

PAPER 8

Teaching with wikis: addressing the digital divide

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Abstract

This paper addresses some aspects of the digital divide affecting teachers and learners in higher education. These relate to divisions arising from variable rates of technology adoption by teachers, which may be especially problematic when students' uptake of technology is much more rapid than those who teach them, and also to divisions within the student body which teachers need to accommodate when they plan the design of learning.

To address these divisions, we designed a pilot online workshop to prepare a small group of teaching staff at two Australian universities for using wikis in teaching and assessment. Participants were immersed in the experience of collaborating on a project in a wiki as learners, and then asked to reflect on this experience as teachers. We used a participatory action research approach with a view to developing a community of enquiry to investigate this experience for improving future offerings, and informing the participants' teaching practice. This paper reports on the professional development effort, reflecting on the successes and limitations of the work, and lessons learned in relation to bridging the above aspects of the digital divide. We then comment on the potential for further development in the context of the evolution of learning technology as a research discipline.

Introduction

In this paper we report on a pilot online workshop on wikis in teaching and learning collaboratively offered by Deakin and Monash Universities in Australia, in order to address aspects of the teacher-teacher, student-teacher, and student-student digital divide. Today's university students possess varying levels of technological competence, as do teachers. While keeping up with technological change is important to both, assistance with the related professional development is critical if teachers are to be ready and confident to exploit the capacities of new technologies to improve student learning. The workshop aimed to help prepare staff for teaching with wikis by asking them to experience the wiki environment as students and then analyse this experience as teachers. This exposed them to a range of theories, practices and affordances related to teaching with wikis. We used a participatory

action research approach, and the concept of developing a community of enquiry, to implement and reflect on the successes and limitations of this virtual professional development work, and assess the lessons learned, in terms of its contribution to bridging the digital divide, and potential for further refinement to improve the teaching practice of participants.

Digital divisions and Web 2.0 technologies

Generationally, today's university students are diverse. They include 'Baby Boomers' who grew up prior to the digital age, Generation X students who are comfortable with technology (Hoerr, 2007) and 'digital natives' (Prensky, 2001) who include Generation Y and teenage 'Millennials' (Kennedy, Judd, Churchward, Gray & Krause 2008; Oblinger, 2003) who view technology as part of life.

Despite the generational diversity, the majority of students entering university today are Millennials. While Prensky (2001) describes the orientation of 'digital natives' to technologies in generational terms, Bennett, Maton and Kervin (2008) review the evidence in the 'digital natives' debate and suggest that variation within generations is as great as between them. In extensive surveys of first year students, Kennedy et al (2008) found considerable variation in use and preference for technologies beyond the entrenched computers, mobile phones and email. Wilson and Stacey (2004) and Mahoney and Wozniak (2005) use Rogers' (2003) diffusion of innovation theory rather than a generational framework to describe differences in uptake of e-learning strategies by university teachers. In this context, a 'digital native' may be seen as similar to an 'innovator' or 'early adopter' and a 'digital immigrant' as akin to a 'late adopter'. Though many teachers have been using learning management systems (LMS) and are comfortable teaching online, Web 2.0 applications offer a range of affordances which require reconceptualising teaching and learning beyond the rethinking that may already have occurred when first embracing online teaching. Hence, a digital divide is forming between the mainstream teacher using the LMS and the innovative, technologically competent teacher (Mayer, 2006) who has adopted more recent applications. Web 2.0 technologies or 'social software', including wikis, blogs, social bookmarking and social networking services (such as MySpace and Facebook) enable unprecedented sharing and collaboration between users. Dron (2007, p.233) notes that 'one of the most distinctive features of social software is that control and structure can arise through a process of communication, not as a result of design, but as an emergent feature of group interaction.' This places control in the hands of users, compared to centralised teacher control as in an LMS, presenting unfamiliar challenges to some teachers about how best to support learning.

