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New Global Learning Cultures: Interdisciplinarity through networked technologies

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Abstract

The context in which higher education institutions (HEIs) now operate is facing fundamental changes; HEIs are often said to be in a time of crisis, and new models of education are being explored both within and outside the academy. The rise of open educational resources and practices and alternative forms of accreditation are gaining recognition as learners and educators explore new ways of learning and connecting both within and outside the institution. Simultaneous to this rise in new learning cultures and paradigms, traditional disciplinary boundaries are themselves being challenged as networked technologies and changing social/cultural conditions are leading to further critique of traditional pedagogies, and increasing support for interdisciplinarity. In this paper, we explore emerging and converging technologies and disciplines through two higher education international collaboration scenarios. These two projects illustrate the potential of interdisciplinary communities of practice to nurture and support new pedagogical paradigms. We conclude by identifying five design principles for global interdisciplinary projects.

Keywords

mobile learning; communities of practice; social media.

The digital revolution has disrupted and will continue to disrupt what we mean by learning and how we organize our disciplines. Suffice to say, that to think about transdisciplinarity in a networked world is to think about disciplines in a different and evolving context of interconnection and complex forms of communications and interchange.

Burnett, 2011

The context in which higher education institutions now operate is facing fundamental changes; HEIs are often said to be in a time of crisis, and new models of education are being explored both within and outside the academy. The rise of open educational resources and practices and alternative forms of accreditation are gaining recognition as learners and educators explore new ways of learning and connecting both within and outside the institution. Simultaneous to this rise in new learning cultures and paradigms, traditional disciplinary boundaries are themselves being challenged as networked technologies and changing social/cultural conditions are leading to further critique, and increasing support for interdisciplinarity.

In this paper, we explore emerging and converging technologies and disciplines through two higher education international collaboration scenarios. Using a design based research methodology (Reeves, 2005) we connect learners across the globe through content co-production, consumption and critique of social and mobile internet technologies and digital cultures from a range of disciplinary perspectives. These scenarios illustrate Balsamo's (2011) conception of "Designing Culture", which calls for technology to be treated as a post-disciplinary topic, alongside the transformation of universities through an "epistemological reboot". We argue that the integration of mobile networked learning provides a catalyst (Kukulka-Hulme, 2010) for such an epistemological reboot leading to authentic interdisciplinary scenarios.

The goal of the two projects is to create paradigm shifts in the participants' conceptions of teaching and learning, and in the disciplines themselves, leading to student generated content and student generated contexts in learning (Keegan & Bell, 2011; Luckin, et al., 2010), which cross disciplinary boundaries through digital networks and new media technologies.

The two projects include:

1. **ELVSS**: This project included twenty-four professional Sound and Video Technology students, collaborating within the ELVSS12 project alongside higher education student teams in the UK, New Zealand, and France, involving a total of seventy students. In this project, we focus on the production of crowd-sourced films, where international teams collaborate on the planning, filming and editing of content using mobile devices.

2. **iCollab**: This project included twenty-one multimedia and Internet Technology students, collaborating within the iCollab12 project alongside four other higher education student teams in the UK, Spain, Germany, and New Zealand, involving a total of seventy students. In this project, international teams work together using social and mobile technologies to map and situate both the development of their professional online identities, and the impact of the internet on their chosen field (discipline).

The international teams are made up of students from a variety of HE contexts ranging from Performing and Screen Arts to Public Relations, and cohorts from 2nd year undergraduate to Masters level. The participants are not only connecting across boundaries of time and space, but also across disciplines and cultures. The ultimate goal is to develop new ways of seeing and learning through collaborative study of internet technologies and emerging forms of digital creativity, learning from one another's disciplinary perspectives and cultures.

A review of the research literature (Wingkvist & Ericsson, 2011) indicates that to our knowledge these two projects are relatively unique, as although other large scale international mlearning and social media projects exist (see for example (O'Malley, et al., 2005; Unterfrauner & Marschalek, 2010)), they tend to be funded projects with a life-span defined by the length of available funding. Whereas the ELVSS and icollab projects are the reified outcomes of genuine communities of practice that are sustained by the shared interests of the participating lecturers.

Research Methodology

Both projects use a participatory action research methodology (Swantz, 2008; Wadsworth, 1998), with the 2011 research cycle informing the subsequent project iterations in 2012. The focus of the research is exploring collaborative student co-creation across international boundaries enabling pedagogical transformation in multiple contexts.

The research questions included:

1. What is the value added to lecturers and to students from participating in such a collaboration in terms of (for example) acquired competencies, social capital, and motivation.
2. What types of learning activities and pedagogical strategies prove appropriate for this type of student collaboration?
3. What strategies can be used to design the pedagogical use of Web 2.0 tools to create social constructivist learning environments that bridge formal and informal learning contexts, and also bridge international boundaries?
4. What are best practice examples of the pedagogical use of Wireless Mobile Devices (WMDs) to facilitate access to these Web 2.0 tools?

Both projects are supported by a lecturer community of practice (Lave & Wenger, 1991; Wenger, 1998), of which the authors are core members. Each community of practice (COP) meets virtually each week via Google Plus Hangouts, collaborate on curriculum design ideas via Google Docs and Wikis, and create open access media content using their personal mobile devices. The two COPs are made up of lecturers and academic advisors representing a range of courses in four different countries. Thus the lecturers themselves model a paradigm shift in educational practice, with the longitudinal support of an educational researcher, similar to Reeves' (2005) call for new research methodologies based on design-based research to support transformation in educational practice. As participants across the globe we use a range of emerging and converging mobile/social technologies to communicate, collaborate

and create, aiming to produce transformations in learning culture and heightened disciplinary awareness within our respective student cohorts.

