

2011

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Recommended Citation

Hughes, K. (2011). 'The Wiki Way: Supporting Collaborative Learning'. In Proceedings of the Irish Academy of Management Conference, 1-2 September, Dublin.

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THE WIKI WAY: SUPPORTING COLLABORATIVE LEARNING

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ABSTRACT:

Skills in working in teamwork are demanded from graduates, and these are ever more likely to be over the internet. Horizon (2011) calls for this need to be reflected in students' project work. The use of Wikis has been posited as a tool for collaborative online knowledge creation, increasing engagement, and social constructivism (Wheeler and Wheeler, 2008). This study aims to contribute to the debate about the role of wikis and student group work, it should be of interest to instructors who use group work in their teaching, and those who wish to explore the application of web 2.0, tools or wikis specifically, in enhancing learning.

Wikis were adopted to support a collaborative group project in the final (fourth) year of a general Business degree for an optional Marketing Communications module. The wiki was chosen in response to some challenges experienced with the assessment, such as poor progress, last minute action, lack of meaningful collaboration, and inability of the instructor to track progress or identify problems.

The students were surveyed after completion of the project regarding: how the wiki was used (method and functionality), participation levels of the group (also measured through the wiki itself), whether they believed the wiki added value for the assessment, and finally challenges encountered.

Their responses demonstrate the enhancement of the groups' collaboration, improved communication and social construction of knowledge. This supports findings of earlier studies (Wheeler and Wheeler, 2009, Lai and Ng, 2011). Challenges associated with using wikis are presented, and recommendations proposed.

INTRODUCTION:

The arrival of Web 2.0 technologies, with its seemingly limitless potential of user-generated content, instant two-way communication and virtual collaboration, has presented educators with new opportunities for increasing engagement and supporting learning at third level (Richardson, 2010). Open source, interactive and easy to use tools such as blogs, wikis and file-sharing tools have been embedded into modules for assessment, and also used within the classroom as learning and teaching aids.

The importance of developing skills in working in groups has long been a focus of third level institutions, and the potential of wikis has been recognised in 'helping students to develop their ability to collaborate and create knowledge' (Cronin, 2009, p. 67). However, the need for further research into their role in supporting learning and collaboration has been identified (Bruen et al., in Donnelly, Harvey and O' Rourke, 2010, Lai and Ng, 2011), as there are only a few empirical studies into the assessment of learning in the Web 2.0 environment.

A single cycle action research project was conducted with the aim of investigating the use of wikis as a support tool for collaboration on a group project. Wikis were adopted to support a

collaborative group project in the final year of a higher education general business degree for a Marketing Communications module. Prior experience of this project identified problems such as superficial analysis, delayed activity and efforts and a lack of meaningful collaboration. In addition, students complained about stressful group work and social loafing. For all of these reasons, along with appeals to integrate Web 2.0 tools into assessment (Horizon, 2011), the wiki tool was implemented.

CONTEXTUAL SITUATION:

This project was conducted in an Irish higher education institution on a group project for final (fourth) year students of a general business degree in an optional Marketing Communications module. It was carried out in the latter part of the first semester, from November to December (six weeks duration). The assessment requires the groups to analyse a brand, and propose objectives, then prepare a marketing communications campaign to achieve these objectives. In total 58 students registered for this module, and self-selected their groups, resulting in 14 groups of between 3 and 5 members. Age range was from 22 to 25, plus one mature student. The wiki was embedded in the Blackboard Learning Management System (LMS) that the students were familiar with from previous modules.

UNDERSTANDING GROUP COLLABORATION:

There has long been a demand for graduates trained in good team-working skills, and this has been reinforced in graduate needs surveys (Elgort et al, 2008). Recently this has been strengthened by the recognition that collaboration is now just as likely to occur over the internet through virtual teamwork and online, due to increasing numbers of mobile workers, as it is in a face-to-face environment. In consequence, the 2011 Horizon report calls for this online collaboration to be reflected in student's undergraduate project work (Horizon, 2011), with the integration of web 2.0 technologies.

