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# A Case Study of the Introductory Psychology Blended Learning Model at McMaster University

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**Abstract**

This paper provides a brief review of blended learning as a didactic method, and discusses the issues and challenges of using blended learning models in post-secondary education. Blended learning refers to mixed modes of instruction that combine traditional face-to-face classroom teaching methods and online learning materials. The paper will address challenges faced by large classrooms with a diverse student body, and the ways blended learning models can help alleviate those concerns (i.e. technologically savvy students, the need for course scheduling flexibility). In addition, a case study of blended learning in higher education in the context of a unique first year Introductory Psychology program at McMaster University will be discussed. Lastly, the important learning benefits offered by blended learning systems, along with the potential barriers to their implementation will be addressed.

Cet article présente un bref compte rendu de l'apprentissage hybride en tant que méthode didactique. Il traite des problèmes et des enjeux relatifs à l'utilisation des modèles d'apprentissage hybride dans le domaine de l'enseignement postsecondaire. L'apprentissage hybride renvoie aux modes d'enseignement mixtes qui combinent les méthodes d'enseignement traditionnel en présentiel et l'accès à des documents d'apprentissage en ligne. L'article traite des difficultés rencontrées dans les grands groupes comprenant une diversité d'étudiants et des façons dont les modèles d'apprentissage hybride peuvent contribuer à atténuer ces préoccupations (c.-à-d. les étudiants calés en technologie, la nécessité d'une offre de cours souple). De plus, l'article traite d'une étude de cas sur l'apprentissage hybride dans l'enseignement supérieur dans le cadre de la première année d'un programme d'introduction à la psychologie à l'Université McMaster. Enfin, l'article aborde les importants avantages offerts par les systèmes d'apprentissage hybride ainsi que les obstacles potentiels à leur mise en œuvre.

The primary method of teaching in most post-secondary institutions has traditionally centered on classroom lectures where students and instructors meet regularly at a fixed time and place. Importantly, the setting provides immediate student feedback and face-to-face interaction among students and the instructor (Keefe, 2003). However, this approach has been criticized as an insufficient pedagogical teaching method with several disadvantages. For example, some critics have argued that traditional lectures usually involve *passive learning* whereby a learner's role is reduced to receiving information presented for memory storage (Mayer, 2010). This can lead to learning which lacks clear application, deep understanding, and retention of the content (Entwistle, 1992; Gale, 1997; Kazembe, 2010). The design of a traditional classroom lecture-based course can limit student participation and promotion of *active learning* which genuinely engages cognitive activities during the learning process (Gauci, Dantas, Williams, & Kemm, 2009). Ultimately, limited opportunities in transfer of learning can restrict understanding and comprehension.

Instructors are faced with additional challenges of increasing enrollment, campus commuting and a more diverse and variable student body. This is particularly true for instructors of large first year courses who try to augment traditional lectures by facilitating activities that promote application of concepts beyond the classroom. Consequently, universities are moving towards alternative teaching methods tailored to large numbers of students with shifting demographics and resources. These innovative methods incorporate new technologies to provide students with personalized learning. An increasingly popular approach is to deliver the course content through online learning resources. There are two types of online learning used: (1) synchronous learning – all e-learners in a course meet virtually at a pre-determined time; and (2) asynchronous learning – e-learners can log on to the e-environment at any time, view lecture materials, download documents, and communicate with peers and instructor via messages and e-chat (Hrastinski, 2008). Compared to traditional lectures alone, online learning offers unique advantages including self-paced learning, scheduling flexibility, and location flexibility (Bonakdarian, Whittaker, & Yang, 2010).

However, drawbacks for online learning include lack of direct social interaction with academic and peer support and increased opportunity for academic dishonesty (Berge, 1998; McKenzie, Mims, Bennett, & Waugh, 2000; Olt, 2002; Stockenband & Althoff, 1997; Swan, 2002). Nonetheless, online learning technology has the potential to provide many new avenues of teaching to augment the traditional classroom. An optimal learning environment can be achieved by combining participatory traditional classroom practices with online learning technology (Singh, 2003). Traditional teaching offers the immediate feedback and engagement essential for student learning and online technology tailors learning to be flexible, accessible, cost-effective and accommodating to individual needs. In recent years, rather than delivering course material through a single medium (either the internet or classroom) the convergence of both methods has become increasingly prevalent (Graham, 2005; Kim & Bonk, 2006). This approach to teaching and learning is referred to as blended learning, also called hybrid, flexible or distributed learning (Duhaney, 2004; Olapiriyakul & Scher, 2006).

