase a textbook (though, as noted above, we do not know how expensive license fees might eventually be for MOOC content or how they would compare to textbook prices). In a different course, an instructor mentioned that students were more likely to watch the videos than read the textbook because a number of students were unwilling to pay for a textbook. Another course used a MOOC to add macroeconomic context to an introductory course in comparative politics. A statistics course used a MOOC to supplement (but not replace) classroom instruction.

3. **Filling gaps in expertise.** Two instructors were attracted by the possibility of using MOOCs to add expert voices that complemented their own areas of expertise, such as in interdisciplinary programs or survey courses. For example, one professor with a background in information technologies used a MOOC for a module of a human–computer interaction course on product design.

4. **Exposing students to other styles of teaching and class discussion.** Several faculty members believed that MOOCs could benefit their students by exposing them to different styles of teaching and class discussion. For example, one taught a course on modern poetry and had her students participate in the live offering of a corresponding MOOC, in addition to holding weekly face-to-face class meetings. In the past she had struggled to engage students in critical analysis of texts rather than statements of personal likes and dislikes. The seminar style discussions in the MÖOC videos provided a model for her desired style of intellectual discourse. Another team of professors embedded a MOOC on critical reasoning and argumentation into a first-year oral communications course in order to expose students to different teaching styles and personas.

5. **Reinforcing key skills, such as critical thinking.** A studio arts instructor augmented a course on public art installations with a MOOC on critical reasoning and global challenges. This addition served the dual purpose of teaching students to approach art more analytically and providing a background on issues such as water management and obesity that could be subjects for their art projects. A second instructor integrated a MOOC on nutrition into a program seeking to strengthen basic life skills, such as sleep and eating habits, which have been shown to correlate with student success.

6. **Teaching students how to learn online.** A professor incorporated a critical reasoning MOOC into a first-year learning community, using it both for its instructional content and as a vehicle for teaching students to become more effective learners. Students viewed MOOC videos together with an undergraduate mentor and discussed strategies for identifying core concepts and effective note-taking.

Faculty partners also identified several ways in which they themselves benefitted from use of MOOCs. One benefit was professional development, as viewing MOOC content afforded an opportunity for instructors to see how other faculty members in their fields teach similar material and, in some cases, to learn new concepts. Another was relief from time pressure during the semester, as most hybrid courses had reduced class time. For example, the professor who used a MOOC to deliver a module of her course on design appreciated the time savings this approach provided during the semester, as she was teaching five different upper level courses at the time. (She found it helpful that she saw many of the same students in other classes during this period, enabling her to check in with them from time to time.)

Finally, three faculty members liked the flexibility to use class time in different ways without the pressure to cover content. For example, a sociology professor, who by his own admission had been slow to adopt instructional technology, reported feeling “excited” and “exhilarated” by the possibility that using MOOCs could enable him to reorient the course from a focus on teaching content (which students could learn online independently) toward “developing a sociological imagination” through project work. He described the technology tools, such as peer review, as “incredibly empowering” for students and felt energized by the opportunity to overhaul the way his course is taught. (This test is not formally part of the MOOCs study because it ended up using Pearson’s MySocLabs in the hybrid sections, but the MOOC that was initially under consideration helped to spark many ideas about how the course could be redesigned.)
Implementation Challenges

The participants in this study worked through many implementation challenges in order to deliver their courses. Most of these stemmed from the fact that MOOCs on Coursera—as well as the platform itself—were not originally designed to be repurposed for use in other professors’ classes, so many modifications were necessary to fit what sometimes felt like “square pegs in round holes.” The primary issues encountered were content fit, intellectual property, and technology integration.

1. **Content fit.** Finding and adapting online content for a hybrid course posed the greatest challenge for faculty partners. MOOCs reflect the priorities of their creators, and these are not necessarily the same priorities that other faculty have for their own students. Moreover, academic departments develop degree program curricula as a whole, making deliberate decisions about when and where certain content should be taught and which competencies should be assessed within specific courses. To integrate a MOOC into an existing class is not necessarily a simple case of choosing what pieces to include or exclude. Even with online course materials that are a fairly close fit with the pedagogical approach of the instructor and needs of the students, the local instructor may need to reconceptualize or restructure his or her existing course to fit with the online content.

   About a third of the faculty partners said that the MOOC assumed too high a level of prior knowledge or quantitative skills, while four thought that the assessments did not demand the level of rigor instructors would expect for courses in their institutions. Some faculty members reported that the MOOCs they were trying to use taught concepts in a different way or emphasized different topics than they did in their own approach to teaching a subject. In one course, for example, the USM instructor found that some MOOC units covered topics that would be taught in upper division or graduate courses at his institution. Another found that the lecture videos presented topics in a different sequence than his syllabus, and moreover, that they taught concepts in a cumulative fashion with frequent references to previous units, making it difficult for him to use them out of order. He ended up creating most of the online videos for his hybrid sections and only used around 10% of the MOOC videos. (This was in a pilot conducted during the spring of 2012 and is not otherwise reported here.)

   Content fit was particularly important in introductory courses, which are integral to the curriculum and need to be well matched to the abilities of the student population and requirements of subsequent courses in those programs. Finding a MOOC that was a good fit with an existing course was fairly hit or miss given the small number of options available at the time, and even MOOCs that were reasonably well suited required some customization or “bridging.” As a result of these challenges, seven faculty members felt after the study that they could create more appropriate online course materials for their students. All of the instructors participating in this study created their own assessments to go with the MOOCs. In general, we learned that the first generation of MOOCs were structured as coherent narratives, while professors using these materials preferred more flexible modules or “chapters.”

2. **Intellectual property.** During the course planning and delivery period for this study, there was a lot of uncertainty around ownership of MOOCs. In particular, there were questions about whether the IP should belong to the faculty member who created it or to the home institution. Additional questions arose for which there were no clear answers or precedents, such as the following: When an instructor adapts a MOOC for use in a hybrid course, who owns and/or has rights to use the adapted version? What kinds of adaptations should be permitted? Does the instructor who adapted the MOOC have any assurance that these materials will be available for future use? If a new version of a particular MOOC is released, will the instructor be required to use the most recent version, even if that means making adaptations to his or her course all over again? These are critical questions in view of the extensive efforts required to redesign courses using the online materials. For this study we devised ad hoc solutions—and were fortunate to have partners who were willing to participate despite considerable uncertainties as to how these issues would be resolved. It is clear, though, that more standardized policies are necessary to enable large-scale use of these materials in hybrid formats.
A critical underlying issue is how to balance the instructors’ freedom to teach their courses as they wish with the desires of some MOOC creators to monitor or restrict the way their online content is used. The unique value of MOOC materials derives at least in part from their authorship by exceptional professors, and we detected understandable anxiety from several of those approached for this study about losing control of their intellectual creations. Two of these professors expressed concerns about the idea that their courses might be “canned” or repurposed by unknown faculty in other institutions. These worries were by no means universal, however; the majority of Coursera’s partners whose permission we sought to include their courses in our study consented readily.

While MOOCs are “open” in the sense of being free to students who enroll in public offerings, they have fairly restrictive terms for other kinds of use. One may not take these courses as part of any kind of tuition-based or credit-bearing course without specific permission, nor is one allowed to modify or repurpose the content in any way. There is currently no standardized way to obtain these permissions.

3. **Technology integration.** Integrating online learning platforms with campus technology infrastructure presented another set of challenges. The MOOCs used for this study did not “plug” easily into local learning management systems, and thus extensive efforts were required by Coursera and USM staff to support faculty and to enable students to access their local versions of the online course content. Instructors had to work through questions such as the following: Should they embed links to individual videos and online assessments in the campus LMS course page? Should they simply post one link to Coursera and have students navigate their courses within that platform? Or should they download and embed all desired content from Coursera directly into the campus LMS so that students could find all course materials in one place?

Even after these decisions were made, technology integrations did not always go as planned. Although mechanisms were in place in all but one campus to enable “single sign-on” to the online platforms, many students encountered problems accessing the appropriate versions of the MOOCs. One team of instructors that had planned to use an integrated authentication approach abandoned this solution once the course got underway. In survey responses, 21% of free-text comments about what could be improved in the course concerned technology.

The Coursera platform was not intended to be used by instructors on campus, and thus the features did not meet several of their needs. For example, it was cumbersome to transfer grade information to the local LMS systems, and the peer review feature did not work well for small groups of students. One instructor observed that the Coursera dashboard did not work well for a campus-based course, as she could not monitor the progress of individual students.

Finally, these technology integration issues resulted in incomplete usage data. Many students accessed Coursera through multiple accounts or in other ways that prevented us from keeping close track of individual usage. While data from some courses may be complete, uncertainty about how students were accessing the system mean our data are generally unreliable.

4. **Faculty experience.** Overall, the faculty members who participated in the study gave overwhelmingly positive reviews of their experiences. Of 19 instructors who participated in final interviews, 15 said they would like to teach again using MOOCs, and an additional three said they might under certain circumstances. Roughly the same numbers said they would recommend this approach to teaching courses to their colleagues. These responses are not entirely surprising given that most of them had volunteered to participate in the study. Still, it may be indicative of some of the benefits instructors found in using MOOCs that were discussed above.

**Overall Assessment**

About three quarters of the instructors involved reported that they felt they achieved what they had hoped in their courses using MOOCs. Those who wished to expose students to different styles of class discussion were particularly positive about what they observed in their classes. For example, the instructor of the modern poetry course thought her students pushed themselves to make more analytical comments than in past offerings of the course. Her favorite part of the course was a series of sessions in
which she videotaped class discussions with students acting as facilitators, thereby producing her own set of MOOC-like videos. Another instructor reported that her students demonstrated a stronger understanding of how to build an argument than she had seen in the past. Instructors who taught an oral communications course reported that students took time to get used to the styles of professors teaching a MOOC, but they saw this as a valuable experience for students who were accustomed to a homogenous learning environment.

A professor who used two MOOCs to replace secondary source materials was extremely pleased with the results. He thought the MOOC videos provided a more accessible and engaging way to deliver technical information than textbooks. His perception was corroborated by surveys, as his students rated the lecture videos as the most valuable component of the course.

Experiments were least successful when the topic of the MOOC was not closely linked to the campus-based course. One instructor had hoped to broaden the scope of his course by incorporating a MOOC that was not tightly coupled and students appear not to have engaged with either the in-class or online components of the course. In another case study, one student wrote in a free-text response saying she did not understand how the MOOC related to other parts of the course.

We also did not find any benefits to students in a statistics course that supplemented traditional instruction with a MOOC without reducing class time. The instructors observed that students did not expect material covered only in the MOOC to be included on tests, and as a result they skipped over it. One instructor speculated that students approached course content from a utilitarian perspective: If watching all the MOOC videos counted for a small number of points relative to less time-consuming activities, they focused their efforts elsewhere.

**Limitations**

Our methodology carried some important limitations. Perhaps the most important is that we were not able to repeat the side-by-side tests a second time to see whether instructors might obtain better results with more experience. Similarly, these tests were conducted with MOOCs available in summer 2013. It is reasonable to expect that the technical and pedagogical quality of these materials has improved with time and experience. In the future, we recommend conducting tests such as these over multiple iterations to provide formative as well as summative findings on the use of these technologies and to assess benefits to students and faculty over time.

In addition, we did not attempt to randomly assign either students or instructors to treatment and control sections. Our detailed analysis of background characteristics (available in the full report) indicates that the two cohorts of students were extremely similar and gives us some confidence that selection bias was not an important factor driving our results. While we attempted to control for some instructor background characteristics, such as academic rank, it is possible that treatment group instructors differed in unobservable characteristics, such as motivation. As noted earlier, the posttests were created by local faculty in the Maryland system in accordance with the demands of their programs. We were not able to identify suitable nationally recognized instruments with which to validate their assessments of learning outcomes.

Finally, it would be very difficult for others to replicate the implementations used in this study. Instructors were given considerable latitude to design their courses using MOOCs, and the case studies in particular involved an idiosyncratic mix of course topics and contexts. In future work it would be beneficial to narrow the range of variables in order to provide more conclusive evidence about the impact of key design decisions.

**Conclusion**

This study finds that MOOCs can be used to replace some amount of class time without harming students in terms of test score and pass rates. We found that students in the hybrid sections relied heavily on the time they did have with professors, and that those in side-by-side tests reported lower levels of
satisfaction and felt that they learned less. This finding is consistent with other large-scale studies (Bowen et al., 2014; Figlio et al., 2013; Joyce, Crockett, Jaeger, Altindag & O’Connell, 2014) and may suggest a higher perceived value of classroom time. The variation of student responses across our set of test cases suggests that student reactions to hybrid formats may depend on the nature of the course, the quality of the online materials, and how effectively they are integrated into the course.

Our qualitative analysis indicates that there are a number of potential benefits for both students and faculty members associated with use of MOOCs, including flexibility in the use of class time, enhanced critical analysis skills, and exposure to different types of teaching styles and class discussions. Surveys indicate that students found value in the online resources, though slightly less than in the in-class activities. One instructor argued strongly that faculty members should take advantage of all tools and resources available to them to improve education given all the challenges they face with students. Most participants said they would like to teach again with MOOCs and would recommend this approach to their colleagues.

At the same time, the conditions are not yet in place to enable adoption of these models on any significant scale. We do not see signs that MOOC providers (either platforms or content creators) are developing business models to support institutional licensing, and we observe that intellectual property provisions still prohibit use of MOOCs in credit-bearing courses without special permission. Technology integration is still a largely manual process. Any faculty member who did have an interest in using these materials in his or her course would be hard pressed to figure out how to do so. Moreover, few universities provide incentives or support for faculty members to use MOOCs—or other types of existing online courseware—in any systematic way.

The path of least resistance seems to be for MOOC providers to serve unaffiliated learners and for faculty members teaching blended courses to rely upon other types of online resources or to create online materials themselves. From a system-wide perspective, this outcome would be unfortunate given the resources being invested in MOOCs and our national imperative to graduate more students from college. If students did as well in courses using very early MOOCs in spite of the many hurdles they and their professors had to overcome in this experiment, how might they fare using more advanced MOOCs, or MOOCs that were a better fit for their courses? Would faculty members take advantage of them if they had adequate rights, incentives, and support? These questions merit further exploration.

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References


Section II: Comparisons between Traditional and Online Environments

A Large Sample Comparison of Grade Based Student Learning Outcomes in Online vs. Face-to-Face Courses
Joseph Cavanaugh, Stephen J. Jaquemin

Comparing Student Assessments and Perceptions of Online and Face-to-Face Versions of an Introductory Linguistics Course
David Johnson, Chris C. Palmer
A Large Sample Comparison of Grade Based Student Learning Outcomes in Online vs. Face-to-Face Courses

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Abstract
Comparisons of grade based learning outcomes between online and face-to-face course formats have become essential because the number of online courses, online programs and institutional student enrollments have seen rapid growth in recent years. Overall, online education is largely viewed by education professionals as being equivalent to instruction conducted face-to-face. However, the research investigating student performance in online versus face-to-face courses has been mixed and is often hampered by small samples or a lack of demographic and academic controls. This study utilizes a dataset that includes over 5,000 courses taught by over 100 faculty members over a period of ten academic terms at a large, public, four-year university. The unique scale of the dataset facilitates macro level understanding of course formats at an institutional level. Multiple regression was used to account for student demographic and academic corollaries—factors known to bias course format selection and grade based outcomes—to generate a robust test for differences in grade based learning outcomes that could be attributed to course format. The final model identified a statistical difference between course formats that translated into a negligible difference of less than 0.07 GPA points on a 4 point scale. The primary influence on individual course grades was student GPA. Interestingly, a model based interaction between course type and student GPA indicated a cumulative effect whereby students with higher GPAs will perform even better in online courses (or alternatively, struggling students perform worse when taking courses in an online format compared to a face-to-face format). These results indicate that, given the large scale university level, multi course, and student framework of the current study, there is little to no difference in grade based student performance between instructional modes for courses where both modes are applicable.

Introduction
By almost every measure, online education continues to play an increasing role in higher education. A recent survey by Allen and Seaman (2013) of over 2,800 universities and colleges found that 32% of students—over 6.7 million total—are taking at least one online course. While the annual growth rate of online enrollment has slowed from an extremely rapid 30%+ rate of ten years ago, it is still
increasing at a rate of over 9% every year. This growth rate is not surprising since almost 70% of higher education academic leaders believe that online education is crucial for their long-term strategy. Although historically many institutions met online education with resistance, over the past 10 years, the percentage of academic leaders that rate the quality of online classes equivalent or higher than face-to-face classes has steadily increased from about 52% to 77%.

Meta-analytic work spanning the past several decades has identified negligible to modest differences in student performance between online and face-to-face course formats (Bernard et al., 2004; Zhao et al., 2005; Tallent-Runnels et al., 2006; Means et al., 2009). These meta-analyses do indicate significant variation between studies related to study design approach, study objectives, and measured student based learning or performance outcomes. To the extent that online courses are different than face-to-face courses, the grade students receive (i.e. performance) compared to the identical course taught in the alternative format should differ. There is a distinct need in the literature for larger scale studies to test these hypotheses that utilize single uniform institutional datasets composed of a variety of colleges, courses, and students. This paper compares grade based student learning outcomes in online and face-to-face delivery modes for a wide variety of subjects, courses, and course levels over a four-year period of time.

**Literature Review**

Within the academic literature there exists a considerable amount of disagreement about how effective online courses (compared face-to-face courses) are in achieving learning outcomes or educational objectives. Common study objectives within the literature include addressing a range of student based areas such as grade levels (A, B, C, etc.) and disparity, as well as student retention (course and institutional) and matriculation. Most of these studies look at comparisons of online and face-to-face courses taught by one faculty member in one subject at one particular institution. These studies are extremely important as they indicate local scale levels of variation among students; that said, smaller scale studies are not able to suggest institutional level conclusions. Many of these studies are indexed and described in the “No Significant Difference” literature concatenated by Russell (http://nosignificantdifference.org/).

The majority of studies find that there is no difference in grade based student learning outcomes between modes of instruction. For example, Ashby et al. (2011), found no statistical differences in student grades in a developmental math course when taught face-to-face compared to online or blended teaching methods. Similarly, Larson (2009) indicated no statistical difference in grades of students taking an introductory management course. Earlier work by McLaren (2004), also indicated grades of online students in a business statistics course were not significantly different between students completing online compared to face-to-face course offerings. More recently, Driscoll et al. (2012), analyzed grade differences between students taking three online and face-to-face sociology courses. While Driscoll et al. (2012) initially found grades of online students to be significantly worse than their face-to-face peers, after controlling for aptitude (GPA), grade differences between the two course formats were statistically insignificant. Specifically pertaining to larger scale studies, Atchley et al. (2013) utilized a sample of over 5,000 students from a variety of disciplines at a small public school and concurred with these other smaller scale studies that there were no statistically significant differences between student grades of online compared to face-to-face courses.

Some studies have found that online methods of instruction can have negative influences on learning objectives and student grades. For example, numerous studies specifically identify lower grade performance in online compared with face-to-face course sections (Jaggars et al., 2013; Xu & Jaggars, 2013). Increased grade disparity among students has also been associated with online courses, whereby a larger percentage of student grades of A’s, D’s and F’s are present in online courses where more B’s and C’s are associated with traditional face-to-face course formats, which suggests increased variation related to bimodal distributions (Atchley et al., 2013). Jaggars et al. (2013) point out that online courses seem to exacerbate achievement disparities that can occur between students taking face-to-face courses and
parallel reduced course completion rates. Similarly, Xu and Jaggars (2013), in a large sample of students enrolled in 34 two-year public Washington State community colleges, found that students ultimately perform worse in online courses and were also more susceptible to dropping out compared to students in face-to-face formats (Xu & Jaggars, 2013). Relative to performance outcomes on short vs. long term scales in online and face-to-face courses, Johnson and Mejia (2014) indicate that while higher grade variation and lower completion rates are present in online modes, those students that do complete an online course tend to have higher program completion rates. Shea and Bidjerano (2014) also found that after controlling for student attributes, those students taking courses in online formats actually maintain higher matriculation rates to graduation.

Course format modes are often found to significantly relate to particular student populations and demographic attributes (Stewart et al., 2010). These corollaries indicate a need to understand student attributes to appropriately describe trends between online and face-to-face courses. In addition to the grade similarities between online and face-to-face format modes, Ashby et al. (2011) described particular demographic corollaries of course formats. For example, older students and female students in general were more likely to enroll in the online course sections, but minorities were more likely to enroll in face-to-face course sections. Larson (2009) also found that a larger percentage of minorities and male students enroll in face-to-face course sections. Driscoll et al. (2012) found that students taking online courses tend to be older and added that online students also tend to have lower GPAs and work a greater number of hours per week outside of class. Relative to student preparedness as a description of students, Xu and Jaggars (2013) suggest that preparation levels between students taking online courses and students taking traditional face-to-face courses may be different, particularly between subject areas.

Some studies have attempted to explain why students in online classes may have different grade based learning outcomes from students in face-to-face classes. Calafiore and Damianov (2011) suggest that one reason students taking online courses perform worse than their face-to-face peers is due to differences in course participation habits. Using a data set from five online economics and five online finance courses, Calafiore and Damianov (2011) found that the higher the student’s GPA and the more time students spent doing online course work, the better their performance in online formats. Differences in student conduct have also been suggested as a potential explanatory mechanism. However, Hollister and Berenson (2003) provide evidence that the online course format is not necessarily associated with an increase in academic conduct issues (e.g. cheating) compared to face-to-face formats. Moreover, Hollister and Berenson (2003) found no significant difference in students’ grades when taking proctored in-class exams versus online non-proctored exams. Similarly, Hallock et al. (2003) examined the performance of 75 undergraduate business students and found no significant differences in learning styles and ultimately, the grade received by online students. They also found no statistically significant relationships between age, gender, or race with learning styles of online students.

The objective of the present study was to incorporate a large data set of online and face-to-face course outcomes from a single university spanning multiple terms while controlling for often confounding demographic and academic corollaries to generate a robust test for differences in grade based learning outcomes as pertaining to course format.

Methods

To investigate online vs. face-to-face grade differences (student performance), course level data were obtained from a large Midwest public university. Course level data included mean student values for academic (online or face-to-face course format, course GPA, student credit hours, student GPA, college) and demographic (gender, minority status, age) variables. Since the focus of this study is on the comparison of grades between online and face-to-face courses, only courses that were taught in both formats (at least once) by the same instructor were included. The sample therefore consisted of every course taught at the institution over a three year time period that was taught in both an online and a face-to-face format at least once by the same faculty member over this time period. For example, if Professor ‘Smith’ taught ENG 101 once (or more) in both an online and face-to-face format during this time period,
then all sections of ENG 101 taught by him over this time period were included in the sample. If Professor ‘Smith’ did not teach any ENG 101 sections in either an online or face-to-face format, then none of his or her courses would be included in the sample. The suite of academic and demographic variables was included to serve as a control for parsing out variation actually attributable to a difference in course delivery mode. These academic and demographic variables have been supported in the literature to strongly covary with academic performance. Thus, these variables should be factored into any analysis involving student performance as a series of covariates to avoid selectivity bias. For example, nonminority, older, female students and students with higher GPAs are more likely to enroll in online courses (Cavanaugh, 2005; Xu & Jaggars, 2013). Also, in general, it is more likely that students with higher GPAs will achieve higher scores in classes regardless of the mode of delivery. If these variables were not included in the model, then a finding that online courses are associated with higher grades could be confounded by a particular demographic or academic attribute of the students enrolling, and not because the course was being taught in an online vs. face-to-face format. Other variables may also exhibit direct or indirect relationships with the variable of interest. Future analyses should incorporate these given data availability.

Table 1. Mean student course attributes combined and separated by instruction type.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
</tr>
<tr>
<td>Observations</td>
<td>6012</td>
</tr>
<tr>
<td>Student GPA</td>
<td>3.15</td>
</tr>
<tr>
<td>Student Credit Hours</td>
<td>74.25</td>
</tr>
<tr>
<td>Gender (Male)</td>
<td>0.43</td>
</tr>
<tr>
<td>Minority</td>
<td>0.22</td>
</tr>
<tr>
<td>Age</td>
<td>26.98</td>
</tr>
<tr>
<td>CEHS Courses</td>
<td>---</td>
</tr>
<tr>
<td>COB Courses</td>
<td>---</td>
</tr>
<tr>
<td>COLA Courses</td>
<td>---</td>
</tr>
<tr>
<td>CONH Courses</td>
<td>---</td>
</tr>
<tr>
<td>COSM Courses</td>
<td>---</td>
</tr>
<tr>
<td>CECS Courses</td>
<td>---</td>
</tr>
<tr>
<td>OTHER Courses</td>
<td>---</td>
</tr>
</tbody>
</table>

Ordinary least squares regression (OLS) was used to test for the effect of course type on overall course GPA. Ordinary least squares regression is a technique useful for assessing the relationship between an $x$ and $y$ variable where a linear relationship is expected (e.g. grades). Ordinary least squares regression has been used in previous analyses assessing student performance in online vs. face-to-face course types (Driscoll et al., 2012). Of particular use in this context is the ability to run multiple models gradually including explanatory variables to predict student performance. The ordinary least squares approach facilitates the recognition of direct and indirect corollaries of student performance in a given course type. Our initial model utilized a single term approach explaining course GPA as a function of online vs. face-to-face course type. Five models of increasing saturation were then used to parse out the amount of variation explained by other academic and demographic variables irrespective of online vs. face-to-face course types (Driscoll et al., 2012). Given the many direct and indirect relationships associated with these types of data, the issue of multi-collinearity should be addressed. Multi-collinearity is a commonly occurring problem when conducting regression analysis that can lead to erroneous conclusions. Multi-
collinearity associated with independent variables was assessed using variance inflation factor values (Fox & Weisberg, 2011). To reduce non-essential multicollinearity between first order variables and their respective interactions (only one interaction included) a mean centered approach was used for student GPA (Dalal & Zickar, 2012). All analyses were implemented using the car package in the R statistical environment (R Core Team, 2013).

Results

The study included information from 140,444 students enrolled in 6,012 courses between 2010 and 2013. The courses included 1,997 online and 4,015 face-to-face offerings. Students in online classes tended to be older in age, female, non-minority, and have higher academic GPAs despite similar total credit hours enrolled (Table 1). Overall, all independent variables except for minority status were found to relate to course GPA (Table 2). Our initial model to predict student grades as a function of course format was positive and highly significant, explaining approximately 39% of the variability in course performance (Table 2). This suggests that students in online courses will receive a grade point average that is 0.39 points (almost 40% of a letter grade) higher than a student taking a face-to-face course (Table 2).

Table 2. Regression models describing sources of variation in student performance.

<table>
<thead>
<tr>
<th>Independent and Control Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course type (online)</td>
<td>0.390***</td>
<td>0.157***</td>
<td>0.097***</td>
<td>0.100***</td>
<td>0.066***</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.010)</td>
<td>(0.018)</td>
<td>(0.018)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>Student GPA</td>
<td>0.554***</td>
<td>0.464***</td>
<td>0.410***</td>
<td>0.373***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.014)</td>
<td>(0.014)</td>
<td>(0.015)</td>
<td></td>
</tr>
<tr>
<td>Student credit hours</td>
<td>0.0004***</td>
<td>0.0003*</td>
<td>0.001**</td>
<td>0.001***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>-0.329***</td>
<td>-0.249***</td>
<td>-0.251***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>-0.019</td>
<td>0.053</td>
<td>0.042 (0.038)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.038)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.018***</td>
<td>0.013***</td>
<td>0.013***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEHS (CECS)</td>
<td>0.288***</td>
<td>0.277***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.032)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COB (CECS)</td>
<td>-0.160***</td>
<td>-0.169***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.035)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLA (CECS)</td>
<td>-0.041</td>
<td>-0.044 (0.028)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONH (CECS)</td>
<td>0.107**</td>
<td>0.060* (0.04)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COSM (CECS)</td>
<td>-0.090**</td>
<td>-0.100**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.040)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER (CECS)</td>
<td>0.3371</td>
<td>0.342 (0.344)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.346)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course type x Student GPA</td>
<td>0.166***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>3.02***</td>
<td>1.36***</td>
<td>1.303***</td>
<td>1.525***</td>
<td>2.784***</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.04)</td>
<td>(0.048)</td>
<td>(0.060)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.06</td>
<td>0.29</td>
<td>0.32</td>
<td>0.35</td>
<td>0.36</td>
</tr>
</tbody>
</table>
This result is contrary to that of Xu and Jaggars (2011; 2013) who find students’ grades are lower when taking online courses. However, inclusion of additional variables in subsequent saturated models indicated the majority of this variation was a product of other academic and demographic parameters rather than course delivery mode (Table 2). The final saturated model indicated that the majority of course grade variation can be attributed to a student’s GPA. Our results indicate that students with higher GPAs tend to earn higher grades in courses. The final saturated model (Model 5) also showed an interaction between course type and student GPA indicating that students with higher GPAs tend to preferentially select face-to-face courses, and this combination results in the higher course grade. Ultimately, the overall effect of delivery mode in the final saturated model was found to explain less than 0.07 points of variation in course GPA.

**Discussion**

The overall result of little to no difference between course offering formats is consistent with the “No Significant Difference” literature (http://nosignificantdifference.org/). The significance and sign of the demographic variables were also generally consistent with other studies (Driscoll et al., 2012), which is namely that non-minority, older, female students have higher grades than minority, younger, male students. Of particular interest are the results elicited by interpreting the interaction term within the final saturated model. The interaction between course type and student GPA indicates that students with higher GPAs will perform even better in online courses (or alternatively, struggling students perform worse when taking courses in an online format compared to a face-to-face format). This has implications for student success and advising principles when identifying specific cohorts for online and face-to-face education.

Although this study finds grades, independent of demographic and academic corollaries, to be practically similar regardless of the method of instruction, the sample used was from just one institution and only included courses that could be taught in both formats (e.g. excluded science courses with lab components). Future studies should incorporate additional academic and demographic variables wherever possible to expand the scope of the study. Also, additional universities from the United States as well as elsewhere in the global academic community should be included in future models to account for regional differences in instruction. Furthermore, future studies should separate course types by subject to identify intra-institutional variation in grade performance. Course level grade variation should also be more thoroughly quantified to ensure interactions between student grades do not become exacerbated with online vs. face-to-face course format selection. Course completion and program matriculation become essential pieces of assessment and represent two aspects of scale to provide a clearer short and long term measure of the impact of online vs. face-to-face instruction.

**Conclusion**

The landscape of higher education has been the subject of much discussion with recent technological advances. Although teaching technologies and methodologies are always changing, the rapid and ongoing growth of online teaching suggests that this format will be increasingly used in the future (Aslanian & Clinefelter, 2013). Of course, widespread adoption of any technology or methodology does not itself serve as a panacea for higher education. Changes to instructional formats should always be supported by rigorous studies that identify both improvements and shortcomings of each new or old instructional mode relative to learning outcomes. Ultimately, as online education programs continue to grow, success and failure of one format or another should be gauged through instructional content, grade based outcomes, grade disparity, course completion rates, program matriculation, as well as qualitative aspects of higher education.
References


Comparing Student Assessments and Perceptions of Online and Face-to-Face Versions of an Introductory Linguistics Course

David Johnson and Chris C. Palmer
Kennesaw State University

Abstract
This article examines the issue of whether linguistics is better suited for a face-to-face (F2F) environment than an online teaching environment. Specifically, it examines assessment scores and student perceptions of the effectiveness of an introductory linguistics course at an undergraduate state university that has been taught multiple times in both online and F2F modes. To study this issue data was collected about the types of students enrolled in either version of the course, including their GPAs and course grades. A survey with both closed- and open-ended questions was also used to ask students about their experiences and perceptions of the two environments. Students responded to questions on factors such as procrastination, engagement with socially sensitive discussion topics, preferences for discussion modality, and motivations for course enrollment. Results of the data problematize the notion that linguistics (and perhaps other disciplines) is equally suited for an online and F2F environment since students fare better academically and engage more with the F2F linguistics course. Results also show that students with higher GPAs gravitate toward F2F classes. Regarding the course itself, convenience is the primary category that students consistently noted as a reason for selecting the online linguistics course versus its F2F counterpart. Even so, results do show some effectiveness in treating linguistic content online. Suggestions and strategies are offered to further strengthen online delivery of linguistic material to overcome some of the structural hurdles presented by student enrollment patterns and (dis)engagement.

Introduction
When we first decided to teach introductory linguistics as an online course at our undergraduate institution, we were initially met with some incredulity. One colleague remarked, “Wait. Linguistics? . . . Online? Don’t you and your students need to, you know, make and analyze random sounds with your mouths? How’s that going to work?” Our colleague’s surprise at this endeavor is neither unusual nor unfounded. When we began to develop online and hybrid versions of the course, many humanities and
social science courses had already been taught in online formats at our university for several years. But linguistics, up to that point, had been taught only as a face-to-face (F2F) course. We had no precedent to follow and we, too, had genuine concerns about how staples of the field, such as phonology and syntax, could be taught asynchronously, without a chalkboard, in a disembodied virtual space. Moreover, the lack of both precedent and acknowledgment of pedagogical approaches to linguistic content online within existing scholarship became apparent to us. To our knowledge, little has been published and researched about the efficacy and prudence of delivering introductory linguistics courses online.