Challenges of group work:

Students however often dislike group project work, and this can lead to reluctance on the part of instructors to incorporate them into assessments (Palloff and Pratt, 2005). Some of the challenges of working in groups reported by students include the fact that it can be a source of stress due to varying levels of participation and contributions by members, and conflict over decisions and choices. While group collaboration has been shown to improve grades compared to individual work, these are not always realised in practice due to the challenges encountered (Jaques and Salmon, 2007). Managing and supporting students working in groups in order to avoid or reduce these problems has become a focus for instructors. Research into these issues, and efforts to encourage and assist groups, cited the possible potential of web 2.0 tools in enhancing group collaboration (Wheeler and Wheeler, 2009).

Collaborative learning:

The benefits of collaboration over working solo comprise improved efficiency and effectiveness (O' Sullivan et al., 1996). In addition, improved learning, creativity and critical thinking can all be realised from engaging with others. Wheeler and Wheeler (2009) found that the synergies resulting from diversity of ideas and team member strengths can greatly

raise the quality of the final output, so that the students learn from each other, corroborating prior investigation into group collaboration (Jaques, 2000).

It comes as no surprise then that some instructors were quick to experiment with technology, web 2.0 tools in particular, as an aid to online collaborative learning. These early adopters tended to focus on distance and blended learning courses and modules, where the need was greatest. In recent years, this has diffused into face-to-face and 'mainstream' modules and assessment, and the focus now is on best practice and improving interaction, interactivity and engagement (Palloff and Pratt, 2005, Richardson, 2010), and on collaboration and active learning (Cronin, 2009). Wikis have been singled out as having the potential for 'creating more collaborative and truly interactive online learning environments' (Jones, 2007, p. 460), and their adoption is growing.

In essence, a wiki is a web page to which members can add or edit content. It offers a shared online space that allows students to collaborate to create and integrate their knowledge, and to quickly publish online. Its advantages are its open source nature, the ability to upload images, links, and text, to comment and edit others work, and to track changes or revert to past versions of the site. The individual learner has the ability to create and analyse knowledge, then contribute to a shared repository, assimilating contributions from others: knowledge co-creation (Buolos, Maramba and Wheeler, 2006).

Assessing wiki effectiveness:

While many of the benefits mentioned previously have been realised, some researchers argue that the wiki is in danger of being used just for novelty value, rather than for 'sound pedagogical reasons' (Jones, 2007, p. 460). Not all experiences of adopting wikis in education have been positive. Judd (2010) and Cole (2009) both report negative experiences with wikis.

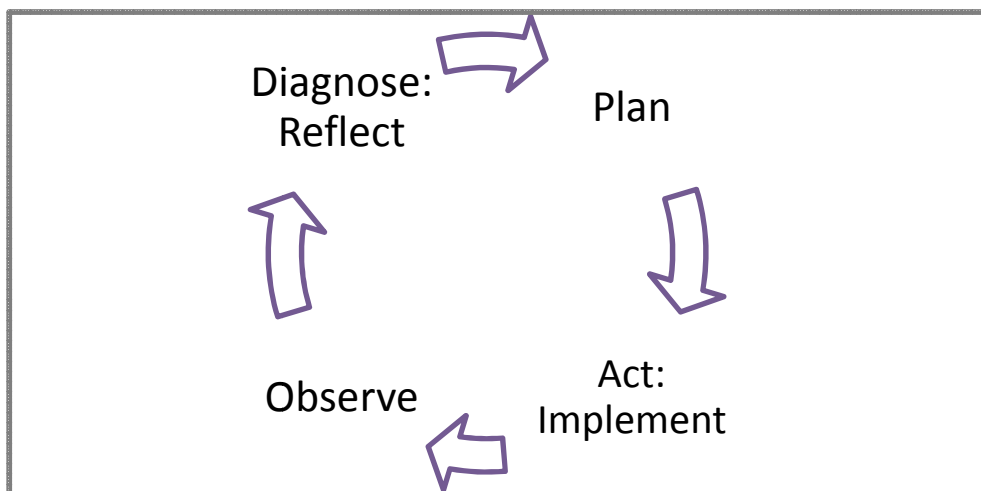
Judd (2010) argues that merely implementing a wiki will not necessarily lead to collaborative learning, and that in fact the wiki activity must be fully integrated in the module, and directed towards achieving specific learning outcomes: constructively aligned (Biggs, 2007). There is a move recently by many educators towards much closer evaluation of wikis effectiveness, through examination of the level and timing of activity and outcomes (Bruen et al, in Donnelly, Harvey and O' Rourke, 2010, Trentin, 2008, Lai, 2011). This is with the aim of ensuring that the early promise of this tool is being met: that students are, in practice, engaged and collaborating actively online.

