Blended Learning Environments

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CONTENTS

Introduction .....................................................................................................................................................................270
Learning Effectiveness .................................................................................................................................................270
Transformational Potential .....................................................................................................................................270
Completion Rates and Academic Performance ....................................................................................................271
Assessment .............................................................................................................................................................271
Access ..............................................................................................................................................................................271
Cost Effectiveness ......................................................................................................................................................271
Student Satisfaction ....................................................................................................................................................272
Faculty Satisfaction ...................................................................................................................................................272
Organizational Considerations .................................................................................................................................273
Research Directions ....................................................................................................................................................273
Institutional Research ..................................................................................................................................................273
Faculty Adoption .......................................................................................................................................................273
Models for Support and Training ............................................................................................................................273
Learning Effectiveness Research ............................................................................................................................274
Conceptual Frameworks and Models .......................................................................................................................274
Role of Live Interaction vs. Computer-Mediated Communication ............................................................................274
Role of Learner Choice and Self-Regulation ................................................................................................................274
Conclusions .................................................................................................................................................................274
References .......................................................................................................................................................................274

ABSTRACT

In recent decades, rapid technological innovation has facilitated a convergence between traditional face-to-face and distributed (or technology-mediated) learning environments. These blended learning environments try to take advantage of the strengths of both archetypal learning environments (Graham, 2006). The emergence of blended learning is highlighted in higher education and in industry training literature. The Chronicle of
Higher Education reports that the President of Pennsylvania State University regards the convergence between online and residential instruction as the “single greatest unrecognized trend in higher education today” (Young, 2002, p. A33). Similarly, the American Society for Training and Development identifies blended learning as one of the top ten emergent trends in the knowledge delivery industry (Finn, 2002). Yet, surprisingly, we understand little about the nature of blended learning systems. This chapter identifies core issues and research about blended learning using the Sloan Consortium’s five pillars (learning effectiveness, student satisfaction, faculty satisfaction, cost effectiveness, and access) as an organizing framework (Lorenzo and Moore, 2002). The authors also discuss future directions in blended learning research.

KEYWORDS

Blended learning environment: A learning environment that combines face-to-face instruction with technology-mediated instruction.

Hybrid learning environment: Alternative term for blended learning environment.

INTRODUCTION

The term blended learning is relatively new in higher education and in corporate settings (the terms hybrid and blended can be used interchangeably). An ongoing discussion has ensued on the precise meaning of the term (Driscoll, 2002; Graham et al., 2003; Jones, 2006; Laster, 2004; Masie, 2006; Oliver and Trigwell, 2005; Osguthorpe and Graham, 2003), however, the most common position is that blended learning environments combine face-to-face instruction with technology-mediated instruction (Graham, 2006; Graham et al., 2003). Traditional face-to-face instruction involves interactions between instructors and learners who are in the same place, whereas technology-mediated instruction uses information and communication technologies (ICT) to mediate the learning experience and interactions without requiring that learners and instructors be located together.

Research suggests three primary reasons for adopting a blended approach to instruction: (1) improved learning effectiveness, (2) increased access and convenience, and (3) greater cost effectiveness (Graham, 2006). Most often, educators adopt blended learning approaches to explore gains and tradeoffs in comparison with strictly traditional settings or entirely distributed environments.

This chapter identifies core issues and research in the blended learning format using the Sloan Consortium’s five pillars (learning effectiveness, student satisfaction, faculty satisfaction, cost effectiveness, and access) as an organizing framework (Lorenzo and Moore, 2002). We also provide some directions for future research. We have chosen to focus on blended learning environments in a higher education context, while acknowledging that significant innovations also occur in informal, military, and corporate contexts (Collis et al., 2005; Harris, 2005; Kirkley and Kirkley, 2005, 2006; Lewis and Orton, 2006; Newton and Ellis, 2005; Wenger and Ferguson, 2006; Wisher, 2006).

LEARNING EFFECTIVENESS

Key questions with regard to the effectiveness of blended environments include:

- What are the affordances of face-to-face and technology-mediated contexts and how can the strengths of each be used to improve teaching and learning?
- How do short-term student learning outcomes interact with more systemic longer term student outcomes?
- What are the emerging models for assessing learning outcomes in the blended learning environment?
- What is the appropriate role for students becoming involved in the assessment of their own learning effectiveness?