Design Principles

The two illustrative projects build upon one of the author's longitudinal (2006 to 2011) participatory action research implementing mobile web 2.0 that identifies six critical success factors for pedagogical transformation. These are drawn from the design and implementation of over 35 projects from 2006 to 2011 exploring pedagogical transformation enabled by mobile web 2.0 integration in higher education (Cochrane, 2010a, 2010b), and include the following:

1. The pedagogical integration of the technology into the course and assessment.
2. Lecturer modelling of the pedagogical use of the tools.
3. Creating a supportive learning community.
4. Appropriate choice of mobile devices and web 2.0 social software.
5. Technological and pedagogical support.
6. Creating sustained interaction that facilitates the development of ontological shifts, both for the lecturers and the students.

By exploring these critical success factors as guidelines for our international collaborative projects we consequently identified five key design principles that could be applied to global interdisciplinarity, including: focus upon nurturing collaboration, establish a framework of mobile social media tools for collaboration and communication, build trust, value creativity, and design for change.

Two examples of global interdisciplinary

This section explores the two examples of global interdisciplinarity. Both of these projects have been through two iterations of implementation and design refinement during 2011 and 2012, and this paper represents one of the goals of the underlying design-based research methodology by exploring the design principles

discovered to support global interdisciplinary collaboration. The development of the collaborative partnership between the authors is also an example of mobile social media enabling global interdisciplinary networking. This partnership was established in 2010 as an outcome of the researcher's remote presentation at the 2010 ALTC conference (Cochrane & Bateman, 2010), where the researcher became aware of the co-author's work on mobile learning (Keegan, 2010a). A search of the co-author's blog (Keegan, 2009, 2010b) revealed a similar interest in mobile learning for pedagogical transformation as that of the researcher. Linking to these examples of mobile movie making on the researcher's blog resulted in a conversation via social media: "*Hi there – notice you linked to my mobile phone film blog posts, cheers for the pingbacks! I'd be really interested in seeing how you get on. Let me know if you need any info*"¹. This led to following each other on Twitter, and the establishment of a partnership between the researcher as an academic advisor in elearning and learning technologies, and the co-author as an expert in mobile movie making within the context of Audio Engineering education in the UK – a similar role to that previously held by the researcher in a prior position in New Zealand. This partnership was reified by the invitation from the researcher for the co-author to participate remotely in two projects in 2011: ELVSS, and icollab.

ELVSS

The Entertainment Lab for the Very Small Screen project (ELVSS) was the brain-child of a Performing And Screen Arts lecturer at Unitec New Zealand, who had been working in partnership with the researcher since 2009 to explore new pedagogies enabled by mobile social media in an elective course within a Film and Television major. The first iteration of the ELVSS project in 2011 involved a single group of twenty students at Unitec, New Zealand, and was co-facilitated by a collaborative partnership consisting of: the course lecturer, the researcher, a New Zealand social media expert, a New Zealand mobile movie expert, and the co-author as an international

¹ <http://thomcochrane.wordpress.com/about/#comment-46>

mobile movie expert. ELVSS11 utilized Skype, Twitter, and YouTube, to facilitate collaboration and communication between the geographically (and timezone) disperse lecturers and the students at Unitec. The ELVSS11 project involved students forming mobile movie production teams using iPhones for shooting their scripted footage, and iPads or laptops for editing the movies. The student teams explored the unique affordances of smartphones for movie making and dissemination, under the guidance and critique of the collaborating lecturers. Thus the ELVSS11 project explored student-generated content situated in a local context. The project was structured as follows:

- An introduction to the iPhone and iPad;
- An overview of mobile social media: Twitter, Blogging, QR Codes, and Augmented Reality;
- A series of overviews of mobile movie making techniques;
- An overview of social media distribution;
- Formation of student production teams;
- Negotiation and co-creation of movie scripts;
- Initial rushes of mobile footage – previewed to the class and lecturers via YouTube
- Student team movie production;
- Presentation and critique of final student team mobile movies;
- Student reflections recorded and uploaded to YouTube.

The five student team mobisodes and student reflections on the project are available on a YouTube channel². Using the iPhones students explored and made examples of filming techniques and positions that were unachievable via traditional film

² <http://www.youtube.com/user/ELVSS11#g/u>

making using standard production-level digital cameras and crews³. They also critiqued the advantages and limitations of the small screen format⁴.

So what did I think of the experience? To be honest a lot of it wasn't new to me. I was familiar with the concept of using small devices for creating video, but at the same time it was really eye opening – the broad unexplored territory I hadn't touched on before... I've never really thought of making films specifically for the iPhone before... keeping in mind where and when the viewer might watch that video and the fact that the video had to be quite concise and short, it was really interesting having that restriction and limitation to work with, that was new to me... Also the convenience and the creativity that the iPod or iPhone enabled – you would not be able to do some of the shots that you can on an iPod on a large traditional film camera. For example, a lot our video was recorded with what we called an “iboom”, which was an iPod taped to the end of a stick that our actor carried while running... It's opened my eyes to the idea that you can create art and something that can be consumed by an audience on a device that it can also be watched on. (Student reflection, 2011)

This illustrates that the project represented a mind-shift for the students: “*I've never really thought of making films specifically for the iPhone before...*” While students used their mobile devices for leisure and social activities, very few had conceived of the educational or professional use of these devices, as illustrated by a pre-project survey of the 2011 students shown in Figure 1.