Even if research and practice in the pedagogy of online linguistics has been somewhat slow to develop, online teaching has become a major mode of teaching in most universities today. Currently, over 30% of college undergraduates take part of their coursework online (Driscoll, Jicha, Hunt, Tichavky, & Thompson, 2012), and this number will surely continue to increase. There has been a growing body of research on online pedagogy, much of which centers on the ongoing debate concerning the quality of online versus F2F courses (Blake, 2009; Lancashire, 2009; Leong, 2010). Online courses deliver content that students can explore and learn, bolstered by video lectures and podcasts that can be replayed as needed; those students ask and answer questions with the instructor and one another that are archived for later reference in online forums; and students take both asynchronous self-assessments and instructor-graded assessments that help them evaluate their learning. Lancashire (2009) notes that online pedagogy might encourage a more thorough engagement with course content than F2F: “Extensive attendant online course materials—teacher commentaries, discussion-board entries, and chat room logs—ensure that students pay full attention to what a teacher says and can review every word uttered during a course up to the final examination” (p. 3). But as Helms (2014) has noted, very little empirical research has been done to compare the effectiveness of the same course delivered in both online and F2F formats within particular disciplines. Hence, it is not clear whether F2F and online courses are meeting the needs of similar student populations. It is not certain that asynchronous discussion achieves the sort of provocative back-and-forth that often arises during in-class debates. And most germane to the topic of this article, it is unknown whether certain disciplines—and subjects within disciplines—are better suited for one mode of delivery over another. For example, Blake (2009) notes that foreign language instructors have at times been hesitant to deliver courses online because second language learning depends on live conversation/interaction for refining cultural and grammatical acumen, especially for improving oral proficiency. But empirical research is needed to determine if such hesitation about online delivery of certain subjects is justified.

To study these issues, this article addresses three related questions that guided research on online delivery of course content at an undergraduate university. First, is the discipline of linguistics suitable to be taught online? Second, can student grades, both in the university generally and in linguistics courses specifically, reveal significant information about the types of students likely to enroll in F2F versus online versions of a course? And third, what are student perceptions of the effectiveness and approachability of an online version of a linguistics course and its F2F counterpart? To address these questions, this article first presents reflections on the unique aspects of linguistics that problematize its delivery in an online format. Quantitative data is then presented showing the distinctive academic profile, based on GPAs, of university students that took an online versus a F2F version of the same linguistics course when given a choice between the two formats. Additional data from student assessment scores are offered to illustrate differences in student performance in these supposedly identical versions of an introductory linguistics course. Next, survey data are presented that address student perceptions of the effectiveness of the online versus F2F versions of the course. The student survey data can and should be viewed in light of the general academic profile and performance of the students who self-selected one of the two delivery modes. Finally, after a discussion of these data, specific recommendations are offered to help linguistics instructors meet the specific difficulties and demands of teaching linguistics online.
Literature Review

Research on online teaching often compares online with F2F courses (Driscoll et al., 2012; Helms, 2014; Logan, Augustyniak, & Reese, 2002; Summers, Waigandt, & Whittaker, 2005) as well as offers advice about “best practices” (Clark-Ibáñez & Scott, 2008). Most of these studies seemingly confirm Russell’s (1999) postulate that there is “no significant difference” between online and F2F classes. Russell (1999) has an impressive list of research to support his position that there are no significant differences between modes of delivery. Summarizing the findings of a U.S. Department of Education (USDOE) meta-analysis of various course delivery modes, Helms (2014) writes the following: “Interestingly then, it appears that, if done ‘correctly,’ the online delivery modality can provide the same (or at least not significantly different) learning environment/opportunity as the F2F (traditional) modality” (p. 147). Even so, Helms’s own research on F2F versus online versions of an undergraduate psychology course finds significant differences in student performance in these modes. Online psychology students were much more likely to have lower GPAs and lower course grades than their F2F peers.

In regard to assessment of students in these different modes, some researchers have noted that assessment conditions were similar in the online and F2F versions of a statistics course they studied (Summers et al., 2005). Other researchers, however, examined a course where the assessment tools were similar, but testing conditions were very different. When asked about the testing conditions within these courses, Driscoll (personal communication, April 9, 2013) noted that online students were allowed to use their textbooks during testing while F2F students were not. Cluskey, Ehlen, and Raiborn (2011) found that in a range of courses, students often cheat when allowed to take online exams with no sort of proctoring system. Students in F2F courses typically have proctors and little to no access to the Internet or other outside sources during exams. Thus, testing conditions among different modes of delivery can vary considerably.

Previous studies of courses in F2F and online environments have addressed not only assessment, but also the manner of delivery of course content in multiple disciplines. Logan et al. (2002), Summers et al. (2005), Smart and Cappel (2006), and Driscoll et al. (2012) examined purportedly identical online and F2F courses in the fields of library science, statistics, business, and sociology, respectively. The online courses in each discipline relied on lectures that these scholars generally assumed to be identical to those in equivalent F2F courses. But even though both online and F2F courses can employ lectures, it should be noted that a recorded lecture in an online course is not the same as a F2F lecture. An important difference is the mode of delivery: Online lectures can differ widely in form, using different technologies—for example, RealAudio for Logan et al. versus PowerPoint for Driscoll et al. Online instructors may also choose to present themselves visually (using programs like Panopto) or provide only their disembodied voice as a narrator walking students through visual presentations of course material. In terms of advantages, Driscoll et al. note that students’ ability to review lectures, an unlikely possibility in the F2F classroom, is a major benefit of online learning.

One particular area of concern among researchers and practitioners of online pedagogy has been student engagement. When comparing F2F and online students, one variable that has been addressed in prior studies has been the tendency to procrastinate. Elvers, Polzella, and Graetz (2003), for example, generally find no consistent differences in psychology students’ procrastination in F2F and online versions of the same course, though they do identify a negative correlation between performance on assessments and tendency to procrastinate only for the online students. To combat disengagement and maintain enrollment in online courses across the curriculum, multiple scholars have argued that instructors must employ strategies for increasing student interaction and providing a sense of community, especially for courses that are difficult to teach online (Clark-Ibáñez & Scott, 2008; Gaytan & McEwen, 2007; Tschudi, Hiple, & Chun, 2009).

Even though online scholarship has often acknowledged the need to adapt pedagogical strategies in online course offerings to increase student engagement, most previous studies of courses offered in
both online and F2F formats have argued in support of Russell’s (1999) postulate. Taken together, these comparative studies of delivery modes have formed a near consensus that there are no significant differences in the content or delivery of that content to students in these different learning environments. Even though comparisons of student attitudes toward online and F2F versions of the same course have been largely underexamined, even these rare studies have tended to confirm Russell’s research. For example, Elvers et al. (2003) found no significant differences in student attitudes toward the effectiveness of online and F2F versions of a psychology class, and Driscoll et al. (2012) found no significant difference in reports of student satisfaction with online and F2F versions of a sociology class. While some small challenges to Russell’s “no significant differences” postulate are offered by scholars, it should be noted that the potential indenticality and effectiveness of F2F versus online delivery has remained untested in a variety of disciplines, including linguistics.

While each academic discipline has unique challenges associated with delivering its content in an online modality, linguistics has several particularly challenging obstacles. For instance, units on phonetics and phonology require hands-on learning—literally—with students feeling their throats when producing voiced versus unvoiced phonemes. Equally problematic are units on syntax, which often require an extraordinary amount of back-and-forth in the classroom, with the drawing of diagrams and constituency trees. Thus, the technical challenges of teaching particular subfields of linguistics demand a scholarly examination of the effectiveness of online and F2F treatment of linguistic material. Unfortunately, most scholarship on linguistics pedagogy at the university level has thus far been focused on F2F classroom techniques. While limited in scope, such research has outlined productive strategies for increasing student learning and engagement: For example, Durian, Papke, and Sampson (2009) discuss effective ways to integrate sociolinguistic analysis into activities and discussion; Curzan (2013) describes methods for integrating linguistics into courses for teachers who are training to enter K-12 language arts education; and Lasnik (2013) reviews strategies for maintaining student participation when discussing syntax in graduate courses. But to our knowledge, no research has been published about the efficacy and pedagogical soundness of delivering introductory linguistics courses online. To extend scholarship on linguistics pedagogy into considerations of the teaching of linguistics in online environments, this paper offers both data and practical suggestions. In short, we aim to answer the following: First, is the discipline of linguistics suitable to be taught online? Second, can student grades reveal significant information about the types of students likely to enroll in F2F versus online versions of a course? And third, what are student perceptions of the effectiveness and approachability of an online version of a linguistics course?

In addressing these questions, the present study of an undergraduate linguistics course adds to existing scholarship on online and F2F learning in several important ways. From a survey of relevant studies, it is clear that many social sciences—such as psychology and sociology, but not linguistics—have been represented in prior research comparing online and F2F versions of the same course. And while many studies of linguistics pedagogy have been conducted, they have been focused on the F2F classroom. For some reason, research on online linguistics courses, and how those courses might compare to F2F ones, has not been a primary focus in existing scholarship. Many prior studies of F2F versus online courses have examined one-term course offerings for comparison, with relatively small student populations. Our study spans multiple terms in which both F2F and online versions of a course were offered, providing relatively large samples of students whose assessment scores ($N = 315$) and survey responses ($N = 136$) can be split into F2F and online subgroups and compared with one another. Because we examine a model in which students self-select their delivery modality rather than being randomly assigned to it—that is, during the period of study, students at our university had the option of taking either the F2F or online versions of the class each term—the results can be compared to similar nonrandomized studies to explore student motivations for enrollment and their ex post facto reflections on the experience. And finally, prior studies of F2F and online versions of a course do not typically examine student perceptions or, if they do, tend to look only at course evaluations. The present study expands the investigation of student perceptions of modality by surveying student attitudes and motivations for taking
online versus F2F versions of the same course, including topics such as procrastination, convenience, and technical difficulty of course material.

**Method**

In order to compare an online versus a F2F linguistics course, the following methodology was used. The focus of research was Introduction to Language and Linguistics, an undergraduate course individually taught by the authors at a large state university in the southeastern United States. It is one of several courses that fulfill a linguistics requirement for English majors, though it is a required course for all English Education majors. While the F2F and online versions of the course necessarily differ in method of delivery (e.g., the use of F2F PowerPoint lectures versus Camtasia lectures in the online version), they are alike in their content, pacing, and goals. Each version devotes identical allotments of time to the same subfields of linguistics, including phonology, morphology, syntax, language acquisition, and sociolinguistics. And both F2F and online versions use a mixture of lecture and class discussion to strengthen students’ knowledge of grammar, in both Standard English and nonstandard dialects.

First, a profile of the type of student who would take the online versus F2F version of this introductory linguistics course was studied by examining the GPAs for students in each subgroup: online students versus F2F students. Five consecutive semesters were examined (fall 2011–spring 2013) and a total of 317 GPAs were averaged: 167 in online sections and 150 in F2F sections. There were two sections offered each semester and students could choose which course they wanted. If they chose the online course they also had to pay an extra $300 in fees for computer-related support. The GPAs were collected from an instructor-accessible university database during fall 2013, even though the courses were offered in various semesters. In other words, the GPAs represent all the university coursework taken by students, both before taking the introductory linguistics course and afterward. A comparison of GPAs, of course, is not sufficient evidence to fully characterize student profiles; however, it does provide insight into the types of students who were likely to select which modality they preferred when offered two versions of the same course within the same term.

One concern about the data collection of GPAs via this method was that the five online courses and five F2F courses were taught by two different faculty members. It is thus possible that students selected their courses based on the reputation of the professors and not whether the courses were online or F2F offerings. So a second comparison was done. This explored the GPAs in online versus F2F sections for students in sections taught by the same professor. Since the same instructor did not teach both F2F and online sections during the same terms, this comparison was necessarily conducted over different periods of time (F2F: spring 2008–summer 2009; online: fall 2011–spring 2013). This second comparison examined the GPAs of 167 students in online sections and 164 in F2F sections.

Second, an examination of the performance of these students was carried out by comparing assessment scores on course material: midterm exams, final exams, and final course grades. In both the online and F2F versions of the course offered by the same professor, the assessments were a midterm exam that covered introductory material on prescriptive and descriptive grammar, neurolinguistics, sociolinguistics, phonetics, and phonology. The final exam covered second language acquisition, syntax and morphology. The final course grade included these two exams, quizzes and homework.

Third, an electronic student survey was developed and sent to 264 students (with 136 students responding) in fall 2013. All students who were enrolled in one of the F2F or online versions of the course in the periods listed above (and who had available, functioning university e-mail addresses) were invited to participate. There was a 52% response rate. Response rates for online and F2F students were similar: 48.5% of respondents enrolled in the online version of the course and 51.5% took the F2F version. The survey was approved by IRB before dissemination with each student giving his or her consent before answering specific course-related questions. The first set of questions dealt with demographics (gender, age, major course of study and number of online courses taken). The next set of questions asked students about their general experiences with online versus F2F classes, especially in
terms of their perceptions of the effectiveness of the modes of delivery. Finally, students were asked a series of questions about their experiences in their linguistics course; variables such as procrastination, engagement with class discussions, and motivations for course enrollment were explored for both subgroups of students.

Whenever possible the questions for F2F and online sections were kept identical in the survey to allow for statistical comparisons between subgroup responses. But due to the differing nature of course delivery some questions were necessarily adapted for different subgroups of survey respondents. For example, when asking F2F students why they chose the F2F version rather than an online class, we included the following option: “I do not like the idea of paying $300 for an online class, so I took it face-to-face.” Since lower course fees could serve as an impetus for enrollment only for the F2F students, this question was posed only to those students who identified as enrollees in the F2F course. While methodologically necessary, the occasional differentiation in the questions posed to each subgroup limited the possibility of statistical analysis for those items. Even so, the differing questions allowed the researchers to fine-tune the survey analysis in the hopes of unearthing noteworthy distinctions in the attitudes of face-to-face and online linguistics students. All tests of statistical significance on quantitative data were calculated with SPSS software. A difference in means or medians was considered significant if the $p$-value was less than .05 ($\alpha = .05$).

To compare the survey data from open-ended responses of F2F and online students, we categorized student comments according to themes that were salient in the surveys: convenience, difficulty of material, interaction, organization, resistance to online classes, and content review. As Patton (1990) and Huberman and Miles (1994) note, analysis of survey data begins with grouping answers from different people to common questions. These groupings then become themes with which to organize the data. Looking for common themes ensured that consistent and somewhat generalizable trends emerged during analysis.

**Results**

**Comparisons of GPAs and Test Scores**

There is a noticeable difference in the type of student who takes online versus F2F sections of linguistics. The data from five semesters of linguistics courses shows students enrolled in F2F courses had, on average, GPAs that were 0.312 higher than those of their peers who enrolled in the online version of the course. An equal variances $t$ test demonstrated that there is a statistically significant difference in the mean GPA of online ($M = 2.802, SD = .702$) and F2F ($M = 3.114, SD = .593$) students enrolled in linguistics classes taught during the same terms, $t(315) = 4.25, p < .001, d = 0.48$. Table 1 shows the average GPAs of students in each term and overall within each mode of delivery. In each semester, the average GPA for the online students was lower than the average for the F2F students. F2F student GPAs were consistently higher than online student GPAs, and the average disparity in each term ranged from 0.255 to 0.424 points.

<table>
<thead>
<tr>
<th>Term</th>
<th>Online GPA</th>
<th>No. of students</th>
<th>F2F GPA</th>
<th>No. of students</th>
<th>Difference GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2011</td>
<td>2.974</td>
<td>$n = 34$</td>
<td>3.303</td>
<td>$n = 34$</td>
<td>0.329</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>2.805</td>
<td>$n = 38$</td>
<td>3.230</td>
<td>$n = 36$</td>
<td>0.424</td>
</tr>
<tr>
<td>Summer 2012</td>
<td>2.948</td>
<td>$n = 27$</td>
<td>3.315</td>
<td>$n = 10$</td>
<td>0.367</td>
</tr>
<tr>
<td>Fall 2012</td>
<td>2.712</td>
<td>$n = 35$</td>
<td>3.016</td>
<td>$n = 35$</td>
<td>0.304</td>
</tr>
<tr>
<td>Spring 2013</td>
<td>2.598</td>
<td>$n = 33$</td>
<td>2.853</td>
<td>$n = 35$</td>
<td>0.255</td>
</tr>
<tr>
<td><strong>Average GPA</strong></td>
<td>2.802</td>
<td>$N = 167$</td>
<td>3.114</td>
<td>$N = 150$</td>
<td><strong>0.312</strong></td>
</tr>
<tr>
<td><strong>Average difference</strong></td>
<td><strong>0.312</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 Comparison of GPA: Students Who Took Online vs. F2F Course, Same Semester, Different Instructors
As mentioned above, in order to account for any influence from the professor instead of the online versus F2F modality, a second comparison of GPAs was conducted. In this comparison all courses were taught by the same professor. Table 2 represents two pools of students taught by the same faculty member over consecutive semesters, though the periods of online and F2F instruction were not overlapping when controlling for the instructor. Even so, the same pattern emerges: online linguistics courses attract students with lower GPAs.

Table 2 Comparison of GPAs of Students Who Took the Online vs. F2F Section of an Introductory Linguistics Course, Same Instructor but Different Semesters

<table>
<thead>
<tr>
<th></th>
<th>Average GPA</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2011–spring 2013: Online sections</td>
<td>2.802</td>
<td>N = 167</td>
</tr>
<tr>
<td>Spring 2008–summer 2009: F2F sections</td>
<td>3.212</td>
<td>N = 164</td>
</tr>
<tr>
<td>Average difference</td>
<td>0.410</td>
<td></td>
</tr>
</tbody>
</table>

The difference in GPAs for online and F2F students, roughly 0.410, is again noteworthy. An equal variances $t$ test demonstrated that there is a statistically significant difference in the mean GPA of online ($M = 2.802, SD = .702$) and F2F ($M = 3.212, SD = .641$) students enrolled in linguistics classes taught by the same instructor, $t(329) = 5.54$, $p < .001$, $d = 0.61$.

In addition to student profiles based on GPAs, a comparison of assessment scores was completed to analyze how the students performed in the two classes. In Table 3, data is presented on three different assessments in nine different courses (five online and four F2F, one of which was a double section) from various semesters. Student scores were included in this comparison only if at least one of the assessments was fully attempted; final grades from students who enrolled in the course but failed to complete at least one exam were excluded from the analysis. A comparison of student grades confirms what Urtel (2008) and Keramidas (2012) have indicated in their studies of other disciplines: Students tend to perform better on assessments in a F2F class.

Table 3 Comparison of Exam and Final Course Grades of an Introductory Linguistics Course Given Online and F2F

<table>
<thead>
<tr>
<th>Number of online students, fall 2011–spring 2013</th>
<th>Number of F2F students, spring 2008–summer 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 146</td>
<td>N = 159</td>
</tr>
<tr>
<td>Mid-term exam mean</td>
<td>Mid-term exam mean</td>
</tr>
<tr>
<td>79.47</td>
<td>88.91</td>
</tr>
<tr>
<td>Final exam mean</td>
<td>Final exam mean</td>
</tr>
<tr>
<td>69.29</td>
<td>79.80</td>
</tr>
<tr>
<td>Final grade mean</td>
<td>Final grade mean</td>
</tr>
<tr>
<td>72.26</td>
<td>84.29</td>
</tr>
</tbody>
</table>

$T$ tests revealed statistically significant differences in the means of F2F and online scores based on all three measures listed in Table 3: midterm exam averages (online $SD = 18.866$, F2F $SD = 10.307$), $t(220) = 5.35$, $p < .001$, $d = 0.62$; final exam averages (online $SD = 24.347$, F2F $SD = 16.238$), $t(249) = 4.39$, $p < .001$, $d = 0.51$; and final grade averages (online $SD = 21.630$, F2F $SD = 11.992$), $t(222) = 5.93$, $p < .001$, $d = 0.69$.

What is particularly noteworthy is the final course average. There was approximately a 12 percentage-point difference between the online and F2F classes. Put in other terms, the class average for online courses was a C, while the class average for F2F courses was a B. It should also be noted that all exams for the online courses were open-book and open-note but were timed. Exams in the F2F classes were closed-book and timed. And the exams were similar in both types of classes; in fact, exams in both formats used many of the same questions.

Responses to Closed-Ended Survey Questions
In addition to an examination of GPAs and exam scores, a survey was conducted to compare student perceptions of the two courses. The first section of the survey investigated demographics and general experiences with online courses. Demographic results included the following:

- 82% of respondents were female, both in the F2F and online versions of the course.
- 55% were of traditional college age (18–24 years old). 21% were 25–30 years old, 17% were 31–40, and almost 8% were 41 years old or older.
- 99% were English or English Education majors.
- 89% of respondents had taken at least one online course during their university studies.

Before conducting the survey, it was hypothesized that English Education majors would be more likely to enroll in the F2F version of the course so that they could observe examples of grammar instruction within a physical classroom space. It was unclear whether other demographic variables, such as the gender or age of a student, would impact the student’s desire to enroll in one version of the course or another. Interestingly, chi-square tests of independence failed to reveal statistically reliable differences in the likelihood of enrollment in F2F or online versions of the course based on gender, $\chi^2(1, n = 129) = .001$, $p = .980$, phi = -.002, or on major, $\chi^2(1, n = 104) = 1.186$, $p = .276$, phi = .107. Similarly, age did not turn out to be a significant factor in traditional (18–24 years old) versus nontraditional students’ choice of format, $\chi^2(1, n = 130) = .246$, $p = .620$, phi = -.044. Students over the age of 30 were more likely to enroll in the online course, and students under 30 were more likely to enroll in the F2F version. But a chi-square test also failed to show a significant difference in these enrollment patterns, $\chi^2(1, n = 130) = 2.024$, $p = .155$, phi = -.125. In other words, while overall GPA and assessment performance were likely to differ for F2F and online students in linguistics courses, the demographic variables investigated among survey respondents did not correlate with their enrollments in either mode of delivery.

The survey had two questions regarding online courses in general. These questions were answered by both F2F and online students. The survey questions were the following:

- I am more likely to engage with class material in an online environment than in a F2F environment.
- When it comes to class discussions, which do you prefer: traditional in-class discussions, or online discussions using bulletin boards or programs like VoiceThread?

Results for these two questions are given in Table 4 and Table 5, respectively.

### Table 4 I am more likely to engage with class material in an online environment than in a F2F environment.

<table>
<thead>
<tr>
<th>Likert scale value (answer choice)</th>
<th>Number of online respondents</th>
<th>Number of F2F respondents</th>
<th>Total number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (Strongly agree)</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>4 (Agree)</td>
<td>10</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>3 (Neither agree nor disagree)</td>
<td>24</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>2 (Disagree)</td>
<td>19</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>1 (Strongly disagree)</td>
<td>6</td>
<td>36</td>
<td>42</td>
</tr>
<tr>
<td>I have never taken an online course.</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 5 When it comes to class discussions, which do you prefer: Traditional in-class discussions, or online discussions using bulletin boards or programs like VoiceThread?

Results for these two questions are given in Table 4 and Table 5, respectively.
Regarding the data in Table 4, a Mann-Whitney test indicated that agreement with the statement “I am more likely to engage with class material in an online environment than in a F2F environment” was, perhaps unsurprisingly, significantly greater for online students (Mdn = 3, Neither agree nor disagree) than for F2F students (Mdn = 1, Strongly disagree), U = 785.5, p < .001, r = .53. But there was a sharp contrast in the intensity of response: 59% of F2F students strongly disagreed with the statement, while only 6% of online students strongly agreed with it.

For Table 5, a chi-square test of independence showed a statistically significant difference in the responses of online and F2F students indicating their preferences for discussion format, $\chi^2(2, n = 130) = 27.38, p < .001, V = .459$. Of the F2F respondents, 90% indicated a preference for traditional in-class discussions, while only 35% of online respondents preferred online discussion. In fact, a plurality of online students (48%) reported that they preferred traditional in-class discussions.

Exploring student attitudes towards discussion more deeply, a later portion of the survey asked each subgroup the following question: “ENGL 3035 [Introduction to Language and Linguistics] covers some sensitive topics, such as the relationship between race and dialects. Did you feel more comfortable discussing these topics because it was [an] [face-to-face or online, depending on respondent’s chosen mode of delivery] class?” We speculated that given some sociolinguistic topics of discussion, including African-American English versus Standard English, students might be more willing to engage with such sensitive topics in the online class given its relatively more anonymous nature. But neither subgroup felt more comfortable in class discussion because of the chosen modality. Majorities of both F2F (68%) and online (57%) students answered “No” or “The online format did not affect my comfort level with discussing sensitive topics.” Furthermore, a chi-square test of independence failed to reveal a statistically significant difference in the responses of online and F2F students to this question, $\chi^2(1, n = 128) = 1.75, p = .186, phi = .117$.

To determine whether online and F2F students differed in their perceptions of engagement in the course, the survey posed the following prompt to each subgroup of students: “When taking ENGL 3035, I felt like I was part of an engaged community of student scholars.” Each student was asked to provide a statement of agreement or disagreement on a 5-point Likert scale, ranging from 5 (Strongly agree) to 1 (Strongly disagree). A Mann-Whitney test revealed a statistically significant difference in the responses of F2F and online students, U = 1019, p < .001, r = .46: F2F students had a mean response of 4.46 and median of 5, whereas online students had a mean response of 3.48 and median of 4. In other words, F2F students showed more intense feelings of engagement and belonging to an academic community than did their online peers.

To explore perceptions of engagement further, all students were asked about their tendency to procrastinate with the following question: “Are you more likely to procrastinate in a face-to-face class or an online class?” As previously mentioned, 89% of all respondents had taken at least one previous online course, so most students had had some experience with online courses and could answer this based on their previous experience. Out of the 130 respondents to this question, 8% responded that they were unsure about their likelihood to procrastinate in either format, and 4% responded that they could not state a preference because they had never taken an online course. A chi-square test of independence revealed a statistically significant difference in the responses of F2F and online students when reporting their likelihood to procrastinate in either modality, $\chi^2(3, n = 130) = 9.458, p = .024, V = .270$. Approximately 63% of F2F students responded that they were more likely to procrastinate in an online class, while only

<table>
<thead>
<tr>
<th>Answer choices</th>
<th>No. online respondents</th>
<th>No. F2F respondents</th>
<th>Total no. respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-class discussions</td>
<td>30</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Online discussions</td>
<td>22</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>I have no preference</td>
<td>11</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>
37% of online students responded that they were more likely to procrastinate in an online class. More interestingly, 41% of online students—a plurality of online respondents—said they were equally likely to procrastinate in either modality, compared to 22% of F2F students who said they were equally likely to procrastinate in either modality.

The survey also inquired about reasons for taking the online class versus the F2F class. But since the questions asked of each subgroup contained necessary but slightly different wording, responses could not be compared directly for statistical analysis. Even so, 71% of online students reported that convenience or scheduling was the primary reason for taking the class in an online format. Only 3% of the online students reported that they learn better in this environment. Of the F2F students, 85% responded that one reason they opted for the F2F section was that they learn better in a F2F environment. These responses dealing with preferences were elaborated upon in the open-ended questions and survey results discussed below.

Responses to Open-Ended Survey Questions

Finally, the survey asked for written comments. The question for the online and F2F subgroups was similar: Please provide any comments about taking the course in an online (F2F) format rather than a F2F (online) format. There were 31 comments from online students. After examining the comments, five themes emerged. Most students’ comments contained more than one of these themes:

- **Convenience**
  - Nine respondents (29%) commented on the convenience of taking an online class.

- **Difficult Material**
  - Nine respondents (29%) commented on the fact that linguistics had difficult material, with eight of these students ultimately claiming linguistics material is inherently too difficult for an online format.

- **Interaction**
  - Thirteen respondents (42%) commented on interaction. Four students preferred the online interaction because they are shy students or because of the sensitive nature of the topics. Nine students commented that they would have preferred F2F interaction.

- **Organization**
  - Fourteen respondents (45%) commented on the fact that the instructor’s organization of schedule and course materials was a key factor in a successful online course.

- **Review**
  - Five respondents (16%) commented that the ability to review recorded lectures was a benefit of the online format.

A major theme of the comments from online students centered around the notion of interaction with the professor and peers. Interaction was also related to the theme of difficult material. Of the students who commented on interaction, most desired interaction with the professor (and not classmates) so as to have their content questions answered more quickly. Also prevalent were comments that mentioned that the convenience of an online format was central to students’ decision to take and remain in the course. One student noted that the convenience of the online format positively impacted the learning experience: “I could take it at my leisure and listen to the lectures in the comfort of my home at any time of the day. If I wanted to go back and listen to a lecture before an assessment, I had the opportunity. I didn't have to depend on my note-taking skills like I would have in a lecture class.” However, most convenience-themed comments from students focused on convenience in terms of flexible scheduling rather than the beneficial effects of the online format on learning of course content.

There were 39 comments from F2F students. After examining the comments, three themes emerged. Most students’ comments contained more than one of these themes:
• Interaction
  o Twenty-seven respondents (69%) commented on the need for interaction with the professor and classmates to learn the material and also process both technical and provocative aspects of the course. They did not believe that knowledge of such technical material could be achieved without significant interaction with the professor, and they were skeptical that such necessary interaction could be accomplished online.

• Difficult Material
  o Twenty-four respondents (62%) commented on the technical nature of the material and that they did not understand how such material could possibly be presented online.

• Resistance to Online Mode
  o Twenty respondents (52%) commented on a hesitancy to take online courses and the fact that only certain subjects could conceivably be taught online. They thought linguistics should not be one of those courses. Indeed, there seemed to be an inherent bias against online courses in general from many F2F students, either due to a previous bad experience with an online class or due to general distrust of online learning (even if a student reported no prior experience with online classes).

A clear pattern emerged in the data from the F2F students. Twenty-seven of the 39 comments dealt specifically with the essentialness of interaction, both with the professor and fellow students. Equally prevalent were comments that acknowledged that students felt the material was too difficult to be covered online. A representative comment from one student emphasized the importance of F2F interaction with the instructor, especially regarding difficult technical material in the course, such as phonology: “For a course like linguistics, I think it is vital to be able to be in a face to face environment. We’re learning not only pronunciation (which to me means you need to be able to see the mouth shape), but we need to have the professor there to hear us to let us know if we’re doing it right/wrong. I have taken online courses with video and I feel as though I didn’t learn as much b/c there was not the immediate interaction between teacher/student and student/student.”

Discussion

Data Analysis and Implications

Overall, the preceding presentation of GPA, assessment, and survey data from students enrolled in an online or F2F version of an introductory college course in linguistics raises several salient points. The first is that, at least in this study, students who are more likely to succeed academically are more likely to enroll in the F2F course and shy away from the online version of the course. Students with lower GPAs tend to opt for the online course and, once enrolled, tend to fare worse on exams and overall course grades than their F2F peers. These data from linguistics courses corroborate studies of students in online versus F2F courses in other disciplines, such as sociology (Driscoll et al., 2012) and psychology (Helms, 2014), which have also found that online students tend to have lower GPAs and perform worse on assessments in online versions of a course than F2F ones. We tend to agree with the reasoning of Driscoll et al. (2012) that the observed lower assessment scores in online classes may be explained by the types of students most likely to enroll in them, rather than the format itself: “Student aptitude is the most important predictor of student performance, and it is only the increased presence of stronger students in the F2F sections of the course that creates the appearance of the online classroom being a less effective learning environment” (p. 321). Our quantitative research cannot explain why students with lower GPAs are more likely to sign up for the online versions of linguistics courses at our university, but the survey results suggest that convenience of course scheduling and access to course content is a driving force for those opting for the online version over the F2F one. Clearly, more research in other academic disciplines is necessary in order to more fully characterize the relationship between GPAs and students’ motivations for choosing online delivery over F2F delivery of the same course.

One factor that does not seem to strongly influence the enrollment or ultimate success of students in the online versus F2F introductory linguistics class is the age of students. First, while the present study
contains a large percentage of non-traditional-age students, as mentioned above, there was no statistical significance in the reported age of a survey respondent and his or her likelihood of enrolling in F2F or online versions of the course. Second, previous researchers have found that older learners tend to earn higher class grades in online classes (Dabbagh, 2007; Wojciechowski & Palmer, 2005) and that older learners spend more time on posting, reading messages, and accessing the course site (Ke & Kwak, 2013; Ke & Xie, 2009). One possible conclusion is that older learners are more intrinsically motivated and self-directed, which are “two critical learner characteristics required by the online learning environment” (Fe & Kwak, 2013, p. 44). So, while older students may have more demands on their time due to jobs and family obligations, we do not conclude from the data that the overall lower performance of online students is attributable to age. Even so, scholars should explore courses in a wider variety of disciplines to more deeply examine the relationship between demographic characteristics, such as age and other variables, such as motivation for enrollment, and success in online classes.

