Using wikis as a learning tool in higher education

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Wikis have originally emerged and are most commonly known as social software, but there is also a growing trend to use wikis as a learning and assessment tool in Higher Education. The latter is the focus of the present paper. The effects of task type and instructions on students' decisions about wiki structure and navigation are considered by examining group wikis created by students of two postgraduate courses as part of their assessed course work. More general issues with wiki-based learning are also considered.

Introduction

Wikis are gaining ground as a learning tool in higher education (HE) (Bower, Woo, Roberts, & Watters, 2006; Choy & Ng, 2007), but relatively little is known about factors that affect the way students use wikis in the context of a course. Outside of Academia, there are at least two common ways in which wikis are used: as social software and as a tool that provides support for group projects and activities, with the former usually associated with open access and the latter associated with restricted (or authenticated) access. The first use is best demonstrated by *Wikipedia* (http://en.wikipedia.org/) – a large collections of interlinked editable web pages that are created and kept up-to-date by users world-wide. Open-access wikis also exist for more specific knowledge areas, such as culture and art, education, politics, travel, science and technology. Key principles of wikis as social software are voluntary participation and bottom-up (or self-) regulation. An important factor affecting the nature of the wiki environment in such large-scale projects as the *Wikipedia* is the sheer number of users that are able to freely contribute to the construction and management of a knowledge base. This type of open-access multi-user environment is able to self-regulate using for example such mechanisms as *soft security*, where the community of users insures the accuracy and appropriateness of the published information (Lamb, 2004). This factor also affects the type of navigation used in wikis: hierarchical or linear navigation options are not suitable because wikis are created and edited by a large number of users and deal with a wide range of user-defined topics. The most common way to navigate wikis is through hyperlinks, words or phrases linked to corresponding areas of a wiki. In addition, such large-scale wikis are usually work-in-progress, as they keep growing and changing, often in an ad-hoc way. Therefore it is not practical to read a wiki "from beginning to end", and users are more likely to search for a topic of interest and read around it.

Restricted access wikis, on the other hand, can be viewed and/or edited by a limited number of trusted users. For example, a wiki can be used as a tool that allows a group of dispersed users, such as conference organisers, to work together to draft and fine-tune the details of an upcoming event, or for a group of authors or researchers to collaboratively work on a report or publication. Wikis are also used as a meeting management tool, which allows participants to suggest and negotiate an agenda and to publish minutes and comments after the meeting. Demarcation between the two types of wiki uses described above is not clear-cut, with some large restricted-access wikis (for example, organization-based wikis) being closer to social software than to a group project tool. The use of wikis in a formal course of study, such as a university course, has common aspects with both of these two types of uses, but is also conditioned by the fact that it is perceived as a learning or assessment activity.

What is different about the use of wikis in the context of a course?

A university course as a unit of study is associated with a number of shared assumptions. For example, such a unit must have defined learning outcomes, and students need to engage in some learning activities that are designed to help them achieve these outcomes. In the HE context, student learning and/or assessment activities conducted using wikis must adhere to such general principles of academic study as academic integrity, evidence-based argumentation, critical thinking and quality of sources. However, students who are new to wiki-based learning, but who have used wikis in their private lives, are more likely to perceive them as a social software tool having little to do with academic rigour. Based on these prior experiences, when using wikis students may be inclined to give more weight to communicating an original opinion than to demonstrating that their opinions are based on sound research-based evidence, or to refer to web pages rather than journal articles, or to take a more relaxed approach to acknowledging

sources (Elgort, Smith, & Toland, submitted). Thus a conflict may arise between students' approaches to wiki-based course work and lecturers' expectations in relation to the standards of student work in a university course. Furthermore, *learning* activities imply that students engage with information and resources using a particular learning environment (such as wikis) in order to achieve a pre-defined learning outcome, and "it is the planned outcome which makes learning a purposeful activity" (JISC: Designing for eLearning). However, the idea of an externally pre-defined outcome is not easily reconciled with the ethos of wikis as social software.

