Optimizing Student Satisfaction Measures Through Teacher Presence Interventions and Contextual Awareness in an Online Course

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Faculty approaches successfully used in traditional classroom settings do not necessarily translate smoothly into online environments and new methods are required to be effective. In this paper we explore teacher presence in online environments. With online teacher presence less can be more and therefore must be consciously managed. Through the use of a single longitudinal case study, we track the evolution of an online MBA course from its initial offering through major revisions made to improve faculty performance. Changes to improve faculty presence are discussed and the importance of contextual factor considerations are proposed.

Keywords: online teaching, faculty presence

INTRODUCTION

Online teaching is growing rapidly in higher education. Teacher presence has been identified as an important predictor of positive student outcomes (Croxton, 2014; Spears, 2012); however, ways to optimize teacher presence in online environments are not obvious (Baker, 2010). Models exist to conceptualize teacher presence in online environments (Garrison, Anderson & Archer, 1999). The methods to optimize presence in such environments remain unclear (Overbaugh & Nickel, 2011) and calls have been made for more research to better understand online teacher presence (Tsiotakis & Jimonyiannis, 2016) and to consider the importance of context (Garrison & Arbaugh, 2007).

This paper starts with a targeted review of the research literature on presence and the Community of Inquiry model that frames the various forms of presence critical in learning environments. A single longitudinal case is next presented where interventions were made to improve faculty performance, as measured by student evaluations of teaching (SET), between the first and second times a new online course

was delivered. Specific actions are highlighted and the counter-intuitive result that "less can be more" in optimizing teacher presence is noted, confirming similar research observations by Arbaugh (2010). In the closing discussion our case observations are used to revisit the Community of Inquiry model and the difficulty in definitively being able to identify specific actions that consistently improve teacher presence in online environments. Structuration theory (Giddens, 1984) is considered in identifying the need for incorporating context, both of the configured learning management system (LMS) on which the course is being delivered and of the academic program and its online norms and behavior in which all courses are embedded.

PRESENCE IN ONLINE LEARNING ENVIRONMENTS

Picciano (2002) defines presence in online environments from the student's perspective: their sense of belonging in and being able to interact with other students and their instructor. Garrison, Anderson, and Archer (1999) proposed the Community of Inquiry (CoI) model to more fully capture the multi-dimensional nature of presence in learning environments. In this model three dimensions of presence are identified as critical to learning: cognitive presence, social presence and teacher presence.

Cognitive presence refers to the degree to which learners construct and confirm meaning through discourse and reflection (Arbaugh, 2008). The elements of cognitive presence comprise a triggering event, exploration, integration, and resolution (Garrison & Arbaugh, 2007). A triggering event is something that causes students to be interested or motivated to engage in the course driving further exploration and integration drawn from various sources both from within and beyond the course. Resolution is the student's ability to apply their newly acquired knowledge.

Social presence can be viewed as performative, with teachers and students interacting and engaged together on activities (Kehrwald, 2008). Social presence represents a student's feeling of connectedness, both socially and emotionally, with others in the online environment (Swan, et al., 2008). Social presence encompasses three elements: affective expression, open communication, and group cohesion all of which impact student success (Scott, 2016; Shea, Li & Pickett, 2016, Garrison & Arbaugh, 2007).

Teacher presence includes a course's design and organization as well as a teacher's facilitation of course discourse and direct instruction if applicable (Scott, 2016; Arbaugh, 2010; Garrison & Arbaugh, 2007; Anderson, Rourke, Garrison, & Archer 2001). Course facilitation includes coherent presentation of content, raising questions that stimulate discussion and advance conversations, establishing time parameters, focusing student efforts, summarizing diverse materials, and confirming understanding (Baker, 2010; Anderson et al, 2001).

Teacher Presence Characteristics

Faculty can establish online teaching presence by engaging students through effective design, facilitation, and direction of their course (Picciano, 2002). Careful design can convey a sense of instructor social and teaching presence from a course's onset (Ladyshewsky, 2013). Anderson, et. al. (2001) describe this design process as the planning and design of the structure, process, interaction and evaluation aspects of the course.