Transformational Potential

Researchers recognize the potential for transforming learning when combining both face-to-face and technology-mediated instruction (Garrison and Kanuta, 2004; Graham, 2006; Graham and Robison, 2007). Many allude to this potential when they state that blended learning capitalizes on the best of both worlds. The simple elegance of the blended learning concept can also be a weakness, however, if the focus is entirely on the mode of instruction rather than the holistic nature of the learning experience. For example, instructors commonly state that their course is a blend that consists of \( x \%) online and \( y \%) face-to-face, which is not informative without knowing the nature of the activities occurring in the distinct learning environments and how the course effectively uses the affordances of the two environments (Cross, 2006). For blended learning to reach its full transformational potential, the primary goal should be rethinking and
redesigning the teaching and learning relationship (i.e., improved pedagogy) with efficiency and convenience as possible secondary benefits (Garrison and Kanuta, 2004, p. 99). Blended learning must capitalize on the strengths of both online and face-to-face modalities to create a more active learning environment (Graham and Robison, 2007).

Completion Rates and Academic Performance

Current studies on learning effectiveness in blended courses and programs concentrate on measures such as grades and withdrawal rates that are highly sensitive to factors such as course level, college, and department. This instability suggests that using course mode as an effect in comparison studies is not a particularly viable line of inquiry; however, some studies have been directed toward learning effectiveness in blended environments. Rochester Institute of Technology’s pilot program reported that completion rates were approximately 95% (Humbert and Vignare, 2004; Starenko et al., 2007), and Reasons and colleagues (Reasons, 2004; Reasons et al., 2005) found that fully online students succeed at rates higher than those in face-to-face or blended courses. Additional studies have shown comparable success in blended courses, yet others report them as superior regarding learning effectiveness (Boyle et al., 2003; Cottrell and Robinson, 2003; Dowling et al., 2003; O’Toole and Absalom, 2003; Riffell and Sibley, 2004). In larger data-mining studies of several thousand student registrations, researchers at the University of Central Florida found that blending learning courses produced comparable or superior success rates compared to face-to-face or fully online modes when college and gender contributions are removed (Dziuban et al., 2006).

Assessment

At present, most assessment mechanisms in blended learning remain traditional, as they are objective, non-contextual, and inauthentic; however, as the initiative matures, student assessment will, by necessity, become interpretive, contextual, and authentic. Brown et al. (2007) identified several important student perceptions about the efficacy of assessment techniques in the blended environment. They found that novice learners believe that traditional measures such as multiple-choice tests better reflect their learning status than more interpretive measures. More experienced learners, however, report confidence in assessment activities that involve collaborative work and interactive feedback. These findings give credence to developing theories that incorporate the nexus of information literacy, technology literacy, and critical thinking into a broader concept of information fluency—a foundation for assessment in blended learning (University of Central Florida, 2005).

ACCESS

Key questions with regard to access include:

- How does the enhanced accessibility afforded by blended learning impact completion rates in higher education?
- How does blended learning impact the educational opportunities for under-represented populations?
- How does accessibility interact with quality of learning?

The issue of learner access is fundamental to blended learning and includes access to institutions, access to programs, and access to courses (Mayadas, 2001). The issue of quality is critical when considering the goal of access. Shea (2007, pp. 19–20) asserts: “If quality suffers, increased access is of no benefit. Students don’t want access to low quality programs, faculty do not wish to teach in such programs, and alumni do not wish to support such programs.”

Three student populations appear to have particular needs with regard to access: those far from campus, those near campus, and those on campus. The issue for these populations hinges on determining the degree to which faculty and students need alternative instructional modalities (Otte, 2005). In addition, instructional modalities such as blending might facilitate access to educational opportunities for students with disabilities. Rochester Institute of Technology provides an excellent example of how blended courses can increase educational opportunities and learning effectiveness for hearing-impaired students (Starenko et al., 2007). Fundamentally, economic principles (e.g., reduced opportunity costs and comparative advantage) yield advantages for students who are either on or near campus.

COST EFFECTIVENESS

Key questions regarding cost effectiveness include:

- What are some effective models for assessing cost effectiveness in blended learning?
- For which contexts (high enrollment courses, specific disciplines) is cost effectiveness accepted and valued by stakeholders?
- What relationships exist between cost effectiveness and student learning outcomes?
The Center for Academic Transformation (Twigg, 2003) developed the primary models for cost effectiveness in blended learning. Using these models, several institutions have demonstrated that it is possible to improve quality and reduce costs, typically through reduced dependence on human resources. Robinson (2005) demonstrated that, by adding technology to the instructional design, quality increases, and in most cases costs are comparable or somewhat lower than face-to-face offerings. The University of Central Florida has reported cost savings, improved facilities utilization, improved learning, and continued program growth (Dziuban et al., 2006); however, return on investment cannot be determined via a simple spreadsheet calculation. Many less tangible factors contribute, including improved student satisfaction, and cost savings may or may not be realized. Blended learning, however, offers real potential for a positive return on investment.

