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The Brisbane media map : participatory design and authentic learning to link students and industry

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ABSTRACT

The Brisbane Media Map is both an online resource and a tertiary-level authentic learning project. The Brisbane Media Map is an online database which provides a detailed overview of about 600 media industry organisations in Brisbane, Australia. In addition to providing contact details and synopses for each organisation's profile, the Brisbane Media Map also includes supplementary information on current issues, trends, and individuals in the media and communication industry sectors. This resource is produced and updated annually by final-year undergraduate Media and Communication students. This article introduces the Brisbane Media Map, its functionality and systems design approach, as well as its alignment with key learning infrastructures. It examines authentic learning as the pedagogical framework underpinning the ongoing development work of the resource and highlights some synergies of this framework with participatory design principles. The Brisbane Media Map is a useful example of an authentic learning approach that successfully engages students of non-traditional and non-design areas of study in human-computer interaction, usability, and participatory design activities.

Keywords

participatory design; authentic learning; industry mapping; media and communication studies; creative industries.

INTRODUCTION

One of the key characteristics of authentic learning is the involvement of students working collaboratively on real-world problems and issues (Herrington et al. 2003). The Brisbane Media Map (BMM) project, initiated at Queensland University of Technology in 2000, addresses a problem facing creative industries in general, and the diverse and dynamic media and communication industry sector particularly. What sets professionals in areas such as architecture, design, film and TV, fashion, and the visual and performing arts apart from other sectors of the economy is the heavy reliance on their creative skills and imagination to produce value. Cunningham (2006) argues that this creative economy is larger than previously calculated, because creative professionals employed in traditional sectors of the economy have so far largely been statistically subsumed under industry classifications which are too broadly defined, such as those produced by ANZSIC (Australian and New Zealand Standard Industrial Classification). The size and significance of the creative industries sector can thus be under-recognized. The BMM project was started primarily as a response to this policy issue within the creative industries sector. So far, the contributing economic value of the creative industries sector has been overlooked and undervalued. Because the media and communication sector is so diverse, and is evolving so quickly, and because uncertainty about its precise definition can obscure awareness

of its size, and its unique characteristics and dynamics, the BMM attempts to raise awareness and draw attention to this issue, and to correct flaws in empirical analysis. Specifically, the BMM seeks to draw attention to the contribution, breadth and depth of the media component of the creative industries sector in the geographical area of Brisbane and South East Queensland.

But the BMM project is not simply about addressing an industry issue: the pedagogical rationale for the BMM is also about negotiating and leveraging the affordances of learning infrastructures in order to create an authentic learning project for final-year Media and Communication students about to graduate and enter the creative economy. The opportunity to critically explore and map the media landscape of their city and region by engaging in an authentic participatory design exercise surrounding a ‘real’ public resource gives students vocationally-relevant experience, as well as an opportunity to apply the various theories and concepts they have learned to a complex practical activity. Authentic learning activities, as defined in the literature, are learning “tasks that have real-world relevance and utility, that integrate across the curriculum, that provide appropriate levels of complexity” (Herrington et al. 2003); they often require student collaboration to address complex and multi-faceted problems and challenges (Reeves et al. 2002). Yet Herrington notes that while an increasing number of educators tout the value of authentic learning, there is not yet a body of “rigorous research studies” to thoroughly substantiate their claims (2006); this article makes a contribution to this body by analysing a successful authentic learning project which has been running for ten years. Analysing the design and scaffolding of the BMM further points up generic issues faced by instructional designers when negotiating with and adapting learning infrastructures to scaffold an authentic learning project.

In the following section we present the BMM and its functionality and trace its history and development since 2000. We then outline the systems design approach in order to give an appreciation of how human-computer interaction (HCI) and information technology (IT) professionals work in collaboration with non-HCI and non-IT students to create, develop, and update the BMM each year. We discuss authentic learning as the underlying pedagogical framework and argue how this type of participatory design work and the design outputs themselves are central in achieving the objectives of the course and have become an enabler for authentic learning. We address key ‘levels’ of the learning infrastructures within which the BMM project is situated—specifically cyberinfrastructures, pedagogical, and institutional infrastructures. We conclude by drawing attention to future developments.