In relation to our focus on teaching with wikis, the challenge is not just about operating the software but about developing a new pedagogy based on exploiting the advantages of wikis and designing learning approaches that suit diverse student groups. Teachers need to rethink learning activities to allow students to benefit from the environment, while also accommodating those who need support to engage in collaborative, virtual knowledge building which reflects 'the wisdom of crowds' (Surowiecki, 2004). Student activities need to be shaped to create a learning community that provides for learner freedom and democratic participation and is capable of synthesising multiple narratives. Moving campus-based study groups to virtual spaces and ensuring that they operate independently is a challenging new skill for teachers. Our three-week long workshop was directed at extending these skills of some interested teachers.

Theory

To guide workshop planning we drew on Wilson and Stacey's (2004) review of professional development programs to prepare staff for online teaching. They note the importance of situating learning activities in authentic contexts and providing opportunities for staff to

share experiences, ideas and reflections with others as they engage as learners, referring to the benefits of combining online and face-to-face learning opportunities so staff experience learning online from the learner's perspective. They also note the benefits of accredited courses that are embedded into the organisation, though we were unable to offer this.

However, we recognised the potential for supporting professional development through communities of practice (Chalmers & Keown, 2006). The use of communities of practice as 'groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise ... by interacting on an ongoing basis' (Wenger, McDermott & Snyder, 2002, p.4) puts into practice ideas from social constructivism (Vygotsky, 1978) which have been dominant in conceptualising social engagement online. Extending this notion, Garrison and Anderson (2003) define a community of enquiry in an educational setting as a critical community of teachers and students who engage in transactions that will further their learning, simultaneously encouraging both cognitive independence and social interdependence. This provided further focus for our planning.

Reflecting the emerging confluences between educational approaches and paradigms which support participatory enquiry (Guba & Lincoln, 2005; Lincoln, 2001), we also planned to implement a participatory action research approach. This is an established model for staff development in higher education (Kember & Gow, 1992; Grundy, 1995; Webb, 1996) that supports critically reflective thinking about one's own practice, is grounded in the principles of teamwork and collaboration to forge new meanings from experience, and offers a clear framework for acting on these (Brookfield, 1995; Carr & Kemmis, 1986; Kemmis & McTaggart, 2005). We hoped that after the initial planning, we would be able to engage with participants in action, observation and reflection, and together identify implications for improved understandings about teaching with wikis, drawing on the value of dialogue for generating new understandings. Reflecting critical theory perspectives (Freire, 1972; Habermas, 1971; Mezirow, 1991), we saw this as empowering both participants and ourselves through critical reflection to foster self development (Cranton, 2006), transforming our understandings about teaching through the experiences offered by this use of wikis.

In addition, the iterative nature of this approach appeared appropriate to the evolving state of knowledge in the area, thereby contributing to the scholarship of teaching and learning by conceptualising the renewability of knowledge about teaching as a form of enquiry (Hutchings & Shulman, 1999), and addressing the divide between research and teaching (Brew, 2006). Current explanations of the scholarship of teaching and learning refer to engagement with the scholarly contributions of others, reflection on one's own teaching practice, communication and dissemination related to theory and practice for members of one's community to build upon (Shulman, 1999), and include ongoing collaboration with students as partners in learning (Trigwell & Shale, 2004), all of which we aimed to address through this project.

Method

We integrated collaborative planning, action, observation and reflection into the workshop design as outlined below.

Planning

Our planning involved design of the wiki environment, including the workshop task, debriefing process, and definition of our role as the three workshop facilitators, with a view to including participants collaboratively in subsequent stages. This was based on successful previous experiences of designing workshops on aspects of e-learning using a blended learning approach where we engaged with the participants as teachers to reflect on the experience following their immersion in a task as students (Benson, Brack & Weaver, 2007). Workshop design was also informed by experiences of using wikis in

teaching first and second year undergraduate students (Brack, Stauder, Doery & Van Damme, 2007) where students in groups were asked to create a wiki presenting their exploration of a biomedical topic within three weeks. The first year students had not previously met, and the course was completed online only. Since an informal survey indicated that most students had no experience with wikis, they were provided with step-by-step instructions on how to set up and use their wikis, and advised of group work strategies and of how to use the wiki discussions for communication and project management.

