

# Building Collaborative Capacities in Learners: The *M/Cyclopedia* Project, Revisited

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## ABSTRACT

In this paper we trace the evolution of a project using a wiki-based learning environment in a tertiary education setting. The project has the pedagogical goal of building learners' capacities to work effectively in the networked, collaborative, creative environments of the knowledge economy. The paper explores the four key characteristics of a 'produsage' environment and identifies four strategic capacities that need to be developed in learners to be effective 'producers' (user-producers). A case study is presented of our experiences with the subject New Media Technologies, run at Queensland University of Technology, Brisbane, Australia. This progress report updates our observations made at the 2005 WikiSym conference.

## Categories and Subject Descriptors

K.3.1 [Computer uses in Education]: collaborative learning

D.2.2 [Design tools and techniques]: User interfaces

J.7 [Computers in Other Systems]: Publishing

## General Terms

Management, Design, Human Factors, Theory.

## Keywords

Wiki, tertiary education, pedagogy, produsage, social constructivism

## 1. INTRODUCTION

For the 2005 WikiSym conference, we reported on the experience of using a wiki as the key tool for running a second year university subject (New Media Technologies) at Queensland University of Technology in Brisbane, Australia (Bruns and Humphreys, 2005). In this project we sought to align a constructivist approach to learning and teaching with technological tools suited to participatory learning. Students used

the wiki collaboratively on a number of tasks, to develop the advanced skills and capacities relevant to their future participation in the workforce in the era of the networked knowledge economy (Castells, 2001, Leadbeater and Miller, 2004, Howkins, 2001); specifically, they collaborated on the development and extension of an online encyclopaedia of new media terms and concepts. Student work was also published at the end of semester in the *M/Cyclopedia of New Media* (wiki.media-culture.org.au), a publication under the M/C – Media and Culture imprint.

Building on our further experiences with this project, in this paper we elaborate on the rationale for restructuring modes of educational experience in this way, through a framework that explores the concept of 'producers' (or active user/producers), and a set of pedagogic goals (C4C) reflecting the needs of practitioners in a networked economy. We canvass the experiences of a number of educators working with wikis, and in the final section give an update on the *M/Cyclopedia* project in the New Media Technologies subject which we reported on in 2005. We reflect on the experiences made so far with this implementation of a wiki in an educational setting, and the ways in which the subject has been adjusted over several iterations based on student feedback and an evolving understanding of what frameworks and approaches such new learning environments require.

## 2. PRODUSERS AND PRODUSAGE IN THE KNOWLEDGE ECONOMY

The shape of work practices is changing as we move deeper into the paradigm of networked economies and networked production. It is not just that digital environments are offering new modes of accessing and participating in the production of digital content. It is that these processes are part of a broad-scale shift where collaborative participation in productive networks has become an essential part of making a living for many people. Peer production and open networks are shifting from the periphery to the core of economic activity (Benkler, 2006). Bruns has written elsewhere (Bruns, 2007b) of the phenomenon he calls produsage, and the activities of producers, that are shaping the new economic structures. Here we give a brief summary of what producers do, what produsage is, and what the four key characteristics of this mode of content creation are. From this taxonomy we identify four key skills needed to survive and thrive in a knowledge

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economy. These are core capacities which should be developed and reflected in our education institutions.

In the emerging social software, 'Web2.0' environment, the production of ideas takes place in a collaborative, participatory mode which breaks down the boundaries between producers and consumers and instead enables all participants to be users *and* producers of information and knowledge, or what can be described as producers. These producers engage not in a traditional form of content production, but are instead involved in produsage – the collaborative and continuous building and extending of existing content in pursuit of further improvement. This kind of activity can be witnessed in a wide range of contexts – from *Wikipedia* and open source software projects to computer games with their mod communities (Humphreys, 2005), blogs, *MySpace*, and *YouTube*. The users create the content, share it with their peers, and add to others' work (under varying terms and conditions). We have shifted away from the linear modes of production associated with industrial-era mass markets.

Produsage has four fundamental characteristics:

1. It is **community based**. Produsage is based on the collaborative engagement of (ideally, large) communities of participants in a shared project. This represents an important shift from industrial production which mainly relies on the existence of dedicated individuals and teams as content developers. Whether in open source software development, citizen journalism, or creative projects, produsage assumes that the community as a whole, if sufficiently large and varied, will be able to contribute more than a closed team of producers, however qualified. This doesn't preclude commercial enterprises from participation; however, they may find themselves having to accede to unaccustomed terms and conditions in order to participate.

