

Using wiki technology in a blended learning environment: the reality

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The rapid pace of change in the area of Information Technology means that innovative ways are needed to provide effective teaching and to engage and support learners. This paper focuses on the use of wiki technology in the context of a blended learning environment in a tertiary institution, and considers the research question, *what are the issues when using wiki technology in a blended learning environment?* A longitudinal case study methodology has been used to report on the use of wiki technology as a course delivery mechanism. This case study revealed that while course content has significant views, students are reluctant to update or contribute to course content and that a wiki navigation structure is complex and an inhibitor to learning. The six year case study also reveals a wiki is not necessarily a *quick* solution for content creation

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Introduction

As a lecturer in Information Technology (IT) at a New Zealand Tertiary Institute, and with an interest in applying digital technology to teaching and learning, web based systems were developed as part of a longitudinal action research study, towards a PhD thesis into “capturing student knowledge at source” (Verhaart, 2009). As the study progressed so too did wiki technology, and at the conclusion of the PhD the wiki was explored as it provided a way to implement the findings of the thesis. In support of this assertion a wiki solution was being used for very large content delivery systems (such as Wikipedia), and in Education (Wikiversity and WikiEducator). From 2008 the author has used a wiki to deliver content to undergraduate IT students for both theory and practical components of various courses. Benefits that emerged included that the wiki offers ubiquitous access from any browser based device, enables critical reading and responsible writing, as well as a sense of collective ownership (Guth, 2007). However, does a wiki live up to these benefits in practice? In this paper the research question, *what are the issues when using wiki technology in a blended learning environment?* will be explored using a case study approach.

Literature review

The case study uses an action research/design research methodology and has been described in other papers (Verhaart, 2009; 2010) and is currently in the fifth iterative cycle. In order to understand how a wiki can be used in an educational context it is useful to provide some background, and the following discussion will consider the technical and pedagogical elements.

Arguably the best-known wiki is Wikipedia, begun in 2001 and is the world's sixth-most-popular website. As of September 2014, it included over 33 million articles, and has a total worldwide monthly readership of approximately 495 million (History of Wikipedia, 2014). The underlying technology is a PHP:Hypertext Preprocessor (PHP) based open-source software called MediaWiki. On this base several educational wikis have been developed, such as Wikiversity and WikiEducator. WikiEducator was launched in 2006 as an international online community project for the collaborative development of learning materials, which educators are free to reuse, adapt and share without restriction (WikiEducator, 2014).

From a pedagogical perspective Parker and Chao (2007) identify several approaches to wikis used in learning, such as supporting the cooperative/collaborative paradigm (provides shared support), promoting cooperation rather than competition, supporting a community of practice, and allowing reflection on the process. Seitzinger (2006) identified that wikis support constructivist learning by allowing students to participate by collaboratively building resources. Other approaches are also identified such as narrative analysis (holistic learning view), cognitive apprenticeship (master-apprentice approach), and project based learning. Duffy and Burns (2006) describe where wikis can be used as a publishing medium for course documents, for students' research projects and as a presentation tool. Augar, Raitman and Zhou (2004) identified that wikis can be used to facilitate computer supported collaborative learning, facilitate information dissemination, enable the exchange of ideas and facilitate group interaction. A well-respected study by Chickering and Gamson (1987) identified seven

principles of good practice in undergraduate education. Some of those principles, such as encouraging co-operation among students, encouraging active learning and respecting diverse talents and ways of learning can be supported in a wiki.

Wikis also support adult learning such as those outlined in Teach 1: Teaching skills 1 (2005, p T1-5), allowing learners to be involved in the learning process, engage in high level thinking and can provide information that will overlap with familiar or known information. However, as Choy and Ng (2007) observed, one obstacle is learning and understanding the wiki syntax. As students are free to add any content, Auger, et al. (2004) indicated it is desirable to provide guidelines, tracking and authentication mechanisms.

Wiki case study

A case study methodology supported by student feedback has been used to evaluate the issues around using wiki technology for teaching and learning. A survey was distributed to students but unfortunately had a low response rate. However, some comments are included in this paper. The research was conducted using students actively involved in a class that used wiki technology, and researching in a *live* environment presents a number of challenges, particularly where the researcher and participants are actively involved. However, Patton (2002) describes a Direct Personal Experience and Engagement strategy, and stated that "...closeness [to the research] does not make bias and loss of perspective inevitable; [indeed] distance is no guarantee of objectivity"(p.47).

