

‘A Wiki for your thoughts’- Can Wikis promote a collaborative learning environment?

Andrew Ferrier
University of Greenwich

Abstract

In this paper, it will be argued that the incorporation of Wikis within a collaborative learning environment can overcome the restraints created by larger classes. The paper will define what a collaborative learning classroom should look like and how Wiki technology has been used to create effective learning environment for large classes. The paper will also set out some ideas for teaching applications incorporating Wikis, along with some correlation evidence showing a relationship between student academic achievement and participation in Wiki activities.

In the context of increased demand for courses and correspondingly greater enrolments, it should come as no surprise to discover tutorial class sizes of twenty-five to thirty students. However, whilst class sizes have increased, the method of and systems behind the timetabling of tutorials haven't changed. Usually, tutorials are allocated an hour, which student inter-class movement effectively reduces to forty-five minutes, obliging the tutor to rethink session strategy. With more students and less time, the tutor faces such restrictive choices as presenting a mini lecture or planning activities with limited scope, with the resultant challenge of judging what (if any) learning has been achieved.

In a research study that focused upon the consequences of large class sizes in higher education, Cuseo (2007) identified such dangers as increased faculty reliance on the lecture method of instruction and reduction in the level of students' active involvement in the learning process, matters that should concern all academics and academic administrators.

Cuseo highlighted other issues, like the reduced frequency and quality of instructor interaction with students and feedback to them, with consequent impact upon the depth of their thinking inside the classroom.

Large class size limits the breadth and depth of course objectives, course assignments and course-related learning outside the classroom; it also lowers students' academic achievement (learning) and academic performance (grades). Students report less course satisfaction in large-sized classes and tend to give lower overall ratings (evaluations) for course instruction delivered in such circumstances. These findings suggest that we should revisit our understanding of what makes an effective tutorial. Is it possible either to alter radically or modify slightly our teaching and learning strategies in order to deal with larger class sizes?

An effective tutorial session should develop the ability of students to be more self-reliant in their learning. Nigam (2013) describes three characteristics behind effective tutorial delivery: tutorials should encourage active learning opportunities, in which students are presented with activities designed to involve them in building their knowledge rather than being passive recipients; tutorials should also foster in students the confidence to think independently and

to discuss their ideas; tutorials also should allow time for tutors to motivate by tailoring activities and tasks to identified individual student abilities.

Physical constraints in the academic delivery systems in universities can make the achievement of Nigam's three characteristics very difficult. Wouldn't it be great if we could, virtually, provide more time, space and flexibility to allow students to become more collaborative and self-reliant in their learning? Could the inclusion of Wikis amongst teaching and learning tools be part of the answer?

In this paper, it will be argued that the incorporation of Wikis within a collaborative learning environment can overcome constraints imposed by larger classes. The paper will define what a collaborative learning environment should look like and show how Wiki technology has been used to create effective learning activities for large classes. The paper will also set out some ideas for Wiki-incorporated teaching applications and offer some evidence of correlation between student academic achievement and participation in Wiki activities.

What is a Wiki?

A Wiki in its basic form is like a cross between a web site and notebook. It can be an individual Wiki, where the user creates and edits her/his own web document, or, more usefully, take the form of a collaborative Wiki, where students working in a small team can create and edit group documents.

Content changes and version updates can be tracked. Some Wikis, such as Wikipedia, have an open editorial rights policy, which allows anyone to make editorial changes; other Wiki sites usually have editorial settings, similar to those for blog sites, with the editorial rights in the hands of one person or collaborative group. These Wiki administrators may extend rights to others or may allow their audience only to read and leave comments. The Moodle Wiki sites work in this way.

Students can update and add further information to the content of their site. Readers can remove and replace published information on a Wiki site if they feel that corrections are needed. Stakeholders (i.e. students and tutors) may leave comments and suggestions. A Wiki also self-tracks its change history, identifying contributors. All stakeholders (including the readers and the original authors) have the same publishing rights. These are the tools a Wiki can offer. Can they be used to achieve the three attributes of self-reliant learning as expressed by Nigam?

Can Wiki be used to enhance a collaborative learning environment?

Answering this question requires some understanding of what an observer would expect to see if participating in a collaborative learning community.