The objective of this paper is to provide a brief review of the blended learning model as a didactic method followed by a case study of a unique first year Introductory Psychology program at McMaster University.

# What is Blended Learning?

There are three common definitions used to describe blended learning (Sharma, 2010). The most common definition of blended learning is the combination of traditional face-to-face instruction of classroom teaching with online learning materials such as web-based learning modules, interactive demonstrations and other electronic tools, typically hosted through a Learning Management System (LMS) such as Blackboard, Moodle, or Desire 2 Learn (Rooney, 2003; Sharma, 2010). Another definition of blended learning involves combining technologies from online learning materials exclusively in a web-based learning environment (Oliver & Trigwell, 2005; Whitelock & Jelfs, 2003). In this approach, there are no face-to-face interactions and communication between the instructor and student are usually in the form of e-technologies, such as e-mail or LMS. Blended learning can also be defined as a combination of teaching methodologies (Driscoll, 2002). According to this perspective, the mix of pedagogical approaches will result in an optimal learning environment, irrespective of any use of technology. In the current report, blended learning will refer to mixed modes of instruction that combine traditional face-to-face classroom teaching methods and online learning materials (Kriger, 2003; Marsh, 2001; Oliver & Trigwell, 2005; Smith, 2001).

Blended learning can be used to promote learning as a continuous process by applying multiple and flexible delivery methods that take place over time rather than at a specific occurrence (Singh, 2003). For example, web-based learning modules can provide a learner with background information, which generally precedes and directs classroom meetings. This shift allows a refocus of face-to-face instructional time from a traditional lecture to a more active colloquium to include elaboration and discussion of information, demonstrations, and application through group activities. In a traditional lecture setting, this active use of instructional time is desired but typically difficult to implement because of the need to focus on advancing through core content. Additionally, online peer communications and e-tutoring can afford learners with educational resources which remain available well beyond the scheduled in-class events. Together, in-class and online resources can be used to promote active and collaborative learning (formally and informally) that is crucial for concept comprehension and application outside of the classroom (Catley, 2005; Olapiriyakul & Scher, 2006; Parsons & Ross, 2002; Ross & Gage, 2006). A blended learning design provides a balance between several learning options and resources tailored to individual needs (Bonk, Olsen, Wisher, & Orvis, 2002). Although there are initial costs of time and resources to design and implement, a mix of online technology and face-to-face interaction results in a flexible learning environment with similar or reduced costs in the long term (Osguthorpe & Graham, 2003; Zhang, 2008).

A blended learning design allows for flexible content delivery to a large audience while still fostering face-to-face contact essential for a robust learning experience (Rovai & Jordan, 2004). In contrast, an exclusive face-to-face instruction design can limit the reach of knowledge to a specific audience at a fixed time and location. However, the mixture of various teaching practices itself does not lead to effective student learning. The methods of instruction must be designed in light of how learners cognitively process knowledge (Garrison & Kanuka, 2004). Effective blended learning designs build on the assertion that students learn best when provided with a variety of tools that maximize their learning potential (Gould, 2003; Hartley, Woods, & Pill, 2005; Singh, 2003; Smedley, 2005). The active feedback in the blended learning design from peers and instructor can promote learning to move beyond repetition and reinforcement of knowledge and structure the integration of knowledge accumulation by engaging learner

attention, allowing more time to be spent on collaboration, and promoting critical thinking and social construction of understanding (Rovai & Jordan, 2004). In traditional teaching paradigms, classroom settings are usually teacher-centered rather than learner-centered; therefore, opportunities for students to engage in such cognitive activities may be less practical. The instructor is typically faced with the challenge to disseminate and cover course information in a limited time, rather than attending to different optimal learning styles (Melton, Graf, & Chopak-Foss, 2009).

In summary, blended learning is an empirically-based approach that encourages learner-centered teaching, and increases interaction and active learning among peers and instructors (Boyle & Nicol, 2003; Collis, 2003; Morgan, 2002). Indeed, such a learner-centered approach can also be implemented into a traditional teaching paradigm; however, there are practical challenges in a model with a single learning delivery medium. Implementing a blended learning paradigm allows new opportunities for learners to discuss content, ask questions, interact with their peers and come to class generally better informed for further discussions, clarifications, and building on knowledge through group activities. These opportunities may be less accessible in a traditional teaching setting where initial exposure to course content typically occurs during class sessions.