Elvers et al. (2003) analyze procrastination as an extrinsic factor; they explore whether the online modality impacts a student’s likelihood to procrastinate. In recommending directions for future research, Helms (2014) advises scholars to examine procrastination as an intrinsic “trait-based” factor that might influence one’s selection of an online or F2F course. The survey data in this study did show a significant difference in F2F and online students’ self-perceptions regarding their tendency to procrastinate in either modality. F2F students are much more likely to adopt the extrinsic view that enrollment in an online course will increase their tendency to procrastinate. A plurality of online students, however, reported that neither format influenced their tendency to procrastinate. These data may suggest that fear of extrinsic causes of procrastination may impact course selection for some students, but also that many other students may perceive their own procrastination to be less dependent on external factors, such as method of course delivery. In any case, it must be remembered that such survey data reveal student self-perceptions rather than objective measures of procrastination in a course. Further research is needed to examine whether or not extrinsic and intrinsic motivations for procrastination differ for online and F2F students.

Furthermore, survey data of students in both courses revealed that the decision to enroll in an online or F2F course was driven by several factors beyond academic performance and motivation. Principal among these is the desire for interaction and engagement. Both the online and F2F students felt as though significant and more meaningful interaction with course material, classmates, and the professor is inherently lacking in an online format. Online students reported that convenience and scheduling were primary factors in their decision to enroll, and even they tended to mention that F2F classes offered better opportunities to interact and engage with course material. Indeed, classroom interaction and participation are integral to good teaching, and research cites interaction and participation as key to effective learning and retention of material. Hull and Saxon (2009) provide an extensive catalogue of research on computer-mediated higher education and conclude that a “consensus among theorists, researchers, and practitioners of educational technology and distance education is that interactivity is a critical variable in learning” (p. 627). Fortunately, technology is constantly improving, and these improvements may provide increasing opportunities for more meaningful interaction in online courses.

Emerging technology allows for various sorts of interaction that many survey participants in this study note is lacking in online formats, and, most significantly, it allows students who are naturally prohibited from participating in a F2F class to do so in an online—and thus less threatening—environment (Summers et al., 2005; Clark-Ibáñez & Scott, 2008). Pointing to online discussion boards as a particular safe haven for students, Tschudi et al. (2009) summarize many of the advantages of online discussion forums. Yet they also acknowledge that the asynchronous nature of online courses, with students often separated from one another by time and space, has the potential to create “a lack of a sense of community [which] may lead to learner disconnection, dissatisfaction, and dropout” (p. 124). The present study of students’ perceptions of interaction in linguistics courses corroborates this notion that students are more likely to feel disconnected in an online course than its F2F counterpart. While interaction is one theme that was prevalent in our data for online students, we suggest that future and more in-depth qualitative research examine how this theme—as well as the other themes of convenience, difficult material, organization, and ability to review course material—influence students’ decision to
select online sections. Also valuable would be an exploration of how these themes, as corroborated by future surveys, affect ultimate student success in linguistics and other technical classes.

While interaction and convenience were major themes for online students, other factors led F2F students to take linguistics in the F2F format. Students commented that the material is too technical for online learning, that it requires hands-on attention, and that it necessitates a back-and-forth exchange in a classroom environment. It is true that online students learned the linguistics material in the online classes, though assessment data showed a lower success rate for online students than their F2F peers. It may be the case that successful performance in an online course requires extra initiative and more external motivation than in a F2F equivalent. In short, linguistic content can be learned effectively by online students, but such learning requires more dedication on the part of students and more initiative on the part of instructors to create opportunities for engaged learning.

Suggestions for Teaching Linguistics in Online Environments

It is undeniable that there were several factors influencing student choice about modality: extra tuition, limited choice of sections open for enrollment, and preconceived notions about online courses. The data presented here show that students acknowledge that online courses can cover the material, but students question whether such coverage in an online format can simulate an interactive and personal engagement with fellow students and the professor with a subject matter that is challenging and provocative. Language is at the heart of the human experience. It is technical, personal, and -according to the perceptions of many students- best discussed in person. Yet there are ways to mitigate the perceived disconnectedness of an online linguistics course: a few of these strategies are highlighted below.

One area of linguistics that encourages interactivity and critical thinking in both F2F and online contexts is dialect analysis. Curzan (2013) provides examples of successful exercises in her own college courses: such as analysis of nonstandard American dialects that encourage future K-12 teachers to think critically about linguistic diversity (pp. e4–e5). These exercises promote “challenging discussions that do not necessarily get sparked just from a reading but benefit from the catalyst of face-to-face conversation” (p. e8). Durian et al. (2009) have shown how analysis of regional variation, such as the data presented in the Linguistic Atlas of the Middle and South Atlantic States (LAMSAS), helps students in F2F classrooms learn how to create generalizations from sometimes very messy data (pp. 231–232). This sort of F2F activity can be adapted to online courses via the use of discussion boards to increase the interaction that survey respondents in this study indicated was a necessity in their learning of linguistic content. Students can work together to analyze dialect patterns in publicly accessible websites, such as LAMSAS (http://us.english.uga.edu/lamsas/de-maps/) or the American Dialect Survey (http://www4.uwm.edu/FLL/linguistics/dialect/maps.html).

So how can the promotion of dialect equality be achieved in the online classroom, especially in light of online students feeling disconnected from their professors and classmates as indicated in the survey? Recall that 90% of F2F students and 48% of online students in this study prefer “regular in-class discussions to online discussion.” To mirror the sort of interactive and immediate discussion that happens in a F2F class, we suggest that instructors develop activities based on the work of Dennis Preston (2011), who uses blank maps of the United States to elicit responses from people about where “correct” or “pleasant” English is spoken. Such activities require students to negotiate the meaning of Standard English itself, as advocated by Curzan (2009): Who speaks the standard, and who, exactly, decides what is or isn’t standard in the first place? Students in online courses can easily use software such as VoiceThread to articulate their views and interact online on these questions and debate with one another about the role of Standard English in American society. While some of the immediacy of a live discussion may be lost, it is, nonetheless, a viable equivalent.

Some students have commented that F2F discussions can become uncomfortable when such social topics as ethnicity, dialect and “proper” forms of language are debated. For example, in an anonymous course evaluation for one of our F2F classes, a student described his or her reservations about discussing African-American English (AAE): “I didn’t like the exercise of sitting in a circle and openly
discussing black vernacular. I felt like no matter what I said, black ppl [people] in the class were getting offended, and the forum made me feel very uncomfortable.” The quantitative results of the present study did not show that F2F or online students perceived either modality to be more appropriate for discussing socially sensitive topics. Even so, it is possible that an online forum might encourage more discussion of such topics than a F2F classroom because online students are often more anonymous than their F2F peers: The race, gender and age of an online student may be less apparent than they would be in a F2F classroom. Moreover, online instructors can take more time to formally correct erroneous or socially insensitive comments from students, codifying such corrections in writing on discussion boards or site announcements. The chance for students to discuss their intuitive knowledge about sociolinguistics with experts through asynchronous discussions can clarify or rectify students’ views on critical sociolinguistic concepts.

A prevalent theme in the survey was that linguistics material is too technical to treat in an online class. This concern, coupled with the fact that students with lower GPAs tend to opt for online classes, makes it necessary to have material and activities that explain these technical aspects as clearly and engagingly as possible. Lasnik (2013) has found that interactive class participation is a key element of the successful teaching of syntax; he provides a number of specific suggestions for guiding students through productive questions and answers in F2F exchanges (pp. e15–e16). By using software such as Flash, online instructors can achieve a significant amount of interactivity with syntax, which is a necessity for this technical aspect of the course. While the interactivity is not the same as in F2F courses, there is still a significant amount of dynamism to be found in such applications. Some sample screen shots from publicly available online syntax tutorials (http://avts.kennesaw.edu/projects/st/syntaxTrees_Ex1.html) are given in Figure 1 and Figure 2:

![Figure 1. Syntax tree tutorial, early stage of drawing.](http://avts.kennesaw.edu/projects/st/syntaxTrees_Ex1.html)
In one sense, these tutorials developed out of practical necessity: Instructors needed to devise a way to show syntax trees as an analytical process and to teach students how to show modification and complementation in a graphic form. But this software can serve as more than a supplement to lecture. For classes with student populations that have advanced skills in software such as Flash, or even in programs such as PowerPoint or Microsoft Paint, participants can be tasked to work independently or collaboratively to create their own digital syntax trees. Even though this approach to syntax may lack some of the dynamic spontaneity of a F2F dialogue, the online tutorials with related practice exercises help students focus on the logical sequence of steps that characterize syntactic inquiry—to trace how words form phrases, phrases form clauses, and clauses form sentences. More empirical research is needed to evaluate the pedagogical effectiveness of such activities in online linguistics courses, but student comments such as the following hint at their efficacy: “The online trees tutorial was extremely helpful. I think other tutorials would also be beneficial because they helped to reinforce or add to my notes.”

These are but a few examples of ways to increase interaction with material and classmates in an online linguistics course. Data collected from students indicate that it is incumbent on professors to think of ways to increase this interaction and explain difficult material well so as to more closely mirror the sorts of interactions achieved in F2F linguistic courses.

Conclusion and Future Research

The present study of student assessment and perceptions in online and F2F versions of an introductory linguistics course offers the following conclusions:

- The F2F and online versions of introductory linguistics should be considered distinct courses, primarily because the student populations likely to enroll in each version differs significantly, and the perceptions of those enrolled differ significantly.
- Variables such as gender, age, and major focus (English vs. English Education) did not seem to influence students’ decisions to enroll in either mode of delivery. But students with lower GPAs were more likely to opt for the online course. And once enrolled, online students tended to fare significantly worse on course assessments than their F2F peers.
F2F students were more likely to feel engaged with course material than were online students, especially in terms of contributing to class discussion and feeling like part of a scholarly community.

F2F students felt that they were more likely to procrastinate in online courses. Online students, however, were more likely to report that the type of course format would not impact their tendency to procrastinate.

Using current and developing technologies, instructors in online linguistics courses must devise and implement more interactive exercises that help students remain engaged with the highly technical content of the discipline. And more empirical research must be conducted to evaluate the effectiveness of such activities for different student populations.

More research is needed to evaluate the effectiveness of online delivery of other linguistics courses. It is quite possible that the results observed in the present study depend as much on the introductory nature of the course as on the difficulty of linguistic content in general. In other words, perhaps GPAs, assessment scores, and student perceptions in an advanced online course might differ markedly from those in an introductory course.

While the data presented in this study reflect the findings of previous studies suggesting some major similarities between F2F and online iterations of the same course, it is unwise to conclude that there are no significant differences in these modes of delivery—at least when student success and student perceptions of courses in both formats are compared. In particular, survey data from both types of courses have shown that students in linguistics certainly don’t perceive these courses to be identical options. What's more, it is clear that instructors must recognize and anticipate these differences in modes of delivery, and differences in the populations most likely to enroll in these modes, in order to better engage students with linguistic material at the undergraduate level.

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References


SECTION III: Case Studies

Introducing the Social Presence Model to Explore Online and Blended Learning Experiences
Aimee L. Whiteside

Is It Worth the Effort? The Impact of Incorporating Synchronous Lectures into an Online Course
Joann S. Olson, Fawn E. McCracken
Introducing the Social Presence Model to Explore Online and Blended Learning Experiences

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Abstract
This study explores the level of social presence or connectedness, in two iterations of a 13-month, graduate-level certificate program designed to help K-12 school leaders integrate technology in their districts. Vygotsky’s Social Development Theory serves as the theoretical lens for this programmatic research. The methods include a case study approach for coding discussions for 16 online courses using the pre-established Social Presence coding scheme as well as conducting instructor and student interviews and collecting observation notes on over a dozen face-to-face courses. The results of this study suggest the need for further research and development on the Social Presence coding scheme. Additionally, this study unveiled the Social Presence Model, a working model that suggests social presence consists of the following five integrated elements: Affective Association, Community Cohesion, Instructor Involvement, Interaction Intensity, and Knowledge and Experience. Finally, this study also highlighted the importance of multiple data sources for researchers, the need for researchers to request access to participant data outside the formal learning environment, and the inherently unique challenges instructors face with multimodal literacy and social presence in blended learning programs.

Introduction

As social learning theorist Etienne Wenger (1998) proclaims, “We are social beings…this fact is a central aspect of learning” (p. 4-5). We crave connections among one another within our learning environments. As instructors, we feel that spark of connected energy when students discover they have the same hometown or when they share a love of a particular animal, similar hobbies or career interests. Though seemingly and deceptively small, these social connections can change students’ perceptions and motivation for a course and influence the entire experience for everyone involved.

As a result, before we dive into the academic content, it is essential to allow time for students to connect and engage with others to develop relationships. In their landmark works on engagement, Conrad
and Donaldson (2004; 2011) refer to this phase as “Social Negotiating” in their early work and “Connect” in their most recent work. These authors suggest that engagement serves as an essential part of an online experience and that it involves a careful, phased process. The basic component of these engaged, connective experiences involves a concept called *social presence* (Short, Williams, & Christie, 1976; Whiteside, 2007).

This study addresses a gap in the literature by exploring social presence within a 13-month certificate graduate-level program designed with both online and face-to-face components. It examines the first two cohorts of a school technology leadership program. Thus, this research offers an in-depth, multi-year examination of coded online discussions, observation notes of face-to-face courses, and interview transcriptions in an effort to better understand the significance of social presence in a blended learning program.

**Literature Review**

Although many new online teachers equate social presence with learning, social presence actually drew its roots from computer-mediated communication (CMC) rather than from the learning sciences (Lowenthal, 2010). It grew out of the telecommunication era of the late 1960s and 1970s when organizations began investing more time, money, and infrastructure into teleconferencing. At this time, CMC researchers viewed social presence as that which was lost or missing from the communicative experience (Short, Williams, & Christie, 1976). These early researchers refer to social presence as the “degree of salience of the other person in a mediated communication and the consequent salience of their interpersonal interactions” (Short, Williams, and Christie, 1976, p. 65).

Then, as various interactive and other communication media evolved, such as interactive television, video streaming, and online learning environments, both Tammelin (1998) and (Whiteside, 2007) suggests a flurry of definitions for social presence emerged. Despite the myriad of definitions, Ruth Rettie, Professor at Kingston University, suggests social presence still remains nebulous. Rettie (2003) categorizes early social presence research into two very distinct categories: a) research that addresses social presence as a “property of a medium in mediated communication”; and b) research that “refers to the perceptions, behaviors, or attitudes of the participants in a mediated interaction.” The first of Rettie’s categories sees social presence as simply a lost or missing attribute of the communication within the medium. In Rettie’s second category of social presence research, social presence grows beyond “that which was lost” in the process, yet social presence exists as a byproduct of the participants’ perceptions, behaviors, and attitudes within the medium (Gunawardena, 1995; Gunawardena, Lowe & Anderson, 1997; Gunawardena & Zittle, 1997; McIssac, & Gunawardena, 1996).

As the focus shifted away from interactive television and toward online and blended learning experiences, the research in social presence began to advance beyond Rettie’s two original categories and into a third “era” (Oztok, & Brett, 2011). Curiously, though, this shift did not make social presence any easier to understand and new definitions continued to emerge from case study research. For example, Polhemus, Shih & Swan (2001) and Tu (2002) explored a one-semester online course in respective studies. These authors suggest that presence is a complex, multifaceted concept that requires further research to understand what comprises social presence and how it affects teaching and learning. Additionally, Na Ubon and Kimble (2003) studied multiple years of an online graduate certificate program. The overall findings for all of the above studies suggest: (a) higher levels of affect, cohesion, and interaction equate to higher levels of social presence; and (b) more research is needed in regard to social presence (Na Ubon and Kimble, 2003; Polhemus, Shih & Swan, 2001; Swan & Shih, 2005; Tu, 2002).

About the same time, University of Calgary Professor D. Randy Garrison and his colleagues continued crafting the Community of Inquiry (COI) Model. The COI Model extends Rettie’s categories by moving away from mere behaviors and focusing on the creation of “deep and meaningful (collaborate-constructive) learning experiences” (Garrison, “Community of Inquiry Model”; Garrison, 2009; Garrison,
2011). Garrison, Anderson, and Archer (2000; 2010) explain the COI as the interconnection of three equal presences: social presence, teacher presence and cognitive presence in relationship to the educational experience. Rourke, Garrison, Anderson and Archer (1999) unveiled a coding scheme which was extended by scholar Karen Swan and her colleagues (2001; 2002). With the emergence of the COI and the Social Presence Coding Scheme, much of the contemporary research in social presence began to gravitate toward this model (Garrison, Anderson, & Archer, 2010; Garrison & Arbaugh, 2007). Since its inception in 1996, contemporary researchers employed the COI Model in dozens of studies across various content areas (Arbaugh, 2005; Garrison & Akyol, 2012; Lomicka & Lord, 2007; Lowenthal & Dunlap, 2010), different learning technologies (Daspit & D’Souza, 2012; Dunlap & Lowenthal, 2009; Nippard & Murphy, 2007; Shea & Bidjerano, 2010), and various types of presence (Boston et al; Cleveland-Innes & Campbell, 2012; Cleveland-Innes, Ally, Wark, & Fung, 2013; Dunlap, & Lowenthal, 2014; Garrison, & Cleveland-Innes 2005; Nagel & Kotze, 2010; Richardson & Swan, 2003; Shea & Bidjerano, 2009a; Shea & Bidjerano, 2009b; Shea, Li & Pickett, 2006; Swan & Shih, 2005; Wise, Chang, Duffy & del Valle, 2004).

In recent years, researchers have made many discoveries about social presence in relation to learning environments, emerging technologies, innovative pedagogies and instructional strategies. Yet, we still struggle to understand the potential of social presence in programs, especially blended learning programs. This study seeks to explore two iterations of one specific blended learning program through a sociocultural lens to gain a better understanding of social presence.

Method

This study explored the level of social presence in a graduate-level certificate program at a large Midwestern university designed to help K-12 school leaders integrate technology in their districts (Hughes, McLeod, Brahier, Garrett Dikkers & Whiteside, 2005; McLeod “CASTLE in Education”). The program consisted of fifteen one-credit courses taught over thirteen months, and this study explored two separate iterations, or cohorts, of this program as well as interview transcriptions and observation notes in a four-year data collection process.

The participants in this program included superintendents, principals, technology coordinators, media specialists, teachers and other school leaders. The first, Cohort 1, consisted of seventeen participants, and the second, Cohort 2, consisted of five participants. There was a mix of ages, genders and races in each cohort. Each cohort began their first face-to-face session in July with four, one-credit courses during an intensive six-day session. The cohort then transitioned to two fifteen-week terms of online coursework and finally, returned to campus for a four-day, face-to-face facilitation of their final three credits. Some examples of courses were as follows: School Technology Funding, Staff Technology Development and Support, School Technology Policy Issues, School Management and Technology, Data-Driven Decision-Making I, Legal and Ethical Issues in School Technology, and School Technology Safety and Security.

This study featured the author in the role of participant-observer, as a curriculum coordinator in the program. It explored the first two cohorts of this program, which equated to 26 months of data from nearly thirty courses. The data collection process for this study began in Summer 2003 and ended in Spring 2007. Despite the age of this data, the study presents one of the few multi-year studies on social presence at the program level. Therefore, these findings are both relevant and significant today because social presence is growing in importance and because of the dearth of multi-year programmatic research for programs blended of online and face-to-face instructional components.

The research questions explored were as follows: (a) How can coded online discussions, face-to-face observation notes, and interview transcriptions illustrate social presence in a learning community?; and (b) How does social presence affect blended learning programs and vice versa? The methods included coding the online discussions for sixteen online courses using a pre-established Social Presence Coding
Scheme as well as examining instructor and student interview transcriptions and the author’s observation notes from over a dozen face-to-face courses.

Theoretical Lens: Vygotsky’s Social Development Theory

As a guiding framework, this study employed the lens of Lev Vygotsky’s Social Development Theory. This framework offers a very different approach to social presence than the commonly-used Social Presence Theory (Short, Williams and Christie, 1976). Whereas, the Social Presence Theory views social presence sensing the “real person” during the online communicative experience, Vygotsky’s (1986; 1978) sociocultural approach examines social presence holistically within a given contextual situation. Specifically, this study centered on two guiding concepts within Vygotsky’s Social Development Theory from *Mind in Society* (1976) and *Thought and Language* (1986): inner speech and zone of proximal development (ZPD). Inner speech helps us understand how thoughts move to written language in online discussions, and ZPD involves the distance between what a student can learn independently and what he/she can learn with competent assistance.

Vygotsky’s notion of inner speech illustrates how learners need collaboration in the process of moving from mere thoughts to actual speech. Initially, according to Vygotsky, the learner develops *speech-for-oneself* as he or she reflects upon their initial thoughts. Then, the learner shares these thoughts with others in a process called *speech-for-others* in an effort to achieve validation through the learner’s peers. As Vygotsky (1986) states, “It is a complex, dynamic process involving the transformation of the predicative, idiomatic structure of inner speech into syntactically articulated speech intelligible to others” (p. 249). Vygotsky suggests that students learn from reflecting on their own thoughts and then sharing those thoughts with their peers and instructors. Although Vygotsky’s work was conducted long before the advent of online learning, this author contends that his concept of inner speech sheds light into understanding how language and interaction with others online enhances the learning process in blended and online learning experiences. The concept of inner speech helps us understand the ways in which students reflect on the material, interact with others, and articulate their learning in online discussions. For example, inner speech unfolds online when students initially lurk quietly and reflect on the material. Then, they read others’ posts, and add their own contribution. Next, this post prompts the instructor(s) and students to add to each other’s posts. Finally, inner speech experiences allow participants in online discussions to unpack, articulate, and understand the material. Additionally, inner speech is often illustrated in this study when an instructor helps a student to enrich and expand their reflections; examples of this concept will be presented in the findings of this study.

Whereas inner speech helps students to better articulate their understanding of individual concepts, the *zone of proximal development* (ZPD) exemplifies the overall amount of “present knowledge” obtained during a learning experience. Vygotsky (1978) defines the zone of proximal development as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). Vygotsky suggests there are three different zones: present knowledge, proximal zone, and distal zone. The ZPD, or zo-ped as Vygotsky often called it, relates to expanding one’s present knowledge into the proximal zone. Furthermore, as one of Vygotsky’s contemporary theorists, Wells (2000), contends there is a relationship between knowledge acquisition and the social aspects of learning. He states, “For learning to occur in ZPD, [there must be]…a willingness on the part of all participants to learn with and from each other” (Wells, 2000, p. 324). Likewise, Salomon and Perkins (1998) suggest the social aspects of learning within ZPD results in an increased level of cognitive performance. These authors reflect on how learning is contextual and “highly dependent on particular cultural and social situations” (Salomon & Perkins, 1998, p. 7). In sum, the ZPD serves as a powerful model that illustrates how learning increases through collaborative experiences with both instructors and peers.
Case Study Approach and Coding Scheme

Within the methodological lens, this study employs discourse analysis within a case study approach (Merriam, 1998; Stake, 1998; Stake, 2000; Yin, 2003). Following the expert advice of Twigg (2001) and her colleagues, this research explores a rich source of data to illuminate the unique paradigmatic and pedagogical shifts involved in education. In short, the intent of this study is not to generalize to different educational environments. Instead, it intends to explore research questions within a specific case study and then suggest areas that may need additional exploration.

This study examines face-to-face observation notes from over a dozen courses, interview transcriptions (for two instructors and four students), and students’ online discussion messages for sixteen courses using the pre-established Social Presence Coding Scheme developed by Rourke, Anderson, Garrison and Archer (1999), Polhemus, Shih & Swan (2001), and Swan (2002). Table 1 illustrates how the Social Presence Coding Scheme divides social presence into three categories and offers fourteen codes to help capture instances of social presence.

Table: Social Presence Coding Scheme

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective</td>
<td>Emotion</td>
<td>Employs conventional expressions of emotion, or unconventional expressions of emotion.</td>
</tr>
<tr>
<td></td>
<td>Humor or sarcasm</td>
<td>Involves teasing, cajoling, irony, understatements and/or sarcasm.</td>
</tr>
<tr>
<td></td>
<td>Paralanguage</td>
<td>Features text outside formal syntax used to convey emotion (e.g., emoticons, punctuation, exclamation, and capitalization).</td>
</tr>
<tr>
<td></td>
<td>Self-Disclosure</td>
<td>Presents details of life outside of class, or expresses vulnerability.</td>
</tr>
<tr>
<td>Cohesive</td>
<td>Additional Resources</td>
<td>Participant provides additional readings, URLs, or other resources to help another participant or the entire group.</td>
</tr>
<tr>
<td></td>
<td>Greetings or Salutations</td>
<td>Uses communication that serves a purely social function: greetings, closures.</td>
</tr>
<tr>
<td></td>
<td>Group References</td>
<td>Addresses the group as we, us, or our.</td>
</tr>
<tr>
<td></td>
<td>Social Sharing</td>
<td>Shares information relating to their work and/or home life. Also includes phatics.</td>
</tr>
<tr>
<td></td>
<td>Vocatives</td>
<td>Addresses or refers to participants by name.</td>
</tr>
<tr>
<td>Interactive</td>
<td>Acknowledgement</td>
<td>Quotes or refers direly to others posts.</td>
</tr>
<tr>
<td></td>
<td>Compliments or Agreement</td>
<td>Compliments others or agrees with the contents of others’ messages.</td>
</tr>
<tr>
<td></td>
<td>Disagreement</td>
<td>Responds to others with a respectful, supported disagreement.</td>
</tr>
<tr>
<td></td>
<td>Inquiry</td>
<td>Asks questions of other students or the moderator. Or requests ideas from students without asking questions.</td>
</tr>
</tbody>
</table>

Additionally, this study draws upon the discursive psychology form of discourse analysis, which is based on Vygotskian principles. Phillips and Jorgensen (2002) explain that this form of discourse analysis explores “psychological processes” beyond “individual information processing” and understands them as “social activities” (p. 5). These authors explain that discursive psychology draws from “the works of
Bakhtin, Mead and Vygotsky” and view “minds and selves as constructed through the internalization of social dialogues” that are “situated language use in the contexts in which it takes place” (p. 108). Since the study involves a discourse community of school technology leaders situated within a specific cohort-based program, discursive psychology matches well with the program and the theoretical framework.

Figure 1 provides an example of a discussion post from Cohort 1 coded using NVivo, a qualitative data analysis tool. The codes appear in the bars on the right-hand side of the screen. It is noteworthy that the unit of analysis is at the sentence level and that all participants have pseudonyms in this example and throughout this manuscript.

![Figure 1: An example discussion post coded in NVivo](image)

This example provides a snapshot of the coding applied to the discussions in sixteen online courses of this program. For example, Ted agrees with his classmate Barney, and refers to him by name. As a result, this section is coded with four different codes: Compliment or Agreement, Acknowledgement, Vocative (Refer to by Name), and Opinion or Comment. He brings in his expertise with a bit of humor as well as with a question, which is coded as both Humor and Sarcasm and as Inquiry (see Figure 1). He uses italics in this passage, which is coded for Paralanguage. Ted provides resources to help Barney and his classmates, which are coded as Additional Resources. Finally, he indicates that he “hopes” the information he provides serves them well, which is coded for Emotion.

Additional data artifacts for this study include the author’s observation notes from over a dozen face-to-face courses as well as two instructor and four student interview transcriptions. The next section reports on the results of the coded data, observation notes and interview transcriptions.

**Results**

The data analysis process for this study yielded a number of findings. The results noted that instructors and students in this study both greatly value social presence. Also, the data analysis process resulted in contradictory results among the data artifacts, which ultimately revealed some shortcomings in the Social Presence Coding Scheme. These findings led to the formation of the Social Presence Model.

**Value and Importance of Social Presence**

The resulting data suggests that in this program social presence carries great value and importance for instructors and students alike. Interestingly, while students see their role in cultivating social presence all the way through the program, the data suggests that instructors may feel they bear more responsibility in the early stages of the program. One of the instructors, Dr. Mike Stanley, mentioned that learners have “one key responsibility” and that is to “take on a very natural responsibility of connecting with each other” (personal communication, May 3, 2006). Stanley commented that, after he fulfills his role of creating ice breakers and “opportunities for them to connect with each other,” the students need to step up
Lydia, a student in Cohort 1, commented that social presence extends past course content and into truly understanding a cohort member. She stated: “Social presence [is]...being able to get past the book knowledge and [about] understanding each other and understanding the relationship the human aspect of the person” (Lydia, personal communication, July 22, 2005). She found that “social presence” means having a “relationship with your colleagues and apply[ing] your knowledge...” When asked to rate the importance of social presence on a one to five scale where five represents the highest level of importance, Lydia said, “For me, it would be a five.” Another student in Cohort 1, Jerry, commented that social presence for him was “the level of comfort and trust you feel with a person in interacting with them” (personal communication, September 7, 2005). Jerry suggested that there were a number of benefits of social presence in the online component of the blended learning program, including not “fighting for the same attention” in person. He explained that the “stigma is always that, well, online is so impersonal...Well, the truth is in a lot of cases, it was better.” Thus, both students and instructors urged the importance of social presence, their responsibility in cultivating it, and its benefits for a blended learning program.

**Contradictory Results among the Data Artifacts**

Overall, the data analysis process suggests social presence is complex and difficult to measure. Although the data analysis process yielded an 80.1% inter-rater reliability result, the coded data conflicted significantly with other qualitative data sources, including instructor interviews and observation notes. Whereas instructors and students in the program commented at length during their interviews about how the second cohort was so closely bonded and connected (also validated by the author’s observation notes), the coded data suggested that the first cohort appeared to be more socially present (see Figure 2).

![Figure 2: Social presence code comparison between the cohorts](image)

The results showed that in Cohort 1 the total number of codes across all 17 participants averages to roughly 316 social presence codes per participant; likewise, the average Cohort 2 participant yielded
only 178 codes. Even after removing a few outliers in Cohort 1, the average Cohort 1 participant yielded nearly double the amount of codes of the average Cohort 2 participant. Based on the coding data, Cohort 1 was more socially present than Cohort 2. However, interestingly, the other forms of data suggest that this assumption is flawed. The results from several interview transcriptions and the author’s observation notes from over a dozen face-to-face courses told a much different story that centered on Cohort 2 as being more socially present.

For example, one set of observation notes in the first summer session of Cohort 2 stated, “Great community in this class” (observation, July 6, 2004). The following excerpt from the author’s observation notes for the last day of class for Cohort 2 noted the close emotional connection in Cohort 2: “Very emotional. Keira thank[ed] everyone for their support. Cried.” (observation, July 12, 2005). In contrast, observation notes from Cohort 1 detected very few instances of emotion and focused more on academic interaction among the participants.

The instructor interviews suggest Cohort 2 to be much more socially present than Cohort 1. One instructor, Dr. Mike Stanley, commented, “The second group was very, very tight. I think mostly because they were such a small group; there were basically just five of them” (personal communication, May 3, 2006). Another instructor, Dr. Sarah Finch, also found the smaller size of Cohort 2 impacted their level of social presence. She stated: “I think everybody in the second cohort participating in the classes was socially present” (personal communication, May 1, 2006). In regard to Cohort 1, Dr. Finch explained that she was “kind of surprised at times” when “even in the last day, they didn't know each other’s names.” Overall, she added: “I don't think that there was as deep or as much connectedness in the first cohort as there was in the second cohort.” Thus, each of the other data artifacts from the author’s observation notes from over a dozen courses to the instructor and student interview transcriptions clearly illustrated that Cohort 2 was far more socially present.

What could be the explanation for the data disparity? Interestingly, Chad, a student in Cohort 2, mentioned that there were a lot of connections and instances of social presence in Cohort 2 that occurred outside of the learning environment (and outside of the data set), which might provide an explanation for the lower levels of social presence. Chad explained: “If I had a problem, I could call Simon or Max or email them and ask him questions about what they thought” (Chad, personal communication, January 16, 2007). Chad found that Cohort 2 participants would email “each other back and forth outside of the [online] discussion.” Thus, social presence existed in Cohort 2 beyond the data artifacts, which may present a reason why there are fewer codes in the learning environment for Cohort 2.

While Chad offers one potential explanation, after carefully examining the data, two key differences emerged between the cohorts that turned out to have significant impact on social presence: (a) the prior knowledge and experience of the participants and (b) the instructors’ involvement and instructional strategies.

Knowledge and Experience as a Component of Social Presence

The first cohort consisted of seventeen students with a wide range of experienced educational leaders. With a few exceptions, Cohort 1 participants’ positions involved district-level positions where participants’ responsibilities and decisions directly affected dozens of teachers and staff members as well as hundreds to thousands of students. Also, in terms of titles, Cohort 1 embodied a vast range of positions, including an Associate Principal, Database Administrator/Programmer, Leadership Forum Director, High School Staff Development Specialist, Dean of Students, Director of Technology, and Director of Instructional Media and Technology; whereas, Cohort 2 consisted largely of middle school teachers.

Thus, Cohort 2 collectively possessed far less leadership experience and knowledge. Most Cohort 2 members worked in a classroom, not in an administrative leadership setting. As a result, there was a wealth of leadership experience in Cohort 1 that was not present in Cohort 2. Simon, a student in Cohort 2, explained why the difference in leadership experience was important and how it affected social presence. He mentioned the benefits of a closely-knit small cohort, and he suggested his only regret about being part of a smaller cohort was there was not “extra perspectives” from which everyone could learn (Simon, personal communication, August 9, 2006). Without a vast collective knowledge base the
participants could, as Simon suggests, lose the motivation to “keep up with the discussion,” whereby the online discussion becomes “lacking” (Simon, personal communication, August 9, 2006).

