A summary of the factors to be considered when developing and implementing a blended course format

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The effect of learning in a course offered in the blended format on individual
performance has prompted interest among academics around the world (e.g., Hsu, 2011
in Asia; Bliuc, Ellis, Goodyear & Piggott in Australia; López-Pérez, Pérez-López,
Rodríguez-Ariza, in Europe; Stewart, Stot & Nuttall, 2011 in the United Kingdom; Xu &
Jaggars, 2011 in the United States). Blended course design has become a global
phenomenon, as administrations attempt to integrate the realities of technology driven
societies with conventional styles of instruction. For example, online learning in
educational institutions in the United States has expanded rapidly in availability over the
past decade: 29% of higher education students took at least one online course during their
fall semester in 2009; a 21% increase over the number reported in the previous year
(Allen & Seaman, 2010).

While blended learning is a widely researched approach for 40 years (Tamin et
al., 2011), there are inconsistencies with how scholars and practitioners conceptualize
blended learning. Blended learning has been used interchangeably with “technology-
mediated learning,” “virtual-work environment,” “synchronous interactive online
instruction,” and “hybrid learning.” Regardless of the title, blended courses typically
involve the integration of traditional face-to-face instruction with online instruction
(Garrison & Vaughan, 2008; Hsu, 2011) in order to achieve the learning objectives.

Research on courses that use the blended format has revealed several positive
results for students such as enhancing the experience of learning (Davis & Wong, 2007),
retention in courses (Anagnostopoulou & Paramar, 2008), cost and time efficiencies
(Singh, 2003), and better grades (Means et al., 2009). Despite recent attempts in
advancing our understanding of blended learning compared to non-blended courses on
student outcomes, few studies have addressed how different blended course formats contrasting different factors contribute to successful outcomes. Owston, York, and Murtha (2012)

Furthermore there is little consensus about the main variables or constructs that should be examined when considering relationships between blended course formats and student performance outcomes. In agreement with Garrison and Kanuka (2004:96), “institutions of higher education need to discover [the] transformative potential [of blended course design] as blended learning allows for flexibility and unbounded discourse.” However, a current void in the blended learning literature clouds our understanding of the interrelated factors contributing to an effective delivery that would allow such a transformation. Therefore, the intention of this paper is to provide a review of potential conditions that could contribute to successful blended learning course design and delivery at the undergraduate level.

The remainder of this paper is divided into two sections: institutional- and individual-level factors explaining the conditions in which a blended course format is effective. It is important to acknowledge that this is an artificial separation of factors as there is an interplay between institutional- and individual-level factors. At the individual-level the role of course structure, course design, and people (both instructors, students) are essential to understanding blended learning performance outcomes (Derntl, Motschnig-Pitrik, 2005); all aspects that are influenced by institutional-level factors such as policy, resources, program type, class enrollment, etc. However, separating variables into institutional and individual factors allows a more “holistic approach” to
understanding what contributes to the successful development and implementation of a blended course format (Bliuc et al., 2007).

**Institutional-level factors**

At the institutional-level, several fundamental conditions exist which impact blended course design and implementation. From an administrative perspective, effective and efficient policies/procedures, thoughtful curriculum planning, flexible room scheduling, and resource support are likely to have a positive impact (Garrison & Kanuka, 2008; Singh, 2003). Alternatively, there are potential infrastructure issues that can hinder the effectiveness of blended learning initiatives that may include the general investment and establishment of reliable and accessible technical infrastructure, management, and ongoing evaluation (Garrison & Kanuka, 2008; Singh, 2003) particularly of course design.

Two key considerations for adapting a blended course format are paradigm level (i.e., subject matter, Saunders & Werner, 2002) and course level (Collopy & Arnold, 2009; Tamin et al., 2011). Results from recent studies suggest that paradigm level is a significant factor predicting learning outcomes in university level courses with technology-mediated learning (Hornik, Saunders, Li, Moskal, & Dzuiban, 2008; López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011). Essentially, a highly developed paradigm is thought to have definitive answers in studying phenomena, which are more common in the physical science courses; however, in courses with low paradigm development, it is thought that multiple answers exist (Pfeffer & Moore, 1980; Lodahl & Gordon, 1972) such as seen in Humanities and Social Sciences courses.
Hornik et al., (2008) found that student performance in technology-mediated environments is greater for courses in disciplines with a highly developed paradigm rather than for courses in disciplines with low paradigm development. Furthermore, the authors’ study suggests that withdrawal rates are lowest for technology-mediated advanced courses (year 4) with high paradigm development; such that, course level (e.g., year one vs. year four) moderated the effects of paradigm level and student withdrawal. In addition to impacting withdrawal rates, research provides support for an interaction between course level and high/lo paradigm and student satisfaction. For instances, based on a 5-point Likert scale where 1 reflects a high satisfaction score, student satisfaction was highest for advanced (4th year) high paradigm courses (mean =1.82) and for introductory (first year) low paradigm courses (mean =1.96). Conversely, student satisfaction was much lower for advanced low paradigm courses (mean =2.48) and introductory high paradigm courses (mean =2.44).