THE BRISBANE MEDIA MAP

The BMM is both a web application at <http://bmm.qut.edu.au/>, and the capstone project for final-year Media and Communication students. The BMM database comprises dynamically searchable profiles of over 600 firms and organisations servicing or located in Brisbane and South East Queensland. The BMM makes visible fine-grained information about the media and communications sector in Brisbane, including its active geographical, historical, and institutional dynamics. Rather than relying solely on governmental ANZSIC classification categories for its core data, participating students draw upon a variety of sources such as student-conducted industry interviews, online research, and industry body directories in order to ensure that the BMM profiles are reflective of the current state of the sector. The BMM also features numerous student essays – and in its latest iteration student-led interviews with, and profiles of industry professionals – which provide additional material for critical discourse, and add value to the resource itself.

The BMM has become a valuable destination for those interested in Brisbane’s media and communication industries, including students looking for internships, job-seekers, media consumers, potential investors and other media industry professionals. Web monitoring data

captured by Google Analytics shows that the BMM now regularly attracts over 7,000 unique visitors per month, most of which come from outside of the university. Reeves et al. (2002) observe that “authentic activities create polished products valuable in their own right;” the BMM’s visitor rate and multiple end users demonstrate that the BMM is valuable beyond its function as a teaching and learning activity.

PEDAGOGICAL INFRASTRUCTURE: AUTHENTIC LEARNING

Curriculum, understood in its fullest sense, includes far more than just unit content: it also comprises elements such as the course’s governing pedagogical philosophy (Fraser & Bosanquet 2006); for this reason, it is important to consider the BMM project’s pedagogical framework—authentic learning—as the first of the levels of learning infrastructure in which the BMM is embedded. Over the course of one 13-week semester, students

- evaluate the existing version of the BMM, critically comparing it against the current topography of Brisbane’s media sector as well as against the needs of end users;
- generate their own taxonomical groupings to accommodate the diversity of Brisbane’s media organisations and firms;
- help with the redesign of the site;
- research and re-write over 600 records; and finally,
- plan and organise the re-launch the resource.

Collis (2005) argues that educating students for knowledge economy employment requires a significant shift in pedagogy: rather than learning how to *listen*, she argues, students need to know how to *do*; rather than learning how to work in isolation, students need to know how to work in multidisciplinary teams; and rather than acquiring information, students need to become co-contributors engaged in the production of knowledge-based resources. Authentic learning has emerged as a key pedagogical modality through which to address these knowledge economy requirements. Authentic learning, which relates to the broader pedagogical concepts of “situated learning” (Brown & Duguid 1993) and problem-based learning (Stepien & Gallagher 1993), is a form of applied education which, as Reeves et al. (2002) observe, can be significantly scaffolded, enacted through, and enabled by online environments.

The BMM is one such environment. The BMM project, in line with Herrington et al.’s definition of authentic learning (2003), involves student participation in a real-world project; authentic learning is thus often referred to as ‘generative learning because the completion of the task requires the students to generate other problems to be solved’ (Herrington et al. 2003, p. 61). The BMM project is not only an authentic learning task, but also an example of a ‘contributing student’ pedagogy, in which “learners become co-designers of study materials for themselves and others” (Collis & Moonan 2005, p. 50): in tackling the authentic task of updating, redesigning, and improving the BMM, each cohort of students creates not only a product (the Map itself) but also a set of reusable resources for next year’s student teams. This is a key element of the pedagogical infrastructure within which the BMM project is situated: the BMM is informed by not only the authentic learning, but also by the related contributing student paradigm. These are particularly ‘open’ learning infrastructures: they rely as much on student input and ideas as they do on the instructor’s.