2. Participants occupy **fluid roles**. Different users or producers will occupy different roles throughout the life of a project. Rather than the rigid hierarchy of roles structured into many linear production models, produsage environments rely on a more heterarchical form, where participants shift in roles over time. Ideally, producers in a community of produsage participate as is appropriate to their personal skills, interests, and knowledges; such participation further changes as current points of focus for the produsage project change. Active content contributors on one aspect of a project may participate in quality assurance processes on another, or may at times act 'only' as users (yet returning to active duty as producers if in the course of their usage they identify the need or potential for further improvement or extension).

3. The 'artefacts' are **unfinished**. In this dynamic model, 'products' are always subject to ongoing work, adjustment, updating, fixing, expansion and so on – they are ultimately merely temporary artefacts of an ongoing process of content development. The 're-mix' practices exemplified through the reworking of texts are made visible in these environments, where revision histories and iterative development pathways can be traced. Artefacts are under continuous development, and never reach a static end point.

4. What is produced is **common property**, although recognition of the **individual merit** of contributors and contributions is a standard feature of produsage environments. Thus, the collaborative nature of the work process, and the capacity to make visible the ways in which individual contributors' work builds on the work of others, render the notion of intellectual property and individual ownership problematic. Often the matter of intellectual property is addressed through legal mechanisms such as open licences, but there are examples of the opposite, where participation is conditional upon the producer signing away their rights beyond what is required for produsage to function. Where intellectual property rights have been sufficiently addressed, on the other hand, the community model generally operates on the basis of merit rather than remuneration: users' motivation to participate as producers is found in the community recognition of individual participants. (We will return specifically to this point when discussing individual assessment in produsage-style group projects in an educational setting).

These four characteristics exist largely in contrast to the linear modes of production and work found in industrial-era paradigms. It is of course the case that our educational practices reflect very much the production modes of the times. At this point of potential transition to the post-industrial frameworks of the knowledge economy we need to consider what the networked models of produsage might require in terms of graduate skills and capacities, and how educational settings can encourage the development of these capacities.

Such transitions necessarily require adjustments in institutional and teaching practices. As Hamer points out, "it is not a simple matter to come up with new course objectives, assessment methods, measures of success, expectations, responsibilities, workloads, quality controls, not to mention learning material." (Hamer, 2006:68) Adjusting learning and teaching strategies to the networked environments, and engaging students by using tools such as wikis, can have a significant impact. Lund and Smørdal point out that "the nature of the school subject (ontology) changes, how we come to know the subject (epistemology) changes and the underlying activity system of teaching is transformed" (Lund and Smørdal, 2006:39). These disruptions are handled with varying degrees of comfort and success by teachers and learners.

### 3. EDUCATIONAL STRATEGIES – THE C4C MODEL

There is a growing need for education to address and problematise the process and practice of user-led content creation, in order to help learners develop a more informed, self-reflexive, and critical perspective on their own practices as information seekers, users, and providers, and to enable a wider range of participants to engage successfully in user-led environments. It is necessary for universities to explore ways to model the processes of produsage in their learning and teaching environments. Traditional and rigid teacher/learner, staff/student, university/client dichotomies are counter-productive to the development of an understanding of the co-creative, collaborative process of produsage, which – as noted above – thrives on a fluid and heterarchical (rather than

hierarchical) organisation of participants. The capacities we must aim to build as we address produsage are not new, but are given new emphases in the context of the outlined produsage characteristics. (These capacities were first developed in a Large Teaching & Learning grant project at QUT – see Bruns et al., 2007, and Bruns, 2007a.)

They are the capacities to be:

1. **Creative.** Rather than employing a narrowly ‘artistic’ definition of creativity here, we mean content creation (artistic, information, knowledge) more generally. The development of creative capacities that can be exercised successfully in the collaborative environment of produsage. Participants need the skills to be collaborative co-creators occupying flexible roles, in contrast to educational practices aiming to position them as self-sufficient creative ‘producers’.

2. **Collaborative.** It is important to build the capacity for collaborative engagement under fluid, heterarchical rather than hierarchical structures. Part of the skill set here is developing the capacity to know when, where and with whom to collaborate, and under what circumstances not to do so. Learners need to come to understand the consequences of collaboration (including questions of intellectual property management as well as the ethical aspects of collaborative work).