³ See for example <http://youtu.be/GgnbWiMd2C0>

⁴ See the following student reflection for example <http://www.youtube.com/watch?v=uq6YUt9UAJU>

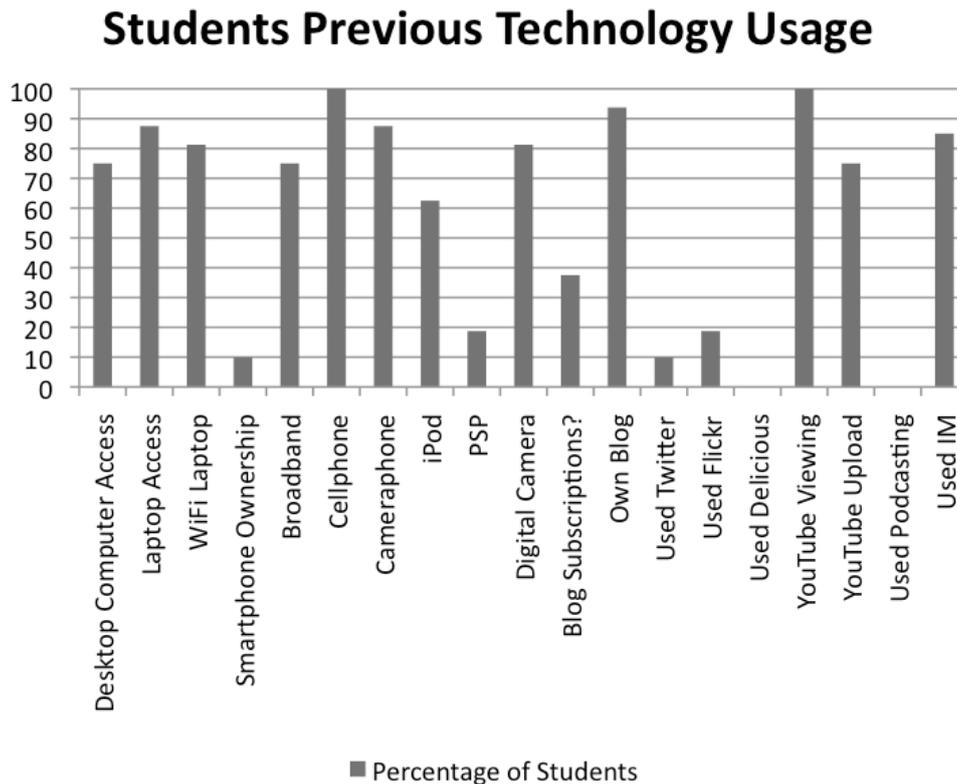


Figure 1: Students previous experience of mobile social media

Figure 1 indicates that the majority of students had limited mobile social media experience prior to the project, and while cellphone ownership was ubiquitous, there was limited smartphone ownership among the students.

The project not only explored an innovative use of mobile technology, but also enabled the course lecturer to reinvent the course's underlying pedagogy. The course was redesigned from a set of content-delivery lectures (pedagogy or teacher-directed), to developing student-negotiated and student-generated team projects (heutagogy or student-negotiated learning) that were supported by the input of a range of mobile learning experts, both locally and internationally. Assessment strategies were also changed, from a previous focus upon students producing written reports on the impact of social media on their industries, to the development of student-negotiated authentic team projects. Rather than the previous content delivery by lecture model, each face-to-face class session involved an overview of an aspect of mobile video production, and was followed by student-led discussions (enhanced with a live Twitter feed) around the

development of their mobile projects. Class notes and outcomes were negotiated with the students and made available on Google Docs. Remote guest lecturers from Wellington (NZ) and the UK (Salford University) were brought into the class via live Skype feeds, with interaction and questions enabled via both the live and asynchronous use of Twitter⁵. At the end of the ELVSS11 project, the student teams presented their co-created mobile movies to the lecturers, and the lecturers gave them critical feedback. Feedback from the remote lecturers was achieved via live Skype sessions projected on a large screen for all the students to watch and ask questions, and also via pre-recorded video feedback uploaded to YouTube⁶. Students then provided reflective feedback on the project process via short video PODcasts uploaded to the course YouTube channel. Student feedback focused upon the unique affordances of mobile film making that they discovered throughout the project, and also upon the difficulty they encountered in negotiating a collaborative scripts within their teams – as this was a new experience for them.