IT INFRASTRUCTURE: THE BRISBANE MEDIA MAP

Oliver and Reeves (2003) note that, because they involve complex tasks, authentic learning activities “encourage interdisciplinary perspectives” and the use of a variety of theoretical and disciplinary perspectives. This point has proved correct in the case of the BMM,

not only for students but also for the instructional team. Interdisciplinary collaboration has been crucial to the ongoing technical development of the BMM. The BMM's learning infrastructure comprises several technical systems, including the design and development of the web application, the database structure and the interface's look & feel. First launched in October 2000, the BMM version 1 was comprised of static HTML pages. Version 2 in 2001 incorporated a Microsoft Access web database using ASP (Active Server Pages). This improved the ease with which the contents of the BMM could be developed, and allowed external users to search and view the site in a more interactive and efficient way. In 2002 a postgraduate Communication Design student brought to the project the necessary skills to move the BMM version 3 to an open source format based on PHP and MySQL that is more compatible with the support and maintenance requirements of the university's underlying LAMP (Linux, Apache, MySQL, PHP) infrastructure. Yet while these interdisciplinary collaborations between IT, design, and media and communication staff provided the necessary technical scaffolding for the BMM itself, they were restricted to staff members; in line with the authentic learning principle of student involvement and agency, in 2002, students were invited into the technical collaborations.

Since 2002 the BMM development approach has actively embraced human-computer interaction and design decisions as an additional part of the student authentic learning experience. Previously, the focus was solely on the students' acquired media industry expertise that informs the website's content, but it left the design and technical development in the hands of external IT support staff. Since 2003, every annual BMM re-development consciously employs strategies to engage students in the (for our students) mostly unfamiliar and sometimes uncomfortable territory of IT, human-computer interaction, usability and web design. This participatory, authentic-learning approach taken to designing the BMM integrates the students as end-users and domain knowledge experts in the system development process; this is what is termed 'participatory design' (Gammack 2002; Greenbaum & Kyng 1991; Schuler & Namioka 1993). By allowing students to see behind the development curtain, and to participate in the re-development process itself, the teaching team avoids a technocratic determination of the BMM by making all aspects of its design a genuinely student-controlled learning experience. Allowing students access to the technical aspects of the BMM assists in avoiding the trap of creating so-called 'authentic' learning environments which are in fact heavily controlled by the instructor: what Petraglia refers to as "the real world on a short leash" (1998). Yet implementing and scaffolding a major authentic learning project, and particularly one that involves non-IT students working in participatory design, is not a straightforward task: it requires substantial work at several levels of the learning infrastructure. How we 'walk the talk' of participatory design to maximise the authenticity of media industry mapping for students, is outlined below.

This participatory learning experience of the design and development process has led to an annual cycle of improving existing and adding new features to the BMM, with version 10 of the BMM to be launched at the end of November 2009. This new version has been ported from PHP to Ruby on Rails. The following section details the backend technology that runs the BMM and examines some participatory design synergies with the authentic learning approach that underpins this work.

IT INFRASTRUCTURE: THE DATABASE

According to Herrington (2006), instructional design-based research will add significantly to the field of authentic learning by complementing more theoretical approaches, and by identifying best-practice design principles which other authentic learning designers can put to use. It is important for this article, then, not simply to describe the BMM as an authentic learning task, but also to analyse and explain its instructional design.

The screenshots in Figures a and b show the two areas of the BMM web application. The public area, available to the world, allows users to search and browse the entire catalogue of media organisations and institutions by categories and locations. Additionally, the BMM presents students' commentaries on current media issues and allows users to leave feedback.