Workshop design

A wiki titled *Wikis in Higher Education* was planned as the primary workshop site and would include:

- resources about the use of wikis in higher education that participants could draw on;
- the workshop task to be completed in teams balanced in terms of experience and combining Deakin and Monash participants;
- guidelines about working on a wiki; and
- links to two workshop team wikis (*Workshop Wiki 1* and *Workshop Wiki 2*).

We planned to advise participants by email when the workshop opened and provide login details, asking them first to log on to *Wikis in Higher Education* to introduce themselves, identify their task and the team they would be working in, and then to log on to their individual workshop wiki to negotiate addressing the task and developing their team response. Workshop wikis would be restricted to team members. The software used necessitated a double login: to the University server, then to each wiki.

We designed a workshop task similar to a student group project that could be undertaken in a wiki, involving assessment of process and outcomes, individual and group participation and a 'product' to be created. At the scheduled completion of the task, participants would be given access to view the other team's wiki, then return to *Wikis in Higher Education* for debriefing. We allocated two weeks for the workshop task and one week for debriefing.

We envisaged that our role as facilitators during task completion would primarily be to observe, and be available to answer questions or offer guidance via the workshop discussion on the *Wikis in Higher Education* site. We intended to take a more proactive role during debriefing in order to facilitate feedback and reflection, summarise participant responses, and share facilitator reflections. We saw *Workshop Wiki 1* and *Workshop Wiki 2* as belonging to team members.

Action

Preparation

Figure 1 shows the relationship between *Workshop Wiki 1*, *Workshop Wiki 2* and *Wikis in Higher Education*.

