

# Employing Wikis for Online Collaboration in the E-Learning Environment: Case Study

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## ABSTRACT

This paper examines the various ways in which students reflect on their very recent experiences in collaborating in an online e-learning environment. Wikis, fully editable websites, are easily accessible, require no software and allow its contributors, in this case students, to feel a sense of responsibility and ownership. Wikis are everywhere, but, unfortunately, the online literature has not yet begun to focus enough on wikis (Mattison 2003). Whereas students are used to the WebCT based university Elearning environment, Deakin Studies Online (DSO), this case study, completed in Nov 2004, was conducted to test the wiki platform as a means of online collaboration in the tertiary education environment. A full analysis of the results is presented, as are recommendations for improving the platform in an effort to employ wikis and utilize them to their full and absolute potential.

**Keywords:** wiki, e-learning, online collaboration

## 1. INTRODUCTION

It has been suggested that the single most neglected topic in the field of e-learning is the interaction between students and computers (Kruse 2002). If a student is feeling lost, confused and consequently frustrated, then their learning will prove insignificant. Furthermore, there also exists a demand to investigate further research in collaboration (Hughes 2002), which is student centered and focuses on the process of students working together and sharing the authority to empower themselves with the responsibility of building on their foundational knowledge (Myers 1991).

Therefore as part of an initial investigation, a web-based survey was conducted with approval from the Human Research Ethics Services, and targeted students at Deakin University who had completed a unit in a fully online environment. The survey consisted of 35 questions, which explored areas incorporating demographic and educational characteristics, a technical delivery review, student interaction feedback, a group work review, a staff reflection and a general reflection. With room for deliberation, students were able to rate and comment on their online learning experiences, as well as offer recommendations which they would

like to see implemented in the future. Full results are available (Raitman, Hamadi et al. 2004).

A wiki (meaning fast in the Hawaiian language) is a completely interactive website which is driven by a specialized web server generating dynamic pages from the results of visitor edits (Bergin 2002). It was discovered and developed by Ward Cunningham in 1993 for the purpose of being used as a composition system, a discussion medium, a repository, a mail system and also a tool for collaboration (Leuf and Cunningham 2001). Additionally, wikis can provide an efficient, flexible, user friendly and cost-effective interface for collaboration, knowledge creation and archiving, and student interaction (Schwartz, Clark et al. 2004).

For the purpose of this particular research, a thorough wiki investigation was conducted to determine basic wiki functionality, review different wikis and to finally select the appropriate wiki which would highlight the necessary features and ensure a useful technology for teaching and learning online (Augar, Raitman et al. 2004).

## 2. METHODOLOGY

This web based survey was again conducted with approval from the Human Research Ethics Services, and targeted students at Deakin University who had completed a unit in a fully online environment. Although encouraged to complete the survey by means of a call for participation, no incentives were offered and all participants remained totally anonymous. They were assured that only aggregated results would be used for research purposes and may be reported in scientific and academic journals.

The survey consisted of 29 questions which were established, reviewed, revised and finally adopted with the intention that the results would provide conclusive feedback to further the research in collaboration in the online e-learning environment. The questions required a single selection choice, or a short answer, and were optional.

## 3. RESULTS AND ANALYSIS

Following, are all the results that were extracted from the survey. It includes demographic and educational characteristics of the respondents, usage results and all the advantages and disadvantages of the wiki according to the users. The same

integral parts of the wiki proved to be preferred by some and questionable by others. Finally, a platform comparison is made between DSO, the university platform which students are familiar with, and the wiki, which is the new trialed platform.

### 3.1 Demographic and Educational Characteristics

As can be seen in Figure 1 the results indicate that of all 158 participants in the survey, 86% were aged 20 – 28 years of age, with another 10% that were mature aged students. Although conducted in an Australian university, 67% of respondents were international students (see Figure 2), reflecting the high intake of international students, which in fact is just under 33% for the School of Information Technology. Figure 3 indicates a 76% rate of students studying on campus and Figure 4 shows how the majority, 74% in fact, referred to an online unit in which they had partaken in their third year of study. Only 7% of respondents had experienced an online unit in their first year of tertiary study. This may suggest that although Deakin University uses online technologies to enrich learning experiences and add flexibility and value for all students, it clearly provides them with time to adjust to the e-learning environment through the completion of 20 units in the first two and a half years of study. However, it must also be noted that some international students have 1 or 2 years of advance standing from an international tertiary institution and then go straight into 2<sup>nd</sup> or 3<sup>rd</sup> year.