Matthieu (2005) states clearly that such an environment would show evidence of shared discovery and learning (in the process of which participants can see and articulate their role) and evidence of functional connections between learners that are meaningful, inclusive and necessary for the accomplishment of work within the learning activity itself. Within such an environment, the development and ownership of course knowledge has been based on the connections of wider related learning and life experiences of other group members. Matthieu makes the point that:

“These connections help situate one’s learning in a larger context by solidifying one’s place in the broader campus community of learners and life experiences. These connections decrease one’s sense of curricular and personal isolation” (Matthieu (2005) page 4).

In general, though Halpern (2011) supports these views, she argues that the implementation of a collaborative learning environment is not easy. However, it is worth noting her observations of student learning behaviour in a collaborative context, which include:

- increased time on task – the more time and effort students put into learning, the greater the probability that quality learning will occur. In general, students spend more time working actively with cooperative learning groups.
- increased motivation – in general, students are more motivated to succeed. Students depend on each other to complete an assignment, a fact that usually increases motivation to achieve at a high level.
- more immediate feedback – students receive more feedback on their learning and thinking and they receive it with more immediacy than in traditional learning settings.
- thinking and learning are modelled as processes – the process of how to think about a complex issue and how to learn is modelled and practised. Thinking and learning become dynamic processes, instead of learning outcomes.
- shared knowledge and skills – when tasks are complex, the knowledge, skills and experiences of group members may be shared, so that the collective knowledge of the group can achieve goals that would elude any single member.
- connected knowledge structures – information is processed more deeply when students are required to process it in a meaningful way.

It could be argued that most lecturers, teachers and tutors already make use of collaborative learning as part of their teaching strategy and that what has been described above is not exactly ‘news’ . Indeed, within the business community, a key indicator of a sound employee is the ability to work as part of a team. Many courses incorporate student team work for such tasks as presenting a business activity or designing business plans. Some of these activities work extremely well and others can result in disaster or failure. Why does this happen?

Middlecamp (1997) indicates that the human element can easily derail the collaborative learning process very quickly. Her discussions with students alerted her to the adverse influence of blockers, such as: people need to go at different speeds; someone may try to dominate the group; quiet people may be overlooked; friction may occur between group members; some members may be perceived as not pulling their weight; some members may be exploited. Some students also added that concepts might not be understood as well if a person doesn't have to figure something out and that a lot of time can be wasted in talking about irrelevant topics. It should be said that this is not an argument against the concept of collaborative learning, but it can show what might happen if there is not a sound pedagogical management strategy on the part of the teacher.

What can Wikis offer?

Whilst not being able to address in entirety the issues raised by Middlecamp, Wikis can nevertheless provide tutors with a powerful tool in managing the implementation of a collaborative learning environment.

Matthews (2009) states that Wikis play an important role in incorporating group work, cooperative learning and collaboration into face-to-face or online learning environments. The space can be used for everything from brainstorming to writing the final presentation. Through her work with Wikis and collaborative learning, she finds they have considerable advantages for both teachers and students. Most of the features she describes are available with the Moodle Wiki tool:

- Users of the Wiki can read, visit, reorganise and update structure and content.
- Most Wikis keep track of changes and maintain a number of versions, providing an edit trail (version control system) of every change made to every Wiki page.
- Many Wikis enable images, videos and multimedia presentations to be embedded directly in the Wiki pages. If this facility is not available, many Wikis provide the means for linking to web sites, images, videos and multimedia presentations.
- Whilst the tools in blogs and discussion boards tend to be developed for one-to-many communication, Wiki tools have the advantage of facilitating many-to-many communication. The key difference is that a Wiki allows any user with the correct permissions to update the content as well as to make a comment in the comment facility, whereas discussion boards limit users other than the author to the comment facility only.
- Any individual who has access to the Wiki can make a comment. This is great way for a teacher to provide feedback to the students on a task and point them in the right direction if they need help. It can also be used for student peers and parents to provide feedback.
- Wikis are generally organised by content; blogs, chronologically.
- Most importantly for the tutor, a Wiki maintains a trail documenting the evolution of a written task. The edit trail enables the teacher to see who has made additions, changes and deletions and when each change occurred.
- In group work, a teacher can see who has contributed and who has not. Within Moodle, a report listing the contribution of individual team members to a Wiki task can be generated.
- Wikis enable students to create a document or presentation which reflects the shared knowledge of the learning group.
- Wikis can be used to facilitate the dissemination of information and enable the exchange of ideas. For this reason, Wikis are often used by 'communities of practice' to facilitate group interaction.

