

**A Review of Literature**

**Mix It Up with  
Blended  
Learning in K-12  
Schools**

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# MIX IT UP WITH BLENDED LEARNING IN K-12 SCHOOLS

## A REVIEW OF LITERATURE

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## INTRODUCTION AND DEFINITIONS

The term “blended learning” represents a wide spectrum of delivery options, tools, and pedagogies, but conceptually refers to instruction that is a mix or blending of traditional face-to-face (f2f) and online components. Horn & Staker (2011) define blended learning as “any time a student learns at least in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace” (p.3). Allen, Seaman, & Garrett (2007) further attempt to quantify the divide, defining it as “between 30-79% of content delivered online with remaining portions delivered by f2f or other non-web-based methods” (Watson, 2008). Lastly, Brew (2008) describes blended learning as “integrating online and f2f formats to create a more effective learning experience than either medium can produce alone.”

## PROLIFERATION

Online and blended learning have experienced significant rates of growth in recent years, and further expansion is anticipated (Horn & Staker, 2011; Picciano, Seaman, Shea, & Swan, 2012; Watson, 2008). A 2009 survey conducted by the Sloan Consortium of 700,000 American public school administrators found over one million students enrolled in one or more online or blended learning course. This figure represents 2% of the K-12 public school population in 75% of the country’s districts. An additional 15% of districts indicated plans to embark on offering online or blended courses within three years. Additionally, while online learning growth of 23% was projected by those surveyed, they anticipated even greater growth for blended learning opportunities (Picciano, et al., 2012).

## METHODOLOGY

This review was based in part on feedback from MERC school division personnel familiar with blended learning. Phone interviews were conducted to better understand the questions and informational needs on the topic. The questions that surfaced in these interviews were compiled and organized into five themes.

### 1. *Pedagogy*

- ◆ What does research say about best practices in blended learning?
- ◆ What are the hallmarks of good blended learning experiences?
- ◆ What instructional elements will make it more effective?
- ◆ What learning activities are best for the acquisition of different skills and content?
- ◆ Should blended learning be used for introducing new concepts or for remediation and review?

### 2. *Content*

- ◆ What subject matter, content areas, and/or skills best lend themselves to a blended format?

### 3. *Professional Development*

- ◆ How do teachers’ roles change in relationship to ownership and practice when moving to blended learning?
- ◆ How do we encourage teacher and administrator buy-in?
- ◆ What resources are available for professional development in this area?

4. *Tools and logistics*

- ◆ What percentages represent an appropriate balance between (f2f) and online instructional components
- ◆ What technologies are best in supporting and facilitating blended learning?
- ◆ What are appropriate ratios for teacher-student interaction to be maximized in blended learning formats?

5. Impact on student populations

- ◆ Is blended learning effective for struggling learners/disadvantaged/at-risk populations?
- ◆ How do we identify students for which blended learning will be appropriate?
- ◆ What populations of students are successful with blended learning?

Utilizing databases and print resources from Virginia Commonwealth University’s Cabell Library, a thorough review of literature was conducted. The database

search was limited to peer-reviewed journals published in the last ten years, using multiple combinations of search terms presented in Figure 1. Other relevant journal articles were identified through citations in the original list of peer-reviewed articles.

## RESULTING RESOURCES

The number of journal articles that directly addressed online or blended learning in K-12 settings was astonishingly low. However, this was not necessarily a flaw of the search process, as the absence of research in this area has been documented.

The United States Education Department (USED) attempted to conduct a meta-analysis of experimental or controlled quasi-experimental studies comparing f2f and online learning modalities published from 1996-2006 in K-12 settings only to discover that no such studies existed meeting methodological criteria. By expanding the publication date to 2008, some studies were identified, but only five K-12 studies were eligible for inclusion (Means, Toyama, Murphy, Bakia, & Jones, 2009).

In another study, all archived masters theses and doctoral dissertations on blended learning uploaded to ProQuest through April, 2012, were analyzed in an attempt to identify trends in the research. Of the 205 resulting manuscripts, only 8% involved K-12 schools, and the authors noted that studies of blended learning in K-12 settings did not consistently appear in the database until 2008 (Drysdale, Graham, Spring, & Halverson, 2013).