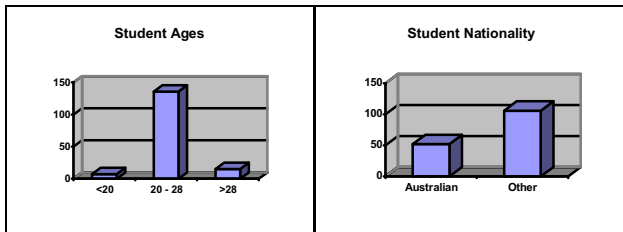


Figure 1

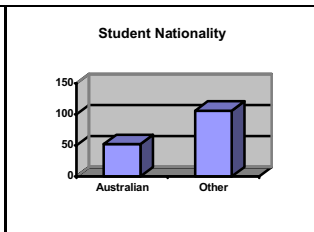


Figure 2

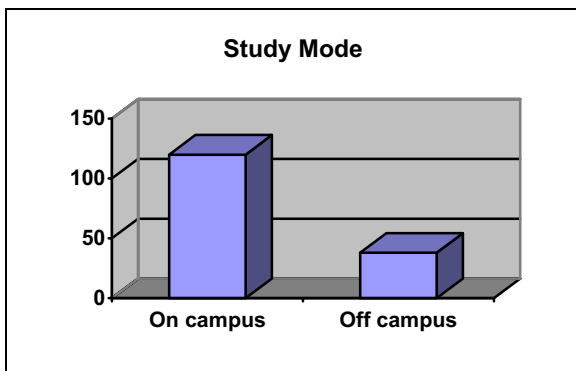


Figure 3

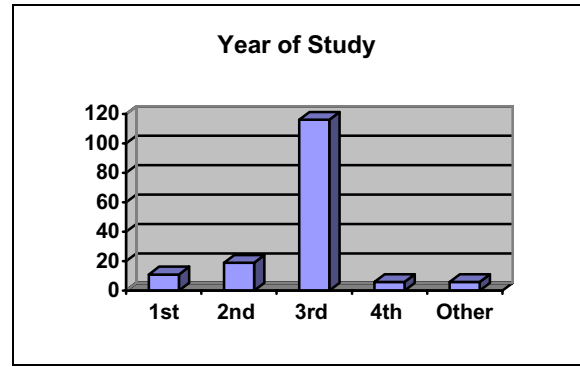


Figure 4

To ascertain how comfortable and experienced students were with computers in general, they were required to nominate their study major. Out of all 158 respondents, 155 of them in fact were enrolled in a course where the study major was related to the School of Computing or Information Technology. 2 students were from the Department of Education and 1 student was from a non computer related department, where all 3 selected this unit as an elective that was not compulsory for their degree.

### 3.2 Usage Results

Once the wiki exercises (Raitman, Augar et al. 2004) were underway, it was evident that 92% of the students participated with continuous activity. And 73% found the wiki software easy to use. Assessment was the motivating key, as is in any tertiary unit, but students remained focused, whilst checking and editing the content of the wiki. Table 1 reflects on how the students felt about getting to know and work with their tutor and other group members in the wiki environment. Alarming, the figures show that although they felt the wiki was easy to operate, it did not really enhance the group as such.

Table 1

	Yes	Somewhat	Slightly	No
Do you feel that you were able to get to know your group members through the wiki exercises?	15%	38%	34%	13%
Do you feel that you were able to get to know your tutor through the wiki exercises?	15%	28%	40%	17%
Did the wiki exercises make it easier for you to communicate with your group members for the	9%	25%	51%	15%

remainder of the semester?				
Do you feel that working in wiki groups online is better than working together in groups face-to-face?	30%	n/a	n/a	70%

These results mirror their overall online wiki experience, as can be seen in Figure 5.

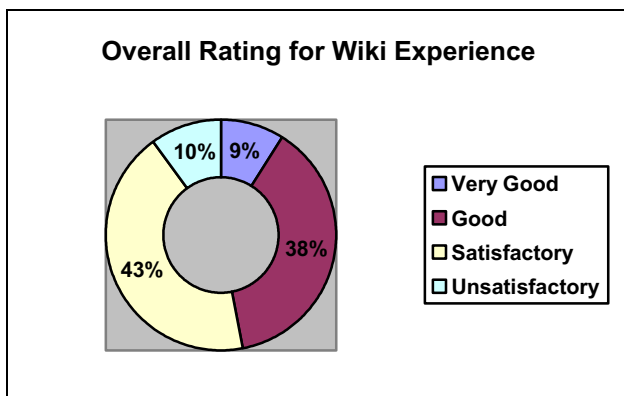


Figure 5

However, having pointed out that the students felt that their group was not cohesive or lending to a virtual community, the majority still enjoyed the discussion and the general wiki environment (see Table 2).