Simon addresses the lack of “extra perspectives,” which connects directly to the sociocultural framework for this study. Specifically, Vygotsky’s (1978; 1986) concept of the More Knowledgeable Other (M KO) within the Zone of Proximal Development (ZPD) suggests there is a relationship between the classes’ collective knowledge and learning potential. Educational researcher Gordon Wells (2000) helps us understand how the ZPD plays a significant role in knowledge acquisition. He explains that “although no member has expertise beyond his or her peers, the group as a whole, by working at the problem together, is able to construct a solution that none could have achieved alone” (p. 324). This perspective helps to understand how the lack of MKOs limits Cohort 2’s ability to gain more knowledge. Moreover, Simon illustrates that a group’s collective prior experiences and knowledge level have a significant impact on social presence as well as student learning. The lack of prior knowledge and experiences for Cohort 2 also relates to another key difference between the two cohorts: Instructor Involvement.

Instructor Involvement as a Component of Social Presence

The instructors of the program, Drs. Mike Stanley and Sarah Finch, used the same core curriculum for both cohorts. Yet, as instructors often do, they saw some room for improvement after Cohort 1 and made minor changes to their instructional approach for Cohort 2.

For example, Sarah Finch observed some Cohort 1 participants responded with a flippant word or two to fulfill the two-post requirement in online discussions. As a result, Dr. Finch added a new requirement for Cohort 2. The Cohort 2 students still needed to meet a particular number of discussion posts, but also had to qualify their answers using categories Dr. Finch developed, such as Substantive Insight, Clarification Question, Affirmation, and Collegial Challenges. Students were required to use these categories in the subject line of their discussion post and to adhere to the definition of the category they selected. Through the categorization, Dr. Finch sought to change students’ levels of thoughtfulness from a quick “yeah that’s really cool” to high levels of critical thinking where students were “metacognitively aware of what they were posting” (S. Finch, personal communication, May 1, 2006). As a result of this change, the average words per discussion post moved from an average of 179 words in Cohort 1 to an average of 203 words in Cohort 2. As Dr. Finch hoped, the discussion posts for Cohort 2 offered a much more thoughtful approach than in the previous year. However, as an unintended result, the data suggests this change adversely affected the level of social presence. One student interviewed in Cohort 2, Simon, referred to the online categories in the posts in as “more academic” and not connected to his needs (personal communication, August 9, 2006).

Another change by the instructors involved adjusting to the lack of leadership experience in Cohort 2. Since many of the Cohort 2 students were not in a position to influence the leadership of their educational organization, the instructor adjusted coursework accordingly. Table 2 shows a contrast between the questions asked of students in Cohort 1 and Cohort 2 in an online school policy course. The highlighted areas represent how this instructor situated the learning with Cohort 1 versus taking a more academic approach with Cohort 2.

This table shows a clear contrast between questions that situate learning within a cohort’s work environment (Cohort 1 Questions) and questions that target the academic course materials (Cohort 2 Questions). Simon, a Cohort 2 student, sheds light on the difference to students in the second cohort. During an interview he continually referred to the online discussions as the “academic” part of the program. Such a distinction had not been mentioned by any members of Cohort 1. Simon considered the online part to be academic because he perceived it as being based only on the course readings, not based on his or his organization’s needs (personal communication, August 9, 2006). Thus, because of the difference in prior experience, the instructors adjusted the content in ways that ultimately affected the level of social presence in the course.
### Table 2: Comparison of Online Discussion Prompts

<table>
<thead>
<tr>
<th>Cohort 1 Questions</th>
<th>Cohort 2 Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your district have a policy in place to deal with issues such as those described in this article? If so, how is it working (also, please post as an attachment so that others can see some models!)? Is it a good policy for dealing with these kind of issues or does it have some shortcomings? If your organization doesn’t have such a policy, what are the disadvantages of that approach?</td>
<td>What policy issues remain unresolved after the first two national educational technology plans? What old priorities should the third national plan continue to address? What new priorities also should be included? Please give a short explanation / justification for your answer(s) [this is important in the policy context where different agendas compete for attention and/or funding].</td>
</tr>
<tr>
<td>Does your organization ask itself the questions Fowler says it should as it implements educational technology policy? What stage(s) is your organization in for some of these various educational technology policies? What from Fowler will be particularly useful to you as you think about your organization’s educational technology policy implementation?</td>
<td>What policy issues remain unresolved after the first two national educational technology plans? What old priorities should the third national plan continue to address? What new priorities also should be included? Please give a short explanation / justification for your answer(s) [this is important in the policy context where different agendas compete for attention and/or funding].</td>
</tr>
<tr>
<td>Which of Dye’s categories does it use to evaluate the efficiency and effectiveness of educational technology policy implementation (or does it not evaluate at all)? What are the advantages and/or disadvantages of your organization’s approach?</td>
<td>When you look at the national educational technology policy initiatives that have taken place to date (e.g., E-Rate, PT3 program, community technology centers, etc.), how would you describe them? Are they examples of mandates, inducements, capacity building, system changing, and/or persuasion? Would the impact of these national policy initiatives have been more successful if they had taken a different form [be sure to describe how you are conceiving of impact, using the terminology from Dye.pdf]?</td>
</tr>
<tr>
<td>On a scale of 1 (terrible) to 10 (excellent), what overall rating would you give your state right now? What is your state doing particularly well? What is your state doing particularly poorly? What should your state be doing differently and how might it get there (remember: it’s easy to articulate problems but not so easy to articulate workable solutions)?</td>
<td>What are your reactions to your readings about state-level technology leadership issues? What were your thoughts and/or questions as you went through these readings?</td>
</tr>
</tbody>
</table>
In sum: after analyzing the data, two key missing components of social presence emerged as the differences between the cohorts: (a) the importance of the knowledge and experience of the participants; and (b) the importance of the instructors’ involvement and the instructional strategies selected between the two cohorts. These features are as central to social presence as the categories in the original Social Presence Coding Scheme: affective, cohesive, and interactive. Therefore, these two missing elements along with the Social Presence Coding Scheme are combined to form the Social Presence Model (Whiteside, 2007).

Introducing the Social Presence Model

This study examines social presence as a powerful, overarching concept (Garrett Dikkers & Whiteside, 2008, 2013; Garrett, Whiteside, Hughes & McLeod, 2005; Whiteside, 2007; in press; Whiteside & Garrett Dikkers, 2008; 2009; 2010; 2012; in press; Whiteside, Garrett Dikkers & Lewis, 2014a, 2014b, 2015). It sees social presence as a master conductor that synchronizes the instructor, students, norms, academic content, learning management system (LMS), media, tools, instructional strategies, and outcomes within a learning experience. Although the original Social Presence Coding Scheme is a great indicator of affect, cohesion and interaction, this multi-year study suggests that it takes far more to define social presence. After examining the data, two important components that affect social presence emerged: a) participants’ knowledge and experience and b) instructor involvement.

Thus, this study expands the Social Presence Coding Scheme into the Social Presence Model. It includes the original categories in the coding scheme and adds two key, additional components. Based on the data, social presence involves five integrated elements—Affective Association, Community Cohesion, Instructor Involvement, Interaction Intensity, and Knowledge and Experience—that together affect participants’ motivation to take an active role in their own and their peers’ learning. To help understand this definition the Social Presence Model in Figure 3 illustrates the five elements that define social presence (Whiteside, 2007).

![Figure 3: The Social Presence Model](image)

The following sub-sections define each element of the Social Presence Model: (a) Affective Association, (b) Community Cohesion, (c) Instructor Involvement, (d) Interaction Intensity and (e) Knowledge and Experience.

**Affective Association** The Affective Association category addresses the emotional connections which occur within the program. This area, which targets instances of emotion, humor and self disclosure related to personal emotion, is represented though the Affective category of the Social Presence Coding Scheme (Rourke, Anderson, Garrison and Archer, 1999; Polhemus, Shih & Swan, 2001; Swan, 2002). It also addresses paralanguage, such as all caps, boldface font style, and emoticons or emojis. Instructor Mike
Stanley finds that if students do not “trust those people and respect those people,” then they are not going to feel the emotional connection (M. Stanley, personal communication, May 3, 2006). Dr. Stanley continues that, if students do not feel an emotional bond, then they are not going to “put it out there,” and then, they “can’t learn from it.” As students invest emotionally in their course community, they can become more invested in the academic course content (Conrad & Donaldson, 2004; Conrad & Donaldson, 2011). In addition to Affective Association, Community Cohesion marks another key component of social presence.

**Community Cohesion** Community Cohesion relates to the course community. This area includes sharing additional resources and information with the group as well as seeing the group as a cohesive whole. It also involves being an approachable group member, which includes codes for greetings, salutations, and vocatives (referring to others by name) as well as sharing information and resources with others. Chad, a student in Cohort 2, finds that “cohort means cohesiveness” (personal correspondence, January 17, 2007). For Chad, the cohort relationship was a big part of social presence. Chad distinguished between being “just part of a group” versus the bonding he experienced in the cohort through activities. Chad explained: “I think as you work together, you’re working towards a goal.”

Instructor Mike Stanley agreed with Chad’s explanation. He suggested, “I think that if you’re feeling disconnected from your class peers, you don’t have as much intrinsic incentive to engage in discussion [and] to connect others to resources that you know about” (M. Stanley, personal communication, May 3, 2006). This statement from Dr. Stanley helps illustrate the interconnected nature of social presence elements, and his role leads to our next element: Instructor Involvement.

**Instructor Involvement** Another important element for social presence which emerged from the literature and the data is the true importance of the instructor’s involvement. Each one of the students interviewed mentioned instructors’ initial community building “activities” were essential to them in establishing relationships and making social connections. Likewise, it is also important for instructors to push their students to engage in critical analyses and higher-order thinking in the online environment. For example, Figure 4 offers three sequential messages between Leanne and her instructor, Dr. Stanley, which illustrate the relationship between instructor involvement and social presence.

**Topic:** Schmoker Discussion  
**Date:** May 11, 2005 10:14 PM  
**Subject:** Re:Chapter 1 (Teaming)  
**Author:** Leanne

In my limited experience, teaming can be a fabulous professional experience, but much is dependent upon the quality and style of leadership and the climate that is established. If cooperation and respect, along with high expectations for all, are modeled, team members will be more likely to interact with these values in mind. If a tone of competition and rivalry is set, then teams will be negatively impacted and less likely to be successful.

**Topic:** Schmoker Discussion  
**Date:** May 12, 2005 1:35 PM  
**Subject:** WHERE IS OUR GOOD LEADERSHIP WHEN WE MOST DESPERATELY NEED IT?  
**Author:** Stanley, Mike
Well said, Leanne, but it's too bad that this even has to be said in the first place... WHERE IS OUR GOOD LEADERSHIP WHEN WE MOST DESPERATELY NEED IT?

**Topic:** Schmoker Discussion
Date: May 12, 2005 9:13 PM  
Subject: Re: WHERE IS OUR GOOD LEADERSHIP WHEN WE MOST DESPERATELY NEED IT?  
Author: Leanne

Thanks for your response, Mike.
I think the problem is that there really isn't much good leadership out there. More often, it's management that is happening, even when it is called leadership. I have been musing on the difference between the two (another article idea!) and have come to some conclusions.

Leaders take you somewhere, they have vision and the understand the big picture, and are able to communicate where they are taking you and why. They inspire trust and elicit respect, although you may not agree with them. They also trust the members of their organization, and because they trust them, they have high expectations for them. Participating in this sort of environment feels good. Management is different in that frequently there is not alot [sic] of leading going on. Managers either try to keep you where you're at or they attempt to herd you where they want you to go. They do not inspire trust or respect. They seldom have vision, but are generally just trying to stay under the radar and "do their job." Being managed does not feel good and can result in feeling of resentment. What best illustrates this for me is how it used to feel in the classroom when everything was working: I wanted to take the kids somewhere, and they were coming willingly- it's an incredible high. Conversely, the days, or weeks, or...) I felt that I was doing purely crowd control felt like crap- there was little reward in it, for anyone.

Now as far as how we've gotten to this point...but, that's another discussion. It felt so good to write this!

Figure 4: Discussion Illustrating Instructor Involvement and Social Presence

In this lengthy example, the student, Leanne, began with a discussion of how team success depends on leadership. Her account was initially written using passive voice, and she seemed to strive to avoid any agency. For example, she talks about “the quality and style of leadership” and need for the concepts of “cooperation and respect” to be “modeled.” When the instructor sensed her frustration and provided some feedback, the tone of Leanne’s response completely changed. Her words suggested she felt more comfortable stating her points, and, at the end of her message, exclaimed, “It felt so good to write this!” In terms of social presence, Leanne’s first message was coded only for Social Sharing and for Comments or Opinions. After the instructor’s feedback, her second message, in contrast, showed the following codes: Acknowledgement, Compliment or Agreement, Emotion, Opinions or Comments, Paralanguage, Social Sharing, and Vocative. This example illustrates the importance of the instructor for engaging and growing social presence within a learning experience. As the instructor helped the student express their thoughts and ideas, we also see a key example of Vygotsky’s concept of inner speech in an online learning environment.

Interaction Intensity Interaction Intensity, by definition, consists of the level of interaction between participants. Interaction Intensity is included in the original Social Presence Coding Scheme (Rourke, Anderson, Garrison and Archer, 1999; Polhemus, Shih & Swan, 2001; Swan, 2002). It includes acknowledgements, which can be a direct quote from another classmate or a paraphrased version of another classmate’s previous statement, such as “I enjoyed the way you integrated Finch’s framework into your district” or “Your thoughts and analysis about copyright really got me thinking about how it is handled in our district” (S. Finch, personal communication, May 1, 2006). Interaction Intensity involves agreement, disagreement, compliments, and questions. For example, Figure 5 provides a discussion
response from Cohort 1’s School Technology Policy Issues course and offers an example of Interaction Intensity.

Subject: Re: CIO
Author: Debbie Date: December 8, 2003 9:07 AM

I agree with the others. Like Paul & Trudy, our Technology Coordinator is a non-cabinet position. Our Technology Coordinator did recently retire. He was formerly a classroom teacher, so like Trudy, it was a step in the right direction. He had the classroom perspective, and had enough working knowledge on the tech front to know what had to be done and to surround himself with the right folks. However, we always seemed to be in an infrastructure focus, which is what was needed at the time.

Well, now that we have the infrastructure & hardware in place, we need to begin the integration focus, to which our previous coordinator would have lent much knowledge & experience to know what was needed in the classrooms. We are thrilled with his successor (who had been his assistant), but she is without the classroom experience as she is just tech-savvy. Luckily, she is aware of this fact. It is my hope that she will surround herself with the correct people and build a working knowledge of what must happen now.

For the utopian position, I also concur that a CIO would be most beneficial. But, it comes down to resources in both [sic] time, money and personnel.

Figure 5: Example of Interaction Intensity

In this message, Debbie shows her agreement with Paul and Trudy, and she refers to her classmates by name (vocative), which showed her level of investment in the discussion.

Knowledge and Experience Finally, another one of the important new themes that emerged from the literature and the data is that prior knowledge and experiences play an essential role in building social presence. Cohort 1 participants’ occupations included various district-level leadership positions that directly affected dozens of teachers and staff members and thousands of students, and they, as a community of learners, offered each other continual advice based on their tremendous expertise. Cohort 2, in contrast, consisted largely of teachers without the leadership roles and experience of the first cohort.

The methodology for this manuscript, and, specifically, Vygotsky’s Zone of Proximal Development (ZPD), provides an explanation why the combined present knowledge of Cohort 2 is much less than that Cohort 1. Wells (2000) explains that the group’s potential equates to the sum of its parts. Without the depth of the knowledge base in Cohort 1, the Cohort 2 participants can, as Simon suggests, lose the motivation to “keep up with the discussion” (personal communication, August 9, 2006). Thus, a group’s collective experience and knowledge level has an impact on social presence. Without the vast collective knowledge to share and the willingness to share it, the number of potential connections reduces, which also reduces the level of social presence.

Overall, the Social Presence Model with its five integrated elements can serve as a heuristic for instructors and students as well as an important tool for current and future research (Garrett Dikkers & Whiteside, 2008, 2013; Garrett, Whiteside, Hughes & McLeod, 2005; Whiteside, 2007; in press; Whiteside & Garrett Dikkers, 2008; 2009; 2010; 2012; in press; Whiteside, Garrett Dikkers & Lewis, 2014a, 2014b, 2015). Social presence affects learning only to the extent that instructors and students are willing to integrate the five elements of social presence. Likewise if the class is not affectively invested in one medium (face-to-face or online) in a blended program, the level of social presence can drop for the entire course. In this study, the lack of connectedness in the online discussions diminished the overall social presence for Cohort 2. Thus, maximizing each of the five elements of social presence in each medium of a program can contribute to a more powerful overall learning experience.

The next section highlights some data-driven discoveries from this study with the hope that researchers will continue to explore social presence in different contexts.
Discussion

This section highlights several key findings from this four-year study on social presence in a blended learning program. The data from this study (a) introduce the Social Presence Model, (b) recommend revisiting the Social Presence Coding Scheme, (c) highlight the importance of multiple data types and informal learning, and (d) determine that blended learning programs demand exceptional facilitation.

Introduced the Social Presence Model

A major contribution of this research involves the addition of two more essential elements to further the understanding of social presence: (a) prior knowledge and experience and (b) instructor involvement and instructional strategies and activities. These additional elements merge with the existing elements of the existing coding scheme to form the Social Presence Model of five integrated elements (Affective Association; Community Cohesion; Instructor Involvement; Interaction Intensity; and Knowledge and experience) that together determine a participant’s motivation to take an active role in their own and their peers’ learning. This model is comparable to the COI; the distinct difference is that social presence serves as the overarching principle that drives learners, instructors, academic content, norms, behaviors, instructional strategies, activities, and outcomes.

Recommended Revisiting the Social Presence Coding Scheme

Although the Social Presence Coding Scheme offers an essential first step to determining social presence, this study as well as other studies, suggests that it needs careful revision to more accurately determine a concept as complex as social presence (Lowenthal & Dunlap, 2014). For example, the coding scheme needs to be weighted. For example, currently an instance of deep self disclosure counts the same as someone using all caps or an exclamation in a post, which results in an inaccurate portrayal of social presence. Likewise, the coding scheme must better determine what constitutes “high” and “low” levels of social presence across courses and programs. Finally, a universal shared codebook would help with coding consistency and overall questions. For example, should a student providing an additional resource count as Community Cohesion or Interaction Intensity? Also, should Social Sharing count as Affective Association, Community Cohesion, or Interaction Intensity, or should it be coded for all of them? This author recommends the Social Presence Coding Scheme receive careful examination and consistent protocols for research.

Highlighted the Importance of Multiple Data Types and Informal Learning

Because of the discrepancies in the data, having multiple types of data proved imperative for this study. Going forward, social presence researchers may wish to consider a number of varied data sources, including but not limited to interview transcriptions, email/Facebook/Twitter/chat/phone/text correspondences, blog responses, video conferences, course assignments, observation transcriptions (from online sessions), and online discussions. These varied data sources help triangulate the results.

Additionally, the author recommends that future studies consider both the formal and informal learning environments because social presence extends beyond the confines of the formal learning environment. Researchers may wish to request IRB approval to study students’ day-to-day texts as well as Facebook, Twitter, Tumbr, Word Press, email, chat, and phone correspondences. This study determined that a large amount of unrecorded social presence happened outside of the scope of the study, which limited the study’s ability to accurately access the amount of social presence.

Determined that Blended Learning Programs Demand Exceptional Facilitation

Finally, this study shows that instructors bear a multitude of responsibilities in blended learning programs. Not only do they have the pressures of developing a clear organizational structure and employing content expertise, but instructors must also consider the role of social presence in that process. As illustrated in Table 2, even seemingly small changes can alter the social dynamics of a learning community.

Furthermore, the instructor and students’ roles and responsibilities change in each medium of a blended learning program. The instructor(s) must be effective facilitators in each medium while carefully
scaffolding their learners through the content. In particular, instructors must facilitate social connections as the students make the transition from a face-to-face classroom to an online learning environment and vice versa. Blended learning programs challenge instructors to be flexible, to wear a number of different hats (active participant, expert, facilitator, and cheerleader), and to think critically about the affordances of the different media in order to continually engage students in meaningful learning and to maintain social presence.

Blended learning programs challenge researchers as well. One discovered weakness of this study is that the author relied on observation notes for over a dozen one-credit face-to-face courses across both cohorts. In the future, this author suggests researchers consider audio or video transcriptions to more accurately capture face-to-face experiences and to better balance data from both the online and the face-to-face components of the blended learning experience. When researching blended learning programs, it is vital to consider the interplay between the online and face-to-face components as well as to fully examine all components of the program.

**Conclusion**

This study explored social presence within the first two cohorts of a 13-month graduate-level certificate program designed to help school administrators integrate technology into their districts. Vygotsky’s Social Development Theory served as the theoretical framework to explore this programmatic data. This study employed the pre-established Social Presence Coding Scheme by Rourke, Anderson, Garrison and Archer (1999), Polhemus, Shih & Swan (2001), and Swan (2002). The coded data showed a disparity in social presence between the two cohorts, which conflicted with other data artifacts, including interview transcriptions and observation notes. Further analysis indicated that the Social Presence Coding Scheme did not completely define social presence—there were two important missing elements. Accordingly, the study unveiled the Social Presence Model, which includes a combination of the three components from the original Social Presence Coding Scheme and the two missing elements. Thus, the Social Presence Model consists of the following five integrated elements: Affective Association, Community Cohesion, Instructor Involvement, Interaction Intensity and Knowledge and Experience.

In closing, social presence is important in blended learning programs because the shifting literacies in multimodal learning environments create unique challenges and opportunities for teaching and learning with profound consequences for learners and instructors (Selber, 2004). Instructors are still exploring the affordances of a mix of face-to-face and online environments and are continually learning more about how to maximize student learning in a multimodal program (Bender, 2012). Blended learning programs are challenging because instructors and learners are toggling among the different media, which requires a lot of adaptability and increases the need for social presence. Therefore, this research provides an exploration of one landscape of learning that may lead to future explorations and advancements within educational discourse. The author recommends more programmatic studies that explore social presence, especially in blended learning programs. Additionally, we need studies that target the role of assessment, engagement, and student learning outcomes (SLOs) in concert with social presence.

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References


Is It Worth the Effort? The Impact of Incorporating Synchronous Lectures into an Online Course

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Abstract

This study explores student achievement, sense of social community, and sense of learning community (Rovai, 2002) in two sections of an online course taught concurrently by the same instructor. One section was delivered in a fully asynchronous format; the other incorporated weekly synchronous lectures using an Adobe Connect environment. Students were randomly assigned to one of the two sections but allowed to change sections (before the semester began) if unwilling or unable to participate in weekly Adobe Connect meetings. Data included grades on course assignments, final course grades, end-of-course evaluations, and responses to the Classroom Community Inventory (Rovai, Wighting & Lucking, 2004). No significant differences were found on measures of academic achievement, student satisfaction, social community, or learning community between the two sections.

Introduction

Engagement and participation are often highlighted as key components of excellence and effectiveness within online courses (e.g., Palloff & Pratt, 2011). Students, faculty, and administrators alike have explored the addition of synchronous activities into existing course work as a means of increasing immediacy (Schutt, Allen & Laumakis, 2009) or “teaching presence” (Garrison & Anderson, 2003) in online education. As bandwidth becomes increasingly affordable and access to the Internet increasingly assumed, adding course components such as real-time lectures or group discussions using web conferencing may, indeed, increase student engagement and learning. This is a move that makes sense, intuitively: when students and teachers can interact and respond in real time, perceptions of student-to-student and student-to-teacher contact (Falloon, 2011; Pattillo, 2007) and a sense of community (Hratinski, 2008) may increase.
However, incorporating synchronous technology requires significant investments in terms of technological infrastructure, faculty development, and student technical competence. In addition, students who may have been drawn to the “no set schedule” nature of a fully asynchronous learning environment may not wish to—or may not be able to—navigate the time constraints of scheduled synchronous sessions. This may be particularly challenging for students who rely on public-access technology (e.g., computer labs at schools or libraries) when they do not have sufficient bandwidth or technological resources at home. What happens to these students if the computer lab happens to be unavailable when the class session is scheduled to begin? It is important to consider whether the real and perceived benefits outweigh the real and perceived costs of these synchronous activities.

This article describes a case study in which one section of an online course incorporated weekly synchronous lectures and another section of the same course (taught by the same instructor) was delivered in a fully asynchronous format. The research questions driving the study were: (1) Is there a significant difference in student achievement and satisfaction when using synchronous video conferencing sessions in a primarily asynchronous distance education course? and (2) Is there a significant difference in students’ sense of learning community and social community when adding synchronous video conferencing sessions to a primarily asynchronous distance education course? In other words: Is it worth the effort?

Literature Review

Given the inherent promise of real-time interaction for increasing student engagement and achievement, many have looked to synchronous activities within online learning, often assuming that it will serve as a way to increase “presence” and immediacy in online courses. Researchers have explored various applications for this technology and results have varied. This literature review explores the relationship between synchronous activities and aspects of “presence” in an online course, the impact of incorporating synchronous activities upon other aspects of the online course, and the suitability of the Classroom Community Inventory (Rovai, 2002) to measure aspects of community within online courses.

“Presence in Online Courses”

Palloff and Pratt (2011) have highlighted “establishing presence” as the “first order of business” (p. 7) for online instructors. Their concept of presence highlighted the social aspects of interacting online: visibility, interpersonal connection, and self-expression that work together to foster points of connection between learners who are physically separated from one another. Other ideas of presence have highlighted cognitive and academic interactions in online courses, such as Garrison & Anderson’s (2003) description of teaching presence. Baker (2010) found that students in asynchronous courses rated their instructors lower, in terms of immediacy, than those in synchronous courses. Baker also found that synchronous students recorded higher levels of presence than asynchronous students, an outcome echoed in research reported by Rockinson-Szapkiw, Baker, Neukrug, and Haynes (2010). Students who participated in synchronous web-conferencing reported that instructors felt less distant during the course and attributed this to the impact of synchronous discussion groups (Patillo, 2007). Hrastinski, Keller, and Carlsson (2010) suggested that synchronous activities can be effectively used to support strong relationships and participation in group projects within a larger class. At the same time, Hrastinski et al. also noted that “weak ties” are developed among “class-wide relations” (p. 656) when synchronous communication is used for lectures or whole-group discussions. These weak ties may result in “decreased cognitive effort” (p. 656) among the group, when compared to asynchronous learning activities.

Increasing presence is likely about more than simply adding synchronous activities into a course, however. Schutt, Allen, and Laumakis (2009) used a combination of delivery methods (video, audio, and text) and instructor behaviors to pinpoint the effect of both setting and instructor behavior upon students’ perceptions of immediacy and social presence. They reported that video-enabled computer conferencing does seem to help an instructor communicate the behaviors that are important for conveying immediacy in an online classroom, but that the technology alone does not increase the sense of immediacy. In other
words, as Schutt et al. stated: “If an instructor fails to employ immediacy behaviors, students are more likely to perceive him/her as nonimmediate, regardless of whether the communication environment is (a) video- and audio-enabled or (b) only audio-enabled” (p. 144). They further highlighted the role of instructor training in promoting immediacy and presence, regardless of the media or technologies employed. Stafford and Lindsey (2007), on the other hand, suggested that the social orientation of the student and the perception of learning using technology strongly influence the student’s perception of teleconferenced courses. Furthermore, the work of Hall and Herrington (2010) called attention to the impact of a learner’s cultural context on his or her comfort level when participating synchronously (or asynchronously). Based on their research, they suggested that students from more typically collectivist cultures may find synchronous conversations to be a more effective medium for discussion, as it promotes consensus and group processing, where as those from more individualistic cultures may be more comfortable with the independent, declarative nature of asynchronous discussions.

**Synchronous Instruction in Online Education**

As evidenced in the literature, incorporating synchronous activities into online courses can have an impact on course outcomes, although this impact may not always be what course designers or instructors had hoped for. Johnson (2008) rotated students through asynchronous and synchronous discussions of course-related case studies and examined both academic achievement and students’ self-reported perception of which mode they felt to be more effective for their own learning, finding no evidence that students preferred one mode over the other. At the same time, courses that included synchronous sessions have, in some cases, also shown increased activity in asynchronous course components (e.g., discussion posts; Spencer & Hiltz, 2003). Participants in Falloon’s (2011) study indicated that while the synchronous session may have allowed for the dissemination of more information and may have facilitated trust-building within the course, they also felt they did not have enough time when working in a synchronous environment to reflect deeply on the content and or comments made by others before they were required to respond.

It seems, therefore, that students may utilize asynchronous and synchronous activities in different, complementary ways in the service of their learning. Teng, Chen, Kinshuk, and Leo (2012) found that students used text [chat] messages primarily to bring greater clarity rather than to engage in synthesis or evaluation of course materials. Oztok, Zingaro, Brett, and Hewitt (2013) noted that students who participated most actively in synchronous components of the class were also likely to be the most active in asynchronous activities in the course. Hrastinski (2008) found that students used asynchronous e-learning for “cognitive participation” whereas synchronous e-learning more often increases “personal participation” (p. 54) that may increase commitment and motivation. He concluded that researchers in online education should move beyond trying to determine whether synchronous or asynchronous instruction was the “best” medium and turn attention to the strengths and contributions of each to students’ learning.

The inclusion of synchronous technology does introduce an element of unpredictability to the learning environment (Melkun, 2012). A power or Internet outage that produces mild frustration for students in an asynchronous environment can be a significant disruption when occurring during a synchronous teaching session. In addition, as discussed earlier, students who rely on public-access technology (e.g., libraries or school computer labs) may find they are unable to access course resources at the specific time required by the instructor. Researchers have also found that structural elements of the course, such as course organization or lack of clarity regarding the purpose for incorporating synchronous elements, influence a student’s engagement with the class (Falloon, 2011).

Rovai and others have conducted research related to classroom community in asynchronous learning settings (Rovai, 2001a; Rovai, 2001b); television-based distance education (Rovai & Lucking, 2003), and blended learning environments (Rovai & Jordan, 2004). Taken as a whole, these studies suggest that while the setting and format of the course may shape students’ experience, the actions of the instructor play a significant role in fostering community within the classroom. In several studies, participants highlighted the impact of the instructor’s familiarity with the synchronous technology in...
facilitating effective and meaningful learning environments (e.g., Bower, 2011; Exter, Korkmaz, Harlin, & Bichelmeyer, 2009; Falloon, 2011). For students in Exter et al.’s (2009) study, the instructor’s comfort with technology was a key component in their evaluation of the course.

Moving beyond the question of whether asynchronous or synchronous learning is “better,” as suggested by Hrastinski (2008), this study seeks to understand the development of social and learning community within an accelerated (five-week) undergraduate course where the synchronous session highlighted material related to one specific assignment each week. By exploring the differences in learning outcomes and perceptions of social and learning community as experienced by two sections of the same course—one delivered fully asynchronously and the other incorporating synchronous lectures—this study seeks to address several gaps in the literature. The intervention focused the synchronous sessions toward the promoting and evaluating the student’s cognitive participation (Hrastinski, 2008) in an online course rather than what may be the default contribution of synchronous technology, namely, the promotion of personal participation (Hrastinski, 2008). In addition to comparing student achievement across two sections of a course taught using various synchronous and asynchronous modalities, this study also seeks an understanding of any variations in student perceptions and experiences of social and learning community.

Methods

This study sought to explore the impact of adding synchronous lectures to an otherwise asynchronous, online, undergraduate course. Researchers sought the cooperation of an experienced online (adjunct) instructor who had indicated an interest in incorporating new strategies and emerging technologies into online courses. Undergraduate courses in the Adult and Graduate Studies division of this small, faith-based college in the Upper Midwest were offered in an accelerated, five-week format; most courses are 3-credit courses. During one particular five-week section, the instructor was assigned to teach two sections of the same undergraduate course. The design team, comprised of the two authors of this article, the instructor for the course, and the Division’s curriculum coordinator, selected these two sections to evaluate the impact of incorporating synchronous technology into online courses in the form of weekly lectures delivered using Adobe Connect. The two sections were offered during the same calendar period and used the same syllabus, assessments, asynchronous discussion questions, and grading scale. The design team identified one assignment each week that would be highlighted and discussed during weekly synchronous lectures, referred to herein as the “targeted assignments.”

Participants

As students registered for this class, they were assigned randomly to either the fully asynchronous (ASYNC) or the asynchronous+synchronous (ASYNC+SYNC) section. Since almost all of the online courses offered by this division are fully asynchronous, the design team recognized that the additional requirement of “set time and place” synchronous activity might prove to be a hardship for students. Therefore, when students were assigned to the ASYNC+SYNC section, they received an e-mail explaining the format of the class, describing the synchronous section, outlining the participation requirements, and asking about their willingness to participate. We moved students out of the ASYNC+SYNC section if they requested ASYNC; we then asked a randomly selected student from the ASYNC section if they would be willing to participate in ASYNC+SYNC section and adjusted registrations as necessary. Even though this strategy may have introduced the possibility of selection bias, it was the best way to honor the time and scheduling expectations of our students. As the class began, 16 students agreed to participate in the ASYNC+SYNC section; 22 were enrolled in ASYNC.