ELVSS12 built upon the lecturer partnerships established through the ELVSS11 project to create an explicit international community of practice of like-minded lecturers in 2012. This COP was reified by the use of Google Docs, Twitter, and Google Plus Hangouts. Using these social media tools, the lecturers spent several months brainstorming and collaborating on designing the ELVSS12 project. Building on the ELVSS11 project, the ELVSS12 project explored student co-production of mobile movies in international teams, guided by an international community of practice of lecturers and mobile social media experts. The four student teams were made up of combinations of: two film students from Unitec (NZ), five audio engineering students from Salford University (UK), and two graphics design students from Strassburg University (FR). To facilitate the work-flow of these international teams, a set of mobile social media tools were suggested and modeled by the lecturers for the students to use in their projects. These tools were chosen because of the availability of mobile apps for both iOS and Android devices that synchronized with cloud-based services, including:

⁵ For example http://youtu.be/Q427tf8e_00

⁶ For example http://youtu.be/Q427tf8e_00

Wordpress as a team eportfolio, Google Docs for co-creating scripts and project milestones, Dropbox for sharing content files (audio, video, animation) between the team members, Twitter for asynchronous communication, and Google Plus Hangouts for synchronous communication.

The ELVSS12 project was structured as follows:

- An introduction to the mobile tools
- An introduction to the 24 frames in 24 hours (24/24) mini project
- A review of the 24/24 footage
- An overview of the sustainability theme for the team movies
- An international group Google Plus Hangout to introduce the three groups to one another
- Assignment of international student teams
- Negotiation and co-creation of movie scripts within their teams
- Student team movie production
- Invitation of student team representatives to participate in the lecturer COP Google Plus Hangouts
- Presentation and critique of final student team mobile movies
- Student reflections recorded and uploaded to YouTube

The interdisciplinary nature of the student teams meant that each team was made up of students with expertise in three different fields important to the mobile movie making process. Each student team had the input of two film major students (NZ), four audio engineering students (UK) for sound recording, editing and sound effects, and two graphics design students (FR) for creating professional animated introductory sequences and credits. At the end of the project, the project mentors (the ELVSS12 lecturer COP), including the technology stewards (Wenger, White, & Smith, 2009; Wentzel, Lammeren, Molendijk, Bruin, & Wagtendonk, 2005) or mobile social media experts, and the lecturers associated with the project, viewed the final versions and gave

reflective feedback on video to the students on their individual pieces. Unitec students edited their sections on their iPads so the NZ portions were fully mobile in their creation. The other participating students used their own personal mobile devices for the project. All of the students participated in the creation of a group Wordpress blog for their team movie project, and most of the students also kept a personal WordPress blog, journaling their ELVSS12 experience. These included personal video podcasts that reflected on the process and how their view of filmmaking was transformed by this experience. Examples of these are collated in the ELVSS12 YouTube channel. The final four videos can be found on the project blog⁷.

In comparison to the ELVSS11 project, the bulk of the students' class time was taken up with establishing their international teams. Thus the main outcome of the ELVSS12 project was the establishment of an authentic international collaboration, rather than an investigation of the unique affordances of mobile devices for creating mobile movies. The initial 24 frames in 24 hours mini project was designed to provide an introduction to the unique affordances of mobile film making, however in practice the students did not connect the implicit link with this project and the explicit introductions to mobile movie making techniques and mobile social media that the previous ELVSS11 project had achieved. Consequently while the final movies were recorded via smartphones, and mobile social media was used extensively for communication and collaboration throughout the project, there was little evidence of the student teams leveraging techniques or technologies unique to the mobile devices in their final movies.

Table 1 (below) provides a summary and comparison of the two iterations of the ELVSS project.

⁷ <http://elvss2012.wordpress.com/projects>

Table 1: Comparison of two ELVSS project iterations

Year	2011	2012
Project Title	ELVSS11	ELVSS12
Project Hub	Moodle	Wordpress
Participants	N=20 students N=5 lecturers	N=36 students N=7 lecturers
Mobile Devices	iPhone 3G and iPad1	iPod Touch, iPad2 (Unitec), and student-owned devices
Pedagogy	Heutagogy	Heutagogy
Project Focus	Co-production	International co-production
Web 2.0 Tools used for collaboration	Wordpress Twitter Qik Skype	Wordpress Dropbox Twitter Facebook Google Plus
Outputs: YouTube channel http://www.youtube.com/user/	ELVSS11	ELVSS2012

The makeup of the international lecturer and social media experts community of practice is illustrated in Figure 2. Figure 2 (below) also attempts to illustrate the interrelationship between the lecturer COP and each of the three course contexts. The course lecturers as members of the organizing COP broker participation within the wider international COP to their own students, effectively bringing them from the periphery of participation within this COP to full participation throughout the ELVSS12 project. Mobile social media tools are shown at the intersections of these four COPs to indicate the role these tools played in enabling participation within this community, and the production of social media artifacts as reified activities of this COP (Wenger, et al., 2009; Wentzel, et al., 2005).



Figure 2 ELVSS12 community of practice

This project involved the development of a lecturer community of practice spanning New Zealand, UK, Spain, and Germany⁸ for exploring collaborative curriculum design and virtual student cultural exchange using mobile web 2.0 tools (Buchem, Cochrane, Gordon, Keegan, & Camacho, 2012; Cochrane, et al., 2011). The icollab11 project involved international collaboration between groups of students in Germany (sociology of technology students at Beuth University of Applied Sciences Berlin), Spain (educational technology students at Universitat Rovira i Virgili), UK (design students at Sheffield University, and audio production students at Salford University) and New Zealand (architecture students at Unitec, and public relations

⁸ <http://icollab11.wikispaces.com>

students at AUT University). Building a core community of practice membership from the participating lecturers over a period of almost six months prior to the implementation of the project with their respective students built up not only a shared toolkit for use, but also built significant trust among the lecturers. The serendipitous nature of mobile web 2.0 tools was also illustrated by the brokering of the project from an initial collaboration envisioned between the UK and New Zealand to a project involving groups spanning across four countries. The project aimed to explore and evaluate which mobile social media tools, pedagogic strategies and learning scenarios could be effective to support international student and lecturer collaboration, participation in decision-making as part of curriculum development and the development of 21st century skills.