Two additional considerations have emerged in the literature as conditions to consider when designing effective blended course formats, they are: class size and type of study (practical vs. theoretical). First, Garrison and Vaughan (2008) and Hornik et al., (2008) argue that class size, or high-enrolment courses might benefit from adaptation from a traditional face-to-face format to a blended format, as it would increase interaction between students and with instructors. It also has the potential to increase the richness of the interactions from answering commonly asked course related questions repeatedly to deeper content related questions. Second, type of study is also important, as Donkor (2010) found through a small experiment comparing the instructional effectiveness of video-based instruction materials and print instructional materials for a block-laying and
concreting program. It was found that the theoretical knowledge acquired by the two methods was equivalent. However, for the acquisition of practical skills, Donkor (2010) found the video-based materials to be superior due to the ability of the students to watch the videos while simultaneously performing the task. In summary, although a lot of the current research available has been conducted on graduate level programs and non-traditional programs, it is obvious that paradigm level (high vs. low), level of study (year one vs. year four), class size (high-enrolment, >500 vs. low-enrolment, <500), and type of study (practical vs. theoretical) all need to be considered when choosing courses to be adapted to a blended format.

**Individual-level factors**

Course design is noted as a key condition to producing effective blended learning courses. However, Cornelius and Gordon (2009:239) call for more consideration for “the course process over course content, and support for the development of learners’ confidence” when designing courses. In addition, students’ satisfaction with course design has been linked to their performance. For example, Precel, Eshet-Alkalai, and Alberton (2009) conducted a study assessing pedagogical components of the course (e.g., aspects of online textbook’s, online video lectures, and online discussion groups) for a blended learning technology graduate program for 58 students during a three-semester period. The results of the study highlight that students’ high ratings of the course’s pedagogical components such as design aspects demonstrate the importance of designing the course in advance to able to account for specific set backs (e.g., technology glitches) in order to provide the best online experience possible.
Course design features such as interactive ability, practice exercises, repetition, instructor presence and timely feedback are found to be associated with improved learning outcomes for internet-based learning courses for health professionals (Cook, et al., 2010) and need to be taken into consideration when designing blended learning courses. Furthermore, time for reflection and interaction with the content as well as with peers and the course instructor are important considerations in developing blended learning courses, as instructional strategies that promote feedback on content and interaction with the content typically prolong learning time and enhancing learning outcomes (Cook et al., 2007). These studies are consistent with Bonk (2010) and Bonk & Graham (2006) regarding design aspects of blended course formats with an underlining theme of an interactive approach. Furthermore, Bonk (2010) suggests that “the coordination between face-to-face and online interaction is the most critical factors contributing to the success of blended learning.”