The use of wikis as a platform for student course work is also complicated by the absence of a formal structure in a wiki, as, in its core, a wiki is simply a collection of individual web pages. One may argue that the structure of an essay or report presented in the form of a traditional text document also needs to be created from scratch. However, an important difference between creating a structure for a text document and a wiki is that conventions about the structure of an academic essay or a project report are reasonable well established, while this is not at all the case for wikis. Furthermore, as a rule, the reader approaches a written essay in a linear manner, following the sequence prescribed by the author. Even if the reader decides to circumvent the linear approach and to go directly to a specific section of the written work, using the table of contents, the reader still has a clear sense of where s/he is within the overall body of the work. In developing a wiki, on the other hand, decisions need to be made not only about how information is structured but also what navigational support (if any) is provided to the reader, and these decisions are crucial to the ways in which the reader interacts with the wiki. Navigational metaphors for a wiki may be borrowed from different genres of communication, such as a paper-based document or a conventional website - a decision which is likely to shape the way the wiki is perceived by the viewers. On the other hand, as outlined above, a *native* wiki approach to navigation is through non-linear hyperlinks and using the search function. The question arises, however, whether such non-structured navigation is compatible with conventions adopted for course-based work, e.g. for an academic assignment.

In this paper, I look at two examples of postgraduate (Master's level) university courses that used wikis in assessed group projects. I consider how the context of an academic course, as well as the nature of the task and instructions given to students influence their decisions about the structure and navigational aspects of group project wikis.

Courses participating in the study

Course A, *Information Systems and Technologies*, is a core course in the Master's in Information Management (MIM) programme. The course is taught in a traditional face-to-face (f2f) mode, students meet for two hours per week for each course, and are typically taking two courses per semester. One of the course assignments is for small groups of students to investigate a *Leading Edge Information Technology* topic. The students have to find articles about their topic in the academic literature and prepare a report; they also have to give a 20-minute presentation to the class. In the present iteration of the course students were instructed to produce the group project report using a wiki. The motivation for selecting the wiki technology was twofold. One of the reasons for using wikis was to provide a way for part-time students to collaborate on a group project in a dispersed environment, outside of contact teaching hours. The other was to build up the skills and confidence of the less IT-literate students (a significant minority in this course) by giving them a hands-on experience of working with a web-based tool, while giving the more IT-literate students a chance to collaborate using the technology that is not yet used widely in the business environment, thus maintaining their motivation using the novelty factor.

Course B, *Advanced Reference Services*, is an elective course in the Master of Library and Information Studies. The course is offered both by conventional f2f teaching on campus and as a distance course supported using a Learning Management System and voice over IP conferencing. Students taking this course are generally competent in the use of IT, and, through previous courses, have basic HTML skills. However most are not IT specialists. In Course B, students complete a group assignment that requires them to create a web-based resource guide to online resources in a specific subject area, a common task performed as part of library service. Students also have to present their guides in a synchronous session, either in a f2f or in an online class. In the current offering of the course, wikis were used as a platform for creating the resource guide. Introducing the wiki technology in the course reflected the lecturer's belief that distributed content management tools, such as wiki, are likely be part of professional practice in information work in future. The existing interest in wikis in the *library and information* field was another reason for incorporating this technology in Course B (see Chawner and Lewis, 2006; Frumkin, 2005). Finally, getting student to work collaboratively using a wiki was predicted to counteract the isolation often felt by distance students.

Assignment wikis: Structure and navigation

Course A

In this course, four groups of students used wikis to create a report focusing on one of the following technologies: Advanced Internet, Broadband, Radio Frequency Identification (RFID) and Wireless Fidelity (WiFi). Each group was instructed to prepare a "knowledge base" that would "consist of a number of linked pages which discuss different aspects of the topic (e.g., technical background, advantages and disadvantages, future directions)." The instructions also required students to refer to a range of sources included at least two "quality academic articles" and to include a "bibliography page", with the details of these sources in the APA format. Let us consider these instructions more closely. The instructions describe the type of information that students are expected to include in the wiki and suggest aspects of its structure. In addition, the marking criteria include an *overview* (a concise summary of the main points of the knowledge base) and *conclusions*, implying that these two elements are also expected to be included in the wikis. By indicating that the wiki will consist of *a number of linked pages*, the lecturer communicates further information about what is expected in terms of the structure of the wikis. Thus student approaches to creating a wiki are, to a large degree, shaped by the instructions.