Facilitation requires real time faculty engagement and includes encouraging, acknowledging and reinforcing student contributions; driving online discussions to consensus and understanding, prompting discussion across all participants; and assessing overall efficacy (Shea, Li, & Pickett, 2006). Regular discussion board postings, responsiveness to student inquiries, focusing and summarizing discussions, confirming understanding and general instructor visibility are necessary elements in establishing teacher presence (Anderson et al, 2001; Mandernach, Gonzales, & Garrett, 2006; Pallof and Pratt, 2003). Simple measures of online presence include posting presentation slides on the course site, developing video mini-lectures, providing personal insights into the course material, and clearly identifying required activities (Anderson, et. al., 2001). Significant correlation between student reporting of such behaviors and perceived course satisfaction have been noted (Shea, Swan, Pickett, & Sau, 2005).

Measuring Outcomes of Teacher Presence Change

Research indicates that teacher presence has an impact on students' success in online learning (Bliss & Lawrence, 2009; Garrison & Cleveland-Innes, 2005; Garrison, Cleveland-Innes, & Fung, 2010; Wu & Hiltz, LaPointe & Gunawardena, 2004). Teacher presence characteristics such as participation management and course structures that encouraged participation (Dzuiban, Shea & Arbaugh, 2005; Brower, 2003) and direct or perceived faculty to student interactions (Jiang & Ting, 2007; Marks, Sibley, & Arbaugh, 2005) have been found to significantly, and positively, impact online student satisfaction and overall faculty ratings from student evaluations of teaching (SETs).

These impacts however are not necessarily linear in nature and appear to be contextually defined. Overbaugh & Nickel (2011) note that ever larger levels of faculty facilitation may be a "waste of faculty time" in highly structured courses. Arbaugh, 2010 even suggests the possibility of a peaked curve structure where increasing teacher presence over a certain level, i.e. high levels of online faculty forum posts, lead to declines in student satisfaction. Student engagement in the course can also be negatively impacted by such behavior (Dennen & Wieland, 2007). Some research even suggests that faculty should minimize their online discussion participation (Dennen, & Wieland, 2007; Levy, 2008; Shea, Li, and Pickett, 2006; Young, 2006). Context was again suggested as important with a particularly likely decline anticipated in post-graduate MBA programs from such "hyper" teacher presence (Arbaugh, 2010).

Wise, Chang, Duffy, and del Valle (2004) found that student evaluations of different course related characteristics were not consistently impacted by the various measures of teacher presence. For example, increased faculty presence impacted student's faculty perceptions and overall satisfaction but not the student's perceived learning or actual course performance. Teacher presence embodied in clear and consistent online course designs however has been consistently found to be a leading predictor of high course ratings by students (Swan, 2002; 2003; Shea, Li, Swan, & Pickett, 2005).

While some may question self-reported student outcomes as a measure of course success Picciano (2002) argues that such measures, when positive, clearly demonstrate a student's desire for continued learning and thus satisfaction. Such student satisfaction measures have been found critical to online course success (Howell, Jeffrey, & Buck, 2012; Roblyer & Wiencke, 2003; Swan, 2001) and teacher presence serves as a significant factor influencing such measures (Croxton, 2014; Estelami, 2012; Harrison, Gemmell, & Reed, 2014; Kranzow, 2013; Spears, 2012). Student satisfaction measures are "... an emotional response ... induced by actual product, service, or process quality..." (O'Leary & Quinlan, 2007), and reflect "... outcomes and reciprocity that occur between students and an instructor" (Thurmond, Wambach, Connors, & Frey, 2002). Student satisfaction and course satisfaction are distinct measures (Arbaugh, 2000; Artino, 2008; Croxton, 2014; Keeler, 2006; Lee et al., 2011) and thus complicate the interpretation of the relationship between teacher presence and "satisfaction" unless clearly defined (Khalid & Quick, 2016).