3. **Critical.** The most commonly understood critical capacity that educators seek to encourage is that of critically engaging with content produced by others. We extend that notion to a number of other fields. To begin with, participants in co-creative environments need to develop sufficient critical capacities to establish the appropriate context for their engagement in produsage processes. This requires a critical stance both towards potential collaborators and their work (in order to identify the most beneficial of all possible collaborations) and towards their own creative and collaborative abilities and existing work portfolio (to gauge whether a potential collaboration would constitute a good fit of styles, abilities, and experience). Additionally, a critical eye is needed in identifying the appropriate venue and conditions for effective collaboration – and further, during the collaborative process itself, critical capacities are indispensable in the giving and receiving of constructive feedback on the ongoing collaborative process and the artefacts it produces. Thus critical capacities must extend well beyond the ability to assess the quality of content encountered in standard research processes.

4. **Communicative.** Obviously, communication skills underpin every interaction and form the generic basis for the other three capacities listed here. But we want to emphasise the need, in a collaborative environment, for an explicit focus on effective and successful communication between participants. Participants need to be both able to be constructively critical, and able to communicate *about* the collaborative and creative processes (a meta-level skill). These are aspects of communication that may need to be fostered specifically, rather than assumed to be inherent in the communication skills of learners.

The C4C capacities are approached through a pedagogical framework very much like that of the ‘contributing student’

discussed by Collis. She suggests that in learning for a knowledge society students need to participate and contribute to the creation of knowledge. Learning is a process of doing, with the teacher as a guide, rather than as a deliverer of content. This model differs from the acquisition model of learning, which tends to reflect the more industrial, linear mode of conceptualising learning. In the contributing student model the emphasis is on generative activities with the ‘learner as an active contributor to learning experience and resources’. (Collis and Moonen, 2005:15). The activities can be flexible – individual or group based –, and the learners produce material that can be re-used by others as learning resources. This serves to provide some authenticity to tasks. The contributing learner model is designed to create lifelong learners, with the ability to be flexible and operate in multi-disciplinary and global contexts. We believe that the C4C set of capacities provides learners with the tools they need for these contexts.

## 4. LEARNING FROM OTHER WIKI-BASED PROJECTS

At this stage a number of wiki-based education projects have been discussed in the literature, with useful information on what proved effective and where the pitfalls were in using wikis to enable the kinds of learning environments discussed above. We identify here a number of areas where teaching issues arose, and a number of areas where learners had difficulties, and discuss some of the strategies employed in our project to address them.

### 4.1 Teacher literacy

For teachers, an initial and quite fundamental issue of technological literacy emerged. (It emerged for students as well, but with other consequences.) McGill et al. (2005) ran two iterations of a course for design students and were able to enhance the scope of the project significantly after they brought a learning technologist and an information management specialist onto their team. These two specialists assisted in setting up more effective technological environments and training both the teaching staff and the students in the technological literacies required. Lund and Smørdal (2006) also noted that the classroom teacher they worked with, in a secondary school wiki-based learning project, was mostly effective in providing scaffolding for student learning through social interaction in the classroom, but was less able to provide scaffolding through the actual wiki, in part due to a lack of facility with the technology. Raman et al. (2005) found that their wiki-based project suffered through a lack of awareness of the affordances of the wiki on the part of the teacher, and thus an inability to exploit its functionality for the benefit of the class. Technological literacy for teachers is thus sometimes an issue, particularly where teachers have been impelled to use wikis rather than initiating the exercise themselves.

Although Richardson rightly points out that “teachers also need to become true *collaborators*. ... Teachers must begin to see themselves as learners alongside their students” (Richardson, 2006:33), in the network of participants they hold the role of a key resource person. They need to be facilitators, mentors and expert participants (Collis and Moonen, 2005) and as such should be skilled in the technology as much as possible. As guides and facilitators they need to provide scaffolding for the learning process. The mere provision of the tool of the wiki is not enough

to generate collaborative co-creation and learning. Such scaffolding can be provided in classroom contexts as mentioned above, but there are also ways in which it can be provided through the affordances of the wiki itself. Li Xu, for instance, generated a number of templates to guide students in what they needed to do in a particular project process (Xu, 2007). We have implemented content templates in the *M/Cyclopedia* project as discussed below.

