RESEARCH ON ONLINE LEARNING

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I. INTRODUCTION

Over the past decade, the Internet has had a profound impact on higher education by enabling the phenomenal growth of online learning. Moreover, just as we were getting used to fully online courses, blended courses, courses which integrate online and face-to-face instruction, seem to be growing in similar, perhaps even more spectacular, manner. Add to that a plethora of emerging digital technologies such as wikis, blogs, podcasting, social software, and serious gaming technologies that are increasingly being incorporated into online or online portions of courses, and one is tempted to despair of ever making sense of online learning. The altered learning environments created by web-based technologies, not only eliminate barriers of time, space and arguably learning styles, providing increased access to higher education, they challenge our traditional notions of teaching and learning, and indeed higher education itself.

The second session of the Sloan-C Summer Workshop focused on research and how it might help us meet this challenge. In particular, presenters in this session were charged with addressing what the research to date can tell us about student, faculty and institutional change, what directions for future research seem most promising, and what we really need to do to move research on online learning to more rigorous and more informative levels.

The papers they wrote are collected in this section. They include: a critical review of what the research literature can tell us about blended learning relative to each of Sloan-C's five pillars of quality in online learning; two papers on one of the more promising lines of research in online learning, research involving the Community of Inquiry framework; an intriguing look at what very large data sets and innovative methodologies can tell us about our students and their reactions to blended course offerings; and an equally provocative thought piece on research on online learning in general which asks us to reconsider how we frame that enterprise, arguing that research on online *education* might generate more meaningful outcomes. The papers are both informative and thought provoking, and although they may generate more questions than they answer, they clearly suggest directions for future research that could move our understanding of online education forward in interesting and important ways. They are briefly introduced below.

II. THE FIVE PILLARS

The problem with making any generalizations from research concerning blended learning is that it involves, well, blended learning. Not only has very little research to date focused specifically on blended courses or programs, blended learning itself encompasses a wide range and variety of implementations. In the first paper in this section, Karen Vignare makes a terrific first pass at this task which seems by its very nature to resemble nothing so much as herding cats.

She begins with a good definition of blended learning: courses or programs that "integrate online with

face-to-face instruction in a planned, pedagogically valuable manner" and that "do not just combine but trade-off face-to-face time with online activity." What is important about this definition is that it cuts the blended learning problem down to manageable, if still daunting, size. She makes the task, and that of her readers, even more manageable by addressing blended learning research in the context of each of the Sloan-C quality pillars. These are learning effectiveness, faculty satisfaction, student satisfaction, access, and cost effectiveness. For each of these, Vignare combines findings from research on online learning, research on higher education, and what little research exists on blended learning to provide useful summaries of the state of our knowledge to date. She concludes by identifying what she views as the most promising directions for future research. In particular, she argues for moving beyond case studies to identify variables that might be quantifiable and generalizable.

Indeed, as educators implement and report on blended learning courses and programs, it is critical that we develop structures and measures for characterizing them well enough that we can begin to generalize from them. As Vignare notes, most of the reports on blended learning are case studies. That is reasonable as the field is exploratory at the moment, but case studies would be much more generally informative if they provided important details concerning their design and implementation. One structure that might help is the inputs-processes-outcomes framework Sloan-C effective practices editors are evolving to make sense of the effective practice descriptions we have been collecting. This framework characterizes best practices, not only in terms of measurable outcomes, but also in terms of how they are constituted (inputs) and implemented (processes). A similar framework applied to blended learning cases might tell us a good deal about what specific blends work for which students and courses. It also could suggest promising variables for further investigation.

III. COMMUNITY OF INQUIRY MODEL

The second set of papers in this section examine the Community of Inquiry (CoI) framework developed by Garrison and colleagues at the University of Alberta [1] to explore how features of written language used in computer conferencing promote critical thinking. The CoI framework recognizes the importance of developing learning communities online, and situates such development primarily in online discussion. It contends that effective learning in online discussions results from the interaction of three elements: cognitive presence, teaching presence, and social presence. Cognitive presence refers to the collaborative exploration, creation and refinement of understandings through discourse. Teaching presence refers to the design, facilitation, and direction of discourse for the purpose of realizing personally meaningful and educationally worthwhile learning. Social presence refers to the ability of learners to project themselves socially and emotionally in online environments. The CoI framework assets that all three elements must be present to support higher order learning in online discussions.

The CoI model has formed the basis for a good deal of research on online learning. Most of this research has focused on one of the three presences, social presence being the most frequently investigated, and much of it has involved content analysis of online discussion transcripts. The two CoI papers in this section argue that, while the framework is one of the most promising for moving research on online learning forward, we must develop more rigorous means for measuring and quantifying its three elements so that such research can be generalized across institutional contexts.

In the first of two papers on the CoI framework, Randy Garrison revisits the research to date on cognitive, teaching and social presence and identifies four issues that a review of the research literature raises. He begins with the most researched of these, social presence, and argues that our understanding of its more important characteristics needs to expand from simply recognizing the importance of establishing socio-emotional relationships on the individual level to include the notion of group cohesion around a common

educational purpose or goal. The second issue Garrison explores is one that has deviled research on online discourse from its very beginnings, namely, the question of moving online discussion beyond the exploration phase to knowledge creation and resolution. Here he explores what might be called the tension between social and cognitive presence, but argues that a redefinition of social presence as above and the provision of appropriate tasks to move students through to resolution might resolve this. He also points to the importance of instructors in facilitating such progression—which brings him to teaching presence; the third issue Garrison addresses concerns how we define teaching presence, an issue raised by recent survey research on the topic. Specifically, Garrison asks whether there is a meaningful distinction between facilitation of discourse and direct instruction in online forums. While conceding there may be little difference between them from a student's point of view, he argues that there are significant differences between them from an instructor's point of view which have important pedagogical implications.