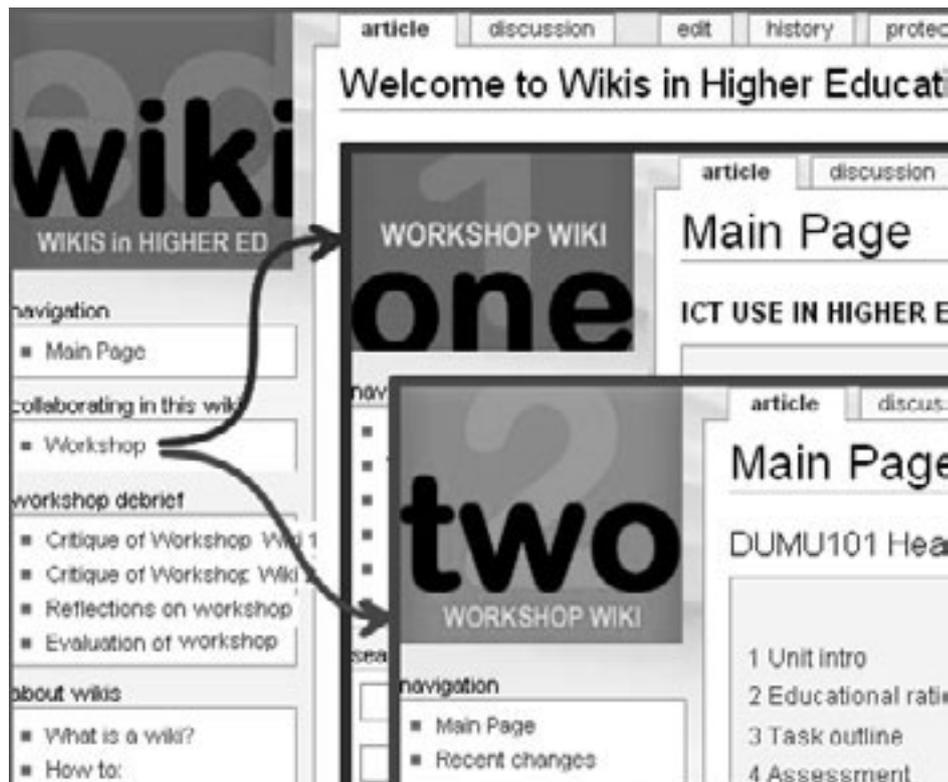


Figure 1 The relationship between wikis

We sought staff interested in participating in the workshop. Thirteen volunteered, including eleven lecturers, one Associate Professor and one courseware developer. They included seven Deakin University participants, the majority of whom were trialling wikis for teaching, and six from Monash University with previous LMS experience, but none in using wikis. We allocated six staff members to Team 1 (in *Workshop Wiki 1*) and seven to Team 2 (in *Workshop Wiki 2*).

Completing the task

We provided task details on *Wikis in Higher Education* and on the Main Page of each workshop wiki, suggesting that participants delete them from the latter when they were ready to begin. We advised them that by undertaking the task they would:

- engage in a wiki as students;
- work collaboratively in a team to create a small body of work;
- present the work in a form which takes advantage of the wiki environment; and
- review the work created as teachers.

We gave the following instructions:

- 1 Identify a student group project which could be undertaken in a wiki.
- 2 Use your wiki with your team members to develop a set of guidelines you will give your students on working collaboratively and presenting their work on this project in a wiki. These will form the instructions you will be giving your students prior to the project you identified above. Use the discussion area in your wiki for group planning.
- 3 Include in your guidelines a simple rubric to assess (a) the wiki content, (b) the group effort, and (c) the individual effort.
- 4 Use the features of the wiki to present your guidelines in a way that takes advantage of the wiki environment.

We included two examples of potential tasks, and noted the availability of additional information (e.g., about preparing rubrics) on *Wikis in Higher Education*.

Observation

We observed task progress through to completion, though some changes of plan occurred during the workshop, resulting in us taking a more active role than anticipated.

Reflection

We asked participants to return to *Wikis in Higher Education* for debriefing, requesting them to:

- 1 **critique** the other team's wiki and comment on content (including the rubric), the team effort, and the individual efforts;
- 2 **reflect** and comment on the experience of working collaboratively in the wiki environment, identifying what they learnt and ideas for using wikis in teaching and learning; and
- 3 **evaluate** the workshop itself, commenting on what was useful and what required changing.

As facilitators, we also recorded our own reflections during the task completion phase of the workshop.

Results

Participants' progress during task completion is summarised in Table 1. They did not return to *Wikis in Higher Education* as planned while they worked in their projects so we sent group and individual emails (e.g., on day 4) to offer encouragement and support. When the wikis did not take shape on schedule, we also offered some guidance in the workshop wikis (e.g., on day 7).

Day	Progress
1	Six participants introduced themselves on <i>Wikis in Higher Education</i> .
2	We sent individual emails to the other seven to request their introductions. Six responded. We added notices to the Main Page of all three wikis to clarify requirements and encourage participants.
3	Four participants in <i>Workshop Wiki 1</i> accessed their wiki, and two in <i>Workshop Wiki 2</i> .
4	Two further participants accessed <i>Workshop Wiki 2</i> . No additional participants accessed <i>Workshop Wiki 1</i> . Participants began negotiating but neither group had begun the task. We sent an email to participants with advice on initiating the task.
5	Two participants began the task in <i>Workshop Wiki 1</i> (both had previous wiki experience). Two began discussing the task on the Main Page of <i>Workshop Wiki 2</i> but did not begin the task. At the end of Week 1, four participants had accessed each workshop wiki.
6	The thirteenth participant joined the workshop, contributing to the discussion in <i>Workshop Wiki 2</i> . Two additional comments were made on the Main Page. A small contribution was made by a third participant in <i>Workshop Wiki 1</i> .
7	A small contribution was made to the task in <i>Workshop Wiki 1</i> . The sixth participant accessed <i>Workshop Wiki 2</i> , making some comments, but no contributions to the task. We added messages to both wikis and some headings to the Main Page of <i>Workshop Wiki 2</i> to model use of the space for the task (rather than for discussion).
8	There were no contributions on either wiki.
9	There were no contributions in <i>Workshop Wiki 1</i> ; one participant began the task in