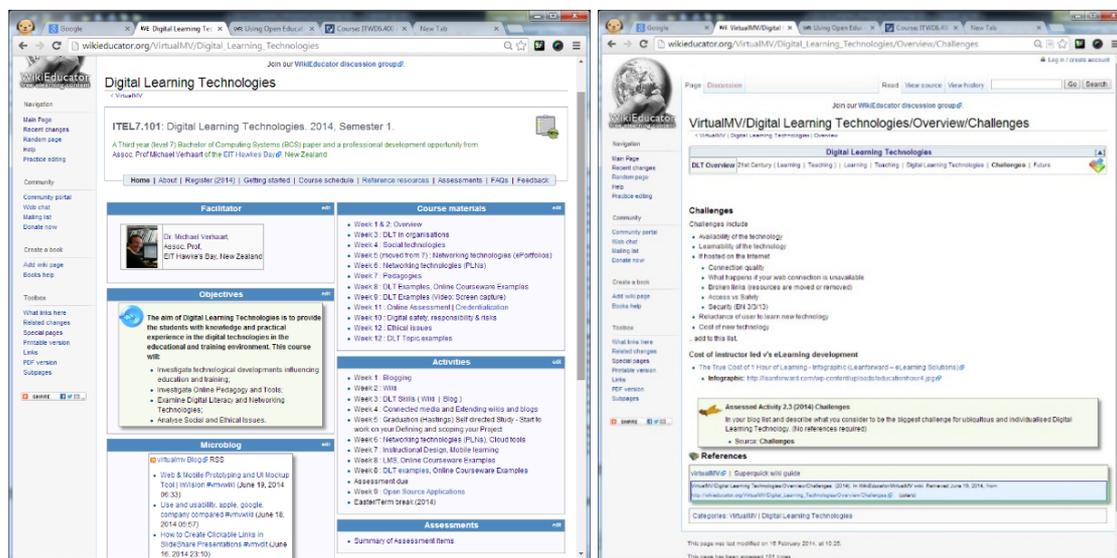


Figure 1: Digital Learning Technologies course on <http://www.wikieducator.org/virtualmv/> (Left top level; Right content page showing an assessed activity)

As part of an action research project considering *how student knowledge could be captured at source*, several technologies were explored. The last two iterations involved using a web based MediaWiki wiki to provide content and activity support for students in a blended environment to undergraduate students in a New Zealand Tertiary Institute. The first was a privately hosted wiki from 2008-2013 and the current iteration, begun in 2013, uses the publicly available WikiEducator. However, the focus of this paper looks at the reality of using a wiki in a blended teaching environment, and the following discussion outlines some of the issues and challenges that have been observed.

Technology issues have been observed while using the wiki. The initial wiki was hosted on a US based server, and therefore was largely under the control of the web host and highlighted several issues including the use of international bandwidth affecting response times. A requirement to update MediaWiki software (which proved to be complex), and continual issues with spamming eventually forced the move to WikiEducator. One of the key benefits of the wiki is that all changes are recorded and can be rolled back, and fortunately, the core edits are text based. However, when a lot of minor edits are done some pages can have a significant history trail, so reverting changes can become a complex and time consuming.

Issues related to content and context have also been observed. The ability to include media from other sources is an important feature when building educational content, as it allows images or videos created by others to be

used as part of the teaching and learning. The ability to use (or re-use) the work of others is a philosophy that underpins the Open Educational Resource (OER) model and in particular the creative commons aspect, and by using MediaWiki as a base, allows seamless integration of the Wiki Commons library of Creative Commons licensed images. However, connecting to other sources is not straightforward. *Content out of context* proved to be an issue when students wished to add content but there was no logical page for it to be added. As a wiki has *continuously changing content*, it also has a tendency to contain *incomplete content*. *Accuracy of content* is also a problem as each author will add content based on their personal knowledge, which in some cases will be an opinion. For user created content it is generally accepted that it will be created under a Creative Commons license (preferably CC-BY-SA), however, users understanding of *copyright* may be at odds with the wiki.