'Social loafers' is a term given to students who wish only to meet minimum task requirements with minimal cooperation or collaboration (Beaudoin, 2002). It had been expected that the measurement of contribution through the analysis of wiki logs would prevent this social loafing, however this proved not to be the case, and non-participation in groups remains an issue. Clearly, there are a range of issues and challenges related to the practice of using wikis in education.

RESEARCH METHODOLOGY:

The main research objective is to support the students' collaborative learning. Arising from this the overall research question is: Can wikis support collaborative learning in students' group work? As previously stated this constitutes a single cycle action research project. Action research is a cyclical process of reflection, and is particularly suited to educational settings (McNiff and Whitehead, 2010). Its aim is primarily to improve practice. In applying the action research cycle to this activity, the sequence of steps used is outlined below in figure 1:

Figure 1: The Action Research Cycle for Using Wikis to Support Collaborative Learning:



Reference: McNiff, J., with Whitehead, J. (2002). *Action Research: Principles and Practice* (2nd Ed). New York: RoutledgeFalmer.

The cycle can be reiterated a second or even third time. The research methodology is presented under those headings.

Stage 1: Reflection:

The first stage comprised a critical reflection on how the students learning could be improved. Fundamental to this reflection was an investigation of the literature on group collaboration and the potential of wikis to support group learning, discussed in the previous section. Reflection on the context of the students' assessment aimed to further understanding of the challenges they faced.

In previous years, students working on this project were slow to progress their project, analysis of critical sections was superficial, and there was evidence that tasks were divided up, with little communication and collaboration between members. Some groups complained about group work being very stressful and members not contributing equally. The instructor had no mechanism of monitoring group progress or members contributions, and so was unable to intervene or provide intermediate support.

The timescale of October to March, and the significant weighting of 40% contributed to a high risk, high stress group context. There was tendency for the groups to concentrate on analysing the brand selected, and allow little time and effort for proposing a creative

campaign. In addition, there was evidence of poor communication, little collaboration, and loafers. Reflection also highlighted the absence of formative feedback during this process. Unless the students groups were very organised, started early and asked appropriate questions in time to make changes, they had no opportunity to discover whether they were on the right track or not.

Stage 2: Plan:

Following the reflection, a number of changes were made to the assessment structure. The long project was split into two well defined sections: First analyse the brand, and make some fundamental decisions, then for section two, propose a creative marketing communications campaign. Wikis were implemented for section one only, in which students were required to review the industry for a brand and make Marketing Communications decisions about target market, budget and campaign objectives - all using the wiki. The grade was divided, so the groups would receive formative feedback after section one on their progress.

Stage 3: Act:

Students were briefed verbally and in writing (with detailed written assessment guidelines) on the project and expected outcomes. Prior studies such as Cole (2009) indicated the importance of a comprehensive briefing process. Guidance was therefore given on the subject (Marketing Communications) concepts to be addressed and a range of resources made available, with links to these in the Blackboard LMS. The wikis were private to each of the groups. Only a few students reported having previously worked with wikis, all had worked in teams throughout their degree.