## 4.2 Assessment issues

Clarity around assessment was also a key issue for both teachers and learners. Given the new contexts of collaborative learning, the individualised and self-focussed instruments of assessment that most students (and teachers) are accustomed to often become anachronistic or antithetical to the collaborative tasks. The wiki, if set up properly with logs for tracking contributions, can bridge the conflict between the need for developing and extending common intellectual property, and assessing the individual merit of contributions and contributors. Both learners and teachers have commented (Forte and Bruckman, 2006:183, Xu, 2007:111) that the ability of the wiki to track the involvement and contributions of students in the processes of collaboration has resolved some of the key anxieties many have had about a strictly outcome-based assessment of group work. Wikis can deal with the problem of 'freeriders' and inconsistent (or last-minute) contributors, allowing for individual grading of group work if desired.

Producers work very much on the principle of rewarding individual contributors with social status, while the project as a whole is something that the group takes credit and responsibility for. In an educational setting, a learner can take credit for their contribution and gain not only social status, but assessment credit. Their contribution is then available for others to engage with and build upon in pursuit of a larger group objective. By contrast, individualised modes of assessment require students to produce work that is read usually by the teacher and no-one else and is rarely used again. The possibility of re-use and the contribution to a larger, community goal add authenticity to the task. At the same time, the ability of wikis to track the contributions of individual participants to a collaborative effort also addresses the perception that the entire project is merely an amorphous and anonymous communal property for which all contributors are responsible in equal (and equally indeterminate) measure.

## 4.3 Critical engagement and evaluation by students

These mechanisms for ensuring the recognition of individual contributions in assessment ameliorate to some extent the resistance learners may have to group and collaborative work. However, there is often still a reluctance to engage in commenting or building on fellow learners' work. While many have identified the built-in mechanisms for reflection and meta-cognition in wikis (e.g. Achterman, 2006, Bold, 2006), the mere existence of the affordance is not enough to induce the practices (Raman et al., 2005). Lund and Smørdal (2006) identified that students in their project were reluctant to comment on each others' work. While the reasons given for this reluctance are often framed around not wanting to cause offence (a characteristic response we noted in our last paper), it does point to students not coming to grips with the meta-level processes of critical thinking, reflection and revision, and the public expression of such processes. Lund and Smørdal argue that students are in a state of transition between

individualised learning and collective learning, and the process of shifting to a sense of collective enterprise is a gradual one. Hamer identified a similar problem, with his students only engaging with the content of others when forced to do so through assessment tasks (2006:71). In the *M/Cyclopedia* project we discuss below, we also addressed this problem by directly tying some assessment to student comments on others' work, and we will further extend this by requiring students to provide constructive critical feedback to their peers. If truly collaborative work is the goal (and it may not always be – many educational projects use wikis to manage individual work), then the reluctance to critically evaluate and to learn how to provide constructive critique to peers must be overcome.

## 4.4 Communication skills

Learners using wiki environments come to recognise the need for clear communication within their collaborative group. For instance, feedback from Forte and Bruckman's (2006) cohort indicated that some students learnt how to more specifically tailor their communication to the audience they were addressing. This emerged through the dialogic process of group collaboration and the realisation that they were failing to communicate their points effectively to each other. Students were able to adjust their writing style, their referencing sources (to gain more credibility with their audience) and so on, in order to produce more effective communication. Working in collaborative teams forced students to identify different perspectives and know what to do about them – how to evaluate and then respond to them (Hamer, 2006). This feeds into an ability to work in cross-disciplinary environments.

These are all skills which move the learner well beyond the capacities required in a straightforward acquisition mode of learning. In an environment where "we must prepare our students to become not only readers and writers, but editors and collaborators as well" (Richardson, 2006:5), a participation mode of learning with 'contributing students' and an emphasis on the C4C capacities is highly appropriate. Hamer commented that students who in other courses did very well in the acquisition mode of learning, did not enjoy the participation model used in the wiki-based course he was teaching. Other students, however, who struggled with acquisition models, thrived in the collaborative environment and did much better than expected (Hamer, 2006:71).

