Abstract
As technology becomes ever more prevalent in the modern classroom, teachers are looking at ways to utilise it for the benefit of their students’ learning. One such tech-tool is the Wiki. Although they are not the most common feature in education, their uses are numerous. This paper will discuss wikis as a tool to carry out, monitor and assess project-based learning.

Key words: Wikis, project-based learning, blended learning, alternative assessment, peer- and self-assessment.

INTRODUCTION
Digital devices in the classroom, such as laptops, phones and tablets, are now becoming as ubiquitous as the whiteboard. Today, it is common to see many students peering into their devices as the lecturer covers the material for the day within a university setting. The same lecture is then reviewed via the lecture-capture system, quizzes are taken via a learning management system such as the Taylor’s Integrated Moodle e-Learning System (TIMeS), and essays are uploaded onto Turnitin, which allows instructors to assess and provide feedback for students’ written work using the assessment tools available within the system. Slowly but surely much of the learning experience is increasing its digital footprint, with new teaching and learning systems and procedures being developed and tried out week by week. Therefore, this ‘how-to-teach’ paper proposes an approach for the use of wikis in project-based learning (PBL). This paper covers features of wikis and explains why they are conducive for project-based work, as well as explains how wikis can be used to monitor progress and accurately assess students’ work.
WHAT ARE WIKIS?
Ward Cunningham first conceived wikis in the mid-90s to create a place where collaboration could be carried out easily and quickly. Since then, wikis have been used in platforms such as Wikipedia, WikiLeaks, as well as other numerous privately created websites. Additionally, their collaborative features have also been utilised in platforms such as Google Docs. Although it is difficult to define wikis, there is a general consensus that wikis are the place for webpage creation, editing and collaboration (Chao, 2007; Chen, Chen, & Sun, 2010; McMullin, 2005). Generally, wikis have a number of features, which make them especially suited for project-based learning.

Table 1. Five uses for a wiki (Adapted from Tonkin, 2005)

| No. | Use                                                                 | Details                                                                                           |
|-----|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1   | Information display and dissemination                               | Video, audio, text, PDFs, word files, PPTs, hyperlinks and images can be uploaded/embedded onto a wiki page, and subsequently downloaded. |
| 2   | Collaboration                                                       | Pages can be created where one to fifty students can collaborate.                                  |
| 3   | Progress                                                            | Lecturers can constantly monitor project progress simply by checking the page of each respective group of students. |
| 4   | Feedback                                                            | Each project page can be accessed by the lecturer which means comments can be provided to help the group stay focused or refine their ideas. |
| 5   | Assessment                                                          | Each student has a login ID that tracks all updates made to a single page. A lecturer can then monitor who is actually doing the work and use this to produce more accurate assessments based on a student’s contribution. |

The information presented in Table 1 has been adapted from a study by Tonkin (2005) and further expanded to illustrate how other features presented by wikis can benefit project-based learning. The next section explains in detail how each step presented above is carried out and why they are beneficial for project work.
**Information Display and Dissemination**

At first glance, a wiki page is a blank canvas ready to be filled with text, audio, video and hyperlinks. At the beginning of each project, a number of pages can be created such as aims and objectives, assessments and sample work.

![Wiki Page](image)

**Figure 1.** A screen shot taken from a wiki illustrating the objectives of the project

Figure 1 shows the screen shot from a sample page with the aims, objectives and links to external documents and websites. Pages such as this can be created quickly and easily to allow both teacher and student to find, download and share information relevant to the project in one location.

**Collaboration**

The most discussed attribute of wikis is their collaborative nature as this allows users to either work synchronously or asynchronously (Cunningham, 2013). In addition, collaboration has long been perceived by many researchers as an effective element for student learning (Gokhale, 1995; Hew & Cheung, 2008; Johnson & Johnson, 1986; Li, 2002; Slavin, 1991; Vygotsky, 1978). Therefore, wikis now present the lecturer with the ideal tool to harness effective collaborative learning both inside and outside the classroom.
The first step in collaboration work is to place students into their respective groups and assign them a page to work on. Next, this page can be locked to allow only the group members and the teacher to see it, or in the spirit of sharing, can be left open for all groups to monitor each other’s progress. The students are now able to continue working in one central environment, where new information can be shared and updated instantaneously. The advantage of this setting is that the need for constant emails and regular meetings is reduced, as each group member can keep track of their progress and know what the other group members are doing. Additionally, when content is uploaded or updated, each member can comment on the new information with regard to its relevance. They may also use the space to clarify and increase understanding on certain areas of the project. Thus, the collaborative nature of wikis creates an environment where students can share and discuss information all under the watchful supervision of the lecturer.