In the next section a case is considered where teacher presence characteristics were manipulated to improve faculty SET ratings. Outcomes measure pre- and post- the intervention are analyzed.

EXECUTIVE MBA (EMBA) ONLINE CLASS INTERVENTION ANALYSIS

This study focuses on an extreme case where liberal arts and management disciplines are incorporated in a 15-month, joint degree, EMBA program developed between a U.S. liberal arts institution and a European business school. The program is delivered over 8 face-to-face full-time weeks spread across 5 different periods and the remainder of class time is online. Students are engaged with either 2 or 3 online courses during any given week. The program curriculum was designed to blend the liberal arts/social sciences into a traditional MBA program with approximately equal numbers of faculty from each institution involved in program course delivery.

Online course delivery is conducted using the business school's learning management system (LMS) which is deployed across all their management programs. The LMS is configured to optimize delivery of asynchronous discussion boards involving students and faculty. In the business courses these asynchronous

discussions typically have students engage in case discussions led by a faculty member. Discussion boards open for student participation on Tuesday morning at 6 AM EST and close on Friday at noon EST.

Prior to the start of the program students participated in online activities on the LMS led by the business school's academic director. The objective of this pre-program work is to familiarize the students with the LMS and the asynchronous discussion board format.

The average student in the program is 39 years old and has a minimum of 10 years' work experience. Students come from around the world and generally work in senior management positions across multiple industries. Student educational backgrounds are equally spread across technical, business, and social science/humanities majors.

For many faculty at the liberal arts institution engagement with this program was the first time they taught online and, in many cases, the first time they utilized an LMS. The liberal arts courses in the curriculum are selected and custom designed to meet the overall management curriculum objectives while retaining the unique perspectives of their disciplines. This merger of disciplines in the curriculum required modest changes to the traditional management courses to remove content where the learning objectives can be achieved through the liberal arts offerings. Achieving this required the introduction of unique liberal arts courses that consider business relevance and address requirements of the business curriculum. An example of this and the case studied in this paper is a course taught by an anthropology faculty member from environmental sciences that directly contributes to the learning objectives of a traditional corporate strategy/ethics business course. The case study focuses on the initial offering of this course and the changes in the course design that were incorporated for its second offering the following year. The initial class had 23 students with 30 students enrolled in the following year. Student feedback on the course and faculty are analyzed pre- and post- the course changes and an independent comparison of means analysis is conducted to determine significance.

The anthropology faculty member was assigned a quarter length course (five weeks of student engagement) that was delivered via four weeks of online discussion board interactions and one week via a synchronous 90 minute video-conference. Delivery occurred in the third term of the five term program and the five weeks of student engagement took place over a ten week period. The majority of the prior courses in the program were traditional business school classes providing the foundation materials for the overall program curriculum.

The anthropology faculty member had never taught online before and, since the course had not been run previously, needed to create the initial program syllabus. The syllabus designed did not include any traditional business case material however it did include a large number of required and optional readings. Final assessments for the class were individual student papers that applied learnings from the course into a relevant real-world situation of the students choosing.

The program has an instructional design team that serves as a resource faculty can draw upon to assist with course design and delivery. The instructional design team provides recommendations to faculty on design and delivery of course materials however the faculty member has final say on the course design and delivery executed for their class. The faculty member in this case did engage with the instructional design team however the initial design was primarily derived from the faculty member's inputs. Faculty engagement with an instructional design team member typically starts with a face to face meeting to discuss the course intentions and to provide an introduction to the online LMS system capabilities and mechanics. Faculty are required to format syllabi in a specific way for LMS posting which is introduced at this meeting. Following this meeting faculty typically communicate their evolving teaching intentions to their instructional designers and feedback and suggestions are provided. This communication typically takes place via a small number of email interactions across several weeks post the first meeting. A final syllabus and course plan must be submitted one month prior to the start of a course and is reviewed by the program academic directors before final approval. The academic director review focuses mainly on issues concerning course content, student deliverables and evaluation criteria.

