

Blended learning with technology

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Blended learning is a well-known term, but not always well understood. This article seeks to provide some recommendations, a clear definition of this approach to teaching and learning, international trends, some affordances, as well as costs, some examples of its use within the different higher education contexts in South Africa, as well as a glossary and references for further reading.

Recommendations

- Re-evaluate the technological infrastructure and ecosystem to ensure that they support the blended learning approach. Furthermore, the integration of educational technologies into the classroom raises concerns about the impact on teaching and learning if the required resources and support are not available, as such an important consideration must go into the uptime, availability and support of the infrastructure. Universities must make choices about priorities within their own contexts. At the most basic level, where lecturers have low levels of computer literacy, a learning management system (LMS) is desirable. Two open-source platforms, Moodle and Sakai, are being used by South African universities for which no licence fees are paid. The commercial platform, Blackboard, which requires annual licence fees, is used by the majority of universities in South Africa.
- Provide professional development as a key element in the success of blended learning initiatives. Staff members need to be trained in the use of learning with educational technologies in a blended environment. Writing for the screen is another important skill. This includes the use of screen-friendly fonts, frequent summaries and white space. Brevity and clarity are important to keep the reader engaged while reading on mobile devices.
- Focus on blended learning design that aims to determine how the blend will work – which parts will be delivered face-to-face and which online. The learning design should start with the curriculum outcomes, and constructive alignment should be created with activities, content and assessment to ensure internal coherence, consistency and transparency. One of the most important functions of course design is to determine a navigation structure that ensures that the student is able to navigate the course with ease.
- Ensure that the two essential facilitation skills are established, i.e. the ability to establish a code of online conduct (including privacy and copyright) and

boundaries around availability (how often students can expect a lecturer to respond, and how often a lecturer expects students to log in and contribute).

- Create social presence and engagement explicitly through visuals, voice and text-based interaction. Student engagement and agency are important for motivation. Formative assessment in the online curriculum supports individual progress (Anderson and McCormick 2005).
- Develop policies around remuneration for online facilitation, which could extend teaching hours beyond what some academics might consider reasonable.
- Choose learning technologies that are fit for purpose. Choices should reflect the value added through the delivery mode.

Definition

Technology has the potential to improve the scale, speed and efficiency of the teaching and learning processes if the focus remains on thoughtful and appropriate pedagogy (teaching approach) and not the technology as such. The evolution of computers in the 1980s set the ball rolling as organisations began to use technology as part of the teaching and learning process.

Blended learning may be defined as the thoughtful integration of classroom face-to-face experiences with technology-enhanced learning experiences. When the technologies used for education and communication outside the classroom are used to supplant some of the face-to-face work, reducing the time actually spent in the classroom, the result is a hybrid course.

The Online Learning Consortium (formerly Sloan-C) has recently updated and expanded its definitions of e-learning (Mayadas and Miller 2015) to allow for clearer distinctions in usage, and defines:

- 'hybrid' at the course level; and
- 'blended' at the programme level.

Many higher education researchers are critical of an institutionally derived, one-dimensional definition of blended learning that focuses on delivery mode without addressing the effectiveness of learning. Means and co-workers have published an empirical meta-analysis of research that shows that students in blended learning perform at least as well or better than students receiving exclusively classroom instruction (Means et al. 2009). They propose that students with online activities spend more time on their learning than classroom-only students. Some universities in the USA are presenting competency-based education (marketed as flexible options) that directly measures learning outcomes, not the time taken to achieve them (Kamenetz 2014). Such online degrees allow students to determine their own pace through coursework (<http://flex.wisconsin.edu/>). Flexible options are popular with non-traditional students who cannot attend university full time, as well as those who wish to fast-track through the programmes after the initial recognition of prior learning. Research can inform how online and blended learning can help more students earn their degrees more quickly.

Current international trends

The Community of Inquiry (CoI) framework theory, methodology and instruments are widely used in the design of online and blended courses, evaluating student satisfaction and researching online teaching and learning (Garrison et al. 2000). This seminal paper has to date (February 2015) been cited 2 590 times. Over many years, CoI has been validated through empirical research in learning theory in diverse disciplines and settings. The CoI website (Athabasca University, n.d.) hosted by Athabasca University contains invaluable resources for online educators.

An educational community of inquiry is a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding. The CoI theoretical framework represents a process of creating a deep and meaningful (collaborative-constructivist) learning experience through the development of three interdependent elements: social, cognitive and teaching presence.



Figure 1: The Community of Inquiry model (Garrison et al. 2001)

Social presence is the ability of participants to identify with the community (e.g. course of study), communicate purposefully in a trusting environment, and develop interpersonal relationships by way of projecting their individual personalities.

Teaching presence is the design, facilitation and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes.

Cognitive presence is the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse (Garrison et al. 2001).

