The nagging question when designing blended courses: Does the proportion of time devoted to online activities matter?

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ABSTRACT

We investigated the relationship between the proportion of time spent online in a blended course and student perceptions and performance. Students in 20 undergraduate courses offered in four different online blend proportions were surveyed on their perceptions, and their final course grades and cumulative grade point averages were obtained. A small but significant relationship was found between blend proportion and perceptions. Students in the Medium (36% to 40% online) and High (50% online) blends tended to have the most positive perceptions of blended learning compared to their peers in the Low (27% to 30% online) and Supplemental blends (100% face-to-face plus weekly online tutorial sessions). Those in the High and Medium blends performed significantly better than students in the other two blends, but no difference was found between the High and Medium blends. We concluded that instructors and institutions seeking to take full advantage of blended learning should consider replacing at least one-third of normal face-to-face time with online activities that facilitate student-to-student and instructor-to-student interaction.

1. Introduction

Blended learning, while offering many advantages to students, faculty, and institutions, can be particularly challenging to implement successfully in higher education (Dziuban, Hartman, Juge, Moskal, & Sorg, 2006; Owston, 2013). One of these challenges is encouraging faculty to rethink the way they have traditionally taught their courses and imagine how they could be taught in the blended mode (Garrison & Vaughan, 2008). A persistent question asked by faculty when they embark on the redesign process is how much time should be devoted to face-to-face classes and how much time to online activities (Alammary, Carbone, & Sheard, 2015). The published literature offers little guidance on this issue, therefore in this study we sought to investigate the issue from the perspective of student perceptions of and performance in blended learning courses where the proportion of time devoted to online activities varied. Our central research question was whether student perceptions and performance are related to the amount of time spent online in blended courses or, in other words, does the proportion of online time in and of itself really matter. We studied 20 undergraduate courses at a large urban university that were offered in four different mixes of online and face-to-face instruction across a variety of academic fields. In addition to contributing to the literature on blended learning, findings about these relationships will help inform

practice by guiding design decisions about how much time might be devoted to online activities in blended courses. They will also help university academic administrators develop policies for implementing blended learning campus-wide (Owston, 2013).

Most blended learning research to date examining student perceptions and performance has concentrated on comparing blended learning to fully online and traditional face-to-face classroom instruction. The present research responds to calls to go beyond comparative studies to investigate factors that moderate or influence the impact of blended learning on students, such as amount of time spent online, instructional design, student preferences, technologies employed, and instructor presence (Means, Toyama, Murphy, & Baki, 2013; Zhao, Lei, Lai, & Tan, 2005). This type of research is now necessary because a consensus is emerging on the question about the relative efficacy of blended learning, as will be discussed later, so there is a diminishing need for comparative studies. Additionally, faculty and institutions typically decide a priori to use a blended approach for reasons such as providing more convenience and flexibility to students or better utilization of classroom space, as long as they are assured that students will achieve at least as well as they would in face-to-face classes. Therefore studies that consider the relative merits of various blended learning designs are of practical value.

A challenge when researching (and implementing) blended courses

or programs is to clarify what the term itself means as there is no consensus in the literature on the definition of blended learning. Surprisingly many blended learning studies fail to operationally define the term. Those that do so may consider blended learning to be when in-class seat time is reduced and replaced by an equivalent amount of online time. The former Sloan Consortium, now the Online Learning Consortium, stated that a course can be considered blended when the amount of online time replaces from 30% to 79% of the total course time (Allen, Seaman, & Garrett, 2007). A broader definition for blended courses comes from the U.S. National Center for Education Statistics that defines blended courses merely as those having some reduced in-seat time (Parsad, Lewis, & Tice, 2008). Examples of courses designed using this replacement model are given by Asarta and Schmidt (2015) who list 20 studies conducted between 2003 and 2011 where seat time was reduced between 25% and 73%. Others are not as concerned about how much, if any, seat time is replaced by choosing to focus on different aspects of the blend. For example, Graham (2006) defines blended learning simply as the combination of face-to-face instruction and computer mediated instruction in an effort to reconcile differences in its definition found in the literature (p. 5). He goes on to classify blended learning into three models according to their primary educational purpose – to enable, enhance, or transform learning—without reference to the relative amount of time spent online. Garrison and Vaughan (2008) view blended learning as "the organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies" (p. 148), again without focusing on how much seat time is replaced or not. Indeed, in some cases the actual amount of time students spend on a course increases when an online component is added without taking anything away from the previous version of the course leading to the so-called "course and a half" syndrome (Garrison & Vaughan, 2008, p. 202). Most of the studies included in a recent meta-analysis by Means et al. (2013) comparing blended learning to face-to-face and fully online learning used online activities to extend—not replace—course time by at least 25% of the normal course time. The authors speculate that one of the reasons students in blended courses achieve higher than their counterparts in the other two instructional modes is that they spend more time engaging with the course resources, while others contend that interactions among students and students with the instructor explain the performance difference (Castaño-Muñoz, Duart, & Sancho-Vinuesa, 2014). In this study we chose to investigate student preferences and course performance in the replacement model because the university where we conducted the study adopted this model as campus-wide definition of blended learning.