Blank wikis were provided to each group and their use was demonstrated in class. The 'Wikis in Plain English' video (www.commoncraft.com) was shown and discussed. A full briefing on working in groups, common challenges, and good practice was followed by a team building exercise. A summary of the briefing activities is as follows:

- Presentation on the learning activity and links to outcomes and assessment criteria (with supporting written document)
- Team work presentation and team building exercise, followed by discussion of the challenges and best practice
- Wiki video shown, wiki in the Blackboard LMS demonstrated
- Class discussion of the assessment, and discussion of linkages to the following semesters assessment

These students had all worked in teams previously, and were used to team work, though as stated, some difficulties with uneven contribution levels and poor communications had arisen previously.

Stage 4: Observe:

This stage comprised monitoring the project and gathering data. A range of data gathering techniques were utilised (McNiff and Whitehead, 2010), including:

- *Instructor field notes:* Students actions and reactions, comments and queries were observed and noted. McNiff (with Whithead, 2002, p. 94) regards field notes as 'important instances of critical incidents', with the aim of documenting important features of the activity.
- *Wiki content and data:* This included the subject information in the wiki, students comments to each other, in addition to the total groups' and individual members' contribution levels. This data can be used to evaluate the students' levels of activity, engagement and collaboration online (Cronin, 2009, Trentin, 2008, Judd, 2010).
- *Questionnaire:* A short, anonymous email survey was conducted after the wikis were completed. This was important to capture the students perceptions of the value (or not) of the wiki, and their experience of group work (Elgort, Smith and Toland, 2008). Of 58 students, 42 questionnaires were completed.

The data collected above was then analysed through a process of sorting, searching, and categorising (Cresswell, 2007, Stringer, 2007). This was then interpreted and triangulated to generate evidence (McNiff and Whitehead, 2010), and reveal key themes. The findings from these are discussed below.

Getting Started:

Despite the time spent on training and familiarisation, additional class time needed to be allocated to the wiki project. When little activity was detected in the first two weeks, class discussion uncovered a lack of clarity of expectations, and a lack of confidence with the activity. This mirrored previous studies, such as Wheeler et al. (2008), when a slow start was due to uncertainty regarding lecturers' expectations, and the potential and functionality of the wiki (for example, whether it could be edited, what style should be used: essay or bullet points).

It became evident that project needed to be treated as a process, with ongoing instructor intervention and workshop-style classroom activities. Examples of other students' wikis were demonstrated, with encouragement to integrate links, images and video in addition to traditional academic material such as theory and references. Class time was set aside for mini workshops on problems and challenges, which ranged from technical issues such as access and formatting, to presentation queries. These were designed according to the students evolving challenges and needs as evident from the wikis, and required a level of agility on the part of the lecturer, as the issues raised anticipated immediate resolution:

'Can we edit posts in this or once its up is that it final?'

In these early stages many queries were technical, regarding access, passwords, and editing of the wiki. As the students overcame these difficulties, the workshops advanced to content-based issues.

Level and Timing of Contributions to the Wiki Sites:

All groups worked successfully with the wikis, that is, they fulfilled the requirements of creating individual pages for each element of the learning activity, and made valid proposals for their brand. The 58 students created a total of 1,200 page versions, during 7,980 views, resulting in the creation of 152 pages of content across the 14 groups. Timing of their contributions was well paced, though evidence points to much lower activity in the first four weeks. Instructor field notes indicate that the students were working on their industry research first, before uploading information for collaboration. These findings reflect similar experiences by previous researchers such as Judd, Kennedy and Cropper (2010), and Trentin (2008).