Each of the student groups explored a variety of mobile web 2.0 tools to create a virtual cultural exchange between the countries involved. These included: mobile polling using polleverywhere.com, mobile Augmented Reality, Twitter, Prezi, blogging via either Wordpress or Blogger.com, sharing YouTube introduction videos⁹, and a group wiki¹⁰. A collection of student-generated projects that were shared for comment between the groups was collated on the group wiki page¹¹. These included: layers of geotagged data for augmented reality browsers (Unitec Architecture student projects), eliciting student peer feedback via Polleverywhere.com (AUT students), Prezi.com presentations (German students), YouTube tutorials (Salford students), and a Facebook group (Tarragona students).

The icollab11 project established a framework and built up the trust within the lecturer international COP to continue into 2012.

The icollab12 project built on the icollab11 experience exploring student-generated digital identity and social media reporting across New Zealand, UK, Spain,

⁹ <http://www.youtube.com/playlist?list=PL546B03EE313199EF>

¹⁰ <http://icollab11.wikispaces.com>

¹¹ <http://icollab11.wikispaces.com/StudentPresentationLinks>

and Germany¹². The core of the icollab12 project was the continued community of practice of lecturers across four countries established in 2011 by the icollab11 project. As a group of like-minded lecturers we used collaborative tools such as Google Docs and Google Plus Hangouts to meet weekly and contribute to brainstorming project ideas for our students. This led to the concept of students as social media reporters. As part of the icollab12 international project, students in each participating country were required to move beyond the ‘classroom’ and use their skills in digital communications and social media content production to become transmedia reporters/citizen journalists. They were to work in groups to develop a series of reports for (and in collaboration with) an international audience. The main focus of the project was to produce rich media reports on Social Media in a) their local community, and b) their chosen industry (for example: web, computing, creative, gigs). Their reports were then presented to students in Germany, Spain and New Zealand – in turn, their fellow #iCollab12 students overseas produced parallel content. At the end of the project, students in each country were asked to vote for the best “Social Media” report¹³, and the winners received an iTunes voucher. Polleverywhere was used as a mobile voting system for the participants to vote for the best student social media reports¹⁴¹⁵. The student social media reports were produced in a variety of formats, with the only prerequisite being that they were accessible via the web. The projects were collated on the icollab12 project blog¹⁶. A summary of the topics, techniques and tools used by the students is provided in Table 2.

¹² <http://icollab12.wordpress.com/about>

¹³ <http://storify.com/thomcochrane/icollab12-social-media-report-votes>

¹⁴ http://www.polleverywhere.com/multiple_choice_polls/LTExNzg1ODMwNTc

¹⁵ The following link is to an example YouTube playlist of the final student presentations for icollab12 project: <http://www.youtube.com/playlist?list=PL4C72B10F1B2AC723>

¹⁶ <http://icollab12.wordpress.com/2012/05/23/final-social-media-reports-from-the-uk/> (UK),
<http://icollab12.wordpress.com/2012/05/10/mobile-media-reporter-in-berlin/> (DE), and
<http://icollab12.wordpress.com/2012/05/01/social-media-report-from-auckland-students/> (NZ)

Table 2: Summary of icollab12 student reports.

Topics	Techniques	Social media tools
QR Codes	Interviews	Twitter
Local social media apps	Role play	Wordpress
Mobile social media use	Curation of social media	Tumblr
Social media use in industry	Surveys	Mahara
Location based services	Polls	Prezi
Social media and religion	Interactive reports with embedded examples	YouTube
Social media and sport/leisure		Wiggio
Public Transport		Storify
		Soundcloud
		Flickr
		Paper.li

For several of the student groups the icollab12 project was a non-assessed project that added an authentic collaborative experience to their course, but did not contribute to their summative assessment. The level of student engagement in this non-assessed project was beyond the expectations of the lecturers. For example, the New Zealand lecturer reflected upon the icollab12 project:

The New Zealand AUT University postgraduate students worked enthusiastically on this collaborative project with the students at Salford University in the UK as well as two other groups (Germany and Spain), guided by the researcher as the technology steward. The students presented their projects in class while streaming a live feed via Qik and also posted them on the project collaborative blog to get feedback from these students, and the public at large, The New Zealand presentations explored how social media has become integral to the city of Auckland. This project was not graded but the students were extremely motivated to create what has become a student-led project. (AUT Lecturer, 2012)

Table 3 provides a summary and comparison of the two iterations of the icollab project.