	<i>Workshop Wiki 2</i> , with a small contribution by another.
10	<p>Three participants contributed to <i>Workshop Wiki 1</i>, one taking a major role in finalising the task. One of the two who had made comments on the Main Page of <i>Workshop Wiki 2</i> on Day 6 made a final contribution and sought help from others.</p> <p>At the end of Week 2, five participants had accessed <i>Workshop Wiki 1</i>, with two making major contributions to cover basic instruction requirements (including the rubric) but with some gaps. Six had accessed <i>Workshop Wiki 2</i>, with one making a major contribution to provide an outline of the task response using the headings we provided on day 7 (but no rubric).</p>

Table 1 Progress during task completion

The debrief

Contributions to the three debrief components are summarised below.

Critique

Four Team 2 members contributed to the critique of *Workshop Wiki 1*, making positive comments about content and group effort. Three Team 1 members critiqued *Workshop Wiki 2*, noting limitations in content (lack of proof reading, task confined to the Main Page, content appropriate but not well organised) and commenting that the group spent too much time on the task context rather than the task itself. Both teams referred to the need for teamwork guidelines or leadership. Neither group commented on individual efforts. We contributed to the critique to demonstrate use of the 'history' function of wikis for assessing individual contributions.

Reflection

Eight participants contributed reflections on the *Wikis in Higher Education* site, referring to:

- the usefulness of the workshop for contextualising how wikis can be introduced to students ('not as straightforward as I first thought');
- how the workshop experience forced participants to be prepared to modify others' contributions ('I really had to get my head around changing other people's contributions'), and noting that democratic approaches are time consuming and require new ways of working;
- the need for more time to discuss and develop a strategy for the task ('we wasted many days simply by "not being there for each other"');
- the need for more time to explore and become familiar with wiki navigation, functions and potential ('navigation in the early stages was very difficult for me'); and
- the importance of investment of time in team formation and development of trust ('we came as strangers and left as individuals').

Evaluation

Five participants contributed evaluation comments, suggesting that the experience of participation was the most useful aspect of the workshop. However, they noted that the value of participation was diluted by:

- technical issues (especially the double login and lack of familiarity with the wiki environment);
- lack of time on task and issues related to group formation; and
- a sense of needing more guidance and leadership.

Discussion

Despite the problems which suggested a need for more orientation, the basic design of the workshop seemed appropriate, including the aim, objectives, the structure (incorporating

the debrief), and the idea of a collaborative task with an output reflecting an assessable student project.

A facilitation issue which emerged was that of determining an appropriate balance between giving help versus giving ownership and control of the workshop wikis to participants. Although we saw the workshop wikis as 'belonging' to the teams, participants hesitated to take leadership, did not offer to undertake specific roles as we suggested, looked for consensus and were reluctant to edit peer work. Some participants suggested that the groups should be provided with a leader but this would have removed negotiation of roles as part of the task, and undermined the egalitarian wiki environment.

The performance and experiences of participants compared with the undergraduate students mentioned earlier are illustrated in Table 2.

	Students	Staff
Performance	<p>Majority accessed wikis within 24 hours</p> <p>Used the discussion to organise tasks, time, troubleshoot</p> <p>Edited wiki early (within three days) and appropriately</p> <p>Task completed within time limit</p>	<p>Eight of 13 accessed workshop wikis at one week</p> <p>One team used the wiki itself for discussion</p> <p>Editing of wiki started on day 5 (Team 1) and day 9 (Team 2)</p> <p>Task only minimally addressed</p>
Experience	<p>Groups self-managed</p> <p>Facilitation (via email) only required in first week</p> <p>No facilitation in wikis required</p>	<p>Teams needed support in teamwork</p> <p>Facilitation required throughout</p> <p>Intervention and modelling required in wikis</p>