## Development of IntroPsych Blended Learning Model

Effectively teaching large introductory level classes has become a challenge in post-secondary education due to an increase in cohort sizes, diversity in academic background, and an increase in the number of students that commute to campus (Cooper & Robinson, 2000; Pascarella & Terenzini, 1998). Compared to previous cohorts, incoming students are typically more comfortable with online technology and have higher expectations for its implementation in course design (Dziuban, Hartman, Juge, Moskal, & Sorg, 2005). As a practical concern, blended learning models have been incorporated by many educational institutions to address these challenges (Dickinson, 2005). McMaster University demanded a high quality educational experience for its first year psychology students to meet the challenge of high enrollment rates (approximately 3000 students in the Fall semester), along with shifting expectations and learning styles of students with diverse academic backgrounds. As a result, the IntroPsych Blended Learning Model (i-BLM) was designed to combine face-to-face instructional methods and innovative online learning materials based on empirical and pedagogical research. Specifically, the i-BLM incorporates the use of online web lectures, traditional live lectures, and small group tutorials for interactive discussions and group activities.

### Web lectures

Online web lectures are released weekly corresponding to course curriculum and provide a major shift in delivery of primary course content. Web lectures provide students unlimited access to lecture material throughout the school term to work at their own pace with navigational controls such as pause, fast forward, rewind, and search. Such tools are especially effective to allow differently-abled and ESL students to review materials according to personal need. Web lectures are modularized allowing students to view their lecture content in an organized fashion that can easily be revisited for review. As a result, students experience greater consistency in how the primary course material is delivered and can spend more time understanding the material, rather than trying to schematize lecture components. The web lectures combine audio,

video, animations and text and are designed based on established pedagogical principles of multimedia presentations to enhance the learning process (Mayer, 2009). Additionally, ongoing research in the Pedagogy and Applied Cognition Research Lab (McMaster University) continues to investigate the optimal design of multimedia learning tools. Web lectures also contain several interactive features such as social communication tools and access to media and supplementary documents related to current course content. Table 1 summarizes the interactive features contained within web lectures[1].

Table 1
*Interactive Features of i-BLM Online Web Lectures*

| Interactive Feature | Description |
| --- | --- |
| Comment wall | A permanent posting forum allowing students to embed their own interesting articles, video links, and comments related to the web lecture. |
| Livechat | An instant chat forum to connect with others viewing the web lecture; student can also address specific questions to course teaching staff during office hours for instant feedback. |
| Media/docs | Instructor-selected videos, youtube clips, images, and source documents that connect course content outside of the classroom. |
| Polls | Embedded polls gauge class opinions to current events related to course content. |
| Checkpoints | Checkpoints are short test questions with contextual feedback that provide a natural break to modules and allow students to gauge their understanding; students are encouraged to review the preceding module if they do not pass the checkpoint. |
| Feedback | Students have the opportunity to provide feedback to the course designer at the end of each web lecture addressing issues of content, information delivery, and suggestions for improvement. |

Student satisfaction ratings with web lectures were assessed using end of term course evaluations. Results are presented in Figure 1, which show a positively skewed distribution of student ratings towards high effectiveness of web lectures as a learning tool. The figure indicates students overwhelming agree with the statement that "the web modules are an effective learning tool." Data presented in the paper were collected in April 2009 with a total enrolment of 3116 students throughout the semester.

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[1] For a direct illustration of the nature and content of the web lectures, visit "intropsych.net" where a sample of the web lecture is provided.

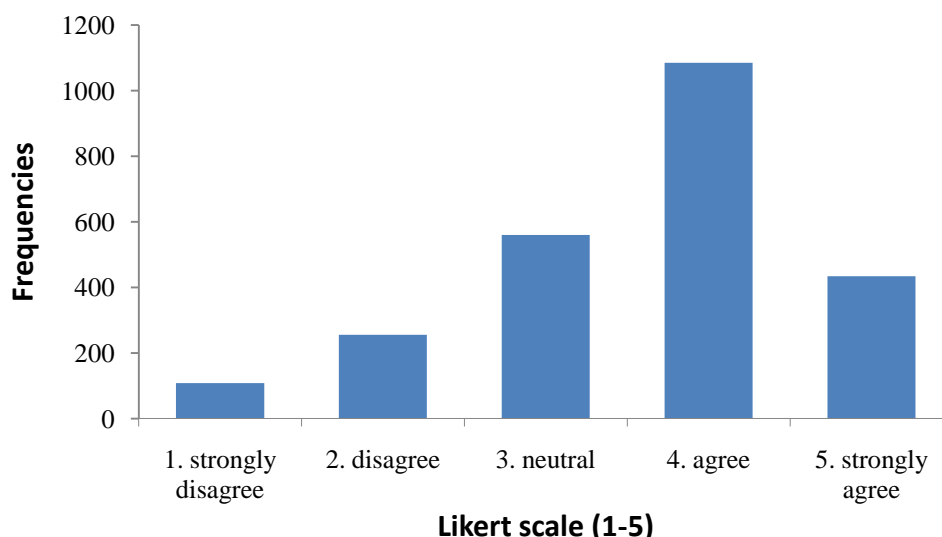**The web lectures are an effective learning tool**