This becomes apparent when examining the final products of the assignment, as all four group wikis are conceptualised by students as collections of pages, each page representing a core aspect of the chosen topic, such as summary/overview of the technology, history, advantages/disadvantages, future directions, and conclusions. However, each of the groups also included one to three pages on aspects of the topic not listed in the instructions.

Navigation in the wikis, on the other hand, was left for the students to work out, and was not represented in the assessment criteria. A list of wiki pages was generated by default by the software, but this list represented all created pages, including those that were used as temporary working spaces and not included in the final version of the wiki report. Therefore the list of pages was not a useful navigation tool for a user who was not part of the wiki development group. However, a link to the home page was always available from this list. The groups' treatment of the navigational aspect of the wikis differed considerably. Two groups did not create a formal navigation menu or bar, linking the pages through hypertext links in the body of the text (Figure 1). In both of these cases hyperlinks to the top-level topics covered in the knowledge base were embedded in the narrative overview of the chosen technology provided on the home page. This approach to navigation had a *native* wiki navigation feel about it. However this meant that in order to read the whole wiki report the reader had to either keep returning to the home page or use the default complete list of wiki pages.
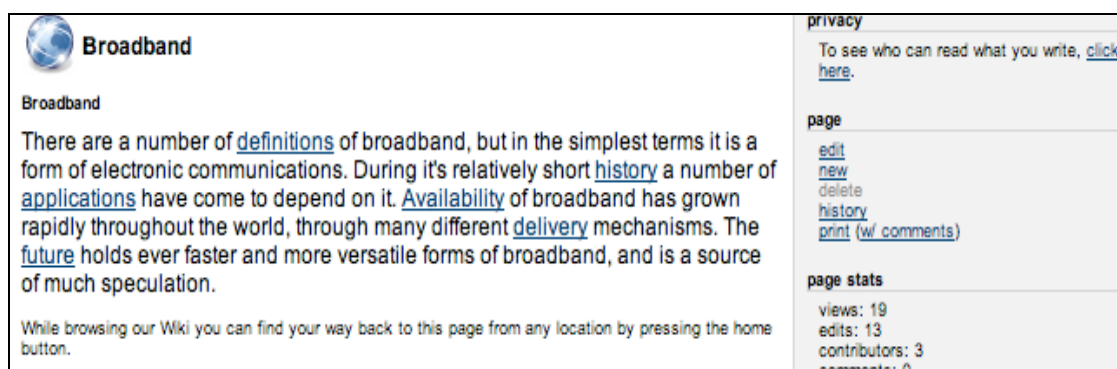

Figure 1: A home page with a *native* wiki style of navigation

The other two groups created additional options for the reader to navigate their wikis. One group, adopting a website metaphor, included a navigation menu on each wiki page which linked to all key areas of the wiki; while the other group gave their home page the form of a hyperlinked table of contents and included *Back* and *Next* navigation buttons at the bottom of each page promoting linear navigation through the wiki (Figure 2). This last solution communicated a strong statement about how students expected the reader to interact with the wiki report.