Course Design

As the design team developed the syllabus, both sections were assigned the same readings, discussion forum questions, and graded assessments. ASYNC and ASYNC+SYNC students were given the same assignments (e.g., weekly asynchronous discussion posts, response paper, etc.) and course
materials (e.g., supplemental readings, un-narrated PowerPoint presentations, etc.) throughout the course; assignments and discussion forum responses were graded according to the same criteria.

Students in ASYNC+SYNC were required to participate in one Adobe Connect session each week; the instructor facilitated one session on Thursday evening, led another on Saturday morning, and also made the recordings available to students. Students chose the session that fit their schedule. For each week of the course, the team identified one writing assignment that would be the focus of the synchronous session. During the Adobe Connect session, the instructor delivered content and led real-time discussions related to that assignment, discussed PowerPoint presentations closely related to the assignment, asked for input from students, and interacted with students via the chat feature of Adobe Connect. The instructor also discussed the requirements of that particular assignment and responded to students’ questions.

The design team made the decision to mute students’ microphones to reduce technical disruptions such as spending significant time helping students get microphones set up, multiple speakers “talking over” each other, and so on. We recognize that this tactic did limit some of the spontaneity of a “live” discussion; however, we were primarily interested in minimizing potential technical difficulties and frustrations for the students as most were unfamiliar with this type of technology. As researchers, we see the potential for incorporating a full range of audio and video technologies into online courses. In this instance, however, our roles as educators and administrators mandated that we limit the synchronous activities to a real-time lecture with text-based chatting, as we did not want technical issues to impede students’ educational experiences. Students were encouraged to attend a pre-class preview of Adobe Connect conducted by the curriculum coordinator, and the first author spent several hours with the instructor in face-to-face and remote practice sessions with Adobe Connect prior to the first synchronous session of the class.

**Instrumentation and Data Collection**

Given that we allowed students to switch out of the section they had been randomly assigned to as described earlier, the study is best described as a quasi-experimental design to evaluate post-intervention measurements of non-equivalent groups. At the close of the course, students in both ASYNC and ASYNC+SYNC sections completed an end-of-course evaluation that included demographic information, an overall course evaluation, and instructor ratings. This end-of-course evaluation included the 10 items of the Classroom Community Inventory (CCI; Rovai, 2002; Rovai, Wighting & Lucking, 2004), which was designed to measure perceptions of social community and learning community in online classrooms. Social community items include “I trust others in this course” and “I feel that students in this course care about each other.” Learning community items include items such as I feel that I am given ample opportunities to learn in this course” and “I feel that my educational needs are not being met in this course.” The CCI was validated using a sample of both traditional and online students. The CCI also separates the concepts of “social community” and “learning community,” which was an important distinction, given that we were interested in the impact of the synchronous environment on both the academic and relational experiences of students in these classes. We also used open-ended questions to gather overall perceptions of various course elements. In addition, we collected overall course grades as well as grades for specific assignments throughout the class. Data were analyzed using SPSS in relation to the research questions.

**Results**

The research questions driving this study explore student achievement and sense of community in response to incorporating synchronous lectures into an online course. Therefore, we compared the two sections on various measures, including course grades, satisfaction with course and instructor, and measures of social and learning community (as measured by the Classroom Community Inventory). Of the 22 students enrolled in ASYNC, 10 (45.5%) completed end-of-course evaluations (including demographic indicators and the Classroom Community Inventory); 10 of 16 (62.5%) students enrolled in
ASYNC+SYNC completed the end-of-course materials. Student demographics for those completing end-of-course materials are found in Table 1.

Table 1 Student Demographics

<table>
<thead>
<tr>
<th>Age Group</th>
<th>ASYNC</th>
<th>ASYNC+SYNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30-39</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>50-59</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>60-69</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Course Grades and Assessments

To evaluate the impact of the synchronous sessions on student achievement, we compared grades in the two sections after final grades were posted. Using the official course gradebook as recorded in the learning management system, we analyzed grade data for all 36 students, as detailed in Table 2. “Discussion Forums” refers to grades for all asynchronous discussion forums assigned throughout the class, generally two per week during the five-week session. “Targeted assignments” represents grades on assessments that were selected by the design team as the focus of each synchronous presentation. Students in ASYNC and ASYNC+SYNC completed the same assignments and were graded according to the same criteria. Overall course grades and assignment-specific grades were slightly higher in the asynchronous section, but none of these differences rose to the p < .05 level.

Table 2 Course Grades in ASYNC and ASYNC+SYNC Sections

<table>
<thead>
<tr>
<th></th>
<th>ASYNC</th>
<th>ASYNC+SYNC</th>
<th>t-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Forums</td>
<td>230.9 (92.4%)</td>
<td>212.4 (85.0%)</td>
<td>1.304</td>
<td>.205</td>
</tr>
<tr>
<td>“Targeted” Assignments</td>
<td>209.0 (92.8%)</td>
<td>198.1 (88.0%)</td>
<td>0.885</td>
<td>.388</td>
</tr>
<tr>
<td>Final Course Grade</td>
<td>88.8%</td>
<td>84.1%</td>
<td>22.1</td>
<td>0.804</td>
</tr>
</tbody>
</table>

Assignment details, such as late submissions or assignment length, were not part of any formal analysis, but the design team noticed that as the class progressed, ASYNC+SYNC students tended to submit assignments after posted deadlines more frequently than students in the ASYNC section. It is possible that students who chose to participate in the Saturday synchronous sessions then found it difficult to complete the assignment by the posted Sunday evening deadline.

End-of-Course Evaluation

At the end of the class, students completed standard course evaluation forms, detailed in Table 3. These end-of-course evaluations asked students to complete an online evaluation using a 5-point Likert-type scale (with 5 being “strongly agree”) to rate various aspects of the course such as timely grading, instructor feedback, and so on.
## Table 3  Comparison of Course Evaluation Items between ASYNC and ASYNC+SYNC

<table>
<thead>
<tr>
<th>Item</th>
<th>ASYNC Mean</th>
<th>ASYNC SD</th>
<th>ASYNC+SYNC Mean</th>
<th>ASYNC+SYNC SD</th>
<th>Mann-Whitney U</th>
<th>Exact Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel that students in this course care about each other. (SC)</td>
<td>4.3</td>
<td>0.7</td>
<td>4.2</td>
<td>0.6</td>
<td>45.5</td>
<td>.739</td>
</tr>
<tr>
<td>I feel connected to others in this course. (SC)</td>
<td>3.8</td>
<td>1.1</td>
<td>3.6</td>
<td>0.8</td>
<td>42.0</td>
<td>.579</td>
</tr>
<tr>
<td>I trust others in this course. (SC)</td>
<td>4.0</td>
<td>0.7</td>
<td>4.1</td>
<td>0.6</td>
<td>41.0</td>
<td>.780</td>
</tr>
<tr>
<td>I feel that I can rely on others in this course. (SC)</td>
<td>3.7</td>
<td>0.9</td>
<td>3.8</td>
<td>0.9</td>
<td>46.5</td>
<td>.796</td>
</tr>
<tr>
<td>I feel confident that others in this course will support me. (SC)</td>
<td>3.8</td>
<td>0.9</td>
<td>4.1</td>
<td>0.6</td>
<td>41.5</td>
<td>.529</td>
</tr>
<tr>
<td>I feel that I receive timely feedback in this course. (LC)</td>
<td>3.8</td>
<td>1</td>
<td>3.9</td>
<td>0.6</td>
<td>48.0</td>
<td>.912</td>
</tr>
<tr>
<td>I feel that this course results in only modest learning. (LC)</td>
<td>2.4</td>
<td>1.1</td>
<td>2.8</td>
<td>1.2</td>
<td>40.0</td>
<td>.481</td>
</tr>
<tr>
<td>I feel that I am given ample opportunities to learn in this course. (LC)</td>
<td>4.1</td>
<td>0.9</td>
<td>4.2</td>
<td>0.9</td>
<td>45.5</td>
<td>.739</td>
</tr>
<tr>
<td>I feel that my educational needs are not being met in this course. (LC)</td>
<td>1.9</td>
<td>1</td>
<td>2</td>
<td>1.4</td>
<td>47.5</td>
<td>.853</td>
</tr>
<tr>
<td>I feel that this course does not promote a desire to learn. (LC)</td>
<td>1.7</td>
<td>0.8</td>
<td>1.4</td>
<td>1</td>
<td>36.5</td>
<td>.315</td>
</tr>
<tr>
<td>On a scale of 1 to 5 (5 being Excellent): How would you rate this course?</td>
<td>4.1</td>
<td>0.7</td>
<td>4.2</td>
<td>0.7</td>
<td>41.0</td>
<td>.780</td>
</tr>
<tr>
<td>On a scale of 1 to 5 (5 being Excellent): How would you rate the online course instructor?</td>
<td>4.4</td>
<td>0.7</td>
<td>4.3</td>
<td>0.7</td>
<td>42.5</td>
<td>.842</td>
</tr>
<tr>
<td>The course syllabus was clear and easy to understand.</td>
<td>4.2</td>
<td>0.6</td>
<td>4.4</td>
<td>0.5</td>
<td>42.0</td>
<td>.579</td>
</tr>
<tr>
<td>This course contained adequate and helpful audiovisual materials.</td>
<td>3.5</td>
<td>0.8</td>
<td>3.8</td>
<td>0.9</td>
<td>39.5</td>
<td>.436</td>
</tr>
<tr>
<td>I was challenged to look at my life, my goals, and my worldview through this course.</td>
<td>4.3</td>
<td>0.7</td>
<td>4.3</td>
<td>0.7</td>
<td>50.0</td>
<td>1.000</td>
</tr>
<tr>
<td>This course required an appropriate amount of work.</td>
<td>4.0</td>
<td>0.8</td>
<td>3.6</td>
<td>1.1</td>
<td>40.0</td>
<td>.481</td>
</tr>
<tr>
<td>The course syllabus accurately reflected course content.</td>
<td>4.1</td>
<td>0.7</td>
<td>4.3</td>
<td>0.7</td>
<td>42.5</td>
<td>.579</td>
</tr>
<tr>
<td>The instructor provided adequate feedback on assignments.</td>
<td>4.1</td>
<td>1</td>
<td>4.3</td>
<td>0.5</td>
<td>48.0</td>
<td>.912</td>
</tr>
<tr>
<td>The instructor was actively engaged in course discussions.</td>
<td>3.9</td>
<td>1.2</td>
<td>4.1</td>
<td>1</td>
<td>46.5</td>
<td>.796</td>
</tr>
<tr>
<td>The instructor integrated a biblical perspective throughout the course.</td>
<td>4.5</td>
<td>1</td>
<td>4.6</td>
<td>0.5</td>
<td>47.0</td>
<td>.853</td>
</tr>
</tbody>
</table>

Note. “SC” indicates item from the social community scale of the Classroom Community Inventory; “LC” indicates an item from the learning community scale of the Classroom Community Inventory (Rovai, 2002).

Students are not required to complete these evaluations and response rates are typically low. As indicated above, 45.5% of ASYNC students and 62.5% of ASYNC+SYNC students completed the evaluations. Therefore, n=10 for each section. Students also provided an “overall” rating for both
instructor and course. A Mann-Whitney U test examining the differences on these measures of student satisfaction between the two sections showed no statistically significant differences between ASYNC and ASYNC+SYNC, as outlined in Table 3. This is due, at least in part, to small sample sizes resulting from small class sizes and low response rate to the end-of-course evaluation materials.

**ASYNC+SYNC student response to using Adobe Connect**

Understanding students’ level of comfort with technology, in general, and with online learning, in particular, is important for evaluating the extent to which the synchronous environment may have impeded or otherwise influenced their experience in the class. Therefore, we added several questions to the end-of-course evaluation materials for students in ASYNC+SYNC specifically related to their comfort level with technology. In terms of comfort with an online learning environment, two students indicated that this course had been their first online experience; seven of the 10 ASYNC+SYNC respondents indicated they had taken at least five classes in an online environment.

We presented students with a 5-point scale (5 being “excellent”) and asked them to rate their comfort level with new technology. All ASYNC+SYNC students selected 4 or 5 on this scale. We also asked these students if they felt that the chat/synchronous sessions using Adobe Connect had been an added benefit in the course. Eight of 10 students selected “agree” or “strongly agree,” two selected “neutral,” and there were no “disagree” or “strongly disagree” responses. We recognize that students less comfortable with technology may have opted out of the ASYNC+SYNC section and elected to stay with a more familiar asynchronous-only course design; the students who initially opted to stay in the ASYNC+SYNC section may have been more comfortable with technology and therefore more prone to find benefit in the inclusion of the synchronous lectures than students from ASYNC may have been.

**Responses to open-ended prompts**

The standard end-of-course evaluation (for both ASYNC and ASYNC+SYNC sections) included a space for students to respond to open-ended prompts regarding the class. Students in both sections commented on the heavy workload required by the course, with one ASYNC+SYNC student concluding “but this is a third-year [300-level] class so that is understandable.” One ASYNC student noted the professor’s “very good interaction during the discussion boards and afterwards in the submitted lessons,” and another indicated that the course materials were “helpful and informative.” ASYNC+SYNC students expressed mixed opinions regarding the synchronous course elements. One student described it as “good for personal instruction.” At the same time, another student described the Adobe Connect sections as “off track and not focused on class materials.” Another commented that “some of the chats could have been more beneficial,” although that student did not elaborate on what would have added to the effectiveness of the chat (synchronous) sessions. Another ASYNC+SYNC student suggested that since only the professor, not students, had access to a microphone, the synchronous sessions “felt like a conference call,” because “[text-based] chatting is not the best way to communicate in a group setting.”

**Social Community and Learning Community**

The purpose of this study was to explore the impact of synchronous interaction on student achievement and engagement, specifically students’ perception of community within the online classroom. To measure perceptions of community, we included the 10-item Classroom Community Inventory (Rovai, Wighting, & Lucking, 2004) with the end-of-course evaluation materials. Five of the items on the scale measure “social community,” and five measure “learning community,” with 1=Strongly Disagree and 5=Strongly Agree. In the ASYNC+SYNC section, social community was rated slightly higher than in ASYNC; however, a Mann-Whitney U test showed no statistical significance in this difference, as outlined in Table 4.

Overall, therefore, there were no statistically significant differences apparent between the ASYNC and ASYNC+SYNC sections of the course. When they addressed the inclusion of synchronous lectures specifically, ASYNC+SYNC students gave no indicator that the Adobe Connect sessions added to their learning. Survey results and grade data suggest there was no significant gain in terms of academic
achievement, social community, or learning community for those participating in ASYNC+SYNC. These findings are discussed more fully in the following section.

Table 4  Perceived Social Community and Learning Community in ASYNC and ASYNC+SYNC Sections

<table>
<thead>
<tr>
<th></th>
<th>ASYNC</th>
<th></th>
<th>ASYNC+SYNC</th>
<th></th>
<th>Mann-Whitney U</th>
<th>Exact Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Community</td>
<td>19.4</td>
<td>2.95</td>
<td>19.6</td>
<td>3.63</td>
<td>46.5</td>
<td>.796</td>
</tr>
<tr>
<td>Learning Community</td>
<td>19.9</td>
<td>3.28</td>
<td>19.9</td>
<td>4.12</td>
<td>49.0</td>
<td>.971</td>
</tr>
</tbody>
</table>

Discussion

This case study explored the potential benefits of adding synchronous lectures to a primarily asynchronous online course. We found no significant differences between the ASYNC and ASYNC+SYNC sections on measures of academic achievement, social and learning community, or course satisfaction. At the very least, this study suggests that incorporating synchronous activities requires careful consideration of the impact of this move on student achievement, student experience, and institutional investment.

Consider the Student’s Achievement

We used three different measures (total discussion forum score, total score on “targeted” assignments, and final course grade) to compare student achievement across the two sections. Grades in ASYNC were slightly higher than in the other section. This suggests that the instructor was not biased toward the ASYNC+SYNC section (i.e., the “treatment” condition); these differences were not found to be statistically significant. On each of these measures, students in ASYNC received higher grades than ASYNC+SYNC, although none of the differences rose to the p<.05 level. This echoes Johnson’s (2008) findings, and it is possible to view this result in two ways. On one hand, as there was no demonstrated, statistically significant benefit for the ASYNC+SYNC students, the inclusion of synchronous lectures could be interpreted as an unnecessary investment, one that does not produce significant gains in student learning. At the same time, there was no demonstrated detriment that occurred for the students included in ASYNC+SYNC. For the institution where students and instructor were already comfortable with these types of technologies (Bower, 2011), with the infrastructure to support synchronous activities already in place (Falloon, 2011), these findings might suggest that while adding synchronous activities may not enhance student academic achievement, they may appeal to students and therefore provide a strategic edge in marketing. When considering this move, it is critical to remember that the student may have chosen a program based on the requirements of a particular modality; adding a synchronous component also constrains the student to participating in class activities at a particular time and place in a way that may not be possible or preferable for the student.

Consider the Student’s Experience

This study also explored the impact of synchronous lectures on student experience, in terms of social and learning community within the class. If the incorporation of synchronous lectures had produced significant gains in terms of social community or learning community—even where no significant differences in academic achievement were noted—this increase in the student’s experience of “presence” in an online course (Garrison & Anderson, 2003; Palloff & Pratt, 2011) might also lead to increased student retention and persistence. The absence of significant differences on these two scales suggests simply adding synchronous lectures is not sufficient to produce increases in either social community or learning community. It is not a magic bullet. It may also be possible that students will
develop social community or learning community by utilizing whatever technologies are provided for
them, whether that is fully asynchronous or some combination of asynchronous and synchronous settings.

As others have noted (Bower, 2011; Falloon, 2011), the “real-time” nature of synchronous
instruction introduces an element of unpredictability that can greatly impact the student’s experience
within the classroom. As students here noted, when given the opportunity to respond to open-ended
prompts, the synchronous sessions tended to get “off track” or be “not focused.” Furthermore, several of
the course design decisions the design team made (e.g., muting students’ microphones to reduce potential
technology challenges) were viewed by the students as reducing the potential of the synchronous sessions
to enhance their learning experience. In addition, requiring students to attend a synchronous session at a
specific time may have resulted in students “attending” class at times they perceived to be less than
optimal, thereby influencing their experience of community within the classroom.

Consider the Investment

In preparing for these classes and this study, the design team invested significant time and
resources. The institution already had access to Adobe Connect through a college-wide site license,
which enabled us to pursue this study without an investment of financial resources. However, the
investment—in terms of human resources—was substantial: rewriting syllabi and updating course shells
to reflect the change in format for the ASYNC+SYNC session, contacting students before the class to
insure their ability and willingness to participate in the synchronous sessions, providing several Adobe
Connect orientation sessions for students, training the instructor in the use of the Adobe Connect
environment, and testing the environment before the class began. In the end, the data here suggests no
notable differences in either learning or community outcomes between a fully asynchronous course and
one that intentionally incorporated synchronous lectures into the course design.

Limitations and Future Research

Students in this five-week accelerated course, populated with primarily non-traditional learners
who had previously taken online courses using only asynchronous modalities, may not be typical of all
online learners, thereby limiting the generalizability of these results to similar students in similar settings.
In addition, the study presented here is taken from two small class sections, resulting in small sample
sizes and limited statistical power. We also recognize the possibility of selection bias that is a result of
allowing students to switch out of ASYNC+SYNC if they were unable or unwilling to commit to the
synchronous sessions. In spite of significant pre-class preparation and training, as well as self-reported
comfort using new technologies as indicated on the end-of-class evaluation, both students and instructor
experienced technical difficulties while working with the synchronous (Adobe Connect) technology,
which may have impeded the sense of social community or learning community that those students might
otherwise have experienced. To limit variability between ASYNC and ASYNC+SYNC, we purposefully
used two sections taught by the same instructor; it is possible that what we have reported here may be
idiosyncratic to this instructor. It is also possible that the Classroom Community Inventory more
accurately measures social community or learning community as it would develop in a full-semester-
length class; five weeks may simply be too short to foster the types of relationships that are perceived as
social community or learning community.

Given the accelerated nature of this course and the technical difficulties that participants
experienced, researchers may benefit from comparing social and learning community as it is perceived
and experienced by students in a longer class or when students use these technologies for the second time.
In addition, conducting synchronous sessions with student microphones enabled (rather than muted, as we
chose to do for this study) might allow for more spontaneous interaction and natural reactions that could
influence. This study focused on presenting academic content using synchronous lectures (i.e., teacher-
student interaction); the impact of synchronous activities on student-student interaction should also be
explored. It would also be beneficial to explore the impact of synchronous technologies with multiple
instructors, each of whom are teaching two sections of the same course to more accurately pinpoint the
impact of the synchronous activities, over and above the influence of the course instructor.
Conclusion

As broadband and other technologies become more readily accessible, program planners, instructional designers, and administrators will likely find themselves considering how these technologies could be incorporated into course and program offerings. “Real-time” classes and “live” instructors may make for effective marketing, but do these features enhance student learning? Educators need to evaluate carefully the impact of technology on the real experiences and learning outcomes of students, moving beyond rhetoric and intuition. The absence of significant differences between ASYNC and ASYNC+SYNC presented here suggests that learning outcomes were not enhanced by the incorporation of synchronous lectures into an online course. The findings here suggest that it is necessary to consider the student’s learning, the student’s experience, and the investment of time and resources when evaluating whether it is “worth the effort” to incorporate synchronous activities into an online course.

References


mediated communication technologies to augment and support effective online helping profession education. *Journal of Technology in Human Services*, 28, 161-177. doi: 10.1080/15228835.2010.508363


SECTION IV: Students

Web 2.0 Technologies and Building Online Learning Communities: Students’ Perspectives
Mariam Mousa Matta Abdelmalak

Exploring Adult Learners Usage of Information Communication Technology during a Virtual Peer Coaching Experience
Richard Ladyshewsky, Ronald G. Pettapiece

Student Satisfaction with Online Learning: Is it a Psychological Contract?
Chuck Dziuban
Web 2.0 Technologies and Building Online Learning Communities: Students’ Perspectives

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Abstract

The purpose of this action research was to explore students’ perspectives regarding using Web 2.0 technologies to develop a community of learners. The course described in this study was a fully online course in an Educational Learning Technologies master’s program at a medium-sized university in the U.S. Southwest. A variety of Web 2.0 tools (Twitter, Google Docs, Skype, blogs, and wikis) were used throughout the course to enhance students’ sense of community. The methods of data collection in this study included students’ reflective journaling activities, the researcher’s journal and field notes, and students’ comments on each other’s reflections. Students indicated that using Google Docs, wikis, blogs, and Twitter gave them a sense of a learning community while using Skype did not. Google Docs and wikis had the most impact on students’ sense of a learning community in the course. Findings suggest that faculty interested in building learning communities in online environments need to use variety of Web 2.0 technologies in order to make students aware of those technologies’ promise for supporting communication.

Introduction

Building learning communities is an important topic for online learning because of the current value placed on social learning in general and because of continuing questions about the capacity of online learning environments to prompt true communities. The literature on distance education highlights many strategies to help online students build a sense of community. Much of the writing on the community-based approach to online learning—that is, related to developing and sustaining it—describes the use of asynchronous discussions (e.g., Clarke & Kinne, 2012; Moisey, Neu, & Cleveland-Innes, 2008; Buckingham, 2003; Brook & Oliver, 2003), introductory activities (e.g., Dixon, Crooks, & Henry, 2006), and group contracts (e.g., Murphy, Mahoney, & Harvell, 2000) as the means by which this community is developed. Few studies explored the role Web 2.0 technologies play in the development of online learning communities. Additionally, little is known about students’ perspectives regarding using Web 2.0 technologies to develop these communities. This paper describes practitioner experiences of using Web 2.0 technologies to develop a community of learners among graduate online students and discusses students’ perspectives in using these tools.
Literature Review

Online Learning Communities

Building learning communities is critical to student success in online environments. Community is widely accepted as a sense rather than a tangible entity (Wiesenfeld, 1996). Sense of community has been defined as “a sense that members have a belonging, members matter to one another and to the group and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). To develop a successful online course, many scholars (e.g., Hiltz, 1998; Russell, 1999; Palloff & Pratt, 2007) suggest that building and sustaining an online learning community is crucial and necessary. Students in asynchronous distance classes work at computers that are miles apart and at varying times of the day, resulting in a feeling of isolation. Fostering online learning communities can help diminish that sense of isolation and, hence, heighten the educational experience of participants (Palloff & Pratt, 2007; Rovai, 2002; Bonk & Wisher, 2000; Hiltz, 1998). Therefore, building learning communities should be a primary goal for online instructors (Palloff & Pratt, 2007; Hiltz, 1998). However, it is important to note that the desired outcome from the formation of a learning community is not only the creation of a social community but also the ability of the instructor to convey knowledge about the content and for the community to collaboratively make meaning from that content (Palloff & Pratt, 2007).

Research supports the fact that the students’ sense of community is important to the learning process. Studies have connected students’ experiences in learning communities with positive learning outcomes, satisfaction with the learning experience (Richardson & Swan, 2003; Moisey, Neu, & Cleveland-Innes, 2008), and enhanced learning achievement (LaPadula, 2003; Overbaugh & Lin, 2006). Rovai (2001) found a significant relationship between classroom communities, the flow of information among online learners, and effective learning.

Technology, social interactions, and the learning content are crucial components of an effective learning community. According to Carabajal, Lapointe, and Gunawardena (2003), there are three dimensions of an online community: a technological dimension, a task dimension, and a social dimension. Carabajal et al. argue that the technology has important consequences for the successful accomplishment of group tasks and the successful maintenance of the group. The technology, Carabajal et al. explain, must allow group members to contribute knowledge; provide scaffolded assistance and the interaction tools needed to adequately relate concepts, experience, and knowledge; and provide a space for the group’s memory. The task dimension includes the learning content, materials, resources, and activities used in the courses (Carabajal et al., 2003). Carabajal et al. state that the social dimension refers to participants maintaining some degree of mutual caring and understanding through frequent interaction. Tu and Corry (2002) propose a similar theoretical framework that includes instruction, social interaction and technology as the three major dimensions of their e-learning community.

Interaction is an essential element of the development of the sense of community. Moore (1989) distinguishes three types of interaction: learner–content, learner–instructor and learner–learner. Moore defines learner–content interactions as “the process of intellectually interacting with content that results in changes in the learner’s understanding, the learner’s perspective, or the cognitive structures of the learner’s mind” (p. 2). According to Moore, learner–instructor interactions establish an environment that encourages learners to understand the content better. This type of interaction is “regarded as essential by many educators and highly desirable by many learners” (p. 2). Moore explains that learner–learner interactions take place “between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor” (p. 4). Several studies support the importance of interactions and learning as essential elements of a cohesive learning community. Fredericksen, Pickett, Shea, Pelz, and Swan (2000) surveyed 1,406 students enrolled in online university courses. They found that students who reported the highest levels of perceived learning also reported the highest levels of interaction with the instructor, higher levels of interaction with classmates, and more participation in their online classes than in their face-to-face classes. Wang (2005) found that social interaction in an online learning community
facilitated learning by contributing to the sense of community, reducing feelings of isolation and providing a context for appreciating diverse perspectives.

Social Presence

There is a strong connection between the development of a sense of social presence and the formation of online communities (Palloff & Pratt, 2007; Garrison, Anderson & Archer, 2000). Garrison et al. (2000) believe that in order to form a community online, a sense of social presence is required among participants. Garrison et al. define social presence as “the ability of participants in the community of inquiry to project their personal characteristics into the community, thereby presenting themselves to others as ‘real people’” (p. 94). Recently, Kreijns, Kirschner, Jochems, and Buuren (2011) defined social presence as “the degree of illusion that others appear to be a ‘real’ physical person in either an immediate (i.e., real time/synchronous) or a delayed (i.e., time-deferred/asynchronous) communication episode” (p. 365).

Social presence is critically important to the success of online courses and to the quality of the online learning experience. Social presence has been correlated with learner satisfaction online (Tu, 2001; Kreijns et al., 2011) and to a sense of belonging to a community (Picciano, 2002). Social presence also influences student learning (Richardson & Swan, 2003; Swan & Shea, 2005). Additionally, social presence is an important determinant for social interaction (Cobb, 2009; Garrison, Anderson, & Archer, 2003; Lowenthal, 2010; Swan, 2002). According to Palloff and Pratt (2007), when there is a high degree of social presence, the degree of interaction between the participants is also high. Picciano (2002) found that perceptions of social presence were correlated with perceptions of learning and interaction, and that perceived learning and perceived interactions were also correlated. Picciano cautions, however, that interaction and presence are not one and the same: “Interaction may indicate presence but it is also possible for a student to interact by posting a message . . . while not necessarily feeling that she or he is part of a group or a class” (p. 22). Simply getting students to talk to one another is not sufficient. Educators need to develop authentic and effective ways to assist students in connecting with peers and building relationships.

Garrison et al. (2000) suggest three categories contributing to the development of social presence among students: emotional expression, open communication, and group cohesion. According to Garrison et al., emotional expression is indicated by the ability and confidence to express feelings related to the educational experience. Self-disclosure is an example of emotional expression and is described as a sharing of feelings, attitudes, experiences, and interests (Garrison et al., 2000). The second category of indicators of social presence is open communication. Garrison et al. argue that responses and rejoinders to the comments and contributions of others are examples of open communication. Thus, using the reply feature to post messages, directing a comment to someone in particular, and referring explicitly to the content of others’ messages can contribute to the development of students’ sense of social presence. The third category of social presence indicators is group cohesion. This category is exemplified by activities that build and sustain a sense of group commitment (Garrison et al., 2000). For helping students to work effectively in activities that involve online collaboration and reduce resistance to the activity, Palloff and Pratt (2007) suggest providing students with an explanation of the importance of and reasons for including collaborative activities. Dell (2004) stresses the importance of giving clear instructions and guidelines regarding not only the assignments but also the method and tools of communication that will be used. Dell also suggests designing evaluation criteria to include peer evaluation. He argues that peer evaluation rewards extraordinary team members while appropriately evaluating noncontributing members. Additionally, the use of an agreement or contract among group members has been noted to be significant in promoting learner satisfaction with collaborative learning experiences online (Murphy et al., 2000; Doran, 2001).

Web 2.0 Technologies

When students participate in online courses the communication that is needed to create and maintain social interaction usually requires technological mediation (Kearns & Frey, 2010). Web 2.0
technologies can effect that mediation. The term Web 2.0 was first used in 2004 and referred to the second generation of the Internet (Schrum & Levin, 2009). The main characteristics of Web 2.0 technologies, as Schrum and Levin (2009) explain: are that they allow users to add and change content easily, collaborate and communicate instantaneously in order to share, develop and distribute information. Web 2.0 technologies can play an important role in the development of a learning community among students in online courses (Kearns & Frey, 2010; Palloff & Pratt, 2009; Gunawardena et al., 2009). According to Palloff and Pratt (2009), Web 2.0 technologies have the ability to enhance the development of learning communities and reduce the isolation and distance felt by students in online courses. Kearns and Frey (2010) recommend that faculty interested in developing communities among their online students need to learn about and experiment with a variety of Web 2.0 technologies in order to make students aware of their potential for back-channel communication. Web 2.0 tools range from those that allow for personal expression to those that support community building (Palloff & Pratt, 2009). Some of the common forms of Web 2.0 technologies currently being integrated into online courses include Skype, Twitter, Google Docs, blogs, and wikis.

Skype is an Internet-based phone service that also allows for conference calling, document sharing, and text messaging (Palloff & Pratt, 2009). Parker, Boase-Jelinek, and Herrington (2011) found Skype to be a good tool for building rapport and social presence among online students. Parker et al. (2011) explain that Skype gave students the opportunity to chat with their peers about how they were progressing in the unit and to share resources, problems and solutions with each other. They also found that Skype allowed the instructor to provide immediate responses to student questions that everyone could see and to chat with a number of students at the same time. Parra (2013) found that Skype was one of the most beneficial and valued online collaborative work tools.

Twitter is a form of a social networking space that allows for microblog entries known as “tweets” (Schrum & Levin, 2009). In 140 characters or fewer, people share ideas and resources, ask and answer questions, and collaborate on problems of practice. Twitter community members post their contributions via the Twitter website, mobile phone, e-mail, and instant messaging—features make Twitter a powerful, convenient microsharing environment (Drapeau, 2009). All of this communication happens in real time, so the exchange of information is immediate (Dunlap & Lowenthal, 2009). Depending on whom one chooses to follow, Twitter can be effectively used for professional and social networking because it can connect people who have similar interests (Lucky, 2009). Twitter can also be an effective way to enhance online learning communities (Dunlap & Lowenthal, 2009). Dunlap and Lowenthal found Twitter to be a powerful tool for establishing informal, free-flowing, just-in-time communication between and among students and faculty, and with the professional community at large.

Google Docs is a free web-based application that allows users to create word processing documents. The Google Doc application allows access to a document from any computer and enhances collaboration by providing a way to share that document with others as viewers or collaborators, or by publishing it on the web (Conner, 2008). Reyna (2010) argues that Google Docs can be an excellent resource for overcoming students’ sense of isolation. Google Docs can support collaborative writing among students (Brodahl, Hadjerrouit, & Hansen, 2011; Blau & Caspi, 2009). Parra (2013) found that the Google Doc application was one of the most beneficial and valued online collaborative group-work tools. Google Docs enable users to edit a document written by other students and suggest modifications by writing comments rather than editing the document itself—features that afford real-time collaborative learning.