*Figure 1*. Student ratings of the extent to which they agree with the statement "The web lectures are an effective learning tool." (n =2442)

## Traditional live lectures

In a very real sense, a traditional live lecture, led by the course instructor, is the de facto standard of a university experience that a student continues to expect. However, unlike a traditional course design, an i-BLM provides more opportunities for students to engage with the fundamental course materials prior to arriving for their weekly live lecture. This allows the instructor to format the live lectures to explore more advanced and interesting aspects of the course material, rather than focusing on meeting the needs of delivering the first exposure of the fundamentals of primary course content. Live lectures also provide intangible benefits of allowing students to receive direct engagement with the lead instructor.

Importantly, the web lectures and the live lectures are designed to be complementary in terms of content and application. For example, a major topic covered in the course is developmental psychology. The web lectures are a student's first exposure to the material and provide foundational principles (e.g., the pros and cons of longitudinal and cross-sectional studies and genetic and environmental influences across lifespan). The live lectures build on this base and introduce case studies and real-life scenarios applying the core concepts discussed in web lectures. For example, a complementary live lecture highlighted case studies on the role of genetic and environmental influence on contemporary topics of interest such as gender identity and early educational enrichment. As a measure of interest, informal tracking of attendance at live lectures consistently reached 90% throughout the term.

**Tutorials**

Tutorials are an important component of how face-to-face instruction time is used. In the i-BLM, small group tutorials (capped at 26 students) meet weekly to provide an intimate setting to further engage students in course material. Tutorials follow an instructor lesson plan, but are flexible to allow for spontaneity and typically include discussions and stationed group activities. Tutorials are significant in the blended learning approach because they provide a small group setting that allows for direct supervision of peer interactions. Courses limited exclusively to lectures (live or online) have a practical limitation in face-to-face interaction with a knowledgeable instructor. Even in the case of traditional live lectures, only a limited number of students can potentially ask a question. Tutorials remedy this issue by providing students with a small, intimate classroom setting, with direct and immediate interaction with peers and a well-informed teaching assistant. Figure 2 summarizes student ratings of attitudes toward the use of tutorials in the course and the value of using diverse instructional delivery.
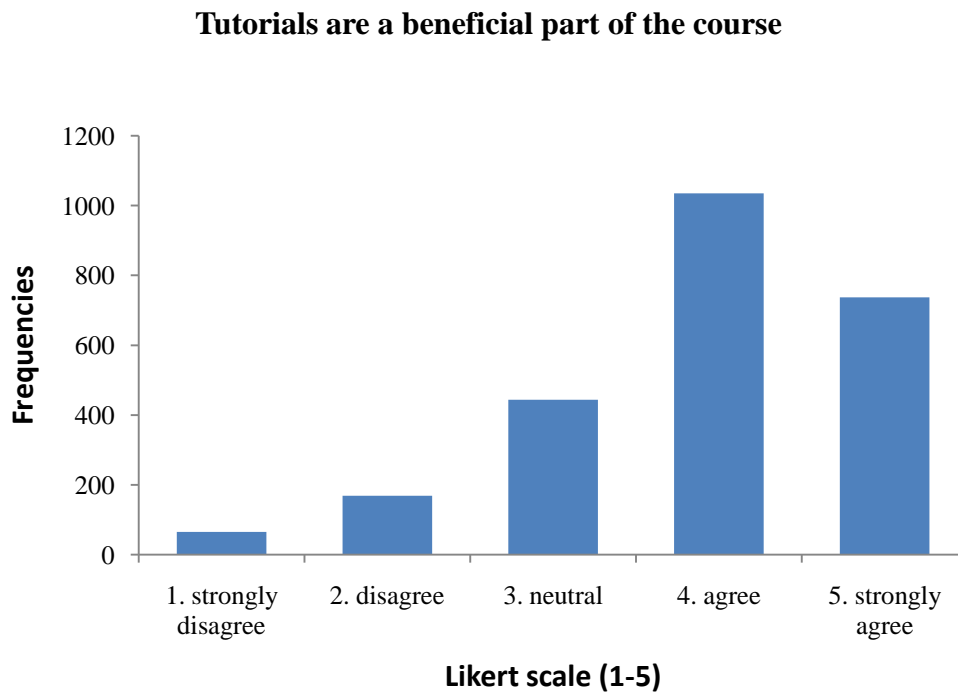
### Tutorials are a beneficial part of the course