Technical issues:

Early on, some technical issues arose – selection of group members and access to the wiki for each member, and creation of pages were common problems. It was necessary to demonstrate this a number of times before the ‘laggards’ had got to grips with the technology. In future, it may be worth considering introducing wikis in a laboratory-based environment, where issues such as these could be ironed out quickly. There were a few access difficulties with different machines, passwords and internet browser compatibility:

‘We also tried to use wiki chat, but that was unsuccessful, so we used Skype instead’

‘We all found it very difficult to use so we ended up meeting up, doing it on word then putting it on Wiki’

Students later reported difficulties with the absence of spell check (even though it is available), and a word count facility as creating extra work. In hindsight, some written instructions on wikis that students could refer to later may address and resolve some of these problems. Some students became more expert in the technology and influenced other groups to work to improve their own wikis, for example with embedded video. Some features were adopted as improving efficiency:

‘Used chat which meant we didn’t have to meet up as much, also linked with skype.’

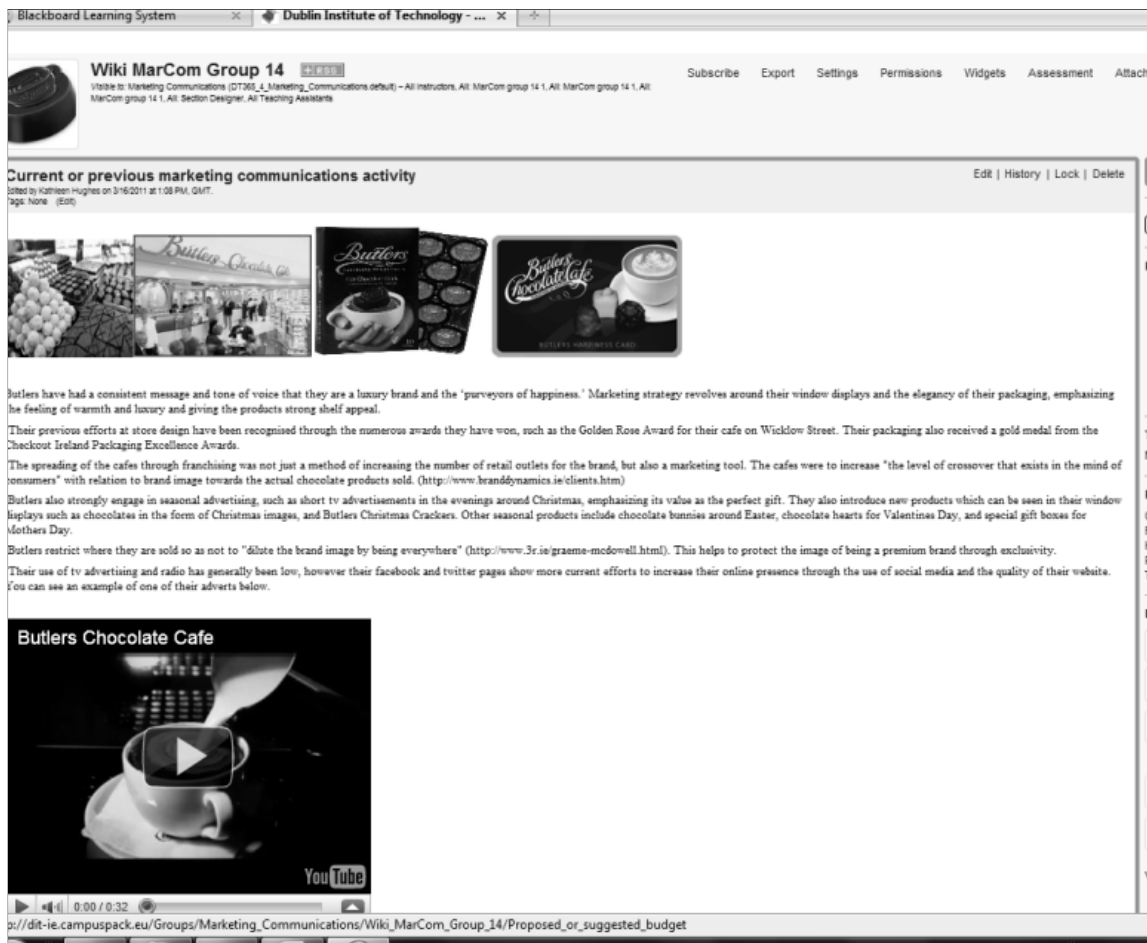
Tutor reflections noted a lack of confidence with the technology for some students. This was evident when the assessment was first briefed and later in individual queries. As this group is soon to graduate and expected to work efficiently online, this was a concern. After working with it for the duration of the project, 57% of respondents reported that they *‘found the wiki easy to use’*, with just under 12 % (11.9%) reporting that they found it ‘difficult’ or ‘very difficult’.