Table 2

	Yes	No
Did you enjoy participating in the online wiki environment?	67%	33%
Did you enjoy the discussion in the wiki?	70%	30%

### 3.3 Advantages of the Wiki

In the survey, students were asked to reflect on the positive characteristics of the wiki which they experienced. Reviewing all opinions, it is clear that there are many ways in which the students were suitably impressed and inconvenienced as detailed below.

Predominant support came from students who were able to interact with the wiki from anywhere at any time due to Internet

access being the only inclusive requirement. This would have been most attractive to the high 31% of total enrolments which were off campus (Figure 3). No additional software was needed, pages downloaded fast and thus it really created that environment of convenience with no restrictions. As reported earlier on, all students are either enrolled in a computer related course or do have computer experience, so it is no wonder that they were not intimidated by a new technology. In fact, embracing a new novel way of communication was definitely welcomed.

The nature of the wiki, in that it is fully editable, thus empowering the user with a sense of ownership and authority, gave the students the platform to collaborate in a relaxed environment. Why relaxed? Because basically they could voice their opinion, submit work and be sure that unless it was defamatory, it appeared as validated work. This lends to a democratic feeling among members who know that they are building on opinions and research and as a result can add their input without any consequential repercussions. As one student commented, 'it is non confrontational'. With all students operating on an equal footing, appearances, accents and body language simply hold no bearing on the quality of the work or the confidence of the contributor.

For the purpose of this case study, using the signature and timestamp was necessary for the purpose of assessment, because students were to be graded on their participation. This feature proved popular because when viewing the page, although not highlighted, one was able to glance at the timestamps to ascertain if any new editions were made to the wiki page.

And, whilst commenting on viewing new page editions, it is worth noting that there was positive feedback on the ease of use of the wiki and its features. Students appreciated that the wiki was easy to edit and all modifications were quick to upload. This made viewing the wiki simple and with scroll control, there was little navigation and minimal clicking of links required.

### 3.4 Disadvantages of the Wiki

Having noted all the positive attributes about the wiki which the students found appealing, it must be pointed out that were aspects about the wiki with which the students clearly were not comfortable.

Students felt that the wiki with its faceless contact was not personal enough for real research to develop. A student might post some thoughts, which could be edited upon by the next participant, but essentially, no discussion ensued. A comprehensive research response may have been evident but students felt that it was more from additions to the text, rather than back and forth discussion.

This all took place in a platform where some students felt that the user interface lacked simplicity and could benefit from more colour, icons and other factors which are initiated from the principles of human computer interaction. It appears the inclusion of more HTML functions would have been desirable as well as an

indication of any new editions having been made since a last access.

However, there are two main areas in which the wiki failed to support confidence among the users. The first one is the fact that students could easily edit other people's work without any real consequence. The wiki provides a person with the freedom to delete someone's work, falsely sign someone else's work for the purpose of assessment or post inappropriate content to the wiki just for the sake of it.

Table 3

No. of wiki pages (excluding personal profiles)	120
No. of page edits	5932
No. of registered users	549
No. of registered administrators	11
No. of page views	44926
No. of unsolicited incidents (e.g. mass deletion, abuse etc.)	0

The results in Table 3 indicate that in fact none of the feared incidents occurred in the environment which saw over 550 people using the wiki. Yet, students still voiced their concerns about the possibility of losing work or having other wiki members defame the wiki page. Although no malpractice occurred at all, and therefore none of the survey respondents could actually pinpoint an incident of concern, they simply felt insecure just by the possibility of what could happen.

The other main technical hitch that disturbed students was the inability to edit the wiki page simultaneously. In other words if Student A started to edit at 2:00pm, Student B started at 2:01pm and finished at 2:03pm, then when Student A completed his editing at 2:06, this final edition did not contain any of Student B's modifications. Although there was no report of this ever occurring in this experiment, students felt insecure about losing their wiki additions should this situation occur.