**Progress**
As project work requires students to work more autonomously and take greater responsibility for their individual learning, the lecturer may only have a few opportunities to check in with each group’s progress unless face-to-face tutorials are conducted. However, monitoring progress has been identified as a contributing factor to a project’s success (Wang, 2009). Wikis simplifies progress monitoring as each project is contained within one website. This means that a lecturer can check each page on a regular basis, and if an issue arises, the lecturer is able to intervene with a comment, email or schedule a face-to-face meeting with the group. Thus, the lecturer can now be a part of the group project from the beginning and monitor it as a silent partner for each group. The lecturer can also encourage the groups who are on track by motivating them further, and assist the weaker groups who may have lost focus. In short, by following the project’s progress on the wiki page, a lecturer is able to remain with the group from the start of a project until its completion.

**Feedback**
According to Hattie & Timperley (2007, p.102), “Feedback is among the most critical aspect that influences students’ learning.” This is especially true, when the feedback informs students on how to complete a task more effectively (Hattie & Timperley, 2007). The researchers also commented that some of the most effective feedback is in digital forms such as audio, video or text. Another noteworthy feature of the wikis is their ability to support feedback options. For example, in the case of audio, a website called Vocaroo (www.vocaroo.com) can be used to quickly record and save feedback. This file can then be hyperlinked or embedded directly onto the wiki page. In the case of video, a screencast (http://screencast-o-matic.com) can be utilised and then linked or embedded onto the wiki page. Lastly, feedback in the form of direct text can also be written on the wiki page providing students with ideas, advice or suggested directions to follow.
Figure 2 illustrates how some feedback features can be easily applied to a wiki page. At the top left is an audio file embedded from Vocaroo, and at the top right is a video, which has been embedded from YouTube. Finally, at the bottom of the page, is an example of direct feedback that has been written (highlighted).

![Figure 2. Screen shot containing audio, video and text feedback](image)

In short, wikis provide the lecturer with a tool that allows them to utilise various feedback methods that can further assist students in completing the project more effectively.

**Assessment**

For some students and lecturers, PBL and collaborative work can cause a number of problems: namely, accurate grade allocation. Grades may be summative and given as a whole to a group. However, this notion presents the problem of “free riders” (James, McInnes, & Devlin, 2002), which refer to member(s) of a group who do not contribute as much as other members to the overall project. With summative assessment, these free riders obtain the same grade as members who contribute a lot, which can create frustration within the group (Strauss & U-Mackey, 2007), and subsequently, lead to a breakdown in the discussion process.
Hence, wikis offer lecturers a solution to help assess students more accurately. Free riding can be quickly dealt with and decreased by monitoring which students log on to the wiki and how often (Caple & Bogle, 2011) (Figure 3). When a particular group member’s name is not featured on the log, the lecturer can intervene and find out the cause. Dealing with free riders early on and monitoring them throughout the project period will ensure a more cohesive group bond is formed. In addition, it will reassure the other group members that their grades will not be compromised. Although logs alone should not be the sole basis upon which an entire grade is awarded, as other considerations must be taken into account, it does however provide the lecturer with a deeper understanding of the group process, which in turn will allow the lecturer to make a more informed decision on grade allocation. Therefore, grade allocation can now be given to individual students within the group, instead of the group as a whole.

![Figure 3. Screen shot of a wikis log, where user information is tracked and saved](image)

**Choosing the Right Kind of Assessment**

There are two types of assessment for projects: formative and summative. The former is carried out during the project period, the latter is given at the end of the project. As projects are incredibly complex and require students to carry out tasks beyond information retrieval, there is a need to assess soft skills such as the ones highlighted in Taylor’s Graduate Capabilities (TGC). Some of these skills include lifelong learning, problem solving, communication skills, interpersonal skills and computer literacy. More often than not, summative assessment is used simply because the only work that can be assessed is presented at the end of the project. Nevertheless, with wikis, the lecturer has access to data which reveals more about the project progress based on students who...
contribute actively. Therefore, there is now enough data to support and corroborate alternative forms of assessment.

Along with peer-assessment (PA), self-assessment (SA) has shown encouraging potential as a reliable form of assessment (Bachman & Palmer, 1989; Chang, Liang, & Chen, 2012; Peirce, Swain, & Hart, 1993). Some researchers have raised concerns about its reliability stating that the results of the SA cannot be confirmed; however, by monitoring the progress on the group’s page and the logs, lecturers are able to make more informed decisions on the accuracy of each student’s SA. The rubric in Figure 4 illustrates how soft skills, such as sharing, collaboration and research can be self-assessed by the students themselves.