## 4.5 Audiences beyond the classroom

A final observation on wiki-style learning environments goes to the point of audience. For many learners, previous assessment tasks have had an audience of one – the teacher. Collaborative learning environments broaden that audience out to at least the other members of the group. But Forte and Bruckman, and our *M/Cyclopedia* project extend the audience further, by publishing student work on the Internet for a broad and basically unknowable audience. It is hoped that the authenticity of the task – that its outcomes will be used as a resource by others – contributes to the motivation for learning. Real world applicability is thought to make the exercise more meaningful. Forte and Bruckman (2006) noted, however, that for the most part their students failed to regard their work as public and seemed surprised to realise that it would be encountered by others. They offer two explanations. The first is that students are naïve about privacy online (and such an explanation is certainly supported by some anecdotal evidence

about students' use of online services). The second, that the students possessed an "adroit cynicism – an indication they understand perfectly well the enormity of the web and are sceptical that anyone could find their ideas buried on a wiki with an obscure domain name" (Forte and Bruckman, 2006:186). The *M/Cyclopedia* project is published online – not as a dynamic wiki, but as a static resource. Each year the student contributions are added in their final form to the *M/Cyclopedia* site (wiki.media-culture.org.au). This site is part of the M/C – Media and Culture (www.media-culture.org.au) suite of publications, which receive a substantial amount of visitor traffic; student contributions are thus rather more visible than is common for student projects. It is hoped this adds to the sense of authenticity. (The most recent student contributions are yet to be added to the site as the shift to a different wiki system, Confluence, has meant that some extra work to develop tools for content conversion is still to be done.)

## 5. THE USE OF WIKIS IN NEW MEDIA TECHNOLOGIES

Since our last report at WikiSym 2005 (Bruns and Humphreys, 2005), several key changes have been made in the New Media Technologies (NMT) subject. From a technological point of view, the most important development has been a move from MediaWiki (an open source platform also used by the *Wikipedia*) to the commercial 'enterprise wiki' Confluence. This move was motivated by a number of factors. On the one hand, while clearly in widespread use by *Wikipedia*, the related, commercial *Wikia.com* wiki host, and a wide range of other for-profit and non-profit operators, the user interface and functionality of MediaWiki was such that it presented a significant obstacle to successful work in the wiki environment for our students. The process of learning how to operate the MediaWiki environment emerged as a hindrance on the way to learning how to operate *within* a wiki environment – contrary to our intentions of enabling learners to work effectively within collaborative user-led online spaces more generally, we found that a MediaWiki-based New Media Technologies subject often at best achieved the aim of providing students with the skills to do basic work in MediaWiki spaces.

Confluence, on the other hand (perhaps because it is a commercially supported solution), has the luxury of offering significantly more features designed to welcome and guide the user through the wiki environment. It offers a notably more advanced WYSIWYG editor which helps us to avoid the need to spend time teaching wiki mark-up language except for some relatively advanced uses; it offers a variety of content watchlists, email notification, RSS feed, content tagging, and other functions which enable users to keep track of changes to pages which are of special interest to them; and it has a variety of other functionality available from the user's personal homepage. From an administrative point of view, too, it provides very valuable tools for our purposes: so, for example, we were able to provide a ready-made template for the pages students were required to add to the wiki – this helped to better ensure uniform formatting as well as the presence of a variety of key sections required in each student-submitted wiki entry (such as bibliographic references and a 'see also' list of internal and external links for further information, but also core content elements like the initial definition of the entry topic, and semi-optional sections including

'history' or 'key aspects'). Another major administrative gain from the move to Confluence was the ability to connect smoothly to existing LDAP user authentication mechanisms at QUT; this enabled us to grant automatic access to the wiki to all students enrolled in NMT, and to ensure that students were identified by their real names, rather than having to rely on students manually creating accounts (hopefully using identifiable usernames) on the MediaWiki system.

Beyond such technological matters, the semester two, 2006 iteration of the subject also saw a further move towards directly addressing the C4C capacities which we have identified as crucial for learners in a user-led, produsage environment: capacities to work collaboratively, creatively, critically, and communicatively in produsage-based, multi-user online environments. In pursuing these aims, the wiki as represented by *Wikipedia* as well as by our own encyclopedia development wiki act both as central exemplars for such produsage spaces in general, and as spaces for the practical exploration and development of such capacities. Our wiki is used in the three main elements of learning and teaching in the subject – in large-class lectures, in small-group lab tutorials, and in the group assessment which is required in the subject. Of these three elements, the latter two proved successful overall, while we will continue to significantly revise our approach to lectures in future semesters.