An important feature of a wiki is the ability of users to author content, however this requires knowledge and an understanding of wiki code (Choy & Ng, 2007), so the content and the presentation quality of the contribution will be affected by the author's ability. Also, as MediaWiki requires updating there are *limitations that will be imposed by implementation*. A big issue for the wiki is building a structure that enables content reusability, and fortunately, MediaWiki allows for the concept of a template which is a page that can be inserted into other pages. However, adding templates to a page significantly increases the difficulty level for authors. For authors WikiEducator has developed a pedagogical framework that allows for learning elements to be embedded in a consistent way, and the suggested course design follows an elaboration theory approach (Mackintosh, 2014; Elaboration Theory, n.d.).

There are issues that affect the facilitator, developer and designer when considering the use of a wiki for education. From a content development view, to conform to a complex pedagogical structure requires a significant time commitment to set up. As tertiary institutions are funded via performance indicators, academics are under pressure to deliver content more efficiently and in a cost effective manner. There is much debate as to the efficacy of funding Open Education Resources, however this view is changing, as is highlighted by the Open Education Resource Universitas (OERu) movement that now spans five continents and has over 35 partner tertiary institutions (OERu partners, n.d.). Another philosophical issue concerns the loss of *control of personal content*, and as several authors can edit a page *ownership* of content becomes blurred.

From a learner and student perspective there are many issues that surfaced. As mentioned earlier, students are free to add any content and as Auger, et al. (2004) indicated, it is desirable to provide guidelines, tracking and authentication mechanisms. While students were told that their additions and changes would be identifiable, for the wiki case study described in this paper, there have never been any formal guidelines on publishing etiquette and interestingly, there have been no known issues with regards to inappropriate content. In small focus groups, students indicated they felt that the wiki was the *lecturers* and felt uneasy adding/modifying content. The wiki can provide an active learning opportunity if an assessable activity is created, however voluntarily students tended not to add content. In an earlier survey conducted by the author in May, 2011 one of the students commented "Until we understand how to change content this is often a barrier to actually changing the content". A user login required for editing implies that anonymous editing is not available in the wiki, and student contributions are tracked via the history feature. This is both a benefit as it encourages responsible editing, however it can also be a barrier as students are unsure how their contributions will be received. One of the skills students need to develop is the ability to read and process information presented on-screen, and this has been further complicated by the number of devices students use to access the web, including smart phones and tablets.

Feedback

A questionnaire was designed and administered to students and some of the comments provide an insight into the use of the wiki in the teaching and learning environment. When asked what they thought were the benefits of using the wiki, students identified: "Being able to edit or add to resource", "Understanding that the use can be shared, edited, amended and more", "Everyone having access to the same resources" and "everyone being able to add their own knowledge and sharing with the class". Comments related to difficulties, problems, issues or disadvantages were identified as: "Cluttered interface", "Confusing multi layered navigation and "not knowing if someone could add bogus information". When asked what could be done to improve the wiki, a student suggested "Redesign structure the content and navigation architecture". A further comment "Maybe some full instructions for students, a user-guide in more detail" needs to be taken on board and implemented. This may change the perceptions of students regarding the difficult navigation structure. When asked if they had changed or modified any content it was mentioned "Information that I looked at did not require changing". This is to be expected as the wiki content matures, but as is hoped, one indicated they "just fixed an error i[sic] noticed on a page". It is interesting to note that the issue of navigation is a recognized issue for the WikiEducator (WE)

community and in 2014 WikiEducator developers trialed a revised navigation interface on the Open Content Licensing for Educators (OCL4Ed) course where the interface did not include page editing rights for participants.

Conclusion

This paper addressed the research question, *what are the issues when using wiki technology in a blended learning environment?* as a framework to identify the reality of using a wiki as a pedagogical platform. While there are many benefits, this paper focused on the issues surrounding the use of the wiki and provided feedback from a case study action research project where a wiki artefact has been used over a number of years, and a small survey from students who have been using the wiki as part of their instruction.

Technology, content and context, authoring and facilitator/developer/designer issues were identified and discussed based on the use of two wiki artefacts since 2008. Of significance was that in reality, students do not contribute in a significant way to constructing or editing content within a wiki. Encouraging contributions can be improved by adding an assessable element into the course requirements, however this tends to be for directed content addition rather than overall content creation. Results from student feedback indicated they were happy with the use of the wiki as a blended teaching and learning delivery mechanism, with access highlighted as a significant benefit. The main negative issues were the navigation was considered to be complex and a feeling that some of the content may be bogus. The wiki is continually evolving as both technology and pedagogy change. It is expected that there will be many opportunities in the future to investigate the efficacy of a wiki in this environment from a delivery and student point of view.

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