Do collaborative learning and Wikis have an impact on student performance?

So far, we have discussed the merits of the relationship between collaborative learning and the use of Wikis. Does, however, the combination of collaborative learning and Wikis affect student performance? With this question in mind, the report tool in Moodle was used to track incidences of student interaction with Wikis, correlating them with end-of-term student results (a rather crude test, but a useful snapshot of any positive correlation between high attainment scores and the use of collaborative learning activities and Wikis). The information collected came from a foundation course and a Year 3 undergraduate course.

Project 1 Foundation Course Business Insights

This course was a fifteen-unit single-term course run as part of the International Diploma Programme.

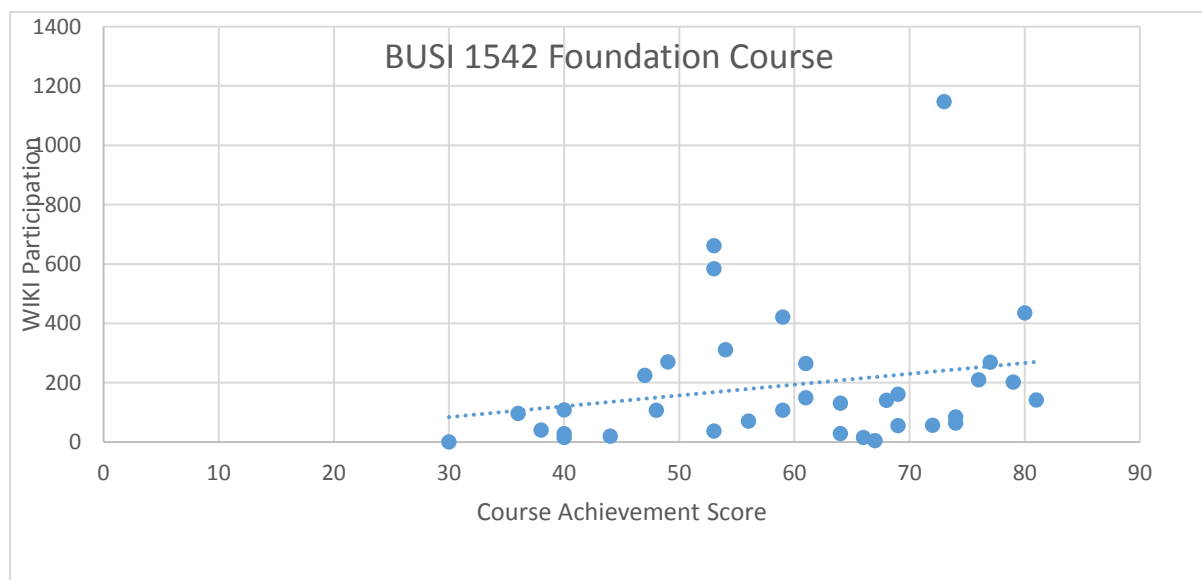
There were forty international students on the course, most of them new to tertiary education. One part of the programme required their exploration of some case studies and response to related key questions, using the Wiki Knowledge Bank after participating in lecture and seminar activities. The idea of the Wiki Knowledge bank was to provide a group 'study notebook' which would consolidate understanding of the theoretical constructs arising from the case study materials. The Knowledge Bank was seen as a good analogy, as it encouraged students to make a group knowledge 'deposit' of ideas, course references, web links and argument examples which could be 'withdrawn' later for deployment in an exam, during peer assessment activities and/or in preparation of essays. They could review (and adapt) other groups' knowledge banks as well.

As English was a second language for the students, it was important to provide opportunities for their development of oral English as well as written: they were encouraged to respond not only via written text, but also via sound recordings (podcast software) or their inclusion of video links in their Wiki knowledge banks - as long as the materials provided addressed the questions and course constructs covered in the delivery of the course.

Student interaction with Moodle was measured on recorded incidences of their viewing, creating, updating or deleting the Wiki content.