### 5.1 Tutorials

Our use of the wiki system in tutorials remained relatively unchanged from previous iterations of the subject, as reported in our 2005 WikiSym paper (Bruns and Humphreys, 2005). We used the wiki to a significant extent in facilitating tutorial work and student interaction outside of classes. Each week, tutors set up pages within the wiki as impromptu discussion groups for their classes, and used these pages to gather ideas and comments on the weekly topic from their students; over the past years, this has proved an effective method especially also of encouraging contributions from those class members who may be initially too shy to speak openly in class. It also helps counteract any domination of class discussions by particularly vocal students. Use of the wiki in class discussion also enables students to post links to Websites and other online resources which may be relevant to the weekly topic, thereby sharing these resources with their classmates and enabling their tutor to discuss such resources in class.

This can be considered as a small but important step towards a more user-led reconfiguration of tertiary education, in keeping with the overall trend to produsage in education and elsewhere, as identified in Bruns (2007a) and Bruns *et al.* (2007). Such use of wikis as a means of moving towards user-led education is also highly dependent on its small-group context, however; as our experiences with reconfiguring the lecture environment (below) indicate, it is more difficult to do so in a large-scale setting involving some 150 students or more. Here, a more structured approach remains necessary, and the simultaneous participation of a large number of students in wiki-based discussion groups may even be counterproductive.

## 5.2 Assessment

Assessment in NMT has been revised considerably since we last reported on this subject, both in terms of the assessment tasks themselves, and in terms of the assessment criteria applied to them. Where the 2005 version of NMT required students to create first an annotated bibliography (as a single-student exercise), then to work in a group on a wiki entry on a self-chosen, major topic, and finally individually again to produce a set of sub-topical entries related to the major topic, this process was streamlined for the 2006 iteration of the subject. A key problem with the 2005 approach was that the process of choosing and producing interrelated topical entries turned out to be unnecessarily and distractingly complex; students at a second-year level appeared not to have the necessary topical understanding and/or strategic approach to divide larger topical areas into individually coherent entries, and were frequently unable to produce sets of interrelated entries at a uniformly high standard. This was compounded by their uncertainty in spite of available help about what topics might constitute appropriate topics for the wiki – we found that frequently, students preferred working on overly ambitious and vague topics and themes (such as ‘Cultural Imperialism’ or ‘Computer Games and Moral Panics’) to more tangible and better defined, if less ‘glamorous’ entries (e.g. ‘World Wide Web’ or ‘Email’).

For the 2006 version of the subject, therefore, we considerably simplified the assessment approach; this time, we required students to work in groups of two for assignments one and two, and of four for assignment three, and in each assignment they were required to produce a wiki entry on a topic chosen from a very limited selection of topics appropriate to the content covered in the subject up to the assignment due date. In keeping with the overall structure of the unit, topics for assignment one were centred largely around new media technologies; for assignment two, around new media uses (e.g. blogging, games), and for assignment three, around wider new media issues (privacy, Internet governance, etc.). This, we felt, gradually increased the difficulty of the assignments over the course of the three assignments – students would be likely to find it easier to research the history of technological developments than investigate current debates around ‘hot’ topics, and be less anxious about what topics were going to be appropriate for their assignments; additionally, it also helped circumvent a problem identified in our previous report, where unaware of each other, individual student projects would work on virtually identical themes under variations of the same topic title (e.g. ‘Bluetooth Security’ vs. ‘Security – Bluetooth’) – in this new iteration of the subject, we were able to control topic titles centrally and thereby ensure breadth and variety of the topics covered by our students’ entries.

In keeping with the C4C framework, we also altered the assessment requirements for the three assignments, and now assess specifically for each of the four capacities highlighted by the framework. In particular, one of the benefits of working within a wiki framework is that it enables us to assess not only the final outcome presented by student groups, but also the pathways by which students arrived at this destination: we are able to examine the edit history of the entries submitted by students, as well as the evidence of team communication amongst the students working on each entry. Amongst the criteria of assessment for each of the

three entries therefore is the following component, weighted at 25% of the total mark and assessing the performance of individual team members rather than of the overall team:

### *Collaboration*

- Over time: collaboration throughout project period
- Across team: communication and dialogue while collaborating in wiki