STUDENT SATISFACTION

Key research questions pertaining to student satisfaction include:

- What components in a blended learning environment contribute most to student satisfaction?
- In what contexts is student satisfaction a viable outcome measure for learning quality?
- How is student satisfaction impacted when students are given a range of options regarding the nature of the blend in a course?

Student issues in blended learning emerge from the traditional academy and from the burgeoning online environments in higher education. Prensky (2001a,b) suggested that digital natives (the millennial generation), who expect the immediacy of technology, collaborative learning opportunities, and active learning environments, force faculty and administrators to adopt more effective pedagogies. Oblinger and Oblinger (2005) claim that for these students computers and personal technologies are a way of life. The Internet is more important to them than television, and they learn primarily through the processes of trial and error (Bisoux, 2002; Oblinger and Oblinger, 2005). We should not be surprised, therefore, that some tension exists between the millennial generation’s preferred learning styles and what higher education currently offers—even in blended courses (Aviles et al., 2005).

Several issues mediate student satisfaction with blended learning. Some studies report consistently high satisfaction levels for blended courses (Dziuban et al., 2004), while others indicate somewhat less positive attitudes (Utts et al., 2003). Some studies indicate that students with an intuitive cognitive style experience a lower sense of community in their blended courses than students with analytic approaches to learning (Graff, 2003). Conversely, studies such as those conducted by Rovai and Jordan (2004) have revealed a greater sense of community in blended courses when compared with face-to-face and fully online courses. Even though investigators report conflicting results about student satisfaction, most studies with substantial and stable samples have found predominately positive reactions; the majority indicate that convenience, flexibility, and the reduced opportunity costs involved in the learning process are the primary factors (Vignare, 2002). These elements tend to be independent of several potentially biasing factors, such as class size and discipline.

FACULTY SATISFACTION

Key research questions with regard to faculty satisfaction with blended learning include:

- What factors lead to faculty satisfaction in blended learning?
- What models do we have for supporting faculty adoption of blended learning?
- How do faculty workloads relate to satisfaction with blended learning in the context of tenure and promotion?

Faculty satisfaction is an important element that supports or detracts from the adoption of blended learning. The University of Central Florida reported that 88% of the faculty who taught blended courses were satisfied with the course and would teach in a blended format again in the future, but only 41% of the faculty in the Rochester Institute of Technology Blended Learning Pilot Project expressed a similar interest (Dziuban et al., 2004; RIT Online Learning Department, 2005). Many documented factors influence faculty satisfaction (Hartman et al., 2000). Three major elements are (1) impact on learning, (2) impact on workload, and (3) recognition that faculty efforts are valued. Many faculty members adopt blended learning because they believe it will improve learning effectiveness; some also believe that it will add convenience and improve their efficiency.
Increasingly, faculty are acquiring new technological skills and assuming new role expectations associated with those skills (Dziuban et al., 2006; Kaleta et al., 2007). In blended learning, the faculty must master the skills of both the face-to-face instructor and the online facilitator; thus, most research reports that implementing blended learning requires additional faculty time and effort (Kaleta et al., 2007; Lee and Im, 2006; Lefoe and Hedberg, 2006). The faculty time investment can be reduced through properly designed professional development and instructional support services such as training opportunities and performance support systems. Many faculty members incur the additional workload costs because they see the benefits for student learning (Starenko et al., 2007) or because they view the extra workload as a cost that will diminish as they become more comfortable with the new technological tools. Although research cites faculty recognition and compensation as key elements in successful blended programs, only one fifth of higher education institutions report providing formal recognition and rewards for technology integration (Green, 2004).

**ORGANIZATIONAL CONSIDERATIONS**

Key research questions with regard to organizational considerations and their impact on blended learning include:

- What organizational components should be in place for blended learning to become a systemic initiative?
- How will blended learning manifest itself in different organizational contexts such as community colleges, metropolitan research universities, and liberal arts colleges?
- What impact is blended learning having on the traditional academy?