As a result, some studies were included in this literature review that might not have been if the body of literature had been more robust. All total, over 50 peer-reviewed journals, 10 professional

**Figure 1: Search Terms for Literature Review**

<i>Search Terms Used for Peer-Reviewed Journals:</i>
Blended learning or hybrid learning online learning +K12
Online pedagogy
Academic subject + blended learning/online learning
Hybrid learning + content area
Teacher training online instructor
Professional development blended learning
K12 professional development
Balance face to face online
Training online methodology
Online class size
Blended learning technology
Student populations + blended learning
Special education + blended learning
Minority students + blended learning

resources (not peer-reviewed, but subject to editorial processes), and 20 published books were identified, read, evaluated, and synthesized. General principles regarding best practice in online education and blended learning will be shared with cautions against broad generalizability, as many of the contexts differed from a traditional K-12 setting. This is a similar approach taken by Means (et al., 2009) in the official USED publication.

## PEDAGOGY

Numerous studies highlighted the importance of shifting pedagogy in moving from traditional f2f to blended and online learning scenarios, not simply changing the medium. Skillful online teaching is ultimately focusing on the facilitation of good communication in ways that promote quality interactions, student engagement, and connections (Davies & Graff, 2005; Donnelly, 2010; Kruger-Ross & Waters, 2012; Orellana, 2006; Pelz, 2003; Picciano et al., 2012; Siemens, 2005; Sutton 2001). Table 1 summarizes hallmarks of best practice online components of blended learning, according to research (Dixson, 2010; Donnelly, 2010; Drysdale, et al., 2013;

Pennegar, & Egan, 2005; Wang, 2009; Willekens, 2009; Zen, 2008; Zhao, Lei, Yan, Lai, & Tan, 2005).

Additionally, one professional resource encouraged administrators and teachers to rethink their use of classroom time with blended learning. Fletcher (2012) encourages teachers to “mine” information from the work in which students engage online to inform and enrich face time, bridging connections between the two modalities.

With regard to technology tools and their potential pedagogical impact on student learning, Hew & Cheung (2012) analyzed experimental studies in which Web 2.0 tools were employed in K-12 and higher education settings to determine their impact on student learning. Results indicated that the impact of podcasts, wikis, blogs, Twitter, and the use of virtual worlds were either positive or neutral, a finding that will hopefully encourage greater instructor experimentation in blended learning applications.

## CONTENT

Jaggars (2012) conducted a qualitative study on student preferences related to enrollment in online courses and found that students preferred “difficult” courses, such as math, to be delivered traditionally in f2f formats, preferring courses perceived to be “easy” in online formats. Among subjects that were rated as poorly suited to online context were lab sciences and foreign language (Jaggars, 2012). The researcher also called for further study into the relationship between academic content areas and suitability to online learning, and as reported by Xu & Jaggars (2013) - “the field has no information regarding which subject areas may be more or less effectively taught online” (p.5).

**Table 1: Hallmarks of Best Practice in Online/Blended Learning**

Fast-paced	Convenient and flexible	Focuses on interactions	Thorough curriculum	Utilizes practical examples
Responsive teachers	Peer feedback	Student-led discussions	Assignment variety	Interaction with content
Active involvement	Prompt feedback	Social presence	Connection with peers	Clear course design
Accessibility	Sense of community	Acknowledges student interests and motivations	Differentiation for learning needs	Personal control and choice

Gayton & McEwan, 2007; Kruger-Ross & Waters, 2012; Manning, 2010; McCombs & Vakili, 2005; Oblinger & Hawkins, 2006; Orellana, 2006; Pelz, 2003; Qiu, Hewitt, & Brett, 2012; Roby, Ashe, Singh, & Clark, 2012; Siemens, 2005; Suttons, 2001; Teemant, Smith,



Xu and Jaggars (2013) conducted a large-scale analysis of online course enrollment across Washington state’s community college system and noticed that humanities, social sciences, education, computer sciences, applied professions, English, mass communication, and natural sciences comprised the bulk of student online enrollment. Falling on the lower end of the spectrum were math, applied knowledge, foreign language, English as a second language, and engineering courses (Xu & Jaggars, 2013).