A blog is a frequently updated online diary or journal; it can be used for news, reviews, personal thoughts, experiences, web links and photos (Schrum & Levin, 2009). Via blogs, students enjoy an opportunity to open the windows of communication by reading their classmates’ postings and having classmates comment on their own writing (Windham, 2007). Clake and Kinne (2012) found that students who used blogs felt a great sense of satisfaction and engagement with the community as a result of using the blogs. In Clake and Kinne’s study, the students found that blogs released them from the typical
participation structures found in classroom discussions and allowed them to broaden the way they converse with others in an online class setting.

A wiki is a collection of web pages designed to enable anyone who accesses it to contribute and/or modify content (Dunlap & Lowenthal, 2009). Wikis allow people to directly update, modify, or delete content and allow multiple users from different locations to collaborate in real time. A wiki is also an effective technology for building learning communities (Lambert & Fisher, 2009; Scott & Liu, 2011). Lambert and Fisher (2009) argue that a wiki offers benefits not typically found in traditional content management systems, such as interaction, creativity, virtual collaboration, resource sharing, joint authorship, seamless integration of Internet-based content, and ease of use. These benefits provide a medium that can be more conducive to building online communities.

**Purpose of the Research**

Given the apparent ability of Web 2.0 technologies to enhance the development of learning communities and reduce the isolation and distance felt by students in online courses, we raised the following question: What are students’ perspectives on using Web 2.0 technologies to develop a community of learners?

**Methodology**

**Action Research**

I chose action research as my research methodology. According to Parsons and Brown (2002), to be an effective educator one must be an “active participant” in the classroom, observing, analyzing, and interpreting information about student learning and then using this information for planning and decision making (p. 22). Carr and Kemmis (1986) define action research as “simply a form of self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out” (p. 162). The basic elements of an action research model are cycles of planning, acting and observing, and reflecting (Lewin, 1948). In an action research project, planning, data collection, data analysis, and the production of results are continuous throughout its cyclical process. After the planning phase, data is collected during the acting and observing phase, and that data is analyzed during the reflecting phase to inform the next planning phase of the next cycle of action research (Lewin, 1948).

In the current study, the planning phase included identifying suitable Web 2.0 technologies that were freely available. A review of the literature on building online learning communities was conducted. Assignments and activities for using Skype, Twitter, Google Docs, wikis and blogs were created with basic instructional scaffolding as described in the following section. During each cycle’s acting and observing phase, the action was implemented, and data was collected. The development of learning communities was informally monitored through students’ interactions with each other, the content and the instructor. Reflecting is the main focus of the third phase of each action research cycle. During this phase, results are evaluated and outcomes are reflected upon. The data were analyzed for patterns and insights.

**Web 2.0 Technologies in Action**

The course described in this study was a fully online course of 25 students in an Educational Learning Technologies master’s program at a medium-sized university in the U.S. Southwest. This course focused on technology and pedagogy. The course content was organized into five modules on Canvas. A variety of Web 2.0 tools (Twitter, Google Docs, Skype, blogs, and wikis) was used throughout the course modules to enhance students’ sense of community. In the first module, students were tasked to create a Skype account, a Gmail account, and a Twitter account and to send the instructor a message using these tools (see Appendix A). The purpose was to help students become familiar with these tools before they used them during the semester.

Skype was used to support student–instructor and student–student interactions. Skype was on the instructor’s desktop; students could send the instructor a text chat message if they saw her online in Skype.
If not, they could type their questions, and the instructor would answer as soon as she got back. Students also were advised to use Skype to communicate with their groups in order to complete the group work.

Twitter was used to facilitate class discussions about the week’s topic. The purpose was to enhance student–content interactions and student–student interactions. The students were asked to read the required articles about the week’s topic and tweet about what they learned from the week’s readings using the course hashtag “#EDUC518.” Students were also required to reply to at least two of their classmates’ tweets. Students’ tweets were graded based on a rubric.

In another module, students were tasked to create a Google Doc describing one learning activity for using a self-selected technology tool in their own teaching. Students were asked to share their Google Docs with their classmates and the instructor. Students were required to comment on each other’s activities by directly writing in their classmates’ Google Docs. Students were also advised to use Google Docs to communicate with their groups.

Blogs were used in order to facilitate students’ interactions with the content and with each other. Students were required to create blogs using Blogger or any other blogging site and to engage in conversations through these blogs (see Appendix B). The students were to blog in response to a prompt. Then they were required to read and comment on each other’s blogs. The course assigned three blogs. Rubrics were used to grade students’ blogs and their feedback to each other.

The students were tasked to work in groups of three or four and collaboratively complete the wiki project. Students were asked to create their groups two weeks before the start of the collaborative activity in order to give them enough time to select team members. Additionally, students were provided with a written explanation of the importance of the collaborative work as well as instructions for completing it (see Appendix C). Students were also given guidance on establishing group policies and procedures and suggestions regarding collaborative technology tools they could use (see Appendix D). Before beginning the group activity, the students were required to complete the group-contact template suggested by Conrad and Donaldson (2004) (see Appendix E). This document suggests that group members specify the primary method and frequency of communication, make contingency plans for emergencies, and decide whether to select a group leader.

In the last module the students were tasked to collaboratively write a wiki about the module’s topic (see Appendix F). Each group’s wiki was required to contain five pages and follow a specific format provided by the instructor. One of the group members would need to volunteer to create a wiki using PBworks or any other wiki site and invite his or her classmates to the wiki he or she created. Students as groups would need to collaborate with each other to create the first two pages of the wiki following the instructions provided by the instructor. Then students were individually responsible for creating a page within the group’s wiki about a topic of their interest. Additionally, students were required to individually do a peer review of at least two of their classmates’ wikis by directly commenting in them. The wiki project was graded based on (a) the quality of the content using a rubric and (b) peer evaluation in which students were asked to assess each other’s performance in the collaborative project using a rubric.

Data Collection

The methods of data collection in this study included students’ reflective journaling activities, researchers’ journal and field notes, and students’ comments on each other’s reflections. At the end of each module, students were asked to reflect on whether the Web 2.0 tool they used in the module gave them a sense of a learning community and why the tool gave them this sense of community (or why it did not). The course assigned five reflective journaling activities (one reflective activity for each Web 2.0 tool used in the course). The students were also asked to share their reflections in the Canvas discussion forum and comment on each other’s reflections. The students were given the following reflective writing prompt: “Did using Google Docs give you a sense of a learning community? Why or why not? Did using Skype give you a sense of a learning community? Why or why not? Did using Twitter give you a sense of a learning community? Why or why not? Did using a blog give you a sense of a learning community? Why or why not? Did the wiki project give you a sense of a learning community? Why or why not?”
Appendix G for an example reflective activity.) Additionally, the instructor kept an ongoing record of her reflections on what she was observing (why she thought things were the way they appeared) and any interactions she experienced, with the goal of building understanding. Data collection through this method was used to substantiate data collected from students’ reflective journaling activities.

The Participants

The 25 graduate students included nine Caucasian females, two Caucasian males, eight Mexican-American females, five Mexican-American males, and one African-American male. Their ages ranged from 23 to 40 years; 12 participants were in their twenties, nine were in their thirties, and four were in their forties. This course represented the first online class for 75% of the learners.

Limitations

This study is limited by the methodology and the researcher’s role in the course. This study focused on one instructor in a single online course, and the instructor is also the researcher. The findings from this study, therefore, have limited generalizability.

Data Analysis

Data collected from the journals and students’ comments on each other’s reflections were read carefully by underlining words, phrases, sentences, or paragraphs that struck the researcher as important insights related to the focus of this research. This process was repeated several times to show the levels of felt significance, as Saldana (2012) recommends. During these processes of reading and rereading, the researcher began to identify the emerging categories. As themes emerged, the data within each theme was compared. The themes were named using words from the students’ data, and rich descriptions including quotes directly from the participants were used to fully illustrate each category’s meaning.

Findings

Students’ Perspectives

Students indicated that using Google Docs, wikis, blogs, and Twitter gave them a sense of a learning community while using Skype did not give them this sense of community. Google Documents and wikis had the greatest impact on students’ sense of a learning community in the course. The following section summarizes students’ perspectives on using Google Docs, wikis, blogs, Twitter, and Skype to develop learning communities.

Google Docs

The majority of the students agreed that using Google Docs gave them a sense of a learning community. The students expressed that using Google Docs was a great way to collaborate. They explained that Google Documents allowed all members to collaboratively work on the document while separate from each other. This capacity for collaboration made the group project easy to complete and gave them a sense of a learning community in the course. The following are students’ own words about their experiences:

- “Google Doc was a great way for collaboration. All members of the group were able to collaborate simultaneously. I loved how each member could work on the single document at the same time. This makes group projects so much easier to complete.”
- “Using Google doc to communicate with my group gave me a sense of a learning community. We were able to work together while being apart. This made collaboration possible; we did not have to take time out of our lives to meet in person somewhere but work at times that were convenient for us.”
- “Google drive is definitely on my top list. I did use Google doc to communicate with my group. It made it feel like we were sitting in class together working on the same paper, but on my own time.”

Some students perceived the Google Doc application as a great tool for building a learning community.
through the open exchange of ideas and information. These students stated the following:

- “Google doc lets me share information with my classmates no matter where they were and what they were doing. We really come together as a learning community. Google doc is the best way to create learning communities.”
- “Google doc was one of the primary ways the groups I worked with communicated and collaborated. This technology provided a great sense of learning community through the ways we used the Google Doc as an open forum. One group member could pose an idea or question and the rest of the group could add, edit or comment on the idea.”

Some other students expressed the feeling that Google Docs gave them a sense of a learning community by providing the ability to edit documents written by other students and the ability to suggest improvements by writing comments:

- “Google Doc has been my favorite part of this class. Google doc allowed for several students to edit a project they can all have access and view from anywhere. It saves paper it saves doing time that I am not doing something many times and if there was a mistake I can correct it and highlight it and I know what I need to change next time. I believe using Google Doc to communicate with my group did give me a sense of learning community. It was awesome actually.”
- “Google Drive was by far one of the best things I was introduced to in the course. The ability to work on a project or any other type of document with others in real time from anywhere was great. We could edit and communicate. Before Google drive, students had to email files and combined feedback from multiple students into one file. Google drive truly gave me a sense of learning community.”
- “It allowed for not only my groups to communicate with each others but it too allowed my classmates and instructor to communicate with me and I with them, and give and receive feedback in real time. Being able to read their comments and get their feedback allowed me to evaluate my work and improve it. This is how Google doc gave me a sense to what a learning community is.”

The Wiki Project

The majority of students strongly agreed that the Wiki Project gave them a sense of a learning community. Some students expressed the opinion that the wiki project enabled them to learn from each other through the ability to share ideas and information with other students, which created a true learning community. These students stated the following:

- “Working with my Wiki group was a great example of a learning community. We all contributed with ideas and all learned from the strengths of each other. When one person was particularly good at a task we would all learn from him and when another person was creative in visual design we would all learn from his strength. Overall I felt that the final outcome of our Wiki project was the combination of all of our group members’ strengths.”
- “Working in groups in the Wiki project gave me a sense of a positive learning community. The wiki project provided a better opportunity for a learning sharing community. When there are more than two people, more ideas are definitely brought up.”
- “I really enjoyed this assignment in full. Being able to work with a group and to collaboratively write a wiki truly gave me a sense of a learning community. This was done by being able to work with other and share information and ideas. The constant interaction and sharing gave me a real sense of a learning community.”

Some students expressed the feeling that the exchange of comments within the wiki gave them a sense of a learning community. However, other students explained that the commenting feature in the PBworks was an obstacle to their sense of community:
“Working in a group for the wiki project definitely provided a sense of a learning community, especially when we had to review the other group’s wikis to provide feedback and critique. The assignment was planned well and allowed for collaboration between group members and pushed the class to evaluate each other’s work in a constructive manner.”

“The commenting feature on the wiki was a bit more tedious to work through because people who wanted to comment had to be added before they could do so. Since the wiki was limited to just a selected few in the class it didn’t give me the same sense of community as some of the other activities.”

Some students explained that using the group contract was a major factor affecting the effective use of the wiki:

- “Creating a contract was such a great foundation for our project, and it was something we could always turn to when in doubts for our responsibilities and what we were trying to get across in our wiki.”
- “The group contract made me feel that I was liable for doing this actual assignment and owned responsibility for my parts in the assignment.”
- “The use of contract among group members facilitated collaborative learning experiences. By creating a group contract we each were held responsible for the contribution and success of the group work.”

**Blogs**

The students agreed that using blogs gave them a sense of a learning community. Some students expressed the opinion that the commenting feature in the blogs allowed them to actively engage with one another’s ideas and perspectives:

- “The commenting feature in the blog was very easy to use, and I enjoyed the feedback directly on my blog, which gave me a sense of a learning community.”
- “Commenting on blogs was like social media. I have never read a blog or write in a blog, but while doing it I realized that it was just like MySpace or Face Book. The learning community was strong and made me realize I have been doing that for my own pleasure, not for academia.”
- “The commenting feature on blog definitely made it easy to communicate because I get emails right away that someone commented on my blog. That is really neat because you are able to provide feedback to one another really quickly and being an online course that is really important communication.”

Some students expressed the feeling that receiving feedback about their work from their classmates supported their sense of a learning community:

- “Being able to receive feedback on one’s blog is excellent. To receive advice and exchange ideas is an excellent feature that I used in communicating with my classmates. Any times comment that can be used to better improve one’s blog is a huge plus. This is a perfect source of communication with classmates and is a perfect example of a learning community.”
- “I do think that the feedback created a learning community. Receiving feedback felt like my classmates cared about my project; they actually read what I had to say and gave great input.”

Other students explained that being able to see their classmates’ work and how they dealt with the week’s topic or assignment had a positive impact on their sense of community:

- “The blogs we created were an excellent way to promote a learning community. By far they were the most comprehensive in displaying students work and fostering meaningful feedback/critique. There is a definite value in utilizing this tool for learning sharing. If I ever had questions regarding an assignment it was always nice to see the different solutions my classmates arrive at when approaching similar obstacles.”
Twitter
The students expressed the opinion that using Twitter gave them a sense of a learning community. Some students perceived Twitter to be a good tool for building a learning community because it enabled them to share their own ideas and to read others’ ideas. The following are some examples of comments made by students:

- “Using Twitter gave me a sense of a learning community. Sharing Tweets and reading Tweets of other made me feel connected to a learning community.”
- “Twitter allowed for students to be able to post ideas, read other’s ideas, and comment on other’s ideas. This gave me a sense of community by being able to share ideas.”

Some students used Twitter not only to communicate with their classmates but also to connect with others who shared similar interests, which gave them a “great” sense of a learning community, as mentioned by this student:

- “By setting up a Twitter account I was able to get to know others not only in our course but others in the same field as well. This gave a great sense of a learning community. Now I have ‘friends’ that are in the same field as I am and I get to see and hear about their experiences and crafts that they use in their own classrooms.”

Some students expressed that using the hashtag feature in Twitter supported their sense of community:

- “Before this class, I used twitter to read news. During this class, I learned about the ability to create learning communities using the hashtags. With the hashtags, we are able to share links to resources and tweet/discuss topics with other students.”

Some students perceived Twitter to be a good tool for building a learning community because of the ease of using the Twitter application in their cell phones:

- “Using Twitter gave me a sense of a learning community. It is really easy to use. You can even use it on your cell phone. Sharing Tweets and reading tweets of other on my cell phone made me feel connected to a learning community.”

Other students, however, felt that using Twitter did not give them a sense of a learning community because the use of Twitter was limited to only one assignment. Other students expressed the opinion that they preferred to use Twitter for personal purposes and that they were not comfortable using it in the class:

- “For Twitter, I didn't really feel the sense of learning community. It probably can be a useful tool but with Canvas and other Web 2.0 tools we used over the duration of the course I found it unnecessary. Perhaps if we used it more in more than one assignment, it could be a useful collaborative tool.”
- “Twitter did not give me a sense of a learning community because I have had a Twitter account for many years and use it for my personal entertainment. I did not feel comfortable using Twitter for this class, I had to make a new account just for class and I never logged on again to that account after our assignment was done.”

Skype
Few students felt that Skype gave them a sense of a learning community. The majority of the students did not use Skype to communicate with their groups. Instead, they used their cell phones or the messaging feature in Canvas to communicate with their peers:

- “I did not use Skype to communicate with my group. We did not feel that we needed to use it. We exchanged not only email addresses, but also cell phone numbers in order to be able to contact one another when needed.”
- “I did not use Skype to communicate with my group; we had a lot of scheduling issues. Along with the wiki project, we used Google doc and Canvas messaging to work out our schedules duties and addressing our questions.”
On the other hand, some students saw Skype as a good tool to communicate with their group members because it was similar to face-to-face communication. Other students indicated the Skype chat gave them easy access to the instructor:

- “Using Skype to communicate with our group gave me a sense of community. It was a great tool to have a conversation ‘face to face.’”
- “Skype is an excellent tool that allows anyone to communicate online face to face. It is perfect for the sharing of ideas especially in group projects.”
- “I never really got the chance to use Skype to communicate with my group. However Skype was a great tool for communicating with the instructor. When I could not find solutions from my classmates her availability made possible for me to navigate parts of the course that I found difficult or misunderstood.”
- “I did not use Skype to communicate with my group. However, I did use it to communicate with my instructor and her responses were fast and easy because it seemed very direct.”

**Discussion and Implications**

The goal of this action research was to explore students’ perspectives on using Web 2.0 technologies to develop a community of learners. The students perceived Google Docs to be a good tool for building a learning community. They expressed the opinion that Google Docs facilitated collaboration by providing students with the ability to edit documents written by other students from anywhere and at any time, to share ideas and information, and to suggest improvements by writing comments. Based upon this finding, the author will strongly consider using Google Docs as a way to support and facilitate collaborative group work.

The students also said that the Wiki Project gave them a sense of a learning community by providing them with the ability to learn from each other, to share ideas and information, and to exchange comments; however, some students struggled with the commenting feature in PBworks and felt it was an obstacle to the creation of a sense of a learning community. Only users appearing in the users list of a workspace would be able to make comments. Anonymous users or users who were logged in with a PBworks account but who had not joined the group space could not make any comments on any page. This limitation would require students to add everyone in the class to the username list whether they had a PBworks account or not, which would be difficult in a class of 25 students. In order to solve this problem and to enable students to comment on each other’s wikis, the instructor created a peer review schedule in which two groups were assigned to review each group’s wiki. Even with this solution, students struggled to understand the process and considered it to be complicated, especially when the groups whose wikis were required to be reviewed were different than the groups whose wikis were required to be added to, which made it difficult to follow up on the process. Based on this experience with PBworks, the author will create a class wiki to which all students are added; then each group can be responsible for creating a page in the class wiki. As a result of the author taking this approach, all students will be able to comment on each group’s work.

The author will continue use the group contact to promote learner satisfaction with collaborative learning experiences online because students explained that the group contact was a major factor that made wiki use effective.

Findings also revealed that using blogs and Twitter gave students a sense of a learning community. The students said that using the blogs’ commenting feature gave them a sense of community, enabling them to receive feedback about their work from their classmates and to see their classmates’ work. The students felt that using Twitter gave them a sense of a learning community by providing them with the ability to share ideas not only with their classmates but also with others who had similar interests. Using the hashtag feature in Twitter and using the Twitter cell phone application also supported students’ sense of community; however, some students said that using Twitter did not give them a sense of a learning community because the use of Twitter was limited to one assignment or because they preferred
to use Twitter for personal purposes. Despite the misgivings of these students, the author will nonetheless extensively use Twitter and blogs throughout future courses to help students experience how these tools can be used for educational purposes since so many students found them useful in this study.

Few students said that Skype gave them a sense of a learning community. The majority of the students did not use Skype to communicate with their groups; rather, they preferred using their cell phones or the messaging feature in Canvas. Therefore, the use of Skype will be modified; the author will ask students to schedule Skype sessions with her to discuss students’ progress in the course activities. The purpose is to help students to experience the power of Skype to facilitate communication among the students and between students and the instructor.

In sum, building and sustaining strong learning communities should be an essential dynamic in virtual classrooms. The findings from the current study suggest that Web 2.0 technologies can promote students’ sense of learning communities in online classes. It is true that building online learning communities is a difficult task; however, doing so is an integral step for improving learning and teaching in online environments, and thus work in this area should continue.

References


Appendix A

Setting Up Your Course Tech Toolkit

Setting Up Your Course Tech Toolkit. Time: 15 min.–2 hours. Value: 15 points

For this class, there are three tools that you should become familiar with right away.

Tool #1: Create a Skype Account and Chat w/Instructor

What is it?

Skype is an online communication tool for one-on-one or group conversations. It provides different ways to interact in synchronous and asynchronous formats.

Why use it?

It is free, easy to use, and supports team and group communication and collaboration. If you have Skype already installed on your computer or laptop, then just add me. If you do not have Skype installed, go to http://www.skype.com and download Skype. It’s free.

Directions:

- Go to Skype to download the software. See the Help for Windows users or Help for Mac users if you need help. During the installation process, you'll be asked to create a Skype user name and to add contacts to your contact list. Add me and the students you know to your contact list.
- If you need help, post a message in Course Help discussion topic.
- When you can, begin a text chat with me when you see me online so I will know that you were successful in installing and using Skype. If you don't see me online in Skype, post a message to me in Skype. I'll get back to you ASAP so we can have a voice conversation if possible. It's very fun!

Tool #2: Create a Gmail Account and Send a Gmail Message

What is it?

It’s an e-mail account offered by Google and includes Gmail, Google Docs, Calendar, Sites, Scholar, and much more.
Why use it?
Gmail is always available wherever you are, from any device: desktop, laptop, phone, or tablet. It’s always easy to find what you’re looking with the power of Google Search right in your inbox.
Directions:
- Go to http://gmail.com and click “Create an account” on the right, and follow the directions.
- Send me a Gmail message. My Gmail address is mariammatta76@gmail.com.

Tool #3: Create a Twitter Account
What is it?
Twitter is a microblogging service. It allows you to post 140 characters for each “tweet.” You can send personal messages to others on Twitter, follow other twitterers, post links to websites, and search tweets by words, tags, and people. You can also see what topics are trending in your geographic location or anywhere in the world.
Why use it?
People use Twitter to communicate with others in concise sentences or phrases. As a teacher, you can follow other teachers who share teaching ideas, researchers in your field, or even your students.
Directions:
- Sign up for a free account.
- Complete your Twitter profile. Decide to make your account public or private. Put a picture on your account and add a background image.
- Create a post and at the end add “#EDUC518.” You can use a maximum of 140 characters. See an example of a Twitter account at https://twitter.com/mariammatta. Don’t freak out; just do this. If you don’t like it, after the course you can delete it.

Appendix B
Blogging Project
Overview
Create a blog on Blogger to write on the following topic: why Web 2.0 is good for teaching and learning.
Instructions
- Create an account at http://www.blogger.com, and let me know your blog ID or URL. You may use a pseudonym and limited biographical information to protect your privacy if you wish, but I must be informed of your ID so I can grade your assignment. If you already have a blog, you may either use it here or create a new account specifically for this class.
- Please note that you can use any blogging sites.
- In your blog, write (750–1,000 words) on the following elements:
  - Convince your reluctant administrator or colleague that the use of Web 2.0 technologies will enhance students’ learning experiences.
  - What are examples of Web 2.0 tools being used for student engagement and deep learning?
  - In practical day-to-day terms, how would you implement Web 2.0 in a meaningful way that facilitates learning and offers more than just skills in manipulating software?
- Include your personal experiences with Web 2.0 Technologies to support your argument.
- Include references and citations to relevant articles that support your argument.
• Post the link of your blog in this discussion.

**Grading**
• Your blog will be assessed using the rubric (20 points).
• Comment in two other students’ blogs (10 points).

**Appendix C**

**Group Work Instructions**

**Overview**
Using group work is an important strategy for teachers and students for the following reasons:
• Collaboration enhances learning outcomes.
• Group work allows students with different backgrounds to bring their special knowledge, experience, or skills to a project, and to explain their orientation to others.
• Group work gives students a chance to teach each other.
• Collaboration gives students a structured experience so they can practice skills applicable to professional situations.
• For online courses, group work reduces the potential for learner isolation that can occur in the online environment.

**Instructions**
In the wiki project, you will be asked to work in a group of three students. To help you create your group, here are some instructions:
• Use the introduction discussion in the Getting Started module and students’ contributions on the previous discussions to help you make decisions about who might make good group partners for you.
• Create your group. (Use this tutorial to help you join a group: http://guides.instructure.com/s/2204/m/4212/l/64913-how-do-i-join-a-student-group.)
• Read the Group Work Guide.
• Complete the Group Contract.
• By Nov. 5, have one person from your group submit the link to your group contact.

**Appendix D**

**Group Work Guide**

**Overview**
Using group work is an important strategy for teachers and students. Of course, there are challenges to address and potential roadblocks to avoid. This guide provides resources and examples to help you and your group address the challenges and start out on the right track in the development of your collaborative product.

**Establishing Group Policies and Procedures**
As a group you will need to consider the following:
• How will you communicate?
• Will there be a permanent group leader, or will this task be rotated in some way?
• Who will be assigned to post the group’s assignment in your discussion area by the due date?
• How often will you be expected to check for updates from your group members?
What will be your group’s policy on absences?
What policy will you have in place to resolve intragroup conflict that may arise?

Collaborative Tools
There are so many collaboration tools available that the biggest problem for groups ends up being reaching an agreement on which tools to use. Here are my recommendations:

- Canvas Group Tools. You have group tools in your course. They will be a great option!
- Skype (http://www.skype.com). Skype is great for free synchronous collaboration allowing text, audio, and video chat. The ability to share files and large chunks of text are excellent features of Skype.
- Google Docs (http://docs.google.com). Google Docs is a great tool for online collaborative writing. It’s just like using MS Word, and everyone in your group can edit the same document online at anytime. If you have a Gmail account, you may already have Google Docs as a feature when you log in to your Gmail account. And one thing that is nice for us is that Canvas has a nifty Collaborations feature that integrates with Google Docs.

Appendix E
Group Contract
Task: Team building exercise
Objective: To determine the code of contract for a team
Group Members: (Write your group members’ names.)
Instructions
Now that you have determined your group, it is time to determine how your group will operate. A good group code of conduct will include, but is not necessarily limited to, the following items:

1. How will you communicate? Will you post notes and updates for one another in your group discussion area in Canvas? Will you communicate via a mass e-mail list, where anything that one group member sends is received by all? Will you meet in person?
2. How often will you be expected to check for updates from your group members?
3. Will there be a permanent group leader, or will this task be rotated in some way?
4. Who will be assigned to post the group’s assignment solution per the due date policy in our syllabus? Will one person be the poster, or will group members take turns posting assignment solutions?
5. What will be your group’s policy, if any, on absences and covering for one another if need be?
6. What policy will you have in place to resolve any intragroup conflict that may arise (for example, if a group member neglects to carry out his or her delegated duties to post the assignment on time, or if a group member is not receiving or responding to group updates as often as expected in Item 2 above)ì?

Appendix F
Wiki Project
Overview
You and your teammates will contribute to and collaboratively write a wiki about constructivism, technology, and the future of classroom learning. The wiki domain will be organized from a home page
with subsidiary pages linked to it and to each other, allowing the reader to explore the information generated by the group. Your wiki should contain five pages (About, Constructivism and Technology Integration Discussion, and three other pages of your choice, about constructivism, technology, and the future of classroom learning, of course).

The pages that make up this project should conform to the format described in the Wiki Format page.

**Group Dynamics And Individual Responsibility**
- As a group, students will be expected to collaborate extensively in designing the overall product.
- As a group, students will collaboratively write the home page/About page and the Constructivism and Technology Integration Discussion pages. However, each student in the group will be responsible for writing one of the other three pages of the group wiki.
- The group should discuss the organization of the wiki site and decide on a division of the work.
- To allow individual assessment of student effort, each page of the three wiki pages produced will be identified with a single student author, whose name should appear at the bottom of the page.

**Instructions**
- One of your group members needs to volunteer to create a wiki (i.e., PBWorks Wiki), invite me (mariammatta76@gmail.com) and your group members (as editors).
- As a group, you are required to create a wiki containing five pages.
- In the home page/About page of your group wiki (worth 20 points):
  - The home page should have the subsidiary pages linked to it and to each other, allowing the reader to explore the information generated by the group. See Wiki Format.
  - Write the name of your group.
  - Provide an overview about your wiki and its purpose.
  - Share the link of your group wiki in this discussion by Nov. 10.
- In the second page of your group wiki (worth 20 points):
  - As a group, discuss your understanding of constructivism and the characteristics of a constructivist classroom.
  - Develop an argument for integrating technologies in teaching based on constructivist learning theory.
  - Reference at least three readings.
  - Write 750–1,000 words.
  - Share the link of your group wiki in this discussion by Nov. 17.
  - Comment on your classmates’ wiki. You will not receive a grade for this part until you comment on other students’ wikis.
- In the three other pages of your group wiki (worth 20 points for each page):
  - Demonstrate through examples how specific educational technologies support the conditions of a constructivist framework for learning.
  - Support your argument with the course readings, your own sources, and your experiences as a teacher and a student with technology.
  - Reference at least three readings in each page.
  - Write 750–1,000 words in each page.
  - Share the link of your group wiki in this discussion by Dec. 1.
- By Dec. 6, individually do a peer review to at least two of your classmates’ wikis by commenting directly in their wikis based on the following guide (worth 40 points):

| What I like (5 points) | What I think could be improved (10 points) | What I have questions or recommendation about (5 points) |
Regarding the Peer Review for the Wiki Project

You need to directly comment in two of your classmates’ wikis. However, only users that appear in the users list of the wiki are able to make comments. Anonymous users, or users that are simply logged in with a PBworks account and not joined to your space, cannot make any comments on any page. It looks like this would require us to add everyone to our username list regardless of if they have a PBworks account or not. I have found that it is not practical to add all of our class members to your wiki, so I created the peer review schedule below.

Peer Review Schedule

<table>
<thead>
<tr>
<th>Group</th>
<th>Peer Review 1</th>
<th>Peer Review 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Group 8</td>
<td>Group 7</td>
</tr>
<tr>
<td>Group 2</td>
<td>Group 8</td>
<td>Group 4</td>
</tr>
<tr>
<td>Group 3</td>
<td>Group 5</td>
<td>Group 6</td>
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<tr>
<td>Group 4</td>
<td>Group 5</td>
<td>Group 7</td>
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<tr>
<td>Group 5</td>
<td>Group 4</td>
<td>Group 3</td>
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<tr>
<td>Group 6</td>
<td>Group 3</td>
<td>Group 2</td>
</tr>
<tr>
<td>Group 7</td>
<td>Group 2</td>
<td>Group 1</td>
</tr>
<tr>
<td>Group 8</td>
<td>Group 1</td>
<td>Group 6</td>
</tr>
</tbody>
</table>

This means that Group 2 needs to review Groups 4 and 8’s wikis and add the members of Groups 6 and 7 to their wiki. Group 4 needs to review Groups 5 and 7’s wikis and add Groups 2 and 5 to their wiki, and so on.

Grading

- Your wiki, with its five pages, is worth 90 points. Each wiki page (except the home page) will be graded based on the wiki rubric.
- Evaluating peer contribution. Each student in the group will evaluate his/her peer contribution based on this rubric.

I will grade the group wiki based on the wiki rubric and based on your peer evaluation to your contribution. For example, if (based on the wiki rubric) your wiki deserves the 60 points and your peers evaluate your contribution as 100%, then your final grade in the wiki project will be 60/60. But if your peers evaluate your contribution as 50%, then your final grade will be 30/60. If your peers’ evaluation of your contribution differed (one said that you deserved 100% while the other peer said you deserved 50%), in that case I will calculate the mean.

Appendix G

Reflective Activity

Reflect on the learning community in this course and how the learning community positively or negatively affected your learning in the course. In your reflection, consider answering the following questions:

- Did using Google Docs give you a sense of a learning community?
- Why did using Google Docs give you a sense of a learning community (or why didn’t it)?

Post your reflection by December 8 and reply to each other. You will receive 10 points for posting your reflection and 10 points for responding to at least three other classmates.
Exploring Adult Learners Usage of Information Communication Technology during a Virtual Peer Coaching Experience

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Abstract
The purpose of this study was to explore how post-graduate students in a fully online business course used information communication technology during a virtual peer coaching experience. In this exploration of technology use it was found students required additional guidance in the use of technologies such as email, telephone calling, and more media rich tools such as Skype and Blackboard Collaborate during a virtual peer coaching session. They did not fully understand how to use these different mediums to guide and structure the coaching experience. They were frustrated by the lack of media richness when using tools with low levels of audio-visual connectivity. The findings suggest that the increasing use of technology in education does not necessarily mean that students will use it appropriately, even if they are adept at learning online or use the technology in their daily lives. Therefore, instructors cannot make assumptions about students’ technological literacy even though these same students may appear to have a high level of competency learning online. Guidelines for using ICT in virtual peer coaching are provided as a result of this exploration.