![Figure 4. Self-assessment rubrics used with a wiki-based project to assess soft skills](image)

Although wikis do not give a definitive answer as to the students’ level of contribution within the project, they do to a certain extent provide the lecturer with a better understanding of who is doing the work and when. In addition, since the lecturer is monitoring the process from beginning to end, and not at specific intervals unlike in the case of tutorials, he or she would be more aware of the students’ involvement as they carry out their work. This along with other techniques, such as peer-assessment, can then help to corroborate results from any alternative assessment.
**BENEFITS**

Wikis present users with a versatile learning environment (VLE) where they are able to construct a customisable website which supports student learning as well as provide the lecturer with a platform to constantly monitor each group’s progress remotely. The lecturer becomes a silent partner by monitoring the progress of the group closely. In addition, the lecturer can intervene when necessary, with advice, comments or suggestions, all of which will maintain the group’s momentum and improve their success. Moreover, with access to more information on each group’s progress, the lecturer is now able to incorporate alternative assessment procedures. All these procedures enable the lecturer to make use of formative assessment techniques by providing constant feedback throughout the project, and allowing soft skills to be self-assessed and corroborated through the logs. Consequently, wikis allow a more holistic approach of assessment, where the ultimate goal is not solely the assessment of the final product but the process itself.

**CONCLUSION**

This paper has outlined five pertinent uses of wikis, information display and dissemination, collaboration, progress, feedback and assessment that can aid in creating a more successful project. As described earlier, wikis provide lecturers with tools that can assist them in monitoring a project to ensure that it runs smoothly and finishes successfully.

Simply put, wikis can be referred to as a tool much like a whiteboard or an iPad. By this notion, they do not enhance learning as much as they help facilitate it because the real learning takes place during the collaborative dialogues between the students and lecturer. The role of the wikis then, are to support this dialogue by providing a learning environment where the lecturer can be a silent partner in each group and guide, advise and support students from the very beginning of the project until the end.

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**REFERENCES**

Bachman, L. & Palmer, A. (1989). The construct validation of self-testings of communicative language ability. *Language Testing*, 6, 14–25.

Caple, H. & Bogle, M. (2011). Making group assessment transparent: What wikis can contribute to collaborative projects. *Assessment & Evaluation in Higher Education*. Retrieved from http://dx.doi.org/10.1080/12602938.2011.618879

Chang, C. C., Liang, C. & Chen, Y. H. (2012). Is learner self-assessment reliable and valid in a web-based portfolio environment for high school students? *Computers & Education*, 60(1), 325-334.
Chao, J. (2007). Student project collaboration using Wikis. Paper presented at the 20th Conference on Software Engineering Education and Training (CSEE&T 2007), Dublin, Ireland.

Chen, J., Chen, M. & Sun, Y. (2010). A new approach for enhancing student reading comprehension and assessing assessment of literary. Computers & Education, 55, 1367–1382.

Cunningham, W. (2013). c2.com. WikiWikiWeb. Retrieved March 2013 from http://c2.com/cgi-bin/wiki

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. Journal of Technology Education, 7(1)

Hattie, J. & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81–112. doi:10.3102/003465430298487

Hew, K. F. & Cheung, W. S. (2008). Attracting student participation in asynchronous online discussions: a case study of peer facilitation. Computers & Education, 51(3), 1111–1124.

James, R., McInnes, C. & Devlin, M. (2002). Assessing learning in Australian Universities: Ideas, Strategies and Resources for Quality in Student Assessment. Melbourne: University of Melbourne.

Johnson, R. T. & Johnson, D. W. (1986). Action research: Cooperative learning in the science classroom. Science and Children, 24, 31–32.

Li, Q. (2002). Exploration of collaborative learning and communication in an educational environment using computer-mediated communication. Journal of Research on Technology in Education, 34(4), 503–516.

McMullin, B. (2005). Putting learning back into learning technology. In S. Moore, G. O’Neill, & B. McMullin (Eds.), Emerging Issues in the Practice of University Learning and Teaching. Dublin: AISHE. Retrieved from http://www.aishe.org/readings/2005-1/mcmullin-D01-M10-2004.pdf

Peirce, B. N., Swain, M., & Hart, D. (1993). Self-assessment, French immersion and locus control. Applied Linguistics, 14(1), 25–42.

Slavin, R. E. (1991). Student Team Learning: A Practical Guide to Cooperative Learning. Washington DC: National Education Association Washington DC.
Strauss, P. & U-Mackey, A. (2007). Group assessment: Dilemmas facing lecturers in multicultural tertiary classrooms. *Higher Education Research & Development, 26*(2), 147–161.

Tonkin, E. (2005). Making the case for a Wiki. *Aridane*. Retrieved from http://www.ariadne.ac.uk/issue42/tonkin/.

Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge: Harvard University Press.

Wang, Y. Q. (2009). Design and evaluation of a collaborative learning environment. *Computers & Education, 53*(4), 1128–1146.