Affordances

The affordances of blended learning and how they are described can vary according to the institutional context, as well as the conceptual frameworks used. Some of the affordances cited include that blended learning gives students access to flexible learning environments and enables them to voice their opinions, form communities of learning, employ a variety of learning styles, and repeat and reinforce learning (Gedik and Kiraz 2012). Adaptive learning programmes can furthermore allow students who need to improve a basic skill like literacy or numeracy, which is not addressed in the curriculum of their enrolled programme, to study and practise on their own and at their own pace until they attain the required standard. Advances in adaptive learning systems and platforms with their powerful feedback loops can also be used in blended learning environments for greater personalisation.

Gedik et al. (2012) consider a key benefit of blended learning for lecturers to be interaction with students in large classes. We also know that lecturers can manage teaching environments better with LMSs, by collecting assignments, marking quizzes automatically and providing immediate feedback, using an integrated grading system, tracking progress and setting up warning systems for early intervention to minimise the risk of students dropping out.

Gedik et al. (2012) consider some of the main challenges that blended learning poses to students to be time management, increased workload, cultural and personal barriers, such as familial and career pressures, and, perhaps most importantly and obviously, technical barriers. It would be safe to say that these challenges could also apply to lecturers' experiences of blended learning.

For an extensive examination of the affordances of blended learning, refer to 'The effectiveness of a blended learning approach in teaching management subjects at a university of technology in South Africa' – a Master's study conducted by Oellermann (2014), which is included in the suggested references for further reading.

Costs

Elements that involve costs include licensing, infrastructure, personnel, and professional development and support.

At the most basic level, an LMS is desirable. LMSs are available as both open-source and commercial products. Open-source products allow the university to access the original source code without any licence fees, whereas

commercial products do not grant access to their source code and have varying licence fees, depending on the product feature set. Each university has to decide for its own context what system it will choose. Many information technology (IT) departments will support only one LMS given their own constrained resources.

Two of the most common open-source e-learning platforms being used by South African universities are Moodle and Sakai, The most common commercial platform, Blackboard, is used by the majority of universities in South Africa.

Increasingly, emerging technologies and social media are also used. Learning design, course design and online facilitation skills can be learnt, and there are more and more courses available to academics in this area, most noticeably those offered free of charge by eMerge Africa and the University of the Western Cape (UWC) locally, and by Leicester University's Institute of Learning Innovation internationally.

The *NMC Horizon Report: 2015 higher education edition*, published by New Media Consortium (NMC) and Educause (Johnson et al. 2015) has predicted a stronger move towards collaboration across higher education institutions (HEIs) in the next five or more years. Institutions are joining consortia to share resources and position themselves advantageously in relation to innovation and learning with technology.

In the Cape Town area, the four HEIs have collaborated in developing professional development short courses on using emerging technologies to improve teaching and learning. This initiative is one of a range of teaching and learning courses that have been offered since 2010 under the auspices of the Cape Higher Education Consortium. The Emerging Technologies course was collaboratively designed by teaching and learning specialists at the four HEIs and jointly delivered for academics across the four HEIs. It has been favourably received and continues to have a high take-up rate four years into its implementation.

Another collaborative initiative across three HEIs in the Western Cape has been the design, development and implementation of a Postgraduate Diploma in Higher Education Teaching and Learning. One of the elective modules focuses on teaching with technologies. This initiative is in the process of being taken further to ten HEIs in South Africa, who will collaborate on sharing resources for postgraduate diplomas in teaching and learning through a common platform. A Recognition of Prior Learning (RPL) online module is being planned for academics who wish to show that they do not have to do the Postgraduate Diploma in Teaching and Learning, owing to their knowledge and competence in the area of teaching and learning. These forms of collaboration will go a long way towards sharing resources across HEIs, rather than reinventing the wheel in each individual institution. Both facilitators and participants have reported the benefits of collaboration on course design, co-teaching and completing learning tasks (see Bozalek et al. 2013 and Ng'ambi et al. 2013 for more information on the collaborative endeavours in the Western Cape and their implications for participants, course facilitators and designers).

On an informal level, as part of priority training short courses at the University of Pretoria, lecturers may attend training in the LMS and a course on the facilitation of e-learning. Many universities offer this type of in-house professional development.

The Durban University of Technology (DUT) has been offering a course in web-based learning and teaching to its staff for some ten years. For a participating academic, the course of 120 notional hours results in a piloted online course and conference paper. Popularly known as Pioneers Online, the course is designed to equip participants with design, facilitation and research skills into web-based learning. Successful candidates obtain a university short course certificate. Owing to Pioneers Online being rooted in the communities-of-practice philosophy, and due to courses and projects such as Induction, Curriculum Renewal and General Education that have run in tandem, DUT now has an established culture of teaching innovation. At present, Pioneers Online has been placed on hold during the executive management's e-learning project, which is aimed at getting 50% of DUT's courses online and to strengthen the IT infrastructure and integrate IT systems. Therefore, training currently focuses on equipping as many academics as possible with basic e-learning skills. DUT has shared professional development expertise and resources through the South African Technology Network (SATN), e.g. by coordinating a Webinar Skills Project over a two-year cycle.