Introduction
The use of information communication technology (ICT) to deliver education is now well established in higher education (Ellis, Ginns, & Piggott, 2009). Learning management systems and ICT have evolved significantly over the past ten years and continue to evolve at a rapid pace. Higher bandwidth, faster internet speeds, mobile devices and advances in Web 2.0 technologies have also meant learning online is much easier and faster, particularly for tech-savvy learners. Adult education, particularly in the post-graduate business education market, has been strongly influenced by this growth in information communication technologies. Students in these programs require flexible learning designs
because they typically work full time and need to balance education with work and family commitments (Millson & Wilemon, 2008). Fully online and blended learning courses can provide this flexibility (De George-Walker & Keeffe, 2010) and academic programs have responded to this need by providing courses in both modes.

Understanding how students engage with ICT is an important part of instructional design in fully online and blended courses. By understanding student usage patterns, guidelines and criteria can be established to assist these learners to achieve optimal learning outcomes. This, in turn, prepares them for work in an increasingly global business environment where, for example, telecommuting (Zey, 2011), virtual mentoring and e-coaching are increasing in importance (Boyce & Clutterbuck, 2011; Boyce & Hernez-Broome, 2010; Clutterbuck, 2010; Khan, 2010; Meister, Kaganer & Von Feldt, 2011) along with other forms of communication to support virtual teams (Quinn, Faerman, Thompson, McGrath & St. Clair, 2011).

Yet, those who understand education and ICT recognize technology is just a medium for delivering content and interaction between teachers and learners. The pros and cons of educational technology must be understood and applied appropriately to achieve strong educational outcomes (Harris & Rea, 2009). Hence, with such a boom in ICT and education do we know whether students are using the technology appropriately (Khan, 2010) and do they achieve the purported benefits of the learning activity using the technology? If a student understands how to email and text, and use FaceTime or Skype to talk with friends, can we assume that this knowledge and skill is transferable to managing a virtual coaching context or chairing a virtual meeting?

To understand this question more deeply, the purpose of this research was to explore how post-graduate students enrolled in an online business course used ICT to support their virtual peer coaching experiences. Peer coaching is an effective strategy for helping students develop leadership and management skills and involves two or more learners of relatively equal status providing support and non-evaluative feedback to one another in pursuit of achieving specific goals (Ladyshewsky, 2010; Ladyshewsky & Ryan, 2006).

**Literature Review**

While there is ample research discussing how students learn online, there is far less research that explores how students use ICT as part of a virtual peer coaching (VPC) experience and little on e-mentoring (Murphy, 2011). The physical classroom and the virtual learning environment are distinctly different. The availability of virtual learning technology does not imply students use it appropriately (Proserpio & Gioia, 2007). A greater understanding of what people do online and how to connect it to good teaching practices is important (Harris & Rea, 2009) because of the increasing usage of ICT in everyday life and work (Baym, 2009; Haythornwaite, 2011; Zey, 2011). There is evidence that incorporating more advanced technology which captures video and sound into educational environments can enrich learning (Arbaugh, 2005). This is consistent with cognitive flexibility theory which espouses that students can learn complex material if they experience it in multiple formats (Hall, Watkins & Eller, 2003).

While there is little research on how students interact in a VPC program, there is research on e-coaching and virtual mentoring even though the definitions of these two processes can be quite diverse (Clutterbuck, 2010). Perhaps the most straightforward definition of these two interactions (e-coaching and virtual mentoring) is described by Clutterbuck (2010), “a developmental partnership, in which all or most of the learning dialogue takes place using e-mail, either as the sole medium or supplemented by other media” (p.4).

Yet, there are a range of other terms that are used to describe these types of interactions (e.g. tele-mentoring, cyber-mentoring, web enabled coaching, etc.) which essentially require some form of ‘electronic-based’ interaction as the primary format for communication (Akin & Hilbun, 2007; D'Abate, Eddy & Tannenbaum, 2003; Rowland, 2012; Zey, 2011). The interaction can involve telephone, video
conferencing, e-mail, online chat sessions, texting and can be synchronous or asynchronous. By introducing ICT into the coaching relationship, it influences the relationship between the coaching process and the coaching outcomes (Boyce & Clutterbuck, 2011). While the introduction of ICT to support e-coaching is controversial for some, it is becoming more commonplace and evidence increasingly suggests its effectiveness (Boyce & Hernez-Broome, 2010). E-coaching primarily is used by coaches to provide assistance on specific projects, to accelerate the achievement of competency and to facilitate transfer of training (Boyce & Hernez-Broome, 2010). Questions are emerging as to whether quality coaching can occur using ICT. A greater understanding of how ICT impacts coaching is needed, particularly the skill base that is needed for both the coach and the coachee to interact in this medium (Boyce & Clutterbuck, 2011).

The literature on virtual mentoring is also beneficial for exploring VPC within an educational context. The literature indicates this type of virtual mentoring occurs in work contexts (Zey, 2011), services contexts (Aoun, Osseiran-Moisson, Shaid, Howat & O’Connor, 2012; Haythornwaite, 2011), and educational contexts (Bierema & Merriam, 2002) and is generally viewed as positive and effective when implemented appropriately. Issues that emerge with virtual mentoring typically relate to the loss of face-to-face contact (Rowland, 2012), the reduction in communication richness (Aoun et al., 2012; Zey, 2011) and the impersonal nature of the experience (Rowland, 2012). Many of these issues could be applied to e-coaching.

More advanced media which enables synchronous audio and visual communication can enable the transmission of multiple verbal and non-verbal cues, natural language, immediate feedback as well as the conveyance of empathy, personal emotions, and feelings (Akin & Hilbun, 2007; Daft & Lengel, 1986). This would strengthen the e-coaching and virtual mentoring experience. Daft and Lengel found that individuals perceived text-based chat as having lower media richness than video conferencing. Video conferencing was perceived, in turn, as having less media richness than face to face communication. Face to face communication and video conferencing were seen to lead to better team cohesion than text based chat and were more efficient as they eliminated the need to type, thus saving time.

This literature offers very useful insights on how virtual mentoring and e-coaching employ ICT and provides a foundation for exploring how post-graduate business students used ICT to support their VPC experience in this study. Further studies exploring virtual communication in mentoring/coaching relationships have been called for, along with qualitative methods to explore process issues (Murphy, 2011). The purpose of this study was to explore how post-graduate business students used ICT to support a virtual peer coaching experience.

**Methodology**

**Sample and Procedure**

The VPC experience was driven by two assignments to drive engagement and learning (Biggs, 2003). The first assignment was the completion of an online 360 degree leadership survey (Quinn, Faerman et al. 2011). This survey collected feedback on a person’s leadership and management performance from subordinates, peers and supervisors. Each student received an interpretive 360 degree report and had to analyze their results and prepare a leadership development plan. The second assignment was to begin the implementation of the leadership development plan with the support of peer coaching. The use of peer coaching to support leadership development has been used successfully in the past (Ladyshewsky, 2007; Ladyshewsky & Ryan, 2006; Ladyshewsky & Varey, 2005).

The students were required to conduct three VPC sessions (over the course of 5–6 weeks) as part of an online management course. They used ICT for the sessions as they were not able to come to the campus and were dispersed regionally, nationally and internationally. The objectives of the peer coaching were to develop students’ skills as coaches, to experience being coachees, and to help students integrate learnings from their course with real-world experiences. The students were given extensive guidance on how to prepare themselves for the peer coaching assignment with modules in the online course dedicated
to coaching theory and practice. The students were not told specifically what ICT tools they needed to use for their peer coaching although there was information in the course on Skype and MSN Messenger as alternative tools to facilitate more media rich communication. Students were familiar with using e-mail and chat forums as these were used in the course to communicate with one another. Blackboard Collaborate™ was used for synchronous discussions in the course.

Participants formed their own VPC teams (n=3) from within the course by reviewing each other’s biographies which were set up using the home journal tool within Blackboard™. They could coach as a team or they could coach in pairs. The VPC team was set up as a triad in case one of the students withdrew from the course.

- Team coaching involved one person taking the role of coachee and the other two parties providing coaching. They would then rotate so each member of the triad had an opportunity to be a coachee. This approach resembles what occurs in action learning sets—although the number of participants are usually greater and the dialogue more reciprocal (Johnson & Spicer, 2006).
- If the triad decided to undertake coaching in pairs the following strategy was implemented so each person had an opportunity to experience the coach and coachee role.
  - Mary (coach) coaches John (coachee);
  - John (coach) coaches Bill (coachee);
  - Bill (coach) coaches Mary (coachee).

As a purposeful sample of convenience (Merriam, 1998) 49 students across two administrations of the fully online management course were invited to share their learning journals for this case study. In the end, a total of 22 students submitted three learning journals each—comprising a total of 66 learning journals.

Data Collection

The reflective journals were written in a format that modelled the experiential learning cycle (Kolb, 1984). This four stage cycle has subsequently been expanded and developed by others (Argyris, 1991; Boud, 1988; Boud & Edwards, 1999; Honey & Mumford, 1987) and involves reflecting on one’s experience, making conclusions about the experience and then re-applying the learning to future experiences. Reflective learning journals are particularly useful for making thoughts visible and concrete and for allowing participants to interact with, elaborate on, and expand ideas (Kerka, 1996). Reflective practice is an essential part of professional development (Schon, 1991).

The written journals were submitted online. These were read by the instructor and then graded. At the end of the course students were invited to submit their reflective journals for review by the investigator (who was also the instructor) as part of this research project. This invitation occurred after the course was completed and their grades released. Students were advised that any identifying information would be removed and pseudonyms used where necessary.

To explore the phenomenon of the student experience using ICT during their VPC sessions, a qualitative methodology in the form of a case study was used. There is little consensus on what constitutes a case study or how this type of research should be done (Brown, 2008). However, Merriam (1998) argues the ‘single most defining characteristic of case study research lies in delimiting the object of study: the case” (p. 27). The case is a “thing, a single entity, a unit around which there are boundaries” (p.27). In this research, the unit was the VPC assignment with its boundaries set by instructions on how to complete the task and achieve the learning outcomes.

Merriam also claims that a case study does not require a set data collection method, but instead, “focuses on holistic description and explanation” (p. 29) which is the purpose of this research—to explore students’ experiences using VPC using ICT. Case studies also enable the investigation of contemporary phenomenon within a real-life context (Yin, 1994). While this VPC experience occurred within a course,
it has direct transfer to the workplace given the increase in virtual communication between managers and their teams.

**Data Analysis**

In order to analyze textual data (the learning journals) reduction strategies are needed to gain a holistic understanding of the information contained in the written passages. This is accomplished by coding the data into units of meaning. The units of meaning are then reviewed through an iterative process in which the investigator undergoes an analysis of the content—comparing and contrasting the content into themes and categories of meaning (Merriam, 1998). The investigator can code the data using their own defining labels—open coding—or have the labels emerge from the data itself—in vivo coding (Creswell, 2003). In this research labels were assigned by the investigator. Only textual data relating to the use of ICT during the VPC was coded.

Reliability and validity in qualitative research are measured in different ways and include terms such as trustworthiness, credibility, transferability and confirmability (Byrne, 2009; Golafshani, 2003). Trustworthiness and credibility are attained through triangulation, which is a validity procedure where the investigator looks for convergence among multiple sources to form themes or categories (Creswell, 2003). There were a total of 22 students who submitted 3 journals—each journal was 1000 words. As a result, there were 66 journals or data sources from which information was extracted on the VPC experience. Transferability refers to how the findings can be applied to other contexts and occurs by offering rich descriptions of the themes that emerge from the research. This makes the content plausible to others. Transferability and confirmability is achieved, in part, by finding supportive research in the literature that lends support to the findings, and by sharing the results for debate in the scholarly community through peer reviews and journal publications.

The strength of using the case study approach is that it provides the researcher with flexibility to work through the data within the bounded system, and to see what emerges from the interrogation of the data. By linking the findings to existing literature, a rich description of the phenomena can be more fully described and understood. While this rich description can be beneficial to others, it does not offer generalizability to all situations. A more controlled study with larger sample sizes would be needed.

**Findings**

The aim of this research was to explore how students used ICT to support their virtual coaching experience. During the coding process it was found that the best way to categorize data was through two themes. The first theme explored the technologies students used (email, telephone, Collaborate and Skype) and the impact it had on their virtual coaching experience. The second category categorized the learners’ opinions of the ICT that was employed and the impact it had on their communication and technology selection. The students experienced several challenges when using the different forms of media for their coaching. They experienced challenges around being able to build rapport, communication, technology failure, and media richness. They also gained insights into how they might have improved their VPC through better use and selection of ICT. For each category of technology, example quotations from the participants are provided to illustrate the phenomena further.

**Student Choice of ICT:**

**E-Mail**

E-mail was used in different ways by the students. In some cases it was the sole mode of communication whereas for others it was used in addition to other media. E-mail was found to be very useful for exchanging information, sharing documents, gaining knowledge of the other parties involved in the VPC relationship and for setting up sessions and parameters for the coaching.

“AB and I made contact via e-mail and established a meeting time and clarified the intention of the meeting…”(004) “… I would send through an e-mail with some pre-reading around my role and my goals.”(005) “… I often sent follow up e-mails to M and K providing additional thoughts.” (024) “…All
initial communication from forming the triad to determining the first coaching session was conducted via e-mail” (021) …

E-mail also supported relationship building because information about one another could be shared. Individuals could seek further information about the individual after reading their online home journal profiles in Blackboard.

“Based on the on-line student home journal profiles, I selected AB as we both worked in similar industries.” … my decision was limited to online information only, I felt that in order to maximise the coaching experience I should select a person with some similarities..” (004) … “I began building the relationship through the sharing of information via e-mail. “(010) … “Our initial meetings were conducted via e-mail due to the group being in different locations…these e-mails are referred to as the forming and norming stages of team development.” (018)”

It was very clear that the medium did not provide a rich coaching experience other than the exchange of factual information. It led to potential miscommunication, lacked the ability to create more authentic communication experiences important to coaching, and did not provide enough information for building the relationship further. All in all, as a medium for undertaking coaching it was ineffective.

“… in the future I would consider if I need to have a verbal conversation, phone or face-to-face, with a potential peer coach rather than relying on an e-mail conversation.” (004) … “The tone in e-mail correspondence from AB felt quite formal … I was mindful not to read too much into the tone of an e-mail as I understand e-mail can easily be misunderstood.” (004)

When there was a failure in more advanced media e-mail often became the only option, particularly if people were in different geographical locations and did not have access to reliable telecommunications.

“I think the reason that the session was still productive (Blackboard technical issue) was that we had previously e-mailed information about ourselves so we didn’t start the session from a stand-still.” (020) … “[we] also decided to use e-mails to keep discussions flowing and as a contingency if one was unable to attend the Blackboard Collaborate sessions….due to technical issues most communication was via e-mail as John found himself in hurricane Sandy in Jamaica and my site had issues with the satellite at the time of the meeting” (018).

**Telephone**

The telephone was used by some students to conduct coaching sessions. It offered a more expansive means of communication because of the verbal cues provided. While some students found it to be adequate, by far more students found it to be ineffective for the coaching experience. There were some issues with this medium, namely telecommunication satellite issues—in one instance, students had difficulty communicating via telephone with another student located on a remote oil rig.

**Effective**

“I had doubt on the effectiveness of coaching over the phone. But in my first coaching session with John and Brad made me realise that my intuition was wrong”. (001) … “No further issues with telephone reception….this session was the best session in terms of output ….It went for a full hour.”(023) … “I felt the telephone method of coaching was quite good… I found through the phone I was able to focus and listen to Jane.” (024)

**Ineffective**

“…I knew that having this session over the telephone instead of face to face would potentially cause issues. … without that face to face communication I did not feel I built the same rapport as from the previous face to face sessions”(005). “…conducting all three sessions with John by phone was a limitation in that it hampered important non-verbal communication….”(016) … “Due to our strictly telephonic conversation non-verbal cues were not possible to gauge” (007).
Blackboard Collaborate

Blackboard Collaborate provides the opportunity for chat with web cam thus enabling participants to see and hear each other in real time. There is also a text-chat window on the screen where participants can write comments as well. When the technology works well it can offer a media rich virtual experience to students, however, when it does not function well it reduces the efficacy of the coaching experience. It appeared that Blackboard Collaborate had many technical issues which impacted students' coaching experiences.

“Virtual face to face [coaching] was administered through Blackboard Collaborate Live Chat (only Mary and I were able to talk to each other, Jane had to write down her comments due to technical difficulties.”(015) … “The technology issues we faced with BB Collaborate Live Chat … resulted in a non-visual PC session … we were all able to talk but stopped us from fully experiencing an up-close coaching session….” (015) … “… again our final sessions were hampered with technical difficulties. With only John being in a capital city both Frank and I struggled with internet connections … eventually John and I managed to log into Blackboard Collaborate for a discussion…”(018) … “As a result of the Blackboard configuration … we couldn’t have three people using microphones [at same time] so I had to type my questions and responses. I found this to be quite disjointed and made it hard for me to be involved in the discussion.”(020) …

Skype™

Skype offered the richest and most simplistic multi-media experience for students to complete their virtual peer coaching. When it worked well and when students used it appropriately, it was highly effective. When it did not work properly or was not used to its full potential it reduced the depth of the coaching experience.

Skype with WebCam

“….we had use of the videocamera which allowed for observation of body language….enhanced with the use of videocamera.” (002) … “Two meetings via SKYPE webcam were used to establish the ‘ground rules’ and to build a relationship between John and myself … overall our first sessions from a coach and coachee perspective were positive and face to face meetings via SKYPE enabled us to develop a rapport.” (022)

Skype Audio Only

“Communicating via SKYPE was another challenge as the triad did not use video conferencing only audio. …The inability to see my peers resulted in issues with timing (e.g. 2 people speaking at once then silences; inability to gauge the impact of the information being shared eg. was it being received with interest or dismissed?) … The medium tended to inhibit the flow of the conversation. The need to defer to each other became paramount in overcoming this issue and by the end of the session we had become more adept at managing this.” (002) … “Skype conference call without webcam (SKYPE quality was poor in that there were time delays between participants.”(0015) … “Because I was not able to see my coaches, I could not use their body language for signs of support.” (0015) … “When the coaching session was moved to SKYPE we were able to hold a three way conversation but without vision. This limited the richness of the communication.”(021)

Skype was considered to be an efficient and flexible tool for communication that enabled students to meet and coach. It enabled them to hold meetings when they are in different parts of the world and in different time zones.

“As a method of communication it was flexible … easier to meet later at night without having to add …travel time.”(006) … “Being able to engage in real time conversation (SKYPE voice conference) resulted in us trying to achieve a number of things in a time restricted session due to time zone differences.” (011) … “I found this session to be very constructive and I felt I was able to coach effectively in comparison to last week’s session where I could only communicate via text due to the Blackboard Collaborate configurations. …” (020) … “The final coaching session was used via SKYPE. I
would definitely use and recommend this technology in the future. However, I would investigate the package required to allow teleconferencing.” (021)

Student Assessment of ICT Use for Peer Coaching

Virtual Communication Skills

Not all students found communicating virtually, especially without visual cues, to be easy. They were able to identify skill gaps and issues that they needed to address in order to maximize communication.

“When coaching, I continued to be hesitant to speak in danger of cutting into anything my peer coaches wanted to say but also at the same time tried to move the conversation forward to avoid awkward silences....” (015) … “I believe that my effective listening suffered because of the mode of coaching... I will make sure that the topic of silence is addressed in the introductory phase to raise awareness and understanding of it.”(015) … …”having one person to focus on and consider in the communication loop...unlike the first two sessions where people spoke all at once or there were silences...the conversation flowed more freely.” (002) … “My coaching sessions took place via SKYPE voice calls due to my peers being located in different countries. I use my hand gestures a lot so I had to adapt to only being able to use my voice. I feel the coaching sessions via SKYPE increased my listening skills and taught me to truly listen.”(014)

Technology Selection

It did not appear that the students had a strong grasp of the various forms of communication technologies available to them and how they could use them to best support their VPC experiences. It seemed they used what was most easy or accessible to them but then realized that it did not provide them with the level of media richness needed to have an effective VPC session. It was at this point that they then started to explore other forms of media.

“In the future I would ensure more thorough investigation of the technology before use...perhaps have been a better result to switch to another form of technology (e.g. Skype) when we found we could not see or talk with Jane (using Blackboard Collaborate Chat).” (021)

Importance of Technology Mediated Communication

The other theme that emerged was the recognition by some students that the ability to communicate and conduct coaching virtually was an expanding role of the manager and a skill they needed to develop further.

“Even though my preferred method of communication is face to face, it is important I do not rule out other modes. Given the geographically diverse organisation I work within and the differing time zones, I must maintain flexibility in how I am able to communicate with people.” (005) … “not having ‘face time’ however is reflective of my current work environment where members are geographically dispersed so I view this (voice only SKYPE) as a good experience in developing my coaching skills via this mode.” (011) … I am glad I had the opportunity to practice this type of arrangement in a non-work environment because it is likely I will need to undertake a remote coaching role at some stage if I stay with my current employer.” (016)

Discussion

The literature talks about how tech-savvy today’s students are and how they are more technologically literate than their instructors (Harris & Rea, 2009). Prensky (2001) refers to these tech-savvy individuals as ‘digital natives’ because they have grown up with technology. In contrast, older instructors are likely to be considered ‘digital immigrants’ because they have had to learn and adapt to technology. (Prensky, 2001). While today’s post-graduate business student is likely to be more ‘native’ than ‘immigrant,’ there is a risk in assuming that the use of technology and software in daily life will transfer to learning situations with specific learning outcomes (Pittaway, Downing, & Osborne, 2010). Making these assumptions can be a recipe for disaster (Bart, 2011) and the findings of this research...
appear to lend further support to these views. Furthermore, the purpose of this research: to explore how post-graduate students used ICT to support their virtual peer coaching has revealed that technology was not used to its full benefit.

One of the major concepts that emerged across the technologies was the issue of media richness to support high quality VPC interactions. Research has indicated when a combination of technologies are used, e-mentoring relationships are strengthened (Murphy, 2011). Applying this to virtual coaching, using e-mail and asynchronous communication tools to exchange information, to set up meeting times, and to forward pre-reading was appropriate. When engaged in coaching, ICT that enabled full audio-visual contact was more appropriate because of the media richness it offered—provided there were no issues with connectivity. Coaching that used e-mail instead of more media rich tools resulted in very different coaching outcomes in one study (Clutterbuck, 2010). As a result, individuals that use ICT to support coaching must use the communication technologies strategically in order to achieve outcomes in line with their expectations (Moreme, 2013). This suggests that students and perhaps even coaching practitioners and their recipients of coaching, need to understand ICT more fully and how it moderates and affects coaching outcomes for both parties.

The students expressed many concerns about the lack of media richness associated with text only or audio only communication. It was not entirely clear why they did not progress to more media-rich platforms where they could use webcams. In some cases it stemmed from not having a webcam, access to high speed internet because of geography, or not having smart phone technology that would enable face to face audio-visual communication such as FaceTime on iPhones. In some cases attempts were thwarted by software and operational difficulties. This is where stronger guidelines and recommendations are needed to support students (Headlam-Wells, Craig & Gosland, 2006; Rowland, 2012) as understanding and skill in using ICT to support coaching is a requisite (Clutterbuck, 2010; Moreme, 2013). These issues become even more pronounced in online delivery, particularly with students in countries where access to hardware and high speed broadband is an issue. Students from these countries may be even more unfamiliar with using ICT and associated software applications within an educational context.

The literature suggests that training in electronic arts is important in order to use communication technologies well (Headlam-Wells et al., 2006; Rowland, 2012) and to achieve success and program outcomes (Zey, 2011) even though electronic communication is used in daily personal and professional practice (Murphy, 2011). Instructors also need to understand the communication technology deeply, how it might affect student learning, and structure the learning experience so students use the technology successfully (Proserpio & Gioia, 2007). This may be difficult for instructors who are considered digital immigrants (Prensky, 2001) and may be part of the reason students don’t necessarily use ICT appropriately.

Other reasons for not shifting or using more advanced forms of communication technologies to support their VPC may find explanation in the Technology Acceptance Model (Davis, 1989) and the Task-Technology Fit Model (Goodhue & Thompson, 1995). The Technology Acceptance Model notes that the perceived usefulness of technology and the perceived ease of use of technology are variables that influence technology adoption and usage. The model is well accepted in the literature and is a valid predictor of computer software use. Students who used technologies such as telephone or e-mail or live chat either may have stayed with those mediums because they were easy to use and useful enough for achieving the learning outcomes. Because the more advanced technologies were less easy to use they were likely not adopted. The Task-Technology Fit Model is based on the idea that tasks and technology need to be compatible. Students may have felt that the coaching task could be done easily by using less complicated forms of technology. In order to increase task-technology fit, the instructor recognized the need to provide more detailed and expansive guidelines to the students. For instructors who are digital immigrants, it may be possible that some of their own incapacity in using ICT may be leading to poor adoption by the students.

There may also be other reasons students did not move to more advanced audio-visual communication. They may have remained with the same media despite its low efficacy, because they only
had three VPC sessions to complete and it may have been too difficult to try and learn and develop competency in a new media within the confines of the assignment. Had the VPC been longer it may have led to more advanced adoption and usage of more complex communication technologies. Students who used the lower media-rich tools may have also used these because they were more superficial learners (Biggs, 2003) and just chose an easy medium to complete the assignment.

Many of the students who started off with these tools became frustrated with them and started to move to more media-rich tools. Several experienced technical difficulties such as slow internet speeds leading to lags in communication, bad internet connections in remote areas and software issues with Blackboard Collaborate. These technical difficulties may have been due to poor skills in using the software or genuine technical issues at the time.

Some students expressed a desire to move on to more media rich tools to enhance the VPC experience. This finding is supported in the literature which found that as bonds increased between individuals communicating virtually, they used more media to communicate with one another—a term called media multiplexity (Haythornwaite, 2011). In other words, by combining different media forms into an e-mentoring experience, relationships may be more successful (Rowland, 2012). This was evident in the comments made by students who used multiple forms of media to support their virtual peer coaching. This suggests that students—and professional coaches for that matter—who use ICT in support of coaching should use multi-layered approaches. For example, use email, telephone and full audio-visual software tools interchangeably based on the objectives they are seeking to achieve in the coaching.

What is interesting is that ‘what’ the students were trying to communicate did not differ by mode of media. They were all trying to ask coaching questions, answer them, build their relationship and assist their peers to progress in their development plans. The telephone was used in different ways to support the VPC in comparison to Skype; for example: e-mail and asynchronous discussion offers more time for reflection and thinking before a response is made (Akin & Hilbun, 2007; Daft & Lengel, 1986) which may be very appropriate for coaching. These mediums are also good for sending information, sharing documents, setting up meetings and discussing content (Purcell, 2004). That said, Purcell argues it is not a good medium for providing feedback or exploring ideas which are important parts of building a relationship, and many of the students’ comments echoed this fact. E-mail and chat may also contain grammar and punctuation issues and abbreviations which interfere with communication. Ideally, telecommunications should be used initially to build the relationship instead of e-mail if virtual face-to-face means are not possible (Haythornwaite, 2011). Several students relied solely on e-mail and from the comments provided, consequently did not have the best experience. Integrating media may be the most appropriate strategy for building successful VPC relationships (Headlam-Wells et al., 2006; Purcell, 2004)

**Recommendations**

Students had difficulties selecting the appropriate ICT and using it effectively. Hence, students would benefit from having information on communication technology selection, tip sheets on how to use the technology, and guidelines for virtual communication to ensure educational objectives and learning outcomes are met (Haythornwaite, 2011). This would help to reduce what appears to be an ongoing issue with technology adoption and usage in online learning (Proserpio & Gioia, 2007). The guidelines developed in response to the findings of this research are attached in the appendix. Hopefully these guidelines will assist other instructors to create better student support when using ICT in their courses.

Some students also lacked the processes and conventions for managing online communication (Headlam-Wells et al., 2006), such as how to listen more effectively and how to manage virtual conference calls. Guidelines on how to communicate in virtual teams and in pairs would also be useful along with practice prior to the advent of the virtual peer coaching sessions.

It was also very clear from students’ comments that the loss of face to face contact (Rowland, 2012) and the reduction in communication richness (Aoun et al., 2012; Zey, 2011) was problematic when
telephone, e-mail or virtual chat (audio) were employed (Haythornwaite, 2011). The use of a webcam to support full audio-visual conferencing was seen as a very effective solution for those students who used this technology. It offered the type of media richness described in the literature that would support successful virtual peer coaching (Daft & Lengel, 1986).

**Limitations**

There are several limitations associated with this research. First, it does not encapsulate all forms of virtual communication technologies. There are many software programs and mobile device applications that are being used to support virtual communication. Keeping up with these can be very difficult. This study only looked at what would be commonly used by most students enrolled in an online course that are dispersed geographically. Secondly, the focus of this study was on how students used communication technologies. It is important to acknowledge that there are different issues that emerge in e-coaching when multiple parties (three or more) are involved in comparison to only two parties. Some of these were apparent in the outcomes of this study, for example, how can you visualize all three parties during a coaching session and how do you manage pacing and speaking intent when there are more than two people on line with no visual contact.

**Conclusion**

Information communication technology continues to revolutionize how human beings interact and communicate with one another. Eventually, these communication formats find their way into the educational environment especially if learning occurs in an online format. Research suggests virtual coaching can be effective if the communication technology is used effectively by all parties, and if these parties are very clear of the intent behind the sessions (Boyce & Clutterbuck, 2011; Boyce & Herne-Broome, 2010; Clutterbuck, 2010; Moreme, 2013). The technology has to be able to provide a solution to reach the agreed upon coaching outcomes.

This research has demonstrated that post-graduate students did not use communication technologies appropriately or to their full effect as part of a VPC exercise to support their coaching and leadership development. This had a negative impact on the cohort achieving the educational objectives set by the instructor. Therefore, the need for best practice guidelines and trouble-shooting support is necessary when using ICT to support learning in situations such as e-coaching. Otherwise, students may use technology inappropriately and not receive the full benefit of their learning in a course. Educators should not shy away from using e-coaching in their courses, but must recognize that there are specific outcomes associated with this type of coaching and a set of competencies users need to have in order to make the experience effective. These considerations need to be built into the course experience and may involve additional training and preparation.

**References**


Khan, A. (2010). Virtual Mentoring: A Quantitative Study to Measure the Effectiveness of Virtual Mentoring Versus Face-to-Face Mentoring. (Ph.D.), Capella University, Ann Arbor, MI. (UMI 3404631)


Research has demonstrated that students do not necessarily use information communication technology (ICT) appropriately or to its full advantage when pursuing specific educational objectives. While we may feel we are competent in using our day to day communications technology to conduct our personal affairs, when trying to achieve specific educational outcomes, technology might have to be used in a more strategic manner.

Students enrolled in this course may find this information of benefit to ensure they start their peer coaching assignment successfully. An important aspect of using the technology is to obtain media richness so you can communicate more deeply and comprehensively. By having full audio and visual communication, it is much easier to read body language, respond to facial cues and interpret messages. This is important for a rich coaching experience. Please review the following forms of ICT before making a decision on how to structure your virtual peer coaching experience.

I would recommend you experiment with the technology BEFORE you start your first formal peer coaching session to work through any learning and technical issues.

**EMAIL:** This technology is good for exchanging background information about each other prior to the start of coaching. It is also good for sharing documents or reports for review prior to a meeting, to confirm coaching times and other administrative aspects of managing the coaching session.

It is not a good medium for engaging in an actual coaching session as visual and verbal clues are lost and the possibility of misinterpretation increases. Only in a situation where there is no other means to communicate should email be used as the ‘live coaching’ tool.

**TELEPHONE** (Traditional or Mobile): While this technology can be used for live coaching it does not provide access to visual cues, only verbal intonation. Hence, it is possible to lose important information that may be helpful in the coaching session. Feedback suggests this medium is ineffective for a good coaching experience. Again, if all other forms of technology fail or there is no access to the internet, then you may need to use telephone. If your peer coach is overseas and long distance charges apply, here are some products you can use over the internet/wifi to communicate freely.

- **OVERSEAS TELEPHONE CALLS:**
  - **VIBER** [http://www.viber.com/](http://www.viber.com/)
    
  This smart phone APP enables you to speak to each other via a WIFI connection without incurring a telephone or long distance charge.
This APP/Software can be used as a telephone medium via WIFI if you are in different countries and want to avoid long distance charges.

**SMARTPHONE TECHNOLOGY:**
- **TEXT MESSAGING** should be used in much the same way as email, in particular, for confirming times and other administrative aspects of managing the coaching session.
- **FREE OVERSEAS TEXTING:** smartphone APPS such as
  - VIBER [http://www.viber.com](http://www.viber.com/)
  - WHATSAPP [http://www.whatsapp.com](http://www.whatsapp.com/)

Both of these APPS enable you to exchange text messages via WIFI if your coaching partners are overseas. This is free and does not incur a text messaging or overseas message charge.

- **AUDIOVISUAL APPLICATIONS**
    can be used successfully as a virtual coaching tool as it offers full audiovisual communication with your peer coach.
    If you have an apple iPad, iPhone, iPod touch or MAC you can make face to face audiovisual calls to another person with the same device with a WIFI connection.
    You can use this APP/Program to make a live video call with up to 10 people.