Students working at the highest level of achievement would need to meet the following standard for this criterion:

- Edit history shows continuous work in updating content in the weeks before the assignment due date
- Comments on entry page used highly effectively and regularly to enhance collaboration on content development

This is an important move beyond traditional forms of assessing student group work, which almost always tend to focus only on the tangible outcome of the group work exercise rather than also on the process of group work itself. If group work is treated as a ‘black box’, a mere means to the end of producing assessable outcomes, this offers little opportunity for teachers to provide feedback and commentary on that process (even though the development of group work skills arguably is more important as a graduate outcome than is the ability to produce assignments); it also contributes markedly to student frustration (as they fear that freeriders or dominating team members will affect their individual results) and provides little incentive for each group member to contribute to the best of their abilities. Wikis offer an opportunity to open up the black box and assess its inner workings, and to directly reward students who contributed to the final outcome in significant ways. Additionally, assessment of the collaborative process also ensures that such collaborative process *does* take place: where in the absence of such requirements, students all too often attempt to do their group work in the last days and hours before the assignment due date, thereby entirely bypassing the important personal and intellectual challenge of encountering and accommodating the individual working styles of other team members, here, overcoming such challenges is a necessary aspect of the assessment process.

## 5.3 Lectures

In semester two, 2006, we also began to rethink the place of lectures within the context of the New Media Technologies subject, as foreshadowed in our 2005 paper. Traditional lectures, following a ‘sage on the stage’ model, are almost entirely counterintuitive especially in a subject which deals centrally with the emergence of new, user-led content production modes (that is, produsage) which have begun to affect significantly the production and broadcast models of many content industries (from software production to the mass media – see e.g. Bruns, 2007b, 2007c). Wikis themselves are a key example for the move from closed-shop production of finished goods for later distribution to ‘end users’ or consumers to an open, collaborative, flexible, and permeable model of informational content creation which invites users to become active co-producers of content.

In the context of NMT, therefore, the goal must be not only to describe such environments to students, but to actively model them in our teaching approaches. In the areas of tutorial and assessment work, this shift is already well underway, as we have outlined above; in the context of lectures (which after all virtually enshrine the lecturer as especially privileged expert), however, this has proven more difficult to achieve. We attempted one approach in 2/2006, with moderate success: this was to post the lecture content to the wiki shortly before each week's lecture, to use the wiki entry as a working text during the lecture, and to invite and address live commentary from students on the wiki (using their laptops on the wireless network). The aim of this approach was to make the lecture more interactive by providing students with the opportunity to give immediate feedback on issues addressed in the lecture (without disrupting the lecturer at each turn), to reposition the lecturer as little more than an additional contributor to the wiki environment, to ensure that lecture content was directly available within the wiki as a point of reference for the students' assignment works, and to model best practice in creating wiki entries on the topics addressed by the lectures.

This approach encountered a number of difficulties, however. On the one hand, the limited visual appeal of the lecture wiki entries proved unattractive to students used to (for better or worse) Powerpoint-based lecture presentations in their other subjects; combined with the fact that the lecture wiki entries *were* available in their entirety on the subject wiki, this was seen by a large section of the student cohort as an excuse not to attend the live lectures, especially towards the end of semester. (This also points to wider discussions on the extent to which, in the context of moves towards flexible delivery and increasing economic pressures on full-time students, the live lecture is still compatible with the present-day realities of student life.) On the other hand, the desired interactivity in lectures also only emerged in a very limited fashion – while some students did attach comments and questions to the lecture wiki entry, only a handful of students regularly brought their laptops to the lecture, and would likely have asked their questions orally as well; additionally, making such comments visible on the lecture hall screen still required a page refresh in the wiki, which proved as disruptive to the lecture flow as a pause for oral questions would have been.

Such experiences should be seen as a useful reminder that for their variable uses, wikis are no catch-all solution to the problems encountered in the modern teaching environment. Effective in the development and deployment of innovative assessment and group interaction modes in contexts where all participants have direct access to networked computing technology, they are less suited for mixed-mode presentational environments. Our own conclusion from the 2/2006 lecturing experience therefore points us in the direction of a number of other new media technologies: we will explore the use of short video podcasts (combining lecture audio and Powerpoint slideshows in some 15-20 minutes, and available in the subject wiki) to introduce the key lecture topics of the week, combined with a more interactive lecture-workshop involving guests from research and industry, and a backchannel communications facility using instant messaging. This will shift 'lecture' content away from the timeslot allocated to the lecture, and addresses the need to offer flexible delivery options to students who may not always be able to attend weekly lectures,

while opening up the 'lecture' time itself to activities which are best suited to a live environment and could not be conducted in any other way.