Table 3: Comparison of two icollab project iterations

Year	2011	2012
Project Title	Icollab11	icollab12
Project Hub	Wikispaces	Wordpress
Participants	N=70 students N=7 lecturers	N=70 students N=5 lecturers
Mobile Devices	iPhone 4 and iPad1 (Unitec), and Student-owned devices	Student-owned devices
Pedagogy	Heutagogy	Heutagogy
Project Focus	Virtual cultural exchange	Students as Social media reporters
Web 2.0 Tools used for collaboration	Wikispaces Twitter Qik Skype Polleverywhere	Wordpress Storify Twitter Facebook Google Plus Polleverywhere
Outputs: YouTube channel Playlist of selected student videos	http://www.youtube.com/playlist?list=PL546B03EE313199EF	http://www.youtube.com/playlist?list=PL4C72B10F1B2AC723

Figure 3 illustrates the relationship between the central lecturer community of practice and the four course COPs involved in the 2012 icollab12 project. Two of the founding members of the icollab11 project changed job roles during 2011 and thus were unable to continue with their participation within the icollab COP in 2012, leaving a core membership of four lecturers and one technology steward. This illustrates the organic, changeable nature of communities of practice, where the shared interest may not be in itself enough motivation to keep members as full participants, but also allows for and acknowledges the importance of legitimate peripheral participation.



Figure 3: iCollab12 community of practice

Discussion

Hameed and Shah (2009) argue that an Institutional cultural shift is required for mlearning implementation, while Balsamo (2011) goes further, arguing that an epistemological reboot is required. Our two examples of interdisciplinary networking enabled by mobile social media provide examples of how this can be achieved.

Nurturing an epistemological reboot

Communities of practice

The ELVSS and icollab projects illustrate the creative power of communities of practice. Neither the ELVSS or iCollab projects were funded projects, and were rather sustained out of the shared interest of the participating lecturers and mobile social media experts. The ELVSS and icollab COPs were reified in the co-creation of curriculum for the projects that valued and nurtured student-generated content and student-generated contexts within authentic environments beyond the classroom. Thus rather than being driven by the delivery of a set body of knowledge, these projects focused upon developing creativity and collaboration. Thus the projects were loosely defined and required continual tweaking throughout – achieved by the weekly lecturer COP meetings and constant interaction via mobile social media such as Twitter. The projects were more akin to a living conversation than following a set text. This level of flux was mitigated by the trusted relationships developed between the COP members. Communities of practice can be powerfully creative when a unique group of experts with complimentary skills work together on interdisciplinary projects to a level that is greater and more creative than what they could achieve individually. Institutions need to nurture and celebrate the development of such interdisciplinary COPs – rather than attempt to mandate and ‘institutionalise’ them. This certainly represents an epistemological reboot (Balsamo, 2011).

Mobile social media

A range of mobile social media was used in both of the ELVSS and icollab project lecturers to enable collaboration and communication across the boundaries of disciplines, timezones, language, culture and geography. Establishing trust among remote participants who had never physically met was a key issue. This was enabled by the use of mobile social media tools such as Skype in 2011 and then Google Plus Hangouts in 2012. The advent of the public release of Google Plus Hangouts in mid 2011 provided a huge boost for establishing more regular synchronous connectivity and resulted in a deeper social connectivity between the teams and project participants. This

was because Google Plus Hangouts supported up to ten synchronous video connections for free, whereas Skype required a paid account for this facility. Google Plus Hangouts also allowed internet connectivity across the various institutions advanced research networks rather than Skype's reliance upon commodity internet connectivity. Thus the use of regular weekly G+ Hangouts more effectively nurtured the development of a sense of community than the previous reliance upon Skype during critical incidents only. Google Plus Hangouts also provided added social value by way of the continual addition of other Google collaboration tools including the integration of shared YouTube viewing, Google Docs, screen sharing, chat, and most recently (at the time of writing) Hangouts On Air that include the ability to broadcast and archive Hangouts for a wider audience via YouTube. The addition of Google Effects for participants to customize a virtual costume during a Hangout also fostered a deeper sense of 'play' within the Hangouts, as illustrated in Figure 4.

Figure 4 is a screenshot of an example Google Hangout between four of the elvss12 lecturers and three of the student participants acting as team representatives. Inviting student team representatives into the weekly lecturer planning Hangouts became a powerful way of brokering the sense of connectivity to an international COP to the students, for whom the collaborative activity of the lecturers had previously been behind the scenes and largely invisible to the students. This also effectively allowed the lecturers to model collaboration and teamwork to the student participants. Connectivity via the Google Plus App for iOS and Android smartphones also enhanced the ability of participants to connect from virtually any context, with the researcher often connecting to the weekly Hangout while travelling on the train due to the time zone differences between the countries involved.