Table 2 Comparison of student and staff performance and experience

The students found wikis easy and enjoyable, and appreciated the benefits of using them for online group work. In contrast, staff struggled with the technology and with collaboration. While the differences in performance and experience of the two groups could be seen as a division between 'digital natives' (students) and 'digital immigrants' (staff), there was also a digital divide within the groups of teachers in their role as learners. Some staff did not understand the social aspects of the software, notwithstanding the introductory information and previous LMS experience, while others demonstrated a better understanding, despite the limitations in task completion. Thus, staff differences may be better explained in terms of patterns of adoption related to diffusion of innovation. However, contextual factors affecting the method also appear to have had a major impact as we explain below.

Reflection on theory and method

Although, participatory action research offered a useful approach for conceptualising the investigative aspects of this project, informing ongoing staff development and, potentially, establishing a basis for future collaboration, failure of workshop participants to form functional teams within their wikis impaired their ability to engage with the task and to form a community of enquiry with us.

Consequently, it appeared that the theoretical drivers could be maintained for the next cycle of planning, if amendments are made to the method. Collaborative engagement between participants in the wikis was inhibited by their previous level of technology adoption, lack of familiarity with the environment, lack of time, and by technical issues, indicating a need for more orientation in both mastering the wiki tools and conceptualising how to engage with

others and create a group output. The participant-facilitator digital divide was greater than we had anticipated and the experience suggested that planning of academic professional development activities needs to include higher levels of orientation and support than we provided. A major difference between the staff and student response to wikis related to motivation. For teachers, the imperative to complete an optional professional development task, given the competing pressures of their professional lives, was much lower than might be expected of students undertaking an assessable group project. The establishment of an institutional context which provides rewards for participation would validate the commitment required for the immersive experience to more readily reflect that of a student group project.

Beginning the workshop with a face-to-face session would improve the method so that participants could meet each other and workshop preparation could involve dialogue, empowering participants through a more collaborative approach to the design, and offering a better orientation to working in a wiki, bringing the experience closer to a blended learning environment. If a face-to-face meeting proves difficult to arrange, it is important to introduce some orientation to ensure that all participants have basic familiarity with the technical aspects of wikis and opportunities for group formation processes prior to starting the task. Allowing time for participants to work out the differences between discussion and facilitation in a wiki compared to a LMS, and engaging with them in this process and in workshop planning may also reduce unequal power relationships between facilitators and participants which inhibit development of a community of enquiry.

Conclusion

We acknowledge the limitations of this pilot project in terms of the self-selected small number of participants. The next action research cycle will provide further evidence on which to base subsequent planning. Implementation in different contexts with staff from a range of backgrounds and experiences of teaching with technology will assist in the development of knowledge about how to support staff in these new approaches to teaching. Despite the limitations in developing a community of enquiry with participants during this iteration, the shortcomings provided a wealth of learning opportunities to inform future action, supporting the cyclical concept of action research. Our learning as facilitators was unquestionably enhanced, and comments by participants during debriefing which requested more professional development efforts of this kind, also suggested the potential for them of ongoing collaborative planning and action. It was as though the workshop itself provided the orientation that was required and participants were now ready to move forward. Thus, the experience offered the opportunity to address aspects of the digital divide related to the adoption of Web 2.0 technologies but also some directions for beginning to overcome it, which are supported by the iterative nature of participatory action research in allowing for continuous improvement.

Similarly, the approach appears appropriate to the development of learning technology as a research discipline because, as noted earlier, responsiveness to practice supports the evolving state of knowledge in the area. In this environment, the evidence base may be seen as growing as much through limitations in implementation as through successes. The experience also highlights the disciplinary potential of learning technology as a field of scholarship by conceptualising the renewability of knowledge about teaching as a form of enquiry which relates research and teaching, placing value on incremental scholarly contributions of this kind to build the knowledge base which is necessary to support the development of learning technology as a research discipline.

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