## 5.4 Student Feedback

Responses to the unit during semester two, 2006 – both formal and informal – have been predictably mixed, then, and largely follow the patterns outlined above. Students have continued to respond favourably to the wiki environment itself, and in the main appear to realise the reasons for working in a wiki environment, as well as the potential benefits they may derive from building their C4C capacities in the context of new media-supported, collaborative environments. They did not find the wiki-supported lecturing approach conducive to their learning, however, and indicated this both in their formal responses to the unit as well as informally by 'voting with their feet', staying away from lectures in latter weeks of the semester.

Further, students also expressed some concern about the assessment structures: while they felt comfortable overall with their work in groups on the wiki entries, and appreciated the ability to be assessed on their own individual contributions to the group effort, rather than receiving simply a generic group mark for their work, they also indicated that the three wiki assignments, though increasing in difficulty, were perhaps somewhat repetitive in their requirements – by the time their work on the third assignment began, some were beginning to lose interest in this work.

This points to a need to further address the assessment structure, introducing some additional variety into the mix. In semester two, 2007, therefore, we are planning to replace the third wiki entry assignment with a more reflective and critical individual exercise (which will still take place within the wiki, however): working alone, students will critically review two existing entries in the encyclopaedia, outlining the strengths and weaknesses of each entry and suggesting ways to further improve them, as well as identifying and defining a unified topical field within the encyclopaedia, and suggesting ways of presenting this field through a summary entry. The aim of this exercise is for students to look beyond the entries they have worked on for their previous assignments, and to develop a better understanding of the totality of the New Media Technologies wiki. This assessment task models practices common in the *Wikipedia* and other large wiki environments: a critical review of existing content by administrators and other contributors (which we will ask students to attach as a comment to the entries they are critiquing), and a 'wiki gardening' effort which leads to the development of portal pages within the wiki. Such work particularly addresses the 'critical' component of the C4C capacities which we have developed.

Beyond such comments related to the New Media Technologies subject itself, we also received a number of interesting comments on the role of wikis in the wider intellectual context of the academy. In particular, students noted the irony of being asked to work within a wiki environment in this subject, while in some other subjects lecturers were still warning them against using the

*Wikipedia* as a reference for their assignments. This points to a more general question about the academic establishment's response to user-led knowledge bases, of course. Our own response to such questions would be to note that students should be as wary of relying on *Wikipedia* as their source as they should be of relying on *Britannica* or any other reference, if for different reasons: the mode of production for any one source of information will necessarily always introduce a certain amount of unavoidable bias. We remain unconcerned if students use *Wikipedia* as a reference in their assignments, but do express strong reservations if this is their *only* reference (or one of few), just as we would mark as 'poorly referenced' an assignment which relied predominantly on *Britannica* or any one textbook as its source – whether including *Wikipedia* as a reference or not, *any* work at an academic level of quality should draw from a wide and varied range of sources. Additionally, some of the academic concerns about *Wikipedia* are over the ease with which students may copy and past content from *Wikipedia* into their own essays; however, such concerns apply to any of the myriad of electronic sources readily available on the Web, and hardly constitute a reason to ban *Wikipedia*, as some academics have suggested in the past, and as some academics (and academic institutions) are continuing to do.

In stark contrast with such antiquated views, likely born out of an overall fear of the casual collapse of academic authority in an environment of produsage and user-led education, our experiences – and the experiences of many others who have begun to explore the use of wikis and other produsage tools in their teaching practice – clearly indicate that there is a place for wikis in teaching, and that the use of such tools can make an important contribution to students' learning experience. More to the point, we believe strongly that the development of the advanced capacities required for effective participation in produsage environments is an increasingly crucial task for education; learners who fail to develop such capacities are likely to be placed in a disadvantaged position as the shift towards a user-led, knowledge-based economy continues. Our exploration of wikis and related technologies in learning and teaching contexts has only just begun, and it is crucial that we continue down this track and share our experiences along the way.

## 6. ACKNOWLEDGMENTS

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