In this case the faculty member worked directly with an assigned instructional designer (ID). The assigned ID supported a number of faculty members teaching in the EMBA program and was familiar with the program's overall curriculum, LMS, and methods applied by the business school faculty for online

course delivery. The ID had nearly 20 years work experience, an M.A. in communication and education, 3+ years' experience in online instructional design and was a certified peer reviewer for the Quality Matters program. The ID team had frameworks they leveraged in working with faculty not unlike those available from Quality Matters, an organization that spearheads efforts to guarantee course quality. In the case of Quality Matters the frameworks has eight general standards and forty-two specific course review standards. The discussions relevant to this case focus on issues related to the general standards on course overview and introduction, instructional materials and learning activities and learner interactions.

Initial Course Offering

The environmental sciences course was first offered in the fall of 2016. The first four weeks of the course were delivered via the online asynchronous discussion boards and the fifth session was delivered via video conference. Student teams were tasked with facilitating each of the online discussion sessions, including moving the forum forward and the wrap up discussions. Although the professor provided instructions and ideas for facilitating the forums, the students didn't feel prepared to take on this role. They felt overwhelmed by this task because the course topics were new for many of them.

The instructor started the online discussion sessions and participated along the way. Feedback was provided to students after the session ended. As an example, during the first online class the faculty member posted 7 times with a cadence of 1 post on Monday before the forum started on Tuesday morning, 5 posts on Wednesday (1 at 5 PM EST and rest between 7:45 and 8:45 PM EST) and a closing post on Saturday after the forum had ended.

As noted in comments in the SETs for this course the students felt the professor was not present. Quotes included: "The professor was barely active in the online sessions." And "Very little facilitation of the discussions by the professor, the groups were left on their own to accomplish the tasks and facilitate the discussion."

The initial 15-page syllabus provided students with the rationale for the course, objectives, session types and flow, course materials, evaluation criteria and expectations, and information about the instructor. The syllabus was overloaded with information including; how to facilitate a forum, required and optional materials, annotations about the assigned readings, references for further study, and links to more resources than were required. The instructor provided information intended to help students navigate the course and make informed decisions but the intention was lost due to the amount and organization of information in the syllabus.

The SET feedback on the course was 3.06 (out of 5.00 where 5.00 is "very high") for the measure "global evaluation of the Professor". This program strives to have all faculty ratings exceed 4.00 so the Instructional Design team was enlisted to aggressively engage with the faculty member to adjust the program's design and delivery to improve the SET performance in year 2.

Course Offering Year 2

For year 2 delivery in the fall of 2017 the syllabus was reduced in size to 8 pages. Specifically, on the design front the syllabus language was edited to reduce verbosity and the course information was better organized on the LMS. Text formatting tools were used to make the syllabus easier to read. All required readings were attached by week to the syllabus and optional readings were organized in a folder on the course site.

The course flow was adjusted to start with the synchronous video conference rather than ending with one. Students got to know the professor better through this up-front synchronous engagement.

For the online discussions the faculty member now facilitated all forums instead of making student teams responsible for this task. The faculty member engagement all took place within the time period scheduled for the online discussion period.

Comments from the SETs improved dramatically with quotes following: "Professor(s) … insights/coaching also very helpful. One of the best courses in terms of applied environmental responsibility. To me, this is what differentiates an EMBA such as this one." "(Professor) … led a great

course that was impactful, in a very short amount of time." And "A passionate teacher who was engaging and innovative in her expectations and teaching methods." The SET feedback on the course improved as well, to 4.11 (out of 5.00 where 5.00 is "very high") for the measure "global evaluation of the Professor" meeting program requirements.