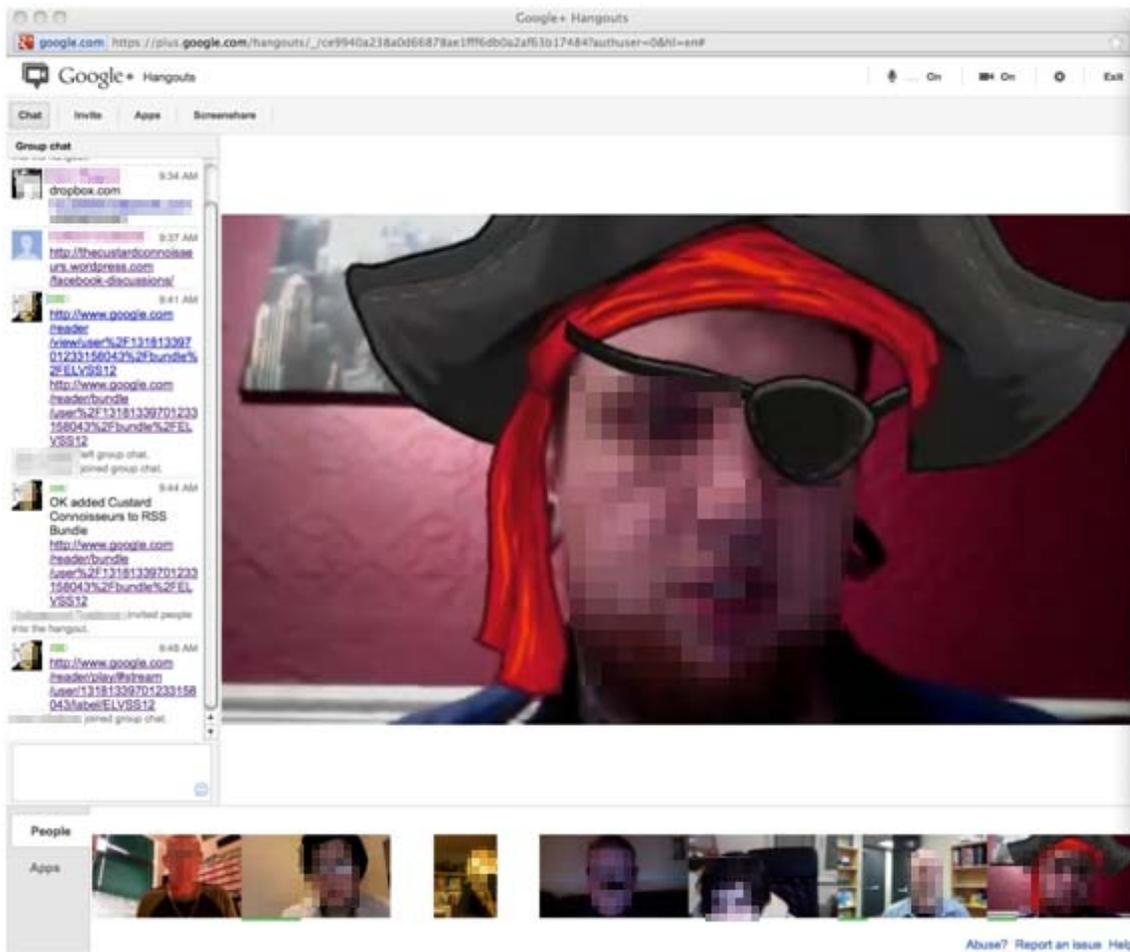


Figure 4: Synchronous collaboration via Google Plus Hangouts

Design principles for global interdisciplinarity

Summarising the key themes across the four projects (ELVSS11, ELVSS12, icollab11, and icollab12) leads to the identification of five design principles for global interdisciplinary projects:

- Collaboration is key - while this is often implicit in collaborative projects, it needs to be explicitly modeled by the lecturers involved in the project. In our cases this was achieved through inviting student representatives into the weekly organizing Google Plus Hangouts and making these available for wider student viewing. Having lecturers interact directly with each others student blogs and twitter conversations also models collaboration.

- Establish a framework for collaboration and communication - use the affordances of mobile social media to enable collaboration and communication.
- Build trust - by establishing lecturer COPs that continue before and after the projects. Make room for social interaction and play within planning sessions by allowing for tangential serendipity, but allow this to be participant driven rather than artificially scheduled.
- Value creativity - celebrate and share student work and be willing to incorporate good ideas into the projects. Although students are driven by assessment we have found that a non-assessed project that emphasizes student creativity within an authentic scenario can be as equally motivating.
- Design the projects to embrace change – change is a characteristic of mobile social media, however there is always more than one solution or social media platform to choose from when platforms unexpectedly close or change during a project.

Collaboration

The collaborative activity of the lecturers as a model of a community of practice for the participating students was initially largely invisible. Inviting student team representatives into the weekly lecturer planning Hangouts became a powerful way of brokering the sense of participation within an international COP to the students. This also effectively allowed the lecturers to model collaboration and teamwork to the student participants. Connectivity via the Google Plus App for iOS and Android smartphones also enhanced the ability of participants to connect from virtually any context, with the researcher often connecting to the weekly Hangout while travelling on the train due to the timezone differences between the countries involved. The value of using mobile social media to establish a framework for collaboration and communication that builds a sense of trust among the participants is illustrated by a reflective feedback blog post on the elvss12 project by one of the lecturers involved:

I love this project. I feel very lucky to be part of a committed team, working on something that is not funded – a genuine Community of Practice where

our passion for mobile filmmaking has brought us together in an international collaboration which spans disciplines, levels... and timezones.

The logistics of coordinating a project like this are not for the faint-hearted. Luckily we have Dan Wagner (NZ), who has done an awesome job of overseeing the whole project – and who is a JOY to work with – alongside Thom Cochrane (NZ), Laurent Antonczak (FR/NZ), Solene Trousse (FR), and Max Schleser (DE)

What's quite beautiful is the shift – which we have experienced on a weekly, sometimes daily basis – towards an emergent CoP model where learners are gradually taking on responsibilities and becoming coordinators. I remember Dan saying 'I'm starting to feel like I know your students now'. That was a magical moment. Next time, we'll develop the model further so that we'll all be hanging out with one another's students from the start.