Finally, Garrison addresses methodological concerns about qualitative transcript analysis and the validity of coding protocols. He points out several problems with content coding including issues concerning units of analysis and specific indicators, arguing for commonly agreed upon protocols. He further contends that the CoI framework has been tested enough to begin to move from qualitative to quantitative analysis. In particular, he argues for the development, testing, and widespread acceptance of social, teaching, and cognitive presence survey items that might support studies that bridged courses, content domains, and institutions.

Ben Arbaugh has done some good research that moves us forward in this direction. In the second CoI paper in this section, he reports on an empirical verification of the CoI framework that he undertook with students enrolled in 55 online classes in the MBA program at his institution using survey data. The survey he developed was based on previous survey research on teaching presence [2], social presence [3], and cognitive presence [3]. It included 18 teaching presence items, 8 social presence items and 4 cognitive presence items. Arbaugh performed an exploratory factor analysis on the items and found that they indeed loaded on factors that described teaching presence, social presence and cognitive presence, with the possible inclusion of a factor he labeled course design and organization (as it was composed of items from those aspects of teaching presence which also loaded the teaching presence factor). As he notes, "the results of this study should provide some encouragement to those researchers interesting in testing the generalizability of the CoI framework."

Indeed, they should. In my opinion, the CoI framework is important both for its theoretical grounding and for its research applications. These two papers together do a very good job of exploring its usefulness as well as how we might to begin to device quantitative and generalizable applications of it. Obviously, there is still much work to be done, especially concerning cognitive presence. A big question for me concerns generalizability. The CoI framework was developed to investigate learning in online discussions, yet survey questions designed to address its components, at least implicitly, address whole courses. The big question, then, is whether or not CoI is or could be a good model of whole courses. If the answer is yes, and I think it might well be, at least for one type of online course, then perhaps we need to look beyond even survey research to more specific and varied measures of learning.

IV. REACTIVE BEHAVIOR, AMBIVALENCE, AND THE GENERATIONS

The fourth paper in this section, which again focuses on blended learning, provides an inkling of what survey research, large data sets, and clever data analyses can reveal. Written by Charles Dziuban, Patsy Moskal and Linda Futch from the University of Central Florida, the paper explores students' satisfaction

with blended formats and attempts to explain this in terms of two theoretical models—one generational and the other having to do with adolescent patterns of behavior. The generational model categorizes learners by generations—baby boomer, generation X, millennial—and suggests that students born in differing eras differentially approach learning tasks. The Long-Dziuban Reactive Behavior Patterns model [4] describes behavior patterns formed in adolescence that likewise affect how students behave academically. It describes four behavior patterns based a combination of students' activity levels (aggressive/passive) and their need for approval (independent/dependent).

Dziuban and colleagues investigated relationships between students' generations, reactive behavior patterns, and their satisfaction with and perceived interaction within blended courses through some very interesting manipulations of data gleaned through a survey given to all students enrolled in blended courses at the University of Central Florida in the 2004/2005 academic year. One problem with their findings is a very low return rate (.07) on the survey, but even with low returns they analyzed 980 surveys. Moreover, the researchers' methods are intriguing and their interpretations of the data not only thought provoking but replete with implications for practice. They thus suggest interesting avenues for the large scale data analyses Vignare advocates in the opening paper in this section.

Dziuban and colleagues begin with a very interesting premise—that the survey responses to their Likert-type rating are characterized by ambivalence—and an even more interesting solution—categorizing them as exhibiting or not exhibiting positive, negative, and ambivalent responses (the three responses in the middle range of a five point Likert scale). They then apply these classifications to show differences in student satisfaction with and perceived interactivity within blended courses related to gender, work status, generational affiliation, and reactive behavior models. Finally, they use classification and decision trees to predict student satisfaction, dissatisfaction and ambivalence in blended learning environments by generations and reactive behavior that may have important implications for both instruction and advising. As previously noted, these notions clearly deserve further investigation.

V. WE SHOULD WATCH OUR LANGUAGE

The final paper in this section, written by Melody Thompson in response to the other papers in this group, cautions us to be careful of the language we use when discussing online education. Thompson first points to the common usage of the word "learning" across these papers to describe the whole educational enterprise, as in "online learning" or "blended learning," a usage I imagine many of us employ. She argues that while substituting "learning" for "education" admirably evokes a student-centered stance, it also encourages us to marginalize the rest of the educational enterprise. In particular, it draws our attention away from instructors and teaching, arguably a critical element in both online and blended courses. Similarly, she argues that recent trends in usage away from "distance education" and towards "eLearning" may be marginalizing distant students. Thompson makes a strong argument for the power of language to shape our thoughts and her observations clearly deserve reflection.

VI. ABOUT THE AUTHOR

Karen Swan is Research Professor in the Research Center for Educational Technology at Kent State University. Dr. Swan's research has been focused mainly in the general area of media and learning on which she has published and presented nationally and internationally. Her current research focuses on online learning, mobile computing and on student learning in ubiquitous computing environments. Dr. Swan has authored several hypermedia programs, co-edited a book on Social Learning from Broadcast Television and is currently working on a co-edited book on ubiquitous computing and a DVD ROM on the latter topic. She served as a project director on several large scale grants including work for the US

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VII. REFERENCES

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