Institutional support mechanisms play a vital role in the success of blended courses and programs. In considering an optimal institutional climate, Hartman (2005) suggested that the organizational foundation should be built on theories of practice where the academic units are able find a common ground for instructional development. He specified that the elements of those theories should address instructional models, faculty development issues, course development structures, and effective assessment designs, both institutional and at the course level. Further, an effective institutional model should undergo continuous refinement and development while the institution develops increased organizational capacity. Hartman argued that an effective institutional approach demands up-front executive buy-in and early infusion into the colleges and departments. Further prerequisites involve faculty- and student-centered approaches that make blended learning something the institution *is* rather than something it *does* (Hartman, 2005).

**RESEARCH DIRECTIONS**

We now focus on two important areas for future research: institutional research and learning effectiveness research.

**Institutional Research**

**Faculty Adoption**

Ultimately, the success or failure of blended approaches hinges on widespread faculty adoption of effective practices. We know relatively little about why faculty adopt and implement a specific blended instructional model and how they are making the instructional choices involved in course redesign (Kaleta et al., 2007). Some course redesign efforts are systemic in nature, such as the 30 projects supported by the Center for Academic Transformation (Twigg, 2003). The majority of change, however, is occurring through a process that Collis and van der Wende (2002) refer to as *stretching the mold*. In a campus-wide survey of faculty, Graham and Robison (2007) found that over one third of the faculty reported having taught a blended course, but many of the blends only made small enhancements to practice and did not change teaching and learning in significant or transformative ways. We need to learn how to avoid some of the traps historically associated with the adoption of technology-rich solutions, such as embracing rigid practices, *status quo* adherence, or a tendency for educational systems to preserve themselves by domesticating new technologies to support old practices (Beckwith, 1988; Salomon, 2002).

**Models for Support and Training**

Research supports the supposition that institutional support is necessary for mainstream faculty and students to adopt blended learning. Issues that require investigation include: (1) how to minimize increased demands on faculty and student time; (2) how to provide instructors and learners with the necessary skills to succeed, particularly in the technology-mediated environment; and (3) how to change the organizational culture into one willing to accept innovations such as
blended learning. Other research might investigate models for faculty support and training in blended environments and what aspects of the models are transferable to other contexts.

Learning Effectiveness Research

Conceptual Frameworks and Models

Design problems, such as creating a blended environment, are highly context dependent, with an almost infinite number of possible solutions. Researchers should better articulate conceptual frameworks that will serve blended contexts (Shea, 2007). The community of inquiry model is one possible framework (Garrison et al., 2000; Garrison and Vaughan, 2007), but it would be more helpful to have a range of rich blended learning models so designers could design tradeoffs in their own specific contexts.

Role of Live Interaction vs. Computer-Mediated Communication

Under what conditions is human interaction important to the learning outcomes and learner satisfaction with the experience? When and why should we be considering human interaction such as collaboration and learning communities (Alavi and Dufner, 2005)? How does live interaction vs. low-fidelity asynchronous interaction affect the learning experience? These questions are just a few that are directly relevant to deciding when to have face-to-face or technology-mediated interactions between participants or with a nonhuman instructional system. Some evidence indicates that learners in blended environments place greater value or emphasis on the face-to-face components, while other findings suggest that the face-to-face elements are unnecessary (Graham, 2006). Research related to better understanding the nature of human interaction in blended learning environments is a promising direction of inquiry (Shea, 2007).

Role of Learner Choice and Self-Regulation

How are learners making choices about the kinds of blends in which they are participating? Are choices being made primarily on the basis of convenience and flexibility? How much information and guidance are being provided to learners to help them make decisions about how different blends will affect their learning experience? Online components are perceived as requiring a greater amount of discipline for learners to succeed (Allen and Seaman, 2005), so how can blended environments be designed to support increasing learner maturity and capabilities for self-regulation?

CONCLUSIONS

Learning environments have affordances that facilitate or constrain different types of interactions and activities. Although much can be learned and synthesized from research in both distance and traditional learning environments, blended environments provide a paradigm that is different than just a linear combination of the two; for example, reactions to the use of computer-mediated discussions can be quite different in a course that also meets face-to-face vs. a completely online course (An and Frick, 2006; Schweizer et al., 2003; Yanes, 2004). In a completely online course, the computer-mediated discussion may be valued as the only means of human interaction, while in the blended context learners might perceive it as a low-fidelity, time-consuming channel for communication. Faculty and learners will take advantage of the opportunities in their learning environments based on their expectations, goals, and understanding of the learning possibilities within the environment. Currently, only a small (but growing) body of research is specifically related to blended environments. We need more research on the design of blended environments and how instructors and learners engage in the act of teaching and learning in these environments.

REFERENCES


* Indicates a core reference.