*Figure 2*. Student ratings of the extent to which they agree with the statement "Tutorials are a beneficial part of the course." (*n*=2442)

**Teaching assistants**

i-BLM teaching assistants (TAs) are upper year undergraduate psychology students, with shared comparable knowledge for the course content of IntroPsych. Approximately 250 applicants apply each year, with 100 selected for interviews. After undergoing a rigorous selection process, during which candidates are scored on their academic achievements, knowledge, rapport, clarity and presentation skills, 40 students are hired to take on the TA role.

All TAs receive training in pedagogically based teaching principles through enrolment in a course dedicated to scholarly teaching and learning[2].

TAs lead tutorials in which they provide important support for the primary course content presented through web lectures and live lectures, and promote a student-centric environment in classrooms. They aim to offer individual attention to students, and enforce a learning environment in which students are active participants through generating, discussing and exploring multiple avenues of problem solving in collaborative activities. TAs also serve as additional support outside of the classroom; they use web media tools such as discussion forums, e-chats, and e-mail to communicate with students.

Student learning is assessed through a variety of components: tutorial participation, a problem-based learning group project (which includes spans the term and includes a presentation and paper), and exams. The course instructor and TAs foster an environment where students are given several opportunities to get help on assignments, and seek guidance on how to write academic papers, cite sources, and present effectively. During tutorials, TAs provide clear expectations of the course assessments with grading rubrics and define academic integrity as a class – this can be done through group activities where each group identifies an academic integrity challenge they have faced.

### Issues and Challenges

Successfully implementing blended learning at a course level involves strategic planning to identify objectives, guide instructional design, and evaluate potential costs and resources (Garrison & Kanuka, 2004). The i-BLM has developed through the use of formal course evaluations and student and instructor feedback to assess objectives and guide adjustments. For example, after two years of implementation, an initial blended model consisting of exclusively of online lectures and tutorials was augmented to include live lectures to address the students' need for direct interaction with the course instructor.

An important element of strategic planning involves co-ordination of instructional design across the components of the blended learning model. If the content presented in each component is redundant, the purpose of a blended learning design breaks down. In the i-BLM, each component is specifically designed with purpose: (a) online web lectures provide primary course content which promote self-paced learning and review; (b) tutorials provide face-to-face interaction with peers and a knowledgeable teaching assistant, providing an atmosphere of active learning to further engage with course material; and (c) live lectures provide students with direct interaction with the course instructor and elaborate on primary course material to provide additional context and application to real-world problems.

Finally, adequately addressing issues of potential costs and resources are important to implementing a successful blended learning model. Start-up costs were minimized by using on-campus media development and commercial software to create online learning tools. The benefits of these initial costs are enjoyed by the large number of students enrolled in the popular introductory psychology courses each semester. Importantly, the absence of multimedia expertise and resources is not necessarily a limiting factor in the use of quality online learning materials. For example, rather than producing customized web lectures, a resourceful instructor can take advantage of existing online resources. Websites such as Academic Earth, iTunes University, and TED openly provide high quality video lectures and podcasts to the general public.

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[2] For a detailed description on the training course, see Sana, Pachai & Kim (2011).

Instructors can designate specific web resources for students to review to create an accessible and efficient online learning resource. This can shift some of the primary course materials to self-paced online learning, allowing class time to be geared toward active engagement of material and group discussion.

In summary, the i-BLM, currently in the format described throughout this paper, was developed between the years 2007 – 2011 to provide a high-quality educational experience to approximately 5000 introductory psychology students enrolled each academic year. Through a combination of online learning technology (web lectures, learning tools through LMS) and traditional face-to-face instruction (live lecture, small group tutorials), students are provided with many avenues to customize learning while pursuing the discovery of psychology.

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