Some early comments include:

‘What part will i start now so?’ ‘Do we need to add a bibliography?’

This is an example of one of the queries that prompted intervention. I reviewed the use of the wiki in class, showing how to edit, and demonstrated the expected format. By the end of the project all groups had become proficient with the technology, uploaded text, video, images and links to the wikis, added attachments and some had personalised their wiki with the relevant brand logo (see figure 2 below).

Figure 2: An example of one of the wikis created by the students (names hidden), personalised, with logos, images and video:



Cooperation in Learning:

Many of the groups (though not all) used the comments section to comment on each others' work, communicate and suggest changes or next steps, with a total of 105 comments made (Students names have been changed throughout, to preserve anonymity):

'Swot is lookin great Sarah and Jack can we move it to company and focal brand section though?'

'Oh thanks you think what I have looks alright? Its hard to actually find the ads, I mostly have to find videos on youtube! I have to go into more detail about the ads and who they're targeting etc, I'm just adding bits as I go along! I just looked at your bit and I think it looks really good :)'

'Just made it look more like a report, gonna do it to the others [pages] when i have the time. David your spelling is god awful.'

As found in previous research (Judd, Kennedy and Cropper, 2010), students were much more likely to edit a page than to make a comment. In terms of online collaboration and communication, 52% of the survey respondents reported that they worked mostly face-to-face

on the project, with only 7% working mostly online, and 41% meeting half online and half face-to-face.

Collaboration:

Examination of the history and wiki contributions reflects evidence of the students learning and collaborating on the project. These findings were triangulated by the feedback from the student email survey and from the instructor observation notes. Some student groups used the comment facility of the wiki to develop ideas and create knowledge together, which corroborates previous studies (Judd, Kennedy and Cropper, 2010):

Student A: *'so lets look at the characteristics of this market? price sensitive? - yes!'*

Student B, in response: *'The pizza industry is definitely effected by price sensitive customers. The [Brand A] dominance of the Irish pizza industry could be affiliated to the excellent meal deals they have as opposed to the standard of the food. [Brand B] Pizza, i think we agree, is fairly expensive. However, thats the target market they want. Young professionals willing to spend money on a higher standard of pizza. Considering the location of the restaurant. Any more thoughts???'*

There is evidence in this and other groups wikis of this type of interaction and idea-generation online. In addition the students found they could improve and add to each others' work, though not all were happy with this aspect of the wiki, some students do not like the idea of 'their work' being changed (Cronin, 2009). The following comments are from the email survey, post project, in establishing how the group used the wiki:

'Used it to discuss aspects, topics, ideas for the theme/company. Then ideas were posted so that others could add input.'

'We each began a section of the assignment and then the other group members could edit it or comment on it'

In previous years, group-work was reported as a source of stress for this class. There is evidence from the wiki of the students supporting each other, co-creating knowledge and collaborating. The wikis were built from joint efforts, all students participated in the wikis, uploaded information etc. The comments show an effort to improve standard and organization of their work, using headings and sub-headings.

'We used the wiki to view each others' work and comment where we felt changes should be made.'

'it is easier to see someone's work immediately to check if your work is on the right track with the project.'

'We could see what others were writing which ensured that we didn't repeat what others had already said and that we were all going in the same direction'.