With ELVSS12, it's about the lived experience – it's the students who are experiencing this collaboration, alongside us as tutors. The boundaries become blurred however. We start to meet one another's friends/families (in the spirit of the project we may hangout any place/any time). It's beautiful. (Elvss12 Lecturer, 2012)

Collaboration in curriculum design or in student teamwork projects was a new experience for the project participants, and did not necessarily come naturally – it needed careful nurturing and support via sustained interaction and experimentation over the projects' life-span.

Collaboration Framework

A number of mobile-accessible web 2.0 tools were used by the participants as negotiated shared collaboration spaces throughout the projects. These became communication and media-sharing hubs for each of the projects. One of the key aspects of the use of mobile social media was to enable the researcher as the technology steward (Wenger, et al., 2009) of these COPs to effectively nurture these geographically disperse teams. Mobile social media were also used to bridge these communities of

practice to potentially worldwide audiences, allowing and inviting peripheral participation in these communities of practice by interested peers. Core tools utilized included:

- Google Plus
- Google Docs
- Wikispaces
- Wordpress
- Dropbox
- YouTube Playlists

The collaborative nature of the projects led to the collaborative redesign of course assessment strategies by the participating lecturers; this involved a move from a focus upon theoretical descriptions of case studies (essays or exams for example) to curating and brokering student-generated content and the social media experiences of each project. Thus assessment strategies focused upon authentic learning (Herrington & Herrington, 2006a, 2006b) rather than merely theoretical conceptions. Some of the tools used to facilitate this new approach to assessment in each of the courses involved included the use of student owned eportfolios and social media curation and critique enabling a shift from teacher-generated content to student-generated content.

- Group Wordpress blogs were established as student-owned eportfolios
- Storify was used for curating and critiquing student-generated social media

Rubrics and guidelines were created by the lecturers involved in each project to outline the requirements for students using these tools within the projects. Often these

‘course requirements’ were negotiated with the student participants, leading to a greater sense of student-ownership of the projects¹⁷.

Building Trust

The transformative impact upon student learning experiences can also be illustrated by example student feedback:

It was a very exciting project to be a part of and I hope that I can do more of this kind of thing in the future. I have gained some valuable skills whilst being a part of the project including elements of leadership, communication and technical skills... Having been part of such an innovative project, I feel, has been a huge privilege and it is a credit to the tutors from each university and them being such forward thinkers that this was so successful. (ELVSS12 student blog post, 2012)

This illustrates the increased student engagement and the pedagogical impact and transformation that can be achieved by collaborative mobile social media projects. Another illustrative student reflection from the icollab12 project highlights the transformational shifts that can be facilitated by such projects:

Before taking part in this project I didn't have too rich an understanding of storytelling through visual media or knowledge of social media in web development. But it has been transformed during the #iCollab12 project...

In conclusion I must say that thanks to this project I have transformed my understanding of social media usage, I understood how powerful it is and I enjoyed it a lot. (icollab12 student blog post, 2012)

The example reflections highlight the level of trust built up between the participants enabled by mobile social media, even though they had never physically met.

¹⁷ See for example: <http://elvss2012.wordpress.com/unitec-elvss-assessment-briefs>

Valuing Creativity

We have used two frameworks to shape pedagogical change: heutagogy (Hase & Kenyon, 2000), and communities of practice (Wenger, 2000). Heutagogy, or self-determined learning is vitally concerned with developing learner creativity (Garnett, 2010). Participation within a community of practice of learners enables a higher level of creativity than that of an individual learner. We view creativity as the key attribute that we want to foster in our students (Cochrane, et al., 2011), required for graduates to make a positive difference in society within their chosen professions. Likewise we have found that collaborative curriculum development is a far more creative process when born out of a community of practice of like-minded lecturers with complementary expertise (Buchem, et al., 2012). As illustrated by the icollab projects a non-assessed project that adds an authentic collaborative experience to students' courses can increase the level of student creativity and engagement in their course. As unfunded projects, the ELVSS and icollab communities of practice are sustained out of the sense of creativity and collaboration experienced by the participating lecturers. However it is yet to be seen how long this model will sustain these COPs.

Design for Change

Another key aspect we have discovered is developing an acceptance and comfort zone with change. Change is fact of life of mobile devices, and social media. The rate of development of smartphones is much faster than the relatively sedentary evolution of desktop or laptop computing. We have also seen the rise and fall of several social media platforms over the lifespan of our projects. For example during 2011/2012 we have seen: the development of Google Plus, the acquisition of Instagram by Facebook, the acquisition of Posterous by Twitter, and the development of a Storify iPad app. However, allowing for and mitigating the changing nature of mobile social media enables a high level of student creativity as each cohort explores new tools and technologies and appropriates these for facilitating collaboration and communication. Designing projects to embrace change ensures that unanticipated changes will not derail

the project. In our case, the support of a community of practice of interdisciplinary experts and technology stewards behind each project has been a key factor in mitigating these rapid changes.

Conclusion

We have shown that global interdisciplinary collaboration can be effectively nurtured and supported by the establishment of global communities of practice, enabled by mobile social media. While the results of these projects have been rich authentic collaborative experiences for the students and the lecturers involved, there are key lessons that have been learnt in developing and nurturing international collaborative projects. We have identified five key design principles for global interdisciplinarity, including: focus upon nurturing collaboration, establish a framework of mobile social media tools for collaboration and communication, build trust, value creativity, and design for change.

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