Design of courses using the blended format can also impact how a “community of learning” is generated. Evidence suggests that blended courses generate a greater sense of community among students than traditional face-to-face or fully online courses (Rovai & Jordan, 2004). A sense of community is also important because it augments social learning. Blended courses draw to some extent on the social constructivist approach to learning which emphasizes that individuals learn from their environment, social relations, and self-reflection on the learning experience (Jonassen, Mayes & McAleese, 1993). Therefore, interactions with peers and course instructors are just as important as interacting with the content.
Learning in a blended course is somewhat premised on the notion that this type of learning boosts collaboration between students and communications between students and instructors. Building upon Garrison, Anderson & Archer’s (2000) “community of inquiry framework,” Shea and Bidjerano (2010) argue that the role of an online learner can create a self-regulated “learning presence,” which refers to an individual’s cognitive, behavioural and motivational resources. These are important resources for forming interpersonal relationships and performing knowledge sharing tasks in a community of learning (Tseng & Kuo, 2010). Furthermore, an individual’s “cognitive presence” can be reached through learning processes and outcomes and are likely associated with perceived and actual learning outcomes (Akyol & Garrison, 2011). In fact, high achieving students (students with a high grade in the course controlling for the students cumulative grade point average) in contrast to low achieving students felt that they learned the course key concepts better than if they had taken the course in a traditional face-to-face format (Owston, York, Murtha, 2012). Finally, Daukilas, Kaciniene, and Vaisnoriene (2009) provide an analysis of factors that have impact upon the quality of blended learning instruction and among the factors listed includes student’s continuous learning disposition. Deficiencies in essential factors such as a students’ inability to accept responsibility for their own learning, the lack of family support, or even the lack of positive and timely feedback may result in a weak sense of community (Rovai & Jordan, 2004). Therefore, a blended learning prototype should promote a sense of community and encourage learner characteristics that include the following: interest in the material taught, self-motivation, independent and self-directed learning, and critical thinking (Irizarry, 2002).
Students’ perceptions and attitudes are linked to quality of learning (Sanprasert, 2010; Ituma, 2011). For example, George-Palilonis & Filak, (2009) explored students attitudes enrolled in a visual communications course through analysis of journal entries, yielding 13,552 statements for analysis, 7,548 in the blended sections and 6,004 in the non-blended sections. The journal data revealed students in the blended sections were significantly less negative about the course material, personal achievement, technology, and their emotional reactions than students in the non-blended sections. These findings are consistent with Ginns and Ellis (2007) who explored the associations between student perceptions, the elearning environment approaches to study, and student grades. The authors used a sample consisting of 127 veterinary science students. Their results provide statistically significant support for the argument that quality of the learning experience (defined by the perceptions of “good e-teaching”, “deep approach to learning”, and “good e-resources”) is positively correlated with grades ($r = .19$, $r = 21$, and $r = .16$ respectively). However it is important to note that low achieving students may not perceive the blended course format in a similarly positive fashion (Owston, et al., 2012).

Additionally, it was found that quality of learning and achieving learning outcomes are connected to quality of approaches to both face-to-face and online discussions (Bliuc et al., 2011). Several factors can contribute to a quality approach to blended learning course design. Stricker, Weibel & Wissmath (2011) investigated the role of usage of online resources on performance. The study consisted of observations and a comparison of two different groups (heavy users vs. light users). The results reveal that ‘heavy’ usage was the best predictor of the final exam grade. This is consistent with Lee et al., (2007) additional findings that reading and attitude towards internet-assisted
learning predicted final exam grades for 48 junior high school students (26 male and 26 female). It is noteworthy that attendance has also been noted as predictor of student performance, as well as other underlying factors such as a students’ motivation or conscientiousness (Stewart et al., 2011), self-regulated learning competence, and attitude towards learning (Cook, 2005; Dutton, Dutton & Perry, 2002).

Positive perceptions of blended learning can be shaped by preparing students for taking a blended learning course via e-lessons (Lee et al., 2007) and stronger service integration, including: student online readiness assessments, course management system tutorial, and online support services, (Xu, Jaggars, 2011). It also might influence perceptions and performance in blended or online courses if digital literacy skills (netiquette, how to engage in discussion forums online, how to evaluate and interpret information found online, knowledge navigation, group work) could be built from inception beginning with a modicum of online activities to achieve learning objectives in lower level courses. Additional factors have emerged from a set of 48 qualitative interviews with graduate students taking a health education blended course suggesting an association of student perceptions of satisfaction with course structure, emotional support, and communication medium (So & Brush, 2009). Overall, these studies highlight that student perceptions of blended learning are shaped by many different factors that can be addressed and can consequentially be linked to quality of learning and learning outcomes.

The perceptions of instructors are also a key consideration to the conditions of effective blended learning. Instructor attitudes play a key role in their willingness (Ocak, 2011) and quality of learning that students receive (Dernt et al., 2005) as, “teachers
enthusiasm about an innovation can be an important factor in terms of how students perceive the innovation from a learning perspective” (Vinesh & Fisher, 2009:43). In fact, instructor involvement in the online environment is an important component to increasing student engagement in the course. Taken together, instructor and student perceptions are essential to learning outcomes. Overall, these studies provide support for the fact that positive perceptions of the learning environment are essential in order to build social connections between students and course instructor (Collopy & Arnold, 2009:99) and so that the student may work more effectively with the content.

Conclusion

To summarize, there are a myriad of factors that could contribute to a successful blended course format. We see several factors at the institutional-level such as policy, resources, program type, class enrollment, and individual-level such as course design, instructors, and students perception that can impact the success of a blended course format. It is important to consider these factors when developing and implementing blended courses that achieve the course or program learning outcomes.
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