Application in different contexts in South Africa

There are a variety of innovative blended learning approaches at different HEIs in South Africa, including flipped classrooms, the use of mobile devices via ubiquitous Wi-Fi, e-mentoring programmes, tutorials, support for multilingualism and learning analytics. At many institutions, the use of blended learning has become the norm and is no longer only a novelty. It is impossible to provide an exhaustive list of all the applications because the use of blended learning applications is very context-specific within each HEI. One of the papers (Bozalek et al. 2013), which stems from a National Research Foundation (NRF) project entitled 'Emerging ICTs in higher education (2011–2013)' states that, while the use of educational technologies is increasingly common among educators, there is still little research on innovative uses of these technologies to transform teaching and learning. The paper foregrounds the contextuality of emerging technologies in terms of levels of institutional development, access to resources, discipline, group belonging and the individual motivation of respondents.

The following list outlines a few strategies that can be used to introduce blended learning into the classroom (IBM n.d.):

- *Moving assessment online:* Moving a test online is a great way to assess learner competency. Furthermore, the automated marking, tracking and reporting of scores reduces the complexities involved in managing large class sizes. Care has to be taken, though, that questions asked are testing higher-order thinking skills. It is also a strategy that requires an institution to have an LMS with a quiz tool or a specialised computer-based testing program.

- *Accessing published resource materials:* The library can collaborate to load resource pages. Students can also be directed to online resources that explore topics in greater depth. This reduces their reliance on the traditional single sources of knowledge such as the textbook. Many open educational resources are also available, such as animations, videos and so on, that can increase their knowledge.
- *Online coaching, tutoring and mentoring:* A great way to extend the learning experience is through the introduction of online mentors or coaches. Online mentoring and coaching provide support and guidance to students outside the classroom.
- *Email and messaging:* This method of blended learning is often overlooked, yet it is one of the most powerful ways of extending the learning experience. The use of distribution lists, task management, attachments and scheduling functionalities provides a rich platform for students to interact with the lecturer. Attention needs to be paid to what is scalable and what is sustainable: no lecturer can answer 3 000 emails a day.

Glossary

Course-level definitions (Mayadas and Miller 2015)	
Traditional classroom course	Course activity is organised around scheduled class meetings.
Synchronous distributed course	Web-based technologies are used to extend classroom lectures and discussions to students at remote sites in real time.
Web-enhanced course	Online course activity complements class sessions without reducing the number of required class meetings.
Hybrid course	Online activity is mixed with classroom meetings, replacing at least 20%, but not all required face-to-face meetings.
Online course	All course activity is done online; there are no required face-to-face sessions within the course and no requirements for on-campus activity.

Programme-level definitions (Mayadas and Miller 2015)	
Traditional classroom programme	The programme may include a mix of traditional, web-enhanced or hybrid courses, but all courses require some face-to-face sessions.
Multi-format programme	A programme mixes, along with traditional classroom courses, other formats that use a variety of different delivery modes, web-enhanced, hybrid, fully online courses, synchronous distributed education, etc., without a specific access goal.
Blended programme	A significant percentage, but not all, of the credits required for programme completion are offered fully online. Typically, up to 30% of the curriculum may be offered as face-to-face or hybrid courses or other face-to-face formats, or as independent study.
Online programme	All credits required to complete the programme are offered as fully online courses. Students can complete the programme completely at a distance, with no required face-to-face meetings.
Flexible option competency-based degrees	These online degrees give students credits for pre-knowledge, measure the attainment of learning outcomes, and do not take completion of credit hours into account (Kamenetz 2014).

Definitions of associated terms	
Digital storytelling	Digital stories are short, first-person video narratives created by combining recorded voice, still and moving images, and music or other sound. The blended learning process involves the lecturer giving a lecture on a topic and giving students assignments that they submit in the form of a digital story. The process of making the stories involves writing a script, creating a digital audio recording of the written script, selecting images for the story on the Internet or taking own pictures, combining recordings and images using a multimedia format and adding background music. This blended learning approach develops students' creativity and authorship, encourages the development of multiliteracies (digital, visual and cultural), student engagement, collaborative learning and deep reflection on the subject matter.

Definitions of associated terms	
The flipped classroom	In the flipped classroom method of instructional delivery, the lecturer instructs lessons at home via video lectures, audio lectures, content-rich websites, online chats, etc., while classroom time is spent by students working on activities in groups, receiving the necessary support from the lecturer and peers. During the class activities, deep understanding of concepts, application and connection to content is made. In this pedagogy, students have a voice and are encouraged to debate, question, make decisions and make choices, and are supported in a learning environment.
Adaptive learning	Adaptive learning is an educational method that uses computers as interactive teaching devices based on artificial intelligence. Computers adapt the presentation of educational material according to students' learning needs, as indicated by their responses to questions and tasks. Learning is thus personalised, not generic. Many commercial providers, such as Pearson's, make use of adaptive learning technologies.

Acronyms and abbreviations

Col	Community of inquiry
DUT	Durban University of Technology
HEI	Higher education institution
IT	Information technology
LMS	Learning management system
NMC	New Media Consortium
NRF	National Research Foundation
RPL	Recognition of prior learning
SATN	South African Technology Network
UWC	University of the Western Cape

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