Quantitative Comparison Year 1 to Year 2

As noted in the literature review, adjustments to design and discourse facilitation approaches can improve measures of teacher presence. On the design front simplification and improved communication were targeted between the two course delivery periods with a "less as more" recommendation used as a key design principle. To that end the syllabus decreased in size from 15 to 8 pages. A text analysis of the Methodology and Course Objectives sections of the syllabus from years 1 and 2 provides a further visualization of this reduction and simplification with an across the board reduction in word count, sentences and syllables between the two versions. The text analysis was conducted with utility: The Methodology section text analysis results for year 1 versus year 2 follow: word count 399 to 182, sentences 23 to 11, and syllables from 682 to 319. Similar results were seen in a comparison of Course Objectives between year 1 and year 2: word count 218 to 75, sentences 7 to 4, and syllables 419 to 170.

Session participation comparisons note adjustments in online discussion facilitation approaches between year 1 and year 2. Observations include on average slightly more and shorter posts in year 2 by the faculty member. On average the post position is higher in year 2 suggesting more guidance versus just responsive posts to ongoing discussions. During the week of the video conference (video conference was week 5 in year 1 and week 1 in year 2) in year 2 the faculty member also engaged with the students in the online discussion boards as well continuing the discussion post the actual video conference that week. In the second to last online discussion week in year 2 the faculty member was extremely active (23 posts) with an average post position of 2 suggesting more responsive interactions to students towards the end of the course period. The faculty member was also active in online discussions during the final week of class interactions. Overall minimum post length increased and maximum post length decreased in year 2. Full data is available in Table 1.

TABLE 1
SESSION PARTICIPATION

SESSION	TOT. POSTS		AVG. POST LENGTH		AVG. POST POSITION		MAX. POST LENGTH		MIN. POST LENGTH	
	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2
1	7	3	1352	2099	2	2	4362	3692	89	639
2	7	8	2799	1639	3	1	8069	10434	51	115
3	7	8	2281	752	4	1	7413	2836	103	142
4	10	23	1703	778	3	2	14763	11478	63	0
5	0	6	0	1307	0	2	0	3803	0	112

Measures of Teacher Presence Change

As noted in the literature review teacher presence change impacts can impact student SET feedback. To that end independent sample t-tests were conducted to compare the SET results from year 1 and year 2 to determine the significance of the observed change. The sample size response was 18 students. The descriptive statistics and t-test results are reported in Tables 2 and 3. The results show that measures of teacher performance are significantly improved post the interventions. The measure evaluating how much you have learned from the course is statistically unchanged pre- and post- intervention.

TABLE 2
SET RESULTS

	YEAR	MEAN	STD. DEV.	STD. ERROR
GLOBAL EVALUATION OF THE PROFESSOR (LOW, NOT BAD, ACCEPTABLE, HIGH, VERY HIGH)	1	3.06	1.11	0.26
	2	4.11	0.96	0.23
THE EFFECTIVENESS WITH WHICH THE PROFESSOR MANAGED DEBATES HAS BEEN (VERY LOW, LOW, ACCEPTABLE, GOOD, VERY GOOD)	1	2.83	1.43	0.34
	2	4	0.91	0.21
EVALUATE HOW MUCH YOU HAVE LEARNED FROM THE COURSE (NOTHING, VERY LITTLE, SOMETHING, ENOUGH, A LOT)	1	3.22	0.94	0.22
	2	3.78	1.31	0.31

TABLE 3
INDEPENDENT SAMPLE T-TEST SET RESULTS

	SIG	MEAN DIFFERENCE	STD. ERROR DIFF	95% CONF. LIMIT LOWER	95% CONF. LIMIT HIGHER
GLOBAL EVALUATION OF THE PROFESSOR (LOW, NOT BAD, ACCEPTABLE, HIGH, VERY HIGH)	0.004	-1.05	0.35	-1.76	-0.35
THE EFFECTIVENESS WITH WHICH THE PROFESSOR MANAGED DEBATES HAS BEEN (VERY LOW, LOW, ACCEPTABLE, GOOD, VERY GOOD)	0.007	-1.17	0.4	-1.98	-0.35
EVALUATE HOW MUCH YOU HAVE LEARNED FROM THE COURSE (NOTHING, VERY LITTLE, SOMETHING, ENOUGH, A LOT)	0.153	-0.56	0.38	-1.33	0.22