2. Theoretical framework

Our study is framed by the literature on the context of blended learning design and implementation, student perceptions about studying in the blended format, and student performance in blended courses.

2.1. Blended learning design and implementation

In higher education blended learning has been implemented in a variety of contexts ranging from individual instructor-designed courses, to blended academic and professional programs, through to large institutional and system-wide initiatives. Bonk and Graham's (2006) Handbook of Blended Learning provides an overview of the diversity of implementations around the globe. Since its publication blended learning continues to expand rapidly and may soon become the norm for instructional design (Brown, 2016).

When designing and implementing blended learning the choice instructors make of the mix of online and face-to-face activities appears to be highly context dependent and contingent on the curricular level (e.g., the nature of the course content and instructional goals, online resources, availability of technology), the human resources level (e.g., student characteristics and learning preferences, instructor experience and teaching style), and the institutional level (e.g., institutional goals and priorities, quality assurance standards) (Diaz & Brown, 2010; Dziuban, Moskal, & Hartman, 2005; Mitchell & Honore, 2007). Some researchers maintain that there is no standard for deciding what content and what portion of a course should be online (Dziuban et al., 2005; Vaughan, 2007). Garrison and Vaughan (2008) emphasize that technology should not be simply added on to an existing face-to-face course, but effective use of the model requires a fundamental rethinking of the course design with the goal of optimizing student engagement. Given the lack of guidelines, Alammary et al. (2015) investigated the criteria instructors thought should be considered when determining the mix between the online and face-to-face components and what their relative importance should be. They found that out of 38 criteria in four different categories instructors rated the highest: (a) availability of technology to enable online delivery, (b) students' access to campus and technology, (c) teachers' willingness to try new teaching methods, and (d) the institutional support for teaching innovation and technology. The authors conclude that "the institution plays the most important role in determining the proportion of online components of blended courses" (p. 79). Likewise, Brown's (2016) systematic review of literature about faculty adoption of blended learning identified the same factors, but also found instructors' attitudes and beliefs about teaching and their workload as well as feedback from students as influences on their decision to employ blended learning.

The overwhelming body of research on blended learning indicates that the inclusion of on-site, face-to-face, sessions where active student participation and interaction with course content are encouraged tend to be more successful and supported by students as they help to establish immediate physical contact with other students in the class (Collopy & Arnold, 2009; Lim, Morris, & Kupritz, 2006). Similarly, the infusion of synchronous communications technologies, or at least a balanced mixture of synchronous and asynchronous technologies, into the online component of the blended course tends to increase the frequency and quality of student and faculty interaction as well as student engagement (Vaughan, 2007). The engagement of students in real-time interaction via video conferencing or instant messaging also helps create visually appealing dynamic experiences similar to those occurring in classroom-based course environments (Castle & McGuire, 2010; Kember, McNaught, Chong, Lam, & Cheng, 2010).

The recent emergence of guidelines and standards for the evaluation of online and blended courses can help instructors in alerting them to critical factors to consider when designing the online portion of blended courses. For example, the Quality Matters (http://qualitymatters.org) rubric sets seven standards for assessing online courses: course overview, learning objectives, assessment and measurement, instructional materials, course activities and learner interaction, course technology, learner support, and accessibility and usability. Each of these standards is in turn broken down into from 4 to 9 sub-criteria, some of which are deemed to be essential and others optional for a course to warrant the Quality Matters certification. Similarly, the Online Learning Consortium (http://onlinelearningconsortium.org) established five "pillars" – learning, faculty satisfaction, student satisfaction, scale, and access – to guide design for quality online education.

Unfortunately, while the literature on the design and implementation of blended environments addresses many of the benefits and limitations of blended learning as well as factors to consider when designing blended courses, it does not address the question of the relative merits of different blended models and their effects on student perceptions and performance.

2.2. Student perceptions

Blended learning is often perceived favourably by undergraduate students who are accustomed to a traditional mode of course delivery