In fact, it can be noted that the two main concerns of content deletion and simultaneous editing were well highlighted by the students in the feedback, but in reality, there was not one incident that occurred to validate their anxieties. The FEAR of losing work or having to duplicate their input was enough to dissuade them from believing the wiki environment was fiercely reliable.

In general all the preceding notes which depict the advantages and disadvantages of the wiki as indicated by to the students can be summarized according to Table 4.

Table 4

Advantages	Disadvantages
Easy access – very convenient	Simultaneous editing
Nonconfrontational – relaxed environment	No 'new message' or 'new modification' alert
Easy to view others work	Limited HTML functions
Fast download	User interface
Signature and time stamp facility	Unintuitive login – sends user back to main page only

### 3.5 Personal Preferences for Similar Points

Table 5 represents further advantages and disadvantages to the wiki which as evident, are of similar nature, but differ only according to the students personal preferences. The one wiki characteristic which appeals to some students simply appears to be equally frustrating for other students.

Table 5

Advantages		Disadvantages
It is a new technology	yet	Prefer what they are used to – avoid new technology
One page – minimal 'clicking' required	yet	Page too long to scroll
Interact anytime	yet	Lack of real time communication
Interact anywhere	yet	Faceless contact
No HTML coding required	yet	Limited HTML functionality
Democratic feeling to express opinion	yet	Too easy to delete someone else's points

### 3.6 Wikis vs. DSO

As mentioned before these wikis were trialed on students who regularly used DSO as their unit platform for all means of communication as well as for accessing all relevant materials for their studies. For the wiki activities, the wiki links to the webpage were found within DSO among the activity requirements. Furthermore, students were assessed for their DSO participation and for their wiki contributions. Therefore, it is safe to say that these students were able to compare the two platforms with suitable experience in both DSO and wikis. Whereas the previous section in this paper solely concentrated on the wiki feedback, further reflections highlighted how the students felt when comparing the two platforms. These thoughts can be seen in Table 6.

Table 6

	Pros	Cons
DSO	<ul style="list-style-type: none"> <li>covers most units at university - familiar</li> <li>very structured</li> <li>many features</li> <li>non editable – no chance of losing content</li> <li>highlights new messages</li> </ul>	<ul style="list-style-type: none"> <li>too structured</li> <li>requires design revision</li> <li>cannot open multiple windows</li> <li>non editable – can be frustrating if wanting to delete an error</li> </ul>
WIKI	<ul style="list-style-type: none"> <li>one page layout</li> <li>very quick and easy access</li> <li>novel way of communicating</li> <li>no downtime / crash</li> </ul>	<ul style="list-style-type: none"> <li>less efficient</li> <li>poor interface</li> <li>cluttered</li> </ul>

The results of the DSO and wiki comparison identify all the factors which influenced the students in an effort to determine their preferences. Although all relevant points are included in Table 6, it must be noted that there were two recurring comments that need further highlighting:

1. Not all, but many students are simply more confident using software that they are familiar with. DSO might be confusing and difficult to navigate, but they have plenty of experience with this platform and prefer to avoid having to familiarize themselves with another piece of communicative technology.
2. As mentioned in Section 3.4 students are scared that their wiki input is not secure because anyone at all has the ability to erase the page content. Therefore, since DSO has no deletion facility and all input is fully accounted for, they prefer to feel confident that their work is protected in a secure environment.

#### 4. CONCLUSION AND FUTURE RESEARCH

It is evident from the results above that students liked the idea of the wiki, were willing to embrace and generally found it easy to use. However, in order to maximize the benefits, it is worth considering the following options which have all been directly recommended by the students themselves.

To support a more suitable wiki in the e-learning environment:

- incorporate icons, colour and interest into a dull interface to promote student motivation
- taking the previous point into account, retain fast internet download

- design the interface of the wiki to resemble the unit or university design
- enable the page contents to be saved as another file e.g. a PDF file
- allow students to delete only their own work so that they can feel secure about their contributions
- make new text or page insertions visible upon login
- add facility for real time chat
- provide more documentation about HTML applications available within the wiki

These conclusive results and recommendations will further be developed, tested, analyzed and published at a later date. Students are keen to support the collaborative wiki tool and are successful at using it sufficiently to complete unit tasks. However, there still remains the necessity to improve the wiki so that all students will feel more naturally instinctive with the use of it and confident that their input is safe and reliable.

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