Education & Research

[View all entries on map](#)

Company	Suburb	Grouping
Australian Film, Television and Radio School	Fortitude Valley QLD	Tertiary
Australian Teachers of Media Queensland, Inc.	Kelvin Grove QLD	Private
Bond University	Miami QLD	University
Bremer Institute of TAFE	Ipswich QLD	Tertiary
Brisbane College of Photography and Art	Spring Hill QLD	College
Commercial Arts Training College	Spring Hill QLD	Tertiary
Council of Australian Media Education Organisation	Ingle Farm SA	Private
CQUniversity Australia	Brisbane City QLD	University
Design College Australia	Fortitude Valley QLD	College
Griffith University	Nathan QLD	University
Jschool	Brisbane QLD	College
Metropolitan South Institute of TAFE	Mt Gravatt QLD	Tertiary
Qantm College	Brisbane QLD	College
Queensland Academy for Creative Industries	Kelvin Grove QLD	Secondary School
Queensland College of Art (QCA)	South Bank QLD	University
Queensland University of Technology	Kelvin Grove QLD	University
SAE Institute	Milton QLD	Institute
Southbank Institute of Technology	South Brisbane QLD	Tertiary
University of Queensland	St Lucia QLD	University

Girls Typing, BMM Team

Television: a Guru-Hypnotist leader
 In a confusing society, has television become the guru-hypnotist leader?
 by Sylvia Cioiko

Search in Education & Research

Fig. a List showing 'Education & Research' providers

The DBMS (Database Management System) is the administration area to which only the teaching team and enrolled students have access. This is the area where the students prepare the content each year for the next version to be launched. The students are grouped into approximately 50 teams, each of which is responsible for a specific area of the site. Simple access control policies govern their rights to modify the content in their assigned areas. The system also enforces the policy that changes must be double-checked, validated and signed off by peers; and it also logs the names of the responsible students for quality assurance purposes. Such an approach is not a pedagogical "short leash" (Petraglia 1998) in this case, but rather a replica of the standard editorial processes undertaken by professional communicators. Using technology to enforce careful editing thus provides students with an experience of professional communication that shows students "the way the knowledge [of spelling, grammar, research facts] will be useful in real life" (Collins 1998, p. 2). Student qualitative feedback often signals an appreciation of this aspect of the authentic learning task: "now I see why you kept telling me how to use apostrophes!" as one student—training as a media and communication professional—commented. The experience of content editing, scaffolded by student-created online style guide on spelling and grammar, as well as by the database's access architecture, provides students with a "cognitive apprenticeship" (Wenger 1998) as media and communication practitioners, not as "legitimate peripheral participants" (Wenger 1998) but as central and active agents.