**SOFTWARE PROGRAMS**
  
    Skype is a very affordable software tool that can enable you to communicate directly with others via a good WIFI or Internet Connection. Both audio and visual communication provides for a rich media experience. When using SKYPE it is important to use both the microphone and WEB CAM so you can hear and see each other during coaching.

    *Feedback from students suggests that this provides the richest coaching experience. It also has a low technology failure ratio so it is generally very reliable when used.*

    **SKYPE enables team coaching to occur. In other words three or more participants can participate in the coaching with full audio and visual dimensions.** The website offers a tutorial and with advanced membership also enables you to record and save the meeting.

- **GoToMeeting** [http://www.gotomeeting.com/online/](http://www.gotomeeting.com/online/)

    This is a software program you can use for a one month free trial, otherwise there is a monthly cost to use this software. The software enables you to run a meeting and to invite one or more other individuals (who don’t have to purchase the software) and allows for full audiovisual communication. You can also share a desktop and work on a document collaboratively. Parties can log in via telephone (although you don’t have visual if you use this aspect) or via their internet with webcam (which provides visual communication).

    The website above provides a walk through tutorial

- **WEBEX** [www.webex.com](http://www.webex.com)

    This is a video conferencing program that enables live audio-visual virtual conferencing, including sharing of desktop, whiteboard and documents. It can be delivered across a range of platforms. It offers a FREE license to run WEBEX meetings for up to 3 people per meeting which makes it a good option if you’re in a triad peer coaching arrangement and want to teach coach. This link provides an overview and training in how to use the software. [http://www.webex.com/products/elearning-and-online-training.html](http://www.webex.com/products/elearning-and-online-training.html)

**BLACKBOARD COLLABORATE**

This unit has a 24 x 7 open Blackboard Collaborate site where students can log into and communicate with one another. The link is located on the left hand menu in your Blackboard Unit. This software can provide for audio-visual communication.

The software is rather complex so technical issues are more common place than using other software programs or APPS noted above.
Student Satisfaction with Online Learning: Is it a Psychological Contract?

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Research Initiative for Teaching Effectiveness
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Abstract

The authors explore the possible relationship between student satisfaction with online learning and the theory of psychological contracts. The study incorporates latent trait models using the image analysis procedure and computation of Anderson and Rubin factors scores with contrasts for students who are satisfied, ambivalent, or dissatisfied with their online learning experiences. The findings identify three underlying satisfaction components: engaged learning, agency, and assessment. The factor score comparisons indicate that students in the general satisfaction categories characterize important differences in engaged learning and agency, but not assessment. These results lead the authors to hypothesize that predetermined, but unspecified expectations (i.e., psychological contracts) for online courses by both students and faculty members are important advance organizers for clarifying student satisfaction.

Introduction

From its inception, online learning has been confronted by concerns about quality from the established educational community and society at large (Carnaghan & Webb, 2007; Akdemir & Koszalka, 2008). Often, in addressing these concerns students’ perceptions of their course experience becomes a surrogate for learning engagement in the context of satisfaction (Swan, 2001; Arbaugh, 2001; Richardson & Swan, 2003; Bolliger, 2004). Because contemporary students view information as a commodity which can be traded openly among a community of learners, collaboration becomes fundamental to a variety of educational outcomes (Shirky, 2010; Dziuban et al., 2013).
Modern technologies are contributing to the dissolution of traditional classroom boundaries (Shirky, 2008). Students connect with their instructors and each other through modalities of almost every variety, greatly expanding avenues of communication. Norberg, Dziuban and Moskal’s (2011) development of a time-based blended learning model, for instance, modifies the instructor’s role (Liu & Hwang, 2010) in learning environments based on students’ synchronous and asynchronous learning preferences. The need for new and more authentic assessment techniques in addition to challenges to traditional educational structures (e.g. semester length time boundaries) raises issues about what moderates students’ academic expectations and satisfaction.

Studies suggest that online students wish to decrease their ambivalence toward formal education by gaining some sense of a carefully delineated path to success (Dziuban & Dziuban, 1998; Dziuban, Moskal & Dziuban, 2000; Long, 2011; Young & Dziuban, 2000). Students prefer active, rather than passive learning environments, and, because they participate in a highly interactive world, they expect the same in their classes (Dziuban et al., 2003). Today’s learners require more outlets for creativity and collaboration which online learning environments can accommodate through a variety of instructional models that are provided anytime, anywhere.

Researchers should not be surprised that identifying the defining elements for satisfaction has become much more dynamic and complex. The construct has multiple facets that tend to be stochastic as a particular course progresses. In this study, we attempt to clarify the underlying (latent) elements of student satisfaction in the context of overall course evaluation for students who respond positively to online experiences on end-of-course evaluation protocols. Feldman (1993) describes the assessment challenges we encounter as distributions of considerations when he argues that responses to survey questions provide only an estimate of the central tendency of an individual’s attitude or belief about a subject or object. Craig and Martinez (2005) summarize the issue: “in retrospect, it seems rather simplistic to think of attitudes as always being unidimensional. After all, who hasn’t experienced mixed feelings about people, places and things that we have encountered or visited in our lives?” (p. 1)

Recent Studies on Student Satisfaction with Online Courses

Multiple approaches define and assess student satisfaction. Rubin, Fernandes & Avgerinou (2013) extended research on the Community of Inquiry (Garrison, Anderson & Archer, 2000) which defines social, cognitive, and teaching presence as being essential to the student learning experience and, thus, student satisfaction. They determined that learning management system (LMS) features greatly impact perceptions of community according to the inquiry framework. In a related study, Mahmood, Mahmood and Malik (2012) argued that teaching presence plays the most critical role in how students evaluate online learning.

The interaction construct plays an important role in both face-to-face and online learning modalities (Kuo, Walker, Belland & Schroder, 2013). In fact, many studies have found that both quantity and quality of student interactions are highly correlated with student satisfaction in almost any learning environment. However, investigators have noted that demographic and cultural considerations also impact the design of appropriate interaction techniques in online learning (González-Gómez, Guardiola, Martín Rodríguez & Montaro Alonso, 2012).

Ke and Kwak (2013) identified five elements of student satisfaction: learner relevance, active learning, authentic learning, learner autonomy, and technology competence. Kuo et al. (2013) determined that learner-instructor interaction and learner-content interaction combined with technology efficacy are valid indicators of students’ positive perceptions. However Battalio (2007), using a criterion approach, argued that a positive course rating requires effective learner-instructor interaction.

Keengwe, Diteeyont and Lawson-Body (2012) argued that students’ expectations influence the instructor’s design of effective technology tools in online courses and are the key to understanding the satisfaction construct. The authors concluded that satisfaction was most impacted by learning convenience combined with the effectiveness of e-learning tools. Dziuban, Moskal, Brophy-Ellison and Shea (2007) found six key elements that contribute to students’ satisfaction: an enriched learning
environment, well-defined rules of engagements, instructor commitment, reduced ambiguity, an engaging environment, and reduced ambivalence about the value of the course.

Because colleges and universities have to be much more responsive to their student client base (Long, 2011; Bordelon, 2012; Allen & Seaman, 2013), ambivalence becomes particularly important. This implies satisfaction is an underlying indicator of success in various learning environments, especially online modalities. Satisfied students appear to be engaged, motivated and responsive; contribute to an effective learning climate; and achieve at higher levels. Dissatisfied or ambivalent students contribute to environments where instructors appear to have much more difficulty facilitating effective learning situations. Faculty members in such circumstances have trouble relating to their students and may incorrectly assume that such difficulties are related primarily to student dissatisfaction with online learning (Dziuban et al., 2007).

A precise configuration of student satisfaction with online learning is proving to be elusive because it might be context dependent (e.g., college, discipline, course level, institution, and, of course, instructor). Bowker and Star (1999) use the term “boundary object” to suggest that these items or ideas adapt to specific needs and constraints while maintaining a common identity. While bringing a community of practice together for communication and inquiry purposes, they are generally are weak in the large cohort. According to these researchers, however, the object (student satisfaction, in this case) is much more well-defined within individual constituencies. These definitional issues appear to reflect what Watts (2011) calls confirmation bias—that is, accepting information that confirms our existing beliefs much more readily than information that does not. To express their degree of satisfaction, students react only to things that they expect, but are never expressly stated (i.e., their predetermined psychological contract) or to what they have already assumed about the course. However, should dissonance with these expectations develop, students may encounter ambivalence characterized by simultaneous positive and negative feelings. These are the mixed emotions described by Weigert (1991) and Long (2011).

**Factor Studies of Student Satisfaction with Online Learning**

A small number of studies conducted by investigators seeking to identify the dimensionality of student satisfaction with online learning have emerged in the past few years. This work has been a natural extension of inquiry into student satisfaction in higher education (Abrami & d’Apollonia, 1991; Feldman, 1976; Feldman, 1993; Greenwald & Gilmore, 1997; Kim, Damewood & Hodge, 2000; Marsh & Roche, 1997; McKeachie, 1997). While prior studies have focused primarily on face-to-face teaching environments, online learning has provided a new dynamic and has re-energized interest in the topic. Arbaugh (2007) adopted factoring methods to validate the Community of Inquiry framework (Garrison et al., 2000) incorporating social, cognitive, and teaching presences. He retrieved these primary constructs and demonstrated that they exhibited excellent reliability. His work extended the original Community of Inquiry framework to a fourth dimension: course design and organization. Stewart, Hong, and Strudler (2004), using principal components analysis, found a fairly complex underlying dimensionality that defines the pattern of student satisfaction in online learning: the evaluative construct for student involved issues such as web page appearance, hyperlinks and navigation facility, technical constraints, online applications, instructional techniques and expectations, content delivery, and the interaction environment. Bangert (2006) found four underlying elements related to the evaluation of online and blended courses: interaction, active learning, time on task, and student cooperation. In a later study, he validated his previous findings using both exploratory and confirmatory factor methods (Bangert, 2008).

In a somewhat different approach to the identification of underlying dimensionality, Wang, Dziuban, Cook, and Moskal (2009) used classification and regression trees to predict student assessment of online courses and identified a series of validated if-then decision rules for predicting students’ perceptions of excellent teaching based on three constructs: facilitation of learning, ability of the instructor to communicate information and concepts, and the instructor’s respect and concern for students.

Dziuban and Moskal (2011) conducted a study of the factor invariance in student satisfaction across online, blended, and face-to-face courses. Using Guttman’s (1954) image analysis, they found a single general component that remained constant across all modalities. The authors concluded that
students do not use the modality of a course to differentiate elements of excellent instruction and course satisfaction.

In a later study, Dziuban, Moskal, Kramer and Thompson (2013) used the alpha factoring procedure (Kaiser & Caffery, 1965) to identify the underlying dimensionality of satisfaction under varying conditions of student ambivalence toward their online courses. Using overall satisfaction with the course, they classified students into five categories: negative non-ambivalent, negative ambivalent, ambivalent, positive ambivalent and positive non-ambivalent, corresponding with the 5-item Likert scale. By factoring the remaining items of the instrument stratified by those categories, they found the highest dimensionality for students in the ambivalent categories and the lowest dimensionality in the non-ambivalent classifications. The factors in the extreme categories (either positive or negative) were identical as were the factors in the positive ambivalent and negative ambivalent categories. The authors hypothesized that the students who appear to be least engaged in their courses (i.e., ambivalent) may be the most reflective and thoughtful about evaluating their educational experience.

**Psychological Contracts as a Basis for Understanding Satisfaction**

By definition, factor analysis studies imply latent dimensions—constructs that cannot be directly observed. Therefore, the underlying components identified in these kinds of studies relate closely to Argyris’s (1960) notion of a psychological contract. These contracts are formed by implicit understanding and are not bound by written or legal agreements of two parties within a reciprocal relationship. They consist of perceived obligations and expectations, and thus, are subjective and vary from person to person (Bordia, Hobman, Restubog, & Bordia, 2010). When broken, or breached, (due to perceived unfairness, inequality, or mistrust), satisfaction and performance decline and workforce turnover increases, consequently impacting attitudes and behaviors (Bordia et al., 2010).

All workplace psychological contracts contain six features: voluntary choice, mutual agreement, incompleteness, presence of numerous contract makers, plan for managing unsuccessful contract losses, and a relational model between employer and employee (Rousseau, 1990). Relational, transactional and balanced define these six features contained within three different types as outlined by Rousseau (1990). Relational agreements are based on loyalty and stability and, thus, foster satisfaction (Raja, Johns & Ntalianis, 2004). Transactional agreements include fewer duties, are usually temporary or short in duration, and usually result in behaviors that align or are consistent with the contributions in which one is rewarded. These contributions are economic in nature and viewed as less significant. The balanced agreement: a hybrid contract that is generally open-ended includes a mutual concern between both parties, but with clear expectations (Raja et al., 2004).

When analyzing and assessing psychological contracts, the three forms of measurement include content-oriented assessment, feature and evaluation. The content-oriented assessment examines the obligations of the agreement; the feature-oriented assessment compares one agreement to another’s based upon attributes of the contracts; and the evaluation-oriented assessment assesses the degree of fulfillment and the amount of change that results (Rousseau & Tijoriwala, 1998).

**Psychological Contracts in Education**

Although Argyris (1960) developed the theory of a psychological contract for the workplace, the idea has important implications for educational environments. Wade-Benzoni, Rousseau, and Li (2006), for instance, contend that students view psychological contracts as a form of mutual exchange in the education process. The interactions between student and instructor are crucial and telling about ongoing perceptions of obligations (Wade-Benzoni et al., 2006). Often there is little to no explicit communication about these arrangements because they are informal and temporary. The power in the relationship within these contracts is predominately asymmetric, favoring faculty members who hold expectations about student performance and control resources such as grades, letters of recommendation, advice on careers, and, in some cases, dissertation research approval (Wade-Benzoni et al., 2006).

Prior to viewing a syllabus, students begin to form expectations as they assess course offerings for academic development, decision-making input, challenges, feedback, and support (Spies et al., 2010).
According to Spies et al. (2010), students pay close attention to the following categories: faculty, futuristic factors, student development, course and curricular content, learning opportunities, involvement, and facilities. These agreements tend to change and become more elaborate as the course progresses.

Within a particular class, both students and faculty form a large number of contracts that present satisfaction challenges if, in the participants’ judgment, their implicit expectations are not met. This suggests that student satisfaction with online learning is, as Lakoff (1987) termed, a function of an idealized cognitive model—a construct fabricated to bring clarity and structure to a situation. Kahneman (2011) describes this thinking as “what you see is all there is.” Because of the complex interaction of these many constructs, however, student satisfaction with online learning appears to be an example of “there is much more than you can see directly.”

The Survey and Sample

The Research Initiative for Teaching Effectiveness (RITE) at the University of Central Florida (UCF) has been surveying UCF’s online students as part of an ongoing impact evaluation since 1996, when the university began offering Web courses. The longitudinal nature of the university’s examination of student attitudes has allowed for refinement and validation from the original survey. Ongoing evaluation allows researchers to accommodate rapid change in the online course environments and provide baseline data on items that may contribute to student satisfaction with these courses (Roberts, 2007).

Response rates for online surveys are always a concern (Sax, Gilmartin & Bryant, 2003). The art of a student survey is the development of an instrument that addresses the target, yet requires a minimal time to complete. The current RITE instrument focuses specifically on the dynamics of student satisfaction with online learning and is presented in a 5-point Likert scale format, ranging from strongly agree to strongly disagree. Items related to the learning management system or to technology itself have been excluded in an effort to minimize survey fatigue. Survey items were validated by examining their psychometric properties from previous surveys in terms of central tendency, variability, skewness and kurtosis, looking for anomalies, and for their relevance to the current state of the online initiative.

Once the original item pool was selected the survey was developed using Google Forms (https://drive.google.com). Students were sent an announcement through the UCF Knights student email platform. Student directions included the purpose of the study, their rights as survey participants, and contact information for both the survey administrators and the University’s Institutional Review Board. Students were advised that the survey was open only to undergraduates 18 years of age and older, and were reminded that the survey was voluntary. Students were free to omit any question they were not comfortable answering or stop at any time with no penalty. Students received no rewards for participation and there were no risks for non-participation. All student data remained anonymous when aggregated. Overall, 1,217 surveys were returned.

An examination of student responses indicated that 84% of students represented the millennial generation, 72% were female, and 76% were unmarried. Almost half of the responding students worked at least 10 hours per week and data reflected the ethnic demography of the university, with 70% of students having a grade point average of at least 3.0. Respondents were experienced with online learning—97% of students indicated taking at least one online course, with a median of five online courses. Students were predominately upperclassmen, with 83% of respondents being juniors or seniors. The university has targeted the majority of its online offerings to the upper undergraduate level, thereby allowing for the transition of freshmen and sophomores to university life prior to extensive online learning. Our respondent sample of predominately upper undergraduates reflects this philosophy. Students who indicated they had not taken an online course were excluded from analyses, reducing the usable sample to 1,197 responses.
Methodology

Reliability and Domain Sampling

Prior to any analysis of the item responses collected in this sample, the psychometric quality of the information yielded by the instrument was assessed with validated techniques. Next, coefficient alpha (Cronbach, 1951) was used to determine the survey reliability. The psychometric sampling issue of how well the items comprise a reasonable sample from the domain of interest is an important aspect of analyzing constructs such as student satisfaction. Addressing this issue, Guttman (1953) developed a theoretical solution illustrating that the domain sampling properties of items improve when the inverse of the correlation matrix approaches a diagonal. Kaiser and Rice (1974) used this property to develop their measure of sample adequacy. The index has an upper bound of one with Kaiser offering some decision rules for interpreting the value of measure of sampling adequacy (MSA). If the value of the index is in the range .80 to .99, the investigator has evidence of an excellent domain sample. Values in the .70s signal an acceptable result, and those in the .60s indicate data that are unacceptable. MSA has been used for data assessment prior to the application of any factoring procedures. Computation of the MSA index gives the investigators a benchmark for the construct validity of the items. This procedure was recommended by Dziuban and Shirkey (1974) prior to any latent dimension analysis. An individual MSA for each variable gives the investigators an indication of whether or not a particular item belongs in the particular domain.

Dimensionality of Student Responses

The investigators sought to determine whether multiple dimensions underlie students’ satisfaction to their online learning environments. This is normally accomplished by the application of some version of the generalized factor analysis procedure. In this study the data were analyzed with Guttman’s (1954) image analysis. The procedure assumes that the data sets divide into two components. The first component is the portion of data that can be predicted from the remaining variables in the set (the image). The second component is the data that is not predictable from the remaining variables (the anti-image). The method is operationalized by predicting a standardized score on a variable for each individual from the remaining variables in the set. The image procedure derives underlying components found in the covariance matrix (the image matrix) of the standardized variables.

The number of factors (components) retained in the final solution was determined by a procedure originally proposed by Dziuban and Shirkey (1993) and later validated by Hill (2011). The method involves the initial assessment of the dataset with the MSA followed by subsequent MSA computation on the matrix of partial correlations once the impact of the first, second, third etc. number of factors have been removed from the system. Once a value in the .60s has been reached, the majority of information from the system has been attained. The initial pattern matrix was transformed (rotated) according to the promax (Hendrickson & White, 1964) procedure. Pattern coefficients absolutely larger than .40 were used for interpretation purposes (Stevens, 2002).

Once the final dimensionality of the data set was determined, factor scores for each subject in the sample were derived using the Anderson and Rubin (1956) method. These scores have a mean of zero and a standard deviation of one and are uncorrelated with each other. They also have a reasonably good relationship to the estimated factor validity. The final step in the handling of the data involved deriving a linear transformation of the standardized factor scores with \( T = (Z \times 10) + 50 \) giving the scores a mean of 50 and standard deviation of 10 for ease of interpretation.

The scores for each factor were used as dependent measures for a rescaled comparison variable related to overall online course satisfaction. Because the number of dissatisfied students was small, the comparison variable was declassified into satisfied, ambivalent, and dissatisfied and used as a factor in the hypothesis test. The investigators were concerned with trends and effect size differences among the dissatisfied (4%), ambivalent (5%), and satisfied (91%) groups followed by Bonferroni post hoc comparisons (Hochberg, 1988).
Results

The promax transformed pattern matrix may be found in Table 1. The overall MSA for the variables set was .94 with an overall alpha reliability coefficient of .96. These values indicate excellent domain sampling and reliability. The individual MSAs indicate each item belongs to the family psychometrically. Upon extraction of three dimensions from the system using the Dziuban-Shirkey procedures, the MSA on the residual correlation matrix was .58 indicating that what remained in the system was essentially noise.

Table 1 Pattern Matrix for the Promax Transformed Image Analysis

<table>
<thead>
<tr>
<th>Items</th>
<th>Engaged Learning</th>
<th>Agency</th>
<th>Assessment</th>
<th>MSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally, I am more engaged in my online courses</td>
<td>.84</td>
<td>.04</td>
<td>-.07</td>
<td>.94</td>
</tr>
<tr>
<td>I have more opportunities to reflect on what I have learned in online courses</td>
<td>.79</td>
<td>-.05</td>
<td>.04</td>
<td>.94</td>
</tr>
<tr>
<td>Online learning helps me understand course material</td>
<td>.76</td>
<td>.03</td>
<td>.05</td>
<td>.95</td>
</tr>
<tr>
<td>There are more opportunities to collaborate with other students in an online course</td>
<td>.67</td>
<td>-.14</td>
<td>-.03</td>
<td>.93</td>
</tr>
<tr>
<td>My online experience has increased my opportunity to access and use information</td>
<td>.66</td>
<td>.11</td>
<td>.06</td>
<td>.95</td>
</tr>
<tr>
<td>I am more likely to ask questions in an online course</td>
<td>.65</td>
<td>-.11</td>
<td>.01</td>
<td>.94</td>
</tr>
<tr>
<td>Generally, I understand course requirements better in an online course</td>
<td>.64</td>
<td>-.09</td>
<td>.19</td>
<td>.96</td>
</tr>
<tr>
<td>Because of online courses, I am more likely to get a degree</td>
<td>.56</td>
<td>.09</td>
<td>-.03</td>
<td>.94</td>
</tr>
<tr>
<td>I can manage my own learning better in online courses</td>
<td>.54</td>
<td>.18</td>
<td>.17</td>
<td>.95</td>
</tr>
<tr>
<td>Take more online courses?</td>
<td>.47</td>
<td>.22</td>
<td>.04</td>
<td>.96</td>
</tr>
<tr>
<td>I am motivated to succeed</td>
<td>-.12</td>
<td>.56</td>
<td>-.03</td>
<td>.81</td>
</tr>
<tr>
<td>I have strong time management skills</td>
<td>.05</td>
<td>.53</td>
<td>-.07</td>
<td>.85</td>
</tr>
<tr>
<td>I am a multitasker</td>
<td>-.05</td>
<td>.57</td>
<td>.05</td>
<td>.87</td>
</tr>
<tr>
<td>Assessment of my academic progress is more accurate in online courses</td>
<td>-.19</td>
<td>-.04</td>
<td>.56</td>
<td>.92</td>
</tr>
<tr>
<td>I can more easily monitor my academic progress in online courses</td>
<td>.14</td>
<td>.11</td>
<td>.51</td>
<td>.92</td>
</tr>
<tr>
<td>Response time from teachers and assistants is quicker in online courses</td>
<td>.24</td>
<td>-.12</td>
<td>.43</td>
<td>.94</td>
</tr>
</tbody>
</table>

MSA = .94
Residual MSA = .58
Average Item Correlation = .70
α = .96

From Table 1, the reader may observe that the first factor appears very general, covering a number of issues associated with online courses ranging from engagement through willingness to take
another online course. However, upon closer examination, it is clear what appears to be very general is quite specific in relation to what students evaluate in online courses. These elements include students’ abilities to engage, reflect, understand material, collaborate, find information, question, understand course requirements, manage their own learning, and increase opportunities for degree completion. This finding suggests students simultaneously evaluate multiple aspects of online courses to make decisions about their class experience. Furthermore, students may evaluate each element separately, especially when they are unsure of their satisfaction levels. We name this factor engaged learning (74% factor variance) and in many respects, it conforms to Tolstoy’s (1878/2004) opening argument and Diamond’s (1999) contention that many elements must be accommodated if conditions are to be resolved satisfactorily. Conversely, any one or more of these elements might cause students to be less than satisfied with their educational experience.

The second factor (17% factor variance) in the pattern matrix involves motivation, time management skills, and multitasking ability. This dimension suggests that students’ sense of agency—that is, students’ ability to initiate and control their own actions in the learning environment—plays a role in their satisfaction with their online learning experience. Students with a strong sense of agency assume responsibility for their learning and bring a sense of empowerment to their classes. Since the majority of students in this study indicated higher levels of satisfaction with online learning, we might reasonably assume they bring a higher sense of agency as well. Agency, however, may not be specifically related to course modality.

The final factor (9% factor variance) depicts the manner in which the assessment process evolves in the online environment. Satisfied students are characterized by an ability to assess and monitor their progress, and indicate that a timely response by the instructor plays an important role in their satisfaction. Therefore, we find online students incorporate three dimensions into their evaluation process of online learning experiences: 1) engaged learning with various course elements, 2) a sense of agency, and 3) an efficient assessment of academic progress.

The factor correlation matrix in Table 2 indicates that these student dimensions are highly and positively related in a generally satisfied population. This suggests that engaged learning, agency, and assessment factors form a highly interrelated lexicon for student satisfaction, with engaged learning most highly related to agency (r =.86) and agency most highly related to assessment (r =.77).

<table>
<thead>
<tr>
<th>Table 2 Factor Correlation Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors</td>
</tr>
<tr>
<td>Engaged Learning</td>
</tr>
<tr>
<td>Agency</td>
</tr>
<tr>
<td>Assessment</td>
</tr>
</tbody>
</table>

The average correlation among the factors in Table 3 is .74 when computed by the method developed by Kaiser (1958). Table 3 contains the means, standard deviations, and significance levels for the three sets of factor scores for the declassified overall satisfaction variable. In addition, the table contains the pairwise combinations that proved significant on the Bonferroni comparison and the associated effect size calculated by the method outlined by Hedges and Olkin (1985). The factor scores for engaged learning and agency lead to the null hypothesis rejection, however assessment did not. For
engaged learning, dissatisfied versus ambivalent ratings produced an effect size of .53, dissatisfied versus satisfied ratings yielded values of 2.01, and ambivalent versus satisfied ratings equaled 1.43. Bonferroni comparisons for the agency factors showed two significant differences with dissatisfied versus satisfied ratings producing an effect size value of 1.03, while ambivalent versus satisfied ratings yielded .77. Each of the above effects sizes by most standards is considered substantial.

<table>
<thead>
<tr>
<th>Factors Scores</th>
<th>Dissatisfied (D) (n=46)</th>
<th>Ambivalent (A) (n=56)</th>
<th>Satisfied (S) (n=1016)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{x} )</td>
<td>S.D.</td>
<td>( \bar{x} )</td>
<td>S.D.</td>
</tr>
<tr>
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<td>10.86</td>
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<td>11.27</td>
<td>43.74</td>
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<td>Assessment</td>
<td>48.93</td>
<td>9.24</td>
<td>49.21</td>
<td>8.56</td>
</tr>
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</table>

**Significant Bonferroni Pairwise Differences**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Engaged Learning</th>
<th>Agency</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied vs. Ambivalent</td>
<td>.00</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Dissatisfied vs. Satisfied</td>
<td>.00</td>
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<tr>
<td>Ambivalent vs. Satisfied</td>
<td>.00</td>
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</tbody>
</table>

**Effect Sizes - Hedges’ g**

<table>
<thead>
<tr>
<th>Categories</th>
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<th>Agency</th>
<th>Assessment</th>
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</thead>
<tbody>
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<td>0.18</td>
<td>0.03</td>
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<td>Dissatisfied vs. Satisfied</td>
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<td>Ambivalent vs. Satisfied</td>
<td>1.43</td>
<td>0.77</td>
<td>0.09</td>
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**Limitations**

There are a number of limitations in this study. Initially it should be noted that the factors derived resulted from a one-time administration of the survey instrument during the semester. Therefore, the stability of the satisfaction factors over an entire semester has not been validated. Second, the study was conducted on individual item responses rather than scales. Although this has precedent in literature, single items with presumed low reliability can be problematic in factor studies such as this because of their instability. Third, many aspects of exploratory factor analysis involve arbitrary decisions, for instance, number of factors to extract, values for salience in the pattern matrix, rotational strategy, and naming the final dimensions. Fourth, online survey research using mass e-mailings to students has the possibility of introducing response bias into the data. This makes replication of studies much more difficult. Finally, although the investigators collected extensive demographic data on the responding students, there was no possibility for controlling for many of the student characteristics that might have influenced the results. This raises a more general limitation resulting from the ease with which survey instruments can be distributed in the electronic environment. This causes many students to suffer “survey fatigue” that can adversely impact response rates.
Conclusion

Student Satisfaction in the Online Environment

From its inception, the Sloan-Consortium (now the Online Learning Consortium) established student satisfaction with online learning as one of its founding metaphoric pillars. In doing so, the organization demonstrated a commitment to the student voice as a component for understanding effective teaching and learning. This commitment by the Online Learning Consortium resulted in two decades of research devoted to understanding how students define excellence in their learning space. Satisfaction with online learning is becoming increasingly important in higher education for a number of reasons. The most important is the rapid adoption of this teaching and learning modality in colleges, universities, and community colleges across the country. However, another mediating issue is the growing sense of student agency in the educational process. Students are able and do express their opinions about their educational experiences in formats ranging from end of course evaluation protocols to social networks of all varieties making their voice more important than ever before.

Factor Studies

Online learning has redefined student satisfaction research. It has caused the education research community to reexamine traditionally held assumptions that learning primarily takes place within a metaphoric container called a “course.” In reviewing the studies that address student satisfaction, from a factor analytic perspective, one point becomes obvious: this is a complex system with very little agreement. Even the most recent factor analytic studies have done little to resolve the lack of consensus about the dimensions that underlie satisfaction with online learning. This appears to be the factor invariance problem in full bloom, where differing contexts mediate how students relate to their learning experiences because a common prototype for online courses has been elusive at best. There exists the possibility that each course incorporates several unique characteristics that make it difficult to identify common factors that are robust across context. Although the results of these studies differ in how many and what dimensions constitute satisfaction, their unifying objective was the same: identify the underlying theoretical perspective of student perception of online learning. In addition, all of them subscribed to latent trait theory, recognizing that the important dimensions that students differentiate when they express their opinions about online learning are formed by the combination of the original items that cannot be directly observed—that which underlies student satisfaction.

Psychological Contracts as a Lens for Student Satisfaction

Very often theories developed in one discipline inform work in another area. We contend that this is the case with the psychological contracts and factors that define student satisfaction with online learning. The theory of psychological contracts explains employee satisfaction through the perspectives of expectations for the work place and employee interactions. These contracts may be common across employees, for instance safety on the job, or they may be unique to individual employees such as promotion. The elements of the contract are implicit in that they are never formally stated, but they are assumed by the individual holding them to be mutually agreed upon between the employee and the employer. Of course, this may or may not be so. Most importantly, a violation of the psychological contract, either real or perceived, by either party, leads to workplace dissatisfaction.

In factor analytic studies, items about student satisfaction with online learning correspond to the formation of a psychological contract. The survey responses are reconfigured into a smaller number of latent (non-observable) dimensions that are never really articulated by the students, but are, nonetheless, fully expected to be satisfied. Of course, instructors have contracts for students as well. Studies such as this identify the student psychological contact after the fact, not prior to the class, however, nothing prevents both from happening and/or a comparison of the two. The prior contract might be identified before the class and the satisfaction factors after the class.
Engaged Learning, the largest contributor to the factor pattern, indicates that students expect instructors to adopt a facilitative role in their teaching. This dimension corresponds to the relational contract where the learning environment is stable and organized with a clearly delineated path to success. Assessment in this situation is evaluation oriented, indexing fulfillment and change (i.e., students achieving learning outcomes).

The second factor, agency, characterizes satisfied students who recognize their abilities and accomplishments in a balanced contract arrangement that they assessed by the degree of agreement between them and the instructor (feature oriented). The final factor, assessment, corresponds to that transactional contract with its evaluation determined by the degree to which the obligations of the course have been met (content oriented).

Although they have been developed in different contexts, workplace contracts and student satisfaction factors are similar. Both attempt to explain the underlying cause of satisfaction or lack thereof. Both are general and non-nonspecific, becoming more complex as the job, class, or classes evolve over time. They are limited in their scope and at best index a kind of average perception of the workplace or educational environment. Rarely are employees fully satisfied with their jobs or students completely satisfied with their classes. However, both contracts and factors frame blueprints for developing instructional design strategies that can improve learning climates. Online learning has unbundled the classroom and the same technologies have done precisely the same to the workplace: no longer are either bound by physical space.

Perhaps in a more traditional time, psychological contracts (predispositions) and student satisfaction elements (post dispositions) were somewhat separate in their context and orientation. However, it seems clear that information and instructional technologies are migrating into the same orientation space. This makes the questions “What did you expect on your way in?” and “Now that you are finished, how was your experience?” part of the same climate assessment paradigm. By coalescing factors and psychological contracts, we might gain insights into more effective learning environments that are not possible when each theory is considered separately. Blending the two takes best features of both and results in something entirely new--something more than you can see in either theory.
References