## PROFESSIONAL DEVELOPMENT

The literature documents the perceived shifting of roles in the move from traditional to online and blended learning, where teachers take on greater facilitation responsibilities while lessening their responsibilities in providing direct instruction. Placing a course in an online format alone does not constitute high-quality online learning, and Donnelly (2010) highlights the “difference between using technology as a delivery mechanism and using it as a communications medium” (p.351). Fletcher (2012) describes teachers in online formats as “curators” of high-quality content.

Since the instructional platform requires changing skillsets and attitudes, Lane (2013) suggests “the goal of professional development [in this arena] should be transformative learning” (p.3). In order to achieve this transformation, professional development should include reflective examination of practice (McQuiggan, 2007) to discourage continued traditional pedagogies in the new delivery format (Lane, 2013).

Researchers call for parallels between professional

development and expected professional practice, which could take the form of using of the same technology tools (Ertmer & Ottenbreit-Leftwich, Sadik, Sendurer & Sendurer, 2012; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009), sustained and job-embedded support through mentoring (Kopcha, 2012), an online class open to instructors across institutions (Lane, 2013), or even a hybrid model (Fletcher, 2012).

Obtaining buy-in from teachers and administrators is a critical first step to piloting new ideas, and researchers suggest that sharing evidence of the positive impact on student learning will be essential (Ertmer & Ottenbreit-Leftwich, Sadik, Sendurer & Sendurer, 2012). Pioneering educators should receive recognition as well as the opportunity to provide leadership to others (Lane, 2013).

**Table 2: Six Models for Blended Learning (Horn & Staker, 2011)**

Face-to-Face Driver	Teacher deploys online learning on case-by-case basis
Rotation	Within course, students rotate between one-on-one, self-paced environment and f2f teacher
Flex	Online platform delivers most curricula with on-site teacher support as necessary (ex. Credit recovery)
Online Lab	Online platform delivers all instruction in lab with paraprofessional supervisions. Works as a course within traditional block schedule
Self-Blended	Students take remote online course to supplement school’s offerings
Online Driver	Online platform delivers all instruction and students work remotely with the possibility of f2f check-ins

## TOOLS AND LOGISTICS

Blended learning can be implemented in many different ways, and Horn and Staker (2011) share six possible models or configurations, summarized in Table 2.

With regard to commercial technologies for online learning, Horn & Staker (2011) describe the state of the market as previously reluctant to significant investment in K-12 products, and as a result, many products lack the needed “raw functionality” and compatibility with

others. In a study of instructor utilization of learning management software features, Christie and Jurado (2009) found that some tools go unused. Rather than worry about underutilization, the researchers encourage instructors to let their pedagogical needs dictate which tools they use (Christie & Jurado, 2009). With regard to instructional platforms, researchers caution institutions not to make assumptions about instructional quality (Picciano, Seaman, Shea, & Swan, 2012).

Online instructors’ self-reports of perceived workload show increased time needed in the new format, citing greater effort in planning and implementation as compared to traditional classroom instruction (Green, Alejandro, & Brown, 2009; Orellana, 2006; Seaman, 2009); some organizations are designing innovative approaches to teachers’ new demands. Horn and Staker (2011) discuss the possibility of “disaggregating the role of a teacher” to increase job satisfaction and directly target the needs of students. This concept includes hiring a “mix of online teachers, who are in charge of academic content; in-person mentors who work with students and their families throughout their high-school careers; and in-person “relevance managers,” who help students apply learning in projects or internships” (p.9). As teachers design courses and create content, divisions may encounter the need to consider revising policies related to compensation and intellectual property (Roby, Ashe, Singh, & Clark, 2012).

Since a critical component of effective online instruction is high-quality interactions among and between students, instructor, and content, the size of online and blended learning classes should be appropriate for maximizing the impact of these interactions.

Classes that are too small may pose challenges for engaging discussions, while classes that are too large can lead to difficulty in creating class cohesion, disengagement from students, student anxiety, a lack of confidence to participate and share ideas, and “information overload” (Aragon, 2003; Colwell & Jenks, 2004; Qiu, Hewitt, & Brett, 2012). Additionally, one study cited an underutilization of instructor expertise due to focused energy on managing large classes (Russell & Curtis, 2012). Suggested class sizes from the literature range from 13-30, as summarized in Table 3.