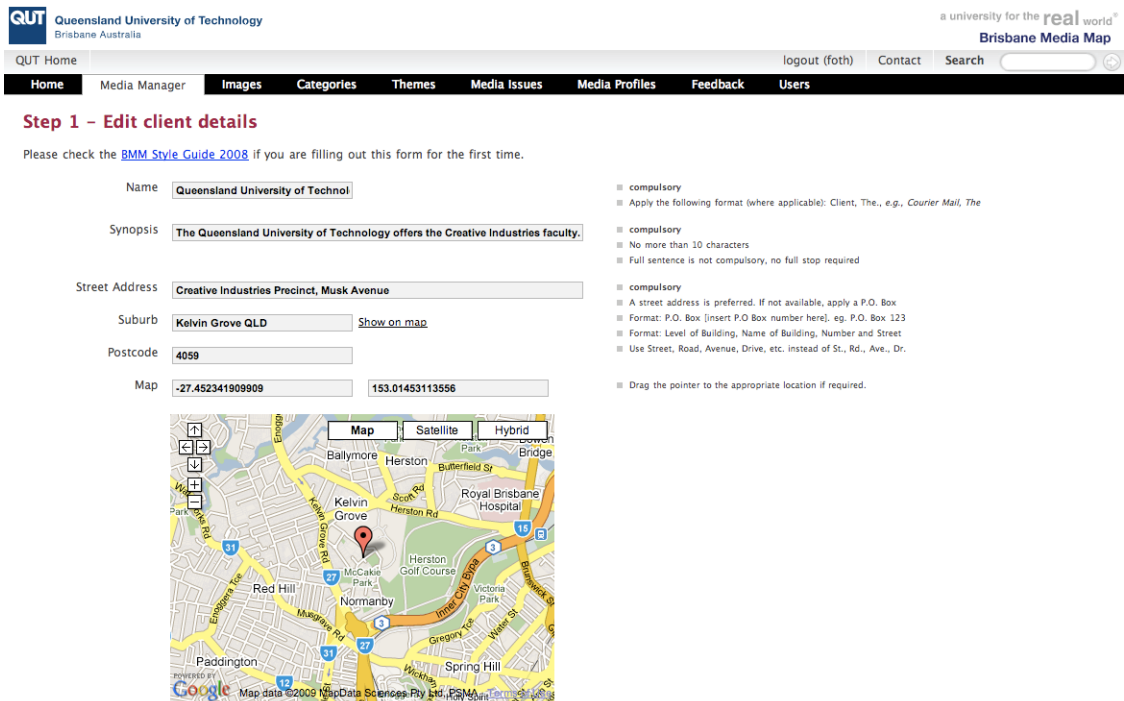


Fig. b The DBMS allows students to edit the content

The students are not only required to update the website’s content, they are also strongly encouraged to take initiative in further enhancing the functionality of the BMM in close collaboration with an HCI and IT expert. Students’ involvement in these aspects of the BMM project allows students “to play diverse roles, thus building robust expertise rather than knowledge limited to a single well-defined field” (Herrington et al. 2003)—a characteristic of authentic learning—and also to learn how to negotiate and communicate with technology experts: a skill required of many media and communication professionals. In order to address the students’ suggestions over a short period of time within the teaching semester, an agile development environment is required; hence the decision to port the BMM from PHP to Ruby on Rails from BMM version 9 onwards.

Finally, the ability for the IT expert to address the students’ input in a timely, sometimes even instant, manner is a great incentive and motivation for the students to suggest changes and take pride in and ownership of them. Simple user interface changes, and even some database changes, can be implemented and discussed on the spot during meetings between the students and the HCI and IT expert. Crucially, in line with authentic learning principles, it allows students to experiment, make mistakes, and learn from them (Herrington et al. 2003) without fatally disrupting the BMM’s IT infrastructure. This type of close and practical collaboration eventually feeds valuable system knowledge expertise to the non-HCI and non-IT students, and on the other hand, their critical domain knowledge expertise to the tutor and web developer.

The participatory design and learning that occurs as part of developing the Brisbane Media Map (Cherry et al. 2003) and the self-organised and decentralised communication within and between student teams (Liccardi et al. 2007) are two strategies that become great motivators for students to be proactive, creative and innovative.

IT INFRASTRUCTURE: LEARNING MANAGEMENT SYSTEMS

While this pedagogical approach productively provides students with a ‘real world’ project, it has significant repercussions on the effective use, design, and adaptation of IT-based learning infrastructures, specifically the Learning Management System (LMS) environment (in the case of the BMM, *Blackboard*) in which the project takes place. To be successful, authentic learning tasks with a contributing student pedagogy require effective scaffolding. Pedagogical scaffolding includes any elements designed to assist students in the authentic learning task: from traditional lectures to technologies for complex online interactions (Herrington 2003, p. 40). Addressing IT-based learning infrastructures involved in authentic learning activities, Collis and Moonen note that “technology is a critical tool in contribution-oriented activities” (2005, p. 61); the Brisbane Media Map project, as discussed above, relies heavily on technology as scaffolding. Beyond the Database Management System, the BMM project relies on two additional key types of IT-based learning infrastructure as technical scaffolding for the project: the LMS, and social media.