At the conclusion of the course, their Wiki interactions were compared with their results with a moderately positive correlation coefficient of **0.31** as indicated in the scatter gram chart below:

Figure 1: Wiki Participation and Course Achievement, BUSI 1542 Foundation Course



Evidence in the Course Moderation Report for this subject, noted a rise of 3% in the mean score for both the Individual essay submission and the Group presentation report activities. The positive correlation coefficient result also shows that the use of Wikis may have made a contribution to this rise of the mean for both assessment tasks, although more research may

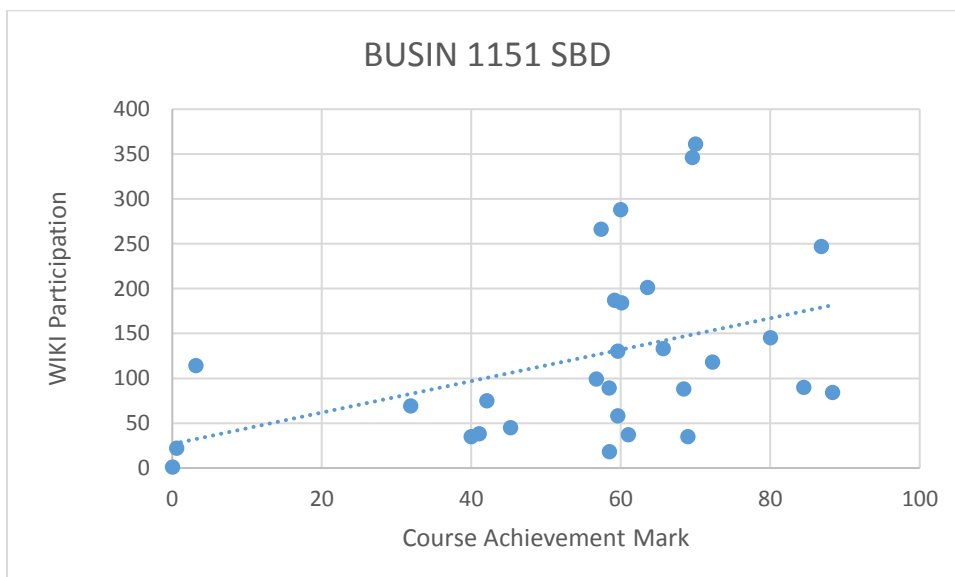
need to be done in order to develop a deeper understanding of the relationship between Wikis and academic achievement. These results will be discussed below.

Project 2 BUSI 1151 Small Business Development

This course was a thirty-unit course as part of the Business Degree Programme. The twenty-nine participants were students in the third year of their course programme. Like the students in the foundation group, these students were encouraged to work as collaborative teams. They used their Wikis for reviewing the case studies presented during the course as well as constructing their group business plans. Being in their third year of study, these students were more experienced and more familiar with the demands and standards required.

Their academic results were recorded along with their Wiki interactions (from The Report Tool in Moodle). They recorded a positive correlation of **0.41**, which was slightly stronger than the first group.

Figure 2: Wiki Participation and Course Achievement, BUSI 1151 SBD



Reviewing the results

The interesting thing about both correlations is that they show a moderate positive relationship between the high student involvement with Wikis and corresponding high academic achievement for the course. Whilst they provide an interesting guide, some caution needs to be taken in the interpretation of these results. It would be an overstatement to say that Wikis alone are responsible. Other factors that need to be taken into account include the ones mentioned above in the studies cited in this report.

Middlecamp (1997) highlights the importance of getting the group dynamics correct in the first place and, during this project, a great deal of time was spent on the achievement of this aspect. All participants in both groups undertook Belbin's team role assessment tests which were used to determine the makeup of the groups, but even this degree of preparation did not eliminate all 'human element' problems within group interactions. However, the use of Wikis played an important role in settling disputes, especially with regard to the matter of

equitable input. The Wiki tool made it easier to track the individual contributions of members and thereby to assess the validity of any disputes about whether all had pulled their weight. Many students were reassured to know that, when it came to assessments, the Wiki tool would ensure that their contributions would be judged fairly and equitably.

It was also interesting that there was a much higher positive correlation recorded for the 3rd year undergraduate students compared to the foundation course students. Various explanations for this are possible, one of which might be that, for the international foundation students, the curriculum and teaching pedagogies and systems used in the delivery of university courses are very different from what they have experienced in their own secondary education systems. In the delivery of curriculum in western higher education, there is a mixture of constructivist and behaviourist systems, which international students may find confusing. Some students also find it a challenge to have to share their own thoughts – especially if they are used to a system which rewards them for memorising and repeating the teacher's views rather than their own.