Although the task of collaboratively creating a knowledge base is closely aligned with conventional use of wikis as shared repositories of knowledge, the resulting wikis were strongly influenced by the requirement to create a report with a clear logical structure and by the expectation that the wikis would be

read and assessed as a finished piece of work – characteristics that reflect the academic register of interaction. The products of this assignment can be described as *academic* or *learning* wikis, incorporating elements of social software, a group project tool and an academic study tool.
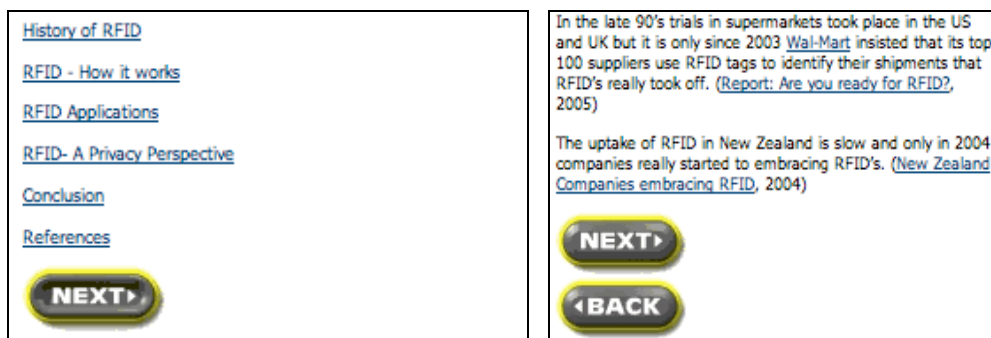

Figure 2: A table-of-contents style home page and a wiki page with the
***Next & Back* navigation buttons**

Course B

In Course B, students organised themselves into seven groups and worked on a web-based resource guide in the subject areas of their choice. The students were instructed to use wikis as a platform for creating the guides, which would need to have "a clear logical structure that reflects the nature of the subject and aids access by the user". The students were also required to state the scope and intended audiences for the guide, to include "appropriate bibliographic details in a standard format, and include an evaluative abstract or equivalent". One of the marking rubrics was "arrangement, navigability, and user-friendliness of the guide". In addition, students were required to keep an online journal which described the process of creating the guide and illustrated how decisions were made about the organization and evaluation of information.

Not surprisingly, the wikis created in this course all had the look and feel of conventional websites. A number of groups used website templates in creating their resource guides. Student journal entries revealed that, in the main, the discussion centred around devising evaluation criteria for online resources to be included in the guides, and the structure of the guide. Much less attention was given to the navigational aspects of the wikis. At various stages of development it became apparent to the groups (or individuals within these groups) that there was a need to provide internal navigation. One student wrote, "I noticed that our pages didn't link to each other so I added links at the bottom of some pages that would link all of our resource pages together." A student from a different group wrote, "I have just finished the internal navigation aspect of the guide. This involved just providing links at the bottom of every page to the *Home*, *About us* and *Selection criteria*. Internal navigation is important to how the website is used and perceived". Journal entries also indicate that students assumed that internal wiki navigation had to replicate the structure of the guide, for example, "The main aim of this meeting was to establish a basic structure for the research guide and how we are going to arrange the resources in a user-friendly and logical format. There was quite a bit of discussion around this issue and we decided that it would be good to have expanding levels. By this I mean, that when the user clicks on the main heading, a second level opens up with subheadings which the user can then choose from. For example, our Legal section will divide into NZ and international and then there will be further subheadings within these."

In the end, all guides were fitted with a navigation menu at the bottom of each page with hyperlinks to the home page, and, in all but one case, to the top-level topic or category pages. As far as the structure is concerned, five of the wikis were two levels deep. For example, the *Contemporary Art Aotearoa* guide had a home page that linked to eight main topics (such as public art galleries, dealer galleries, art magazines, artists, etc.), with individual topic pages containing links to the selected online resources and abstracts describing these resources. The remaining two wikis adopted multi-level hierarchies, with the broader topics represented at the top level, individual wiki pages with abstracts describing the selected resources and links to these resources located at the bottom level, and intermediate levels corresponding to subtopics. Bottom level pages included navigation links to the corresponding higher level topic or to the home page.

Five of the groups shaped their home page as a traditional table of contents, with names of the main topics (and, in some cases, subtopics) listed in the form of hyperlinks. The sixths group (subject area: *NZ Immigration Information*) used a similar approach but included a brief overview with each of the topic

links, while the sevenths group (subject area: *New Zealand Tourist Guide*) created a home page that resembled a *native* wiki page. The home page of the *New Zealand Tourist Guide* was the first content page of the guide containing descriptions and links to more general resources, and providing hyperlinks to two further areas of the wiki – resources specific to the North and South Island.