First, the LMS is used at the beginning of the semester as a standard push technology through which project information is delivered to students. As the unit evolves, the LMS becomes a busy collaborative space: the instructor creates individual folders in which each team can store ongoing work, and grants admin authorisation to specific team leaders so that relevant leaders can upload material such as the project newsletter. For example, admin authorisation is given to the student who is the team leader in charge of collecting updated Print Media organisations’ records through the LMS’s online assignment submission function: all students submit their records through the site, and the Print Media team leader accesses them for editing (Nichol et al. 2005). Each team is responsible for creating a ‘version document’ which details the logic behind its decisions, problems it encountered, and strategies with which it dealt with problems; these documents are held on the LMS for future student cohorts. Similarly, the FAQ section remains available via the LMS each year so that each new cohort can learn from the questions of previous groups. The LMS is thus used to enable longitudinal, asynchronous peer learning by using the contributing student approach. Two types of institutional support related to the LMS are required for the course to succeed: the LMS must be flexible and easily adaptable to the evolving needs of the students, and the ability to allow certain students to have admin authorization to specific areas of the site must be in place. This is not always the case with *Blackboard*, which, for example, restricts access to material submitted through the ‘assignment’ area to staff only; manually reconfiguring the LMS to enable student agency and to allow for efficient and effective authentic learning means a substantial staff time commitment every year.

Second, the students are also encouraged to make use of free online Web 2.0 applications for their collaborative work: these include Google Docs, Google Calendar, delicious, and shareware Gantt charts. Students use the Google applications for collaborative writing and for group organisation; they use delicious for collaborative research. One lecture is delivered to the students on the use of these applications; students can then opt whether or not to use them to manage their work processes in the project. Some students report that they find these applications more intuitive and straightforward to use than the LMS; other students prefer the familiarity of the LMS. Web 2.0 tools thus become an effective add-on to the LMS; students can experiment in order to find the communication tool which best suits their own styles and the needs of their teams.

Students’ feedback on the authentic learning environment indicate that this method of scaffolding for authentic learning is an effective one. In 2005, 2006, and 2007, students ranked the Brisbane Media Map project as the highest-rating unit within the QUT Media and Communication course.

INSTITUTIONAL INFRASTRUCTURES

There are two additional aspects of the BMM's learning infrastructure which need to be taken into account: the organisation of the course in which the project takes place, and the institutional parameters which govern the delivery of courses and the uses of IT-based infrastructures.

Course organization

The course is run over thirteen weeks, during which time students must be introduced to both conceptual and technical aspects of the BMM, work within a hierarchical network of teams to address specific aspects of the project; undertake research; design, build, and upload the revised version of the BMM; and complete individual academic assessment tasks. Ensuring that all of these tasks fit into a standard semester, a semester in which students are also enrolled in other courses, requires careful organization. In the first three weeks of the course, all students meet in a conventional classroom setting and are given three lectures: these lectures familiarize them with the BMM as a media resource, with the basic technical architecture of the BMM, and with the general problems associated with mapping an industry sector as diverse and as swiftly-evolving as media. After these three introductory sessions, students complete an assessment task in which they indicate the specific areas of the BMM project in which they are interested: these areas include researching and updating records for individual subsectors such as print media or community radio, improving site look and feel, and organizing communication within the project team. Based on these indications, each student is then assigned to four or five teams of approximately five students each. The instructor ensures that each student is assigned to a variety of teams so that each student uses technical, research, organizational, and planning skills. Each student is the team leader of at least one team. A list of teams is posted to the LMS in the fourth week. This list also contains a set of basic duties and responsibilities for each team and a map of the hierarchical structure of the organisation as a whole. In line with the contributing student approach, the students assume responsibility for the expectations: the duties and responsibilities list has been partially authored by students in the previous year's iteration of the course after reflecting on their experiences during the BMM process.

The delivery of the course then begins to change, as the focus moves away from the dissemination of information by the instructors, towards the students' own team projects and processes. Physically, the course moves out of the classroom and into the computer labs and smaller meeting rooms. The University's campus-wide WiFi network proves to be highly useful, as students move from room to room with their laptops. In order to assist students with project management and teamwork skills, three workshops are delivered, focusing on team management, time management, and leadership. Workshops, however, comprise only an hour of each week's three-hour session: the remaining two hours are devoted to team meetings organized by the students. Students make use of email, mobile phones, Web 2.0 applications, and the LMS's groupware tools to organize team meetings. Halfway through the semester, each team leader gives an oral presentation to the group which details her/his team's progress, problems, problem solutions, and work still to do. As an aspect of collaborative learning (Kearsley & Shneiderman, 1999), this process allows students to learn from each others' experiences and strategies, as well as familiarizes them with the authentic professional practice of project reporting. The final three weeks of the course do not involve any formal lectures or workshops: teams work in labs or in meeting rooms towards the final deadline by which the new version of the BMM site must be ready for upload. The course thus adopts a flexible delivery approach: it includes formal lectures, instructor-led workshops, student presentations, student meetings, student computer lab work, and