## IMPACT ON STUDENTS

In determining the characteristics of successful online students, researchers describe them as self-directed, self-disciplined, self-controlled, motivated for learning, possessing awareness of/interest in a topic, and having self-efficacy related to the computer, the internet, and online communication (Collis, Buijstens, & van der Veen, 2003; Donnelly, 2010; Hung, Chou, Chen, & Own, 2010; Kruger-Ross & Waters, 2012). Picciano et al. (2012) raises concern about the trend toward online credit recovery, stating that “many of the students who need to recover credits are those who may not have [the] characteristics [to be successful in these courses]” (p.134). One school district in Washington

**Table 3: Class Size Recommendations From the Literature**

Class Size	Context	Source
< 30	Instructor perceptions of ideal online class size	Roby, Ashe, Singh, & Clarke, 2012
23-25	Student satisfaction evaluations in online graduate information studies course	Kingma & Keefe, 2006
15-19	Instructor perception of ideal class size for optimal teacher-student interaction	Orellana, 2006
13-15	Participant and instructor perception of graduate writing courses	Qiu, Hewitt, & Brett, 2012

state pairs students with a mentor in addition to their online instructor to provide scaffolded supports such as providing reminders on deadlines, and establishing timelines for course requirements (Fletcher, 2012).

In comparing f2f and purely online modalities of community college courses, Xu and Jaggars (2013) found students were more likely to withdraw from an online course than a traditional f2f course, and this trend appeared across student racial subgroups. In a study of mostly female undergraduate students using the Myers Briggs inventory, researchers found that introverted students prefer online courses, while extroverts prefer the f2f format (Harrington & Loffredo, 2009). And in another study of modality, “web-based blended courses yield the highest success rate” with regard to completion and the lowest rate of withdrawal compared to lecture capture courses (Moskal, Dzubian, & Hartman, 2012, p.5), perhaps suggesting that the blending of traditional f2f and online formats may serve as a safety net for those at risk for dropping courses and a marriage of the two formats for students with specific delivery preferences.

As blended and online learning continues to proliferate, questions regarding its effectiveness for all students and subpopulations of students will gain importance, especially in light of well-documented achievement gaps. In the large scale study of Washington state community college course enrollment, Xu and Jaggars (2013) suggested that women may outperform men in online courses, but reminded readers that women also tend to outperform men in traditional f2f academic settings. Additionally, they noted that “males, younger students, Black students, and students with lower levels of prior academic performance had more difficulty adapting to online courses” (Xu & Jaggars, 2013, p. 6), again creating a space to further investigate blended learning as a trend to stem the problems related to strictly online student success. Newell (2007) found that while White students may outperform Black and Hispanic students in online courses, this trend is not

unique to the online modality. In fact, Xu and Jaggars (2013) claim that “no studies have examined whether the ethnic minority performance gap is exacerbated by online coursework” (p.3), a critical area for future research.

## SUMMARY AND CONCLUSIONS

Given the numerous unexplored areas in research surrounding K-12 blended learning highlighted in this literature review, the field is wide open and ripe for further investigation. In seeking to address answers for questions related to blended learning and pedagogy, content, professional development, tools and logistics, and the impact on student populations, it seems research is still a new frontier in the K-12 arena, with preliminary studies indicating a positive or neutral bent. Research reminds us that changing the medium or modality of instruction requires more than just new technology, but also new attitudes and skillsets. As a result, professional development for teachers will have to expose them to online learning environments and engage them in reflection if transformative pedagogical practice is desired. Effective online and blended learning experiences will focus on quality interactions, student engagement, and the formation of connections, not the bells and whistles of technological tools that will come and go. Instructional needs and goals should dictate what tools are utilized.

Only qualitative data on student preferences related to content is present in the literature, indicating a preference towards online courses perceived to be “easy” or non-technical. Regardless of content, class size should be intentionally large enough for interaction, yet small enough for personalization and the full utilization of the instructors’ expertise.

While it is not yet known if alternate instructional modalities disproportionately impact student subpopulations, instructors and administrators should think creatively about creating scaffolded supports for students who do not enter with the skills necessary to be successful in an online format.

With regard to recommendations for practice, the encouragement is not to become paralyzed by fear of the unknown, as preliminary research on blended learning is promising. Instead, practitioners should glean lessons of best practice from f2f and online learning pedagogies both including and reaching beyond the K-12 realm to include higher education and professional training in developing common sense approaches to blended learning program offerings.

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