To sum up, in course B, where wikis were used to create web-based resource guides, the instructions and requirements of the assignment combined with prior knowledge of the postgraduate students (many of whom work as librarians) about web-based resource guides significantly influenced the nature of the final product of this task. Ironically, the better the resource guide was constructed the less it resembled a wiki. In fact, such conventions of the wiki environment as limited formatting options, absence of a structured linear-style navigation and its work-in-progress nature may have worked counter to the students' goal to create a web-based resource guide in its traditional form. Nevertheless, the wiki environment was clearly perceived as effective in supporting group work, as indicated in students' feedback provided in an anonymous post-course survey. A clear majority of students (77%) agreed that using wikis encouraged better individual participation in the group project and that using wikis had advantages over the f2f mode of group work. This suggests that wikis may have been the right collaboration tool for negotiating the structure and format of the guides, as well as devising the resource selection criteria and identifying resources to be included in the guides, but not an optimal tool for the final implementation of the guides, conceptualised as static websites.

Discussion and conclusion

In this paper I have considered an emerging genre of wiki-based learning which seeks to combine conventions of academic study and approaches to knowledge creation and sharing of social software. Students' prior experiences with wikis as social software can either contribute to the development of new conceptualisations of academic tasks (*positive transfer*) or interfere with traditional approaches to such tasks (*negative transfer*). To encourage positive transfer, instructors need to select ICT tools that are fit-for-purpose and give students opportunities to ascertain their affordances and reflect on limitations. Other factors affecting students' approaches to assessment include the nature of the task, instructions and marking criteria. For example, *navigability* was included in the marking criteria of course B, but not of course A. This is likely to be one of the reasons why students in course B have taken a much more uniform approach to site navigation than in course A. Also, even though component tasks of the two assessments were very similar (i.e., find, select, consolidate and output information on a chosen topic), in course B students were asked to create a *user guide*, while in course A they were constructing a report in the form of a *knowledge base*. Clearly, the labels chosen by the instructors for the end product of the group projects affected students' approaches to structuring the wikis, with the majority of course B wikis resembling static websites, and some of the course A wikis resembling a traditional text-based report. Finally, in providing task instructions, a balance needs to be struck between giving students enough information to complete the task, without constraining them too much in terms of its execution, thus encouraging students to make their own decisions about the structure and access to information in the wiki. All in all, the results show that students are able to adapt the wiki technology for academic tasks, but that the task may impose constraints on the use of wikis, leading to some of the advantages of the technology being lost in this adaptation.

References

Bower, M., Woo, K., Roberts, M., & Watters, P.A. (2006). Wiki pedagogy - A tale of two wikis. Paper presented at the *7th International Conference on Information Technology Based Higher Education and Training (ITHET 06)*, Sydney, Australia.
Chawner, B., & Lewis, P. H. (2006). WikiWikiWebs: New ways to communicate in a web environment. *Information Technology and Libraries, 5(1),* 33-43.
Choy, S. O., & Ng, K. C. (2007). Implementing wiki software for supplementing online learning. *Australasian Journal of Educational Technology, 23(2),* 209-226. http://www.ascilite.org.au/ajet/ajet23/choy.html
Elgort, I., Smith, A. G., & Toland, J. (submitted). Is wiki an effective platform for group course work?
Frumkin, J. (2005). The wiki and the digital library. *OCLC Systems & Services*, *21(1),* 18-22.
JISC: Designing for eLearning. http://www.elearning.ac.uk/effprac/html/design_intro.htm [Viewed 13 August 2007].
Lamb, B. (2004). Wide open spaces: Wikis ready or not. *EDUCAUSE Review, 39(5), 36-48.* http://www.educause.edu/pub/er/erm04/erm0452.asp?bhcp=1

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