In this case, the use of collaborative Wikis (Knowledge Banks) did play an important role in helping students to focus on developing and building their own knowledge about the course constructs. In contrast to previous years, thanks to the deployment of Wikis, these foundation students more easily grasped essential course theories; Wiki use also contributed to more thoughtful and nuanced peer assessment judgements than previously, both in reviewing group presentations and in commenting on peer essays. But is this a trend or an aberration? More research on this area is needed!

Conclusion

Moodle's Group tools and Wikis have played an important part of curriculum delivery for students, reinforcing the many excellent points that Matthews makes regarding their efficacy. Wikis have been used by students working in collaborative groups for developing and tracking projects and as a repository for project-related resources, links and discussions. To other audiences, they can provide evidence of knowledge growth. Collaborative Wikis provide solid evidence of students' internalising ideas associated with course constructs, something which proves elusive in the course of seminar discussions. Students can also return to their Wikis and either add, edit or modify the content. All entries to the Wikis are retained and so, if a student's contribution has been deleted by other group members, a version will still be accessible within the Wiki history tab. This presents the tutor with the opportunity to measure the effectiveness of the course as well as to address any anomalies that may occur in the learning path of the student.

Wikis also provide the means by which more reticent students may make a valid input into any curriculum discussion. Furthermore, to return to the point made earlier in the paper, they break down the forty-five-minute 'wall' that often occurs with tutorial/seminar delivery.

As Wikis are an online tool, students can arrange to add or build their collaborative Wiki sites at times which best suit them. Rather than their trying to complete tutorial tasks within a short time space, task activities can be captured on the Wiki site. During tutorial sessions, students can use their time to engage in planning how to address the task on the Wiki, allocate sub tasks to appropriate members of the group and agree on suitable reviewing steps. It could therefore be argued that Wikis enable learning engagement beyond the confines of a forty-five- to sixty-minute tutorial. More importantly, they are an excellent tool

for demonstrating that functional connection that Matthieu (2005) sees as important in the development of shared discovery and learning - a keystone in collaborative learning environments.

A 'Wiki for your thoughts' indeed!

Reference list

Barnes, S. (2017) 'Responding to student feedback: From full-cohort lectures to MOLE content and small group tutorials.' School of Health and Related Research. Available at: http://www.sheffield.ac.uk/polopoly_fs/1.259287!/file/Modes_of_Teaching_Small_Group_Tutorials_Barnes.pdf (Accessed: 6 November 2013).

Bruns, A. and Humphreys, S. (2005) 'Wikis in Teaching and Assessment: The M/Cyclopedia Project.' In: Proceedings International Wiki Symposium, 25-32, San Diego. Copyright 2005, ACM Press. Available at: <http://eprints.qut.edu.au> (Accessed: 6 November 2013).

Cuseo, J. (2007) 'The Empirical Case against Large Class Size: Adverse Effects on the Teaching, Learning, and Retention of First-Year Students.' *Journal of Faculty Development*, 21(1), 5-21.

Dias, M. (2010) 'Using WIKIS in University Teaching: The Basics Centre for University Teaching Ottawa Canada October 2010.' Available at: http://tlss.uottawa.ca/site/images/1-SAEA/CPU/publications/01_Wiki_EN.pdf Accessed: 23 May 2016).

Halpern, D. (2011) *Creating Cooperative Learning Environments*. Available at: <http://www.psychologicalscience.org/index.php/uncategorized/creating-cooperative-learning-environments.html> (Accessed: 7 June 2016).

Matheiu, R. (2005) *Creating a Collaborative Learning Environment*. CIRTL Center for the Integration of Research, Teaching, and Learning. Available at: http://www.cirtl.net/files/Guidebook_CreatingACollaborativeLearningEnvironment.pdf. (Accessed: 16 June 2016).

Matthews, C. (2009) *Exploiting the potential of Wikis to support collaborative and cooperative learning activities in the online environment*. Available at: <http://www.otago.ac.nz/cdelt/index.html> (Accessed: 7 June 2016).

Middlecamp, C. (1997) 'Students speak out on Collaborative Learning.' Available at: <http://archive.wceruw.org/cl1/cl/story/middlecc/TSCMD.htm#speed> (Accessed: 7 June 2016).

Nigam, A. (2008) 'How to Conduct an Effective Tutorial Class.' *How to Conduct an Effective Tutorial ClassEzineArticles.com*. Available at <http://ezinearticles.com/?How-to-Conduct-an-Effective-Tutorial-Class&id=1223771> (Accessed: 22 June 2017).