DISCUSSION

Garrison and Arbaugh (2007) suggest a need to consider other variables when evaluating courses in concert with the Community of Learning construct. Suggestions include subject matter, software, characteristics of learners, and characteristics of instructors. These variables are significant and to the extent possible we have attempted to control for them. In our temporally extended single case analysis by analyzing the same course before and after an instructional design intervention we kept the subject matter constant. The LMS software did not change between the periods of this analysis. The students in the class were different however the program in which the class was taught remained the same and the high level demographics of the students (average age, gender mix, industry mix, geographic distribution and levels of careers) were extremely similar. To further control for learner characteristics we analyzed the SETs for another faculty member teaching a non-traditional EMBA class during the same time periods who did not engage with the instructional design team during this entire period; no statistical difference was noted in this course's SETs between these two cohorts of students. The anthropology professor for the class being studied was constant year to year as was the faculty member for the control course. The course by its nature however was quite different from the majority of the others students were taking in the program by that

point in their studies. This situation was consistent across the time period studied however perceptions of this course could have been impacted by its consistent but different subject matter.

This case suggests that instructor willingness to internalize feedback and adjust their course is critical to SET improvement. If the instructor in our case had been unwilling to work on redesign with our ID or unwilling to modify materials in the online platform or unwilling to put in the time required when the course is live online the positive results observed in this case could not have been achieved.

This extreme case also suggests another contextual variable that is important to determining appropriate actions to take to improve teacher presence. The course in our case is part of an overall curriculum that has embedded within it a model of online interaction in both the LMS (software), training of the students (pre-work on how classes work online) and in the execution of other courses students take. When faculty try new things that are not consistent with these online curriculum norms (i.e. faculty posting before and after an online session is supposed to be closed, setting up a class where students direct the online discussions independently as examples from this case) students will be confused and react accordingly. Student feedback for the first year of the course in this case study included recommendations that this faculty member speak with other faculty members in our curriculum to gain a better understanding of how online discussions should be managed. Breaking norms can have impacts on SET results. These recommended contextual elements can be visualized as boundary conditions within which course design should be interpreted. Fortunately, our ID member was familiar with the norms of behavior being exercised in the rest of the curriculum.

Structuration theory (Giddens, 1984; DeSanctis & Poole, 1994; Poole, 2008), commonly applied in the information systems space, raises the importance of both structure and agents, on an equal level, in social system analysis such as the online learning environments being analyzed in this paper. This proposed contextual extension to the Community of Inquiry and other standards frameworks is consistent with the call from structuration theory to consider structure in all such analyses. These contextual elements may also help explain some of the inconsistent results noted in the literature review for certain interventions to improve teacher presence.

Study Limitation

While efforts were made in the study design to control critical variables the change in tacit knowledge about the program, the students and the LMS that the faculty gained after their first experience in this new course context remains a confounding variable for this study (Devaraj and Kohli, 2003).

Future Work

A number of future research efforts are suggested by our study. One is to manipulate the environment (with controls) to test the setting of student expectations on norms for online delivery by providing up front training to some students on the LMS where a larger aperture of what is acceptable online faculty presence is explained and potentially visualized. A second potential research effort would be to compare the same course delivered by the same faculty across different LMS environments. Analyses could also be conducted to determine any underlying assumptions, in this case about pedagogical methods, embedded in the LMS configurations.

Further Implications

While this paper reports on a specific course case study the implications of the findings are far broader. Contextual constraints require more strategic thinking on the part of faculty in designing and delivering online courses and customization of course design to the contextual environment is a critical finding from this study. However, as faculty design and customize delivery of their coursework for online programs the residual artifact has characteristics of a book or song that deserves proper intellectual property protection which is not necessarily protected in current online environments. In addition to the extent time and effort on customization are highly situational specific faculty compensation for one off customizations may also be warranted.

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