substantial use of the functionalities of the institution's course management system for group and team communication. This course organization approach is not necessarily familiar to students, although it mirrors standard professional project lifecycles; instructors ensure that students are scaffolded by the tools, skills and support they need as they shift into this often-new model of learning activity (Hoffman & Ritchie 1997).

Staffing.

Instructional staffing requirements for an authentic learning course such as the BMM differ from those of conventional lecture-based courses. The BMM project involves three staff members: the course coordinator, the tutor, and the technical manager. The course coordinator is responsible for: the administration of the course, designing assessment tasks, managing the LMS, organizing and delivering lectures and workshops, and ensuring that the course meets institutional graduate capabilities' frameworks. The BMM project demands additional types of work from the course coordinator. In the authentic-learning environment, the course coordinator acts as a resource and as a mentor for individual students and student teams, addressing problems and assisting in decision-making processes as they emerge. During the team-meeting stages of the project, the course coordinator circulates among team meetings, offering guidance and maintaining a project-wide perspective. The course coordinator also assists students with negotiation skills: student team leaders must regularly negotiate the scope of their teams' work with other team leaders, team members must negotiate the scope of the work within their teams, and students responsible for individual organizations' records must sometimes negotiate with industry representatives who request that information be added to or removed from their organization's record. The course coordinator also acts as the permanent liaison point between industries and the BMM: year round, the course coordinator monitors the feedback area and the email inbox for the BMM, and responds to industrial and other user feedback regarding specific entries and overall site design. The course coordinator must therefore be able to manage the course at both micro and macro levels, and to balance the requirements of the university, industry partners, and individual students in order to ensure that the new version of the BMM is ready to be launched at the end of the semester.

Rather than delivering standard tutorials, the course's tutor functions as a mentor, circulating through team meetings and reporting emerging problems and ideas to the course coordinator. The tutor is also responsible for marking assessment material.

The technical manager plays a similar hands-on role. The technical manager does more than perform the conventional tasks of designing the BMM's technical architecture and features, ensuring the technical functioning of the site, and maintaining the site's security and currency. In the context of this course, the technical manager also attends student team meetings and responds to student queries and requests as they emerge, pointing out technical practicalities of student suggestions, assisting with technical implementation of student ideas, and providing students with technical instruction where required.

The course coordinator, tutor, and technical manager thus work as a mentoring project team, as well as fulfilling the standard responsibilities associated with their roles. This can be challenging, particularly when tutors and technical managers are hired annually on casual contracts and are not provided with formal training in mentoring or project-based leadership. However, the BMM experience demonstrates that the team-style mentoring role can also be a stimulating and rewarding experience for staff accustomed to less-involved, more-conventional professional roles. However, while much of the scholarly literature on authentic learning focuses on ways in which to scaffold students into and through authentic learning activities, very little focuses on the related needs of instructors, many of whom may not have experienced this pedagogical framework before. Further research is required to identify ways in which to support instructors in the dynamic, unpredictable, and rewarding authentic learning approach.

ENGAGING WITH LEARNING INFRASTRUCTURES

For such an innovation to work in practice in other organizations, support and guidance must be available around three key stakeholder perspectives.