Evidence of learning from and with each other is demonstrated by the improvement in the content of the wikis and the overall grades achieved, and learning outcomes were met. Collaborative did occur, with encouragement and support throughout the process.

Disadvantages of the Wikis:

Not all students used the comment facility; a few preferred to discuss issues face-to-face, and some worked together around a laptop, making changes as a group. This rendered the wiki individual contribution measurement tool meaningless for those groups, and made the wiki just extra work!

'it adds more work than necessary, would be better off without it'

In a similar vein, some groups clearly had a successful history of collaboration:

'We got together in the college and worked together like we do with most assignments. I am in a group with friends that I am with anytime I am in college so working together was never going to be a problem'.

For these groups, the wiki did not appear to add much value.

Convenience and Efficiency:

Students separated from each other physically were more enthusiastic about using the wiki. Although this is a full time, campus-based programme, some students travel a distance to attend classes and their availability for meetings became problematic when unanticipated heavy snowfalls closed transport links (and the college) in December:

'One of the group members lived outside of Dublin and we were able to get input from her on the project during the bad weather in November and December because she could work on the project from home'.

Some just found it efficient and time saving:

'It was a convenient way for a group to work together without 4 people sitting around one laptop. It also helped not having to trek into the college to carry out group work.'

The challenges of meeting up are often reported as one of the hurdles of group work (Jaques, (2000), so this was an important benefit. A number of the students stated their intention to use wikis in future group projects, perhaps one of the best indicators of success!

Students' opinions:

Other comments that don't fall into the previous categories indicate students personal views of using the wiki:

'It allowed us all to really contribute to the assignment. We all had a voice and everyone was heard. It was a great way to ensure everyone pulled their weight.'
'I think its something that should be implemented for all assignments'.

Tutor as moderator:

Once the students began using the wikis the tutor was able to monitor the progress of the students, and view and track their activity on the wikis in a way not possible on other platforms. This development was new to both the students and the instructor, and presented some interesting challenges (Salmon, 2003). It made sense to then allow time in class to address whatever issue was current for the students – for example researching target markets – and a set of ‘frequently asked questions’ was developed as a resource.

These interventions evolved as required in this instance, but required time and a certain agility. It would be beneficial for future projects to attempt to predict and pre-plan these, around ‘common problems’, and techniques. Similarly, additional resources available through the students’ Blackboard LMS could be further developed, to include both technical trouble shooting, and academic and content support information.

CONCLUSION: CAN WIKIS SUPPORT COLLABORATIVE LEARNING?

There can be no doubt that web 2.0 technologies will play an ever increasing role in higher education. The findings from this research suggest that wikis can support and add value to collaborative group learning, in the form of improved communication, a sounding board for ideas and repository for information. It is clear that the learning and collaboration can and does occur in an online environment. In addition the advantages of improved communication, overcoming physical distance and a single version were much appreciated by many groups, who saw this as an efficient and effective medium that they would like to see adopted much more widely.

Some challenges to implementing wikis were identified and should be highlighted. The necessity of constructive alignment has been widely discussed, so the wiki assessment was aligned to learning outcomes, teaching strategy and grades. However, the new technology was in hindsight not given enough attention. It is recommended that the use and features of wikis requires more than a single briefing and demonstration. It would be beneficial to make available a guide to the features (such as editing, page history, chat etc.) and how they work, for students to consult as needed. In addition, in some situations it may be appropriate to hold the briefing in a laboratory, where students may engage with the technology immediately.

The advantages of using wikis for the tutor have been identified in the literature, along with the instructors’ role (Salmon, 2003). It allowed monitoring and tracking of the groups’ activity and progress, which then set the agenda for in-class workshops on the groups’ evolving project.

This study has demonstrated the unique capabilities of wikis in supporting students’ collaborative learning in this context, and has contributed to improved practice. Future development of the research described in this paper (cycle 2) will involve deeper examination of the changing role of the instructor, the implications of e-moderating on class activities, and of students levels of engagement and collaboration.

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