For the faculty

Typically a course embedding an authentic learning activity such as the Brisbane Media Map will have an academic staff member as key person responsible for the academic integrity and management of the course, particularly overseeing the engagement of the industrial partners, mentoring the persons who will serve as tutors or support persons for the students, and determining the standards and criteria for student assessment. Such an academic takes on new roles compared to traditional lecture-oriented teaching (Oliver 2003), including quality control of material for public access and liaison work with local industry partners. The scholarship of teaching takes on new dimensions when the teaching process focuses on the scaffolding of group work within which students make their own decisions about key design aspects of their work.

For the students

Students need a well-organized resource environment, in which the expectations of the course and appropriate support materials are available. They also need groupware tools, such as shared workspaces; tools for document version control and distributed annotation, feedback, and editing; tools that allow them to manage their own work-in-progress and at the same time make work ready for assessment accessible to peer reviewers and faculty before going public. They need tools to manage their shared agendas and for different forms of communication. They also need skills in communication via a web environment in terms of presentation design and user-interface considerations.

For the university

Students must be allowed admin or at least instructor-level access to certain areas of the institutional learning-management system so that it is used more as a groupware environment than a course-presentation environment. A campus-wide WiFi network and student use of laptops are important to the flexibility needed for participation in multiple teams while accessing common resources. The continuity and security of the BMM environment as well as free public access to the environment must be maintained by the University. Any changes of the BMM's web address must be indicated by redirects when previous web addresses are called up by site users.

FUTURE DIRECTIONS

The authentic learning and participatory design approach underpinning the development work of the BMM has produced more ideas for innovative new features than we are able to implement each year due to limited time and resources. We hope to continue to incrementally feed design and development inspiration from this ideas pool. We briefly outline two key proposals that emerged so far.

First, the BMM system has been the basis for the formation of the Sydney News Media Map at the University of Technology, Sydney, the Melbourne Media Map at La Trobe University, and the Malmö Media Map at K3 (Konst, Kultur och Kommunikation), Malmö University,

Sweden. Like the BMM, these maps seek to provide an extensive overview of media industries in their geographic areas. This gives us the opportunity to link these sites in a conceptual and analytical way to create a federated database of media maps that also tie in with national and international industry mapping studies. And it would produce new opportunities for students from different universities to collaboratively participate in this project. Such authentic international collaboration will prepare students for working in the increasingly global media and communication sector.

Second, it is now possible for students to track back across ten different versions of the BMM to see how this industry field, and student perceptions of it, have evolved over time. The availability of this longitudinal data gives us the opportunity to add a time machine feature to the BMM that would allow users to look at the conceptual cartography of the local media industry at any time since 2000. It would also be possible to compare two different points in time or analyse development and progress over time.

CONCLUSION

This article introduced the Brisbane Media Map, a comprehensive directory of Brisbane's media and communication industries. It traced nearly a decade of developing this resource from a static website to a database-driven web service using technology such as Ruby on Rails, AJAX and the Google Map API. We analysed the authentic learning and participatory design strategies that are employed to guide the annual development and maintenance work on the BMM. Joan Greenbaum (1993) suggests three perspectives that help us here to succinctly summarise the case for our authentic learning, participatory design approach. First, the *pragmatic* perspective recognises that the domain knowledge of the participating final year Media and Communication students is crucial to the successful design of this resource. Defining the appropriate categories and structure allows students not only to demonstrate their critical and analytical skills, but also to liaise with industry and future employers whilst researching the BMM's content. Second, the *theoretical* impetus behind the participatory approach comes from our experience of 'building shared, experiential understandings between different stakeholders in the design process' (Robertson 2005). The exchange of ideas between participants from IT/HCI and non-IT/HCI backgrounds enables a dialogue that encourages mutual learning. Third, the authentic learning approach responds to a *political* perspective that recognises students' right and need to influence their own learning experiences and outcomes. The example of the BMM can inform authentic learning and participatory design approaches in other courses in order to promote the utility of HCI design practice beyond the traditional core disciplines of IT and design studies. Understanding how the BMM has worked, for ten years, from the combination of pedagogical and design perspectives employed in this article, contributes to the growing field of authentic learning research.

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