ORIGINAL RESEARCH ARTICLE

Nurturing global collaboration and networked learning in higher education

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We consider the principles of communities of practice (CoP) and networked learning in higher education, illustrated with a case study. iCollab has grown from an international community of practice connecting students and lecturers in seven modules across seven higher education institutions in six countries, to a global network supporting the exploration and evaluation of mobile web tools to engage in participatory curriculum development and supporting students in developing international collaboration and cooperation skills. This article explores the interplay of collaboration and cooperation, CoP and networked learning; describes how this interplay has operated in iCollab; and highlights opportunities and challenges of learning, teaching and interacting with students in networked publics in higher education.

Keywords: communities of practice; networked learning; collaboration; cooperation; social media; mobile social media

Introduction

The communities of practice (CoP) concept, rooted in social learning theory, emphasises collaboration across strong ties and the process of membership from initial peripheral participation to fuller participation as members of a community engaged in a process of collective learning (Lave and Wenger 1991; Wenger 1998; Wenger, McDermott, and Snyder 2002). With the growing prevalence of networked individualism and the ubiquity of social media, CoP in higher education must be considered in a wider context of networked communication, participatory culture and networked learning. iCollab is a community of practice that intentionally operates within and across networks, building upon the principles of CoP and networked learning as well as connectivism (Downes 2007; McConnell, Hodgson, and Dirckinck-Holmfeld 2012; Siemens 2005). iCollab connects students and lecturers in seven modules across seven higher education institutions in six countries. The ethos of iCollab is open, connected and democratic, seeking to build a sense of trust and mutually beneficial relationships among and between students and lecturers. The interplay and complementarity between collaboration and cooperation, communities and networks, and strong ties and weak ties lies at the heart of the iCollab project.

This article begins with an exploration of CoP and networked learning, highlighting the potential tension between them as well as their complementarity.

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Then, the rationale, inception and evolution of the iCollab project is described, with a focus on its evolution into a global network of educators and students. The article concludes with reflections of the authors and iCollab practitioners on the opportunities and challenges of learning, teaching and interacting with students in networked publics in higher education.

Collaboration and networked learning

The concept of CoP describes how people 'engage in a process of collective learning in a shared domain of human endeavor' (Wenger 2006). The concept can be, and has been, used to describe and theorise learning communities in higher education (Hodgkinson-Williams, Slay and Siebörger 2008). Higher education now takes place within a sociotechnical context that is changing rapidly. This changing context is characterised by ubiquitous connectivity, a shift from knowledge scarcity to knowledge abundance and a move from hierarchical towards networked forms of social organisation. As networked individuals, people move within, between and beyond various CoP throughout their lives (Castells 2010; Rainie and Wellman 2012; Ryberg and Larsen 2008). Thus, while the CoP concept focuses on strong ties and collaboration, more loosely tied cooperative modes of learning are increasingly evident (Ryberg, Buus, and Georgsen 2012).

Whereas a CoP is sustained via strong ties of a shared domain of interest of the participants, a network tends to function around more flexible links between participants on a more ad hoc basis. Theoretical frameworks such as connectivism and networked learning seek to understand learning in this broader networked context. Connectivism is the thesis that knowledge is distributed across a network of connections; learning consists of the ability to construct and traverse those networks (Downes 2007; Siemens 2005). In the connectivist model, a learning community is considered a node in a larger network. Networked learning theory is rooted in an understanding of learning as a social, relational phenomenon, specifically locating learning and knowledge construction in the connections and interactions between learners, teachers and resources (McConnell, Hodgson, and Dirckinck-Holmfeld 2012).

Jones and Esnault (2004) highlighted tensions that exist between the metaphor of networks and CoP. While CoPs blend the individual and collective in a shared commitment and a common domain, networks have no collective dimension. Access to networked information flows and exchanges may be direct or indirect, intentional or serendipitous (Wenger, Traynor, and de Laat 2011). However, the two poles are not necessarily opposed; they may be complementary (p. 15):

> Social learning is enhanced by a dynamic interplay of both community and network processes. Such interplay combines focus and fluidity as it braids individual and collective learning. The work of fostering learning needs to take advantage of this complementarity.

To make the most of such complementarity, social media plays an important role in both nurturing a community of practice and facilitating wider network interactions. Nurturing CoP is identified as a critical element in their sustainability (Wenger, White, and Smith 2009). Social media, particularly mobile social media (MSM), can be an enabling platform for collaboration and cooperation across temporal and

spatial boundaries. The interplay and complementarity – between collaboration and cooperation, communities and networks, and strong ties and weak ties – lies at the heart of the iCollab project. iCollab is a community of practice that intentionally operates within and across networks.

While social media usage has been prevalent among higher education students for a decade, only in recent years has its viability as a learning medium been considered by a growing number of educators (Arteaga Sánchez, Cortijo, and Javed 2014; Czerniewicz and Brown 2013; Junco, Elavsky, and Heiberger 2013; Reed 2013; Sugimoto *et al*. 2015; Tess 2013; Timmis 2012; Waycott *et al*. 2013). Selwyn (2010) noted three factors that tend to motivate the use of social media in higher education: recognition of students as connected, creative and networked individuals; the changing relationship between learners and knowledge, that is, construction versus consumption; and the rise of informal, user-driven learning. Social media can be used to facilitate synchronous and asynchronous connections between and among students and lecturers – not only within courses and institutions, but also across multiple institutions, countries, time zones and academic terms. Open sharing of media on personal mobile devices, outwith institutional virtual learning environments (VLEs), can support pedagogies which aim to challenge the conventional one-to-many power relationship between lecturers and students (Mott and Wiley 2009). Cochrane *et al*. (2013) note that use of MSM within iCollab aims to support 'shifts from teacher-directed pedagogy to student-generated content and student-generated contexts', explored further below.

iCollab inception and evolution

iCollab is an international community of practice connecting students and lecturers in seven modules across seven higher education institutions in six countries: Ireland, the UK, Spain, Germany, Australia and New Zealand. The goal of iCollab is to explore and evaluate mobile web tools, engage in participatory curriculum development and create opportunities for students to develop international collaboration and cooperation skills (Cochrane *et al*. 2013; Cochrane and Keegan 2012). iCollab challenges the typical format of modules, courses and programmes, which run for a set period of time with a focus on discrete units of assessment; iCollab students work across cohorts, levels, institutions, countries, academic terms and time zones, using social media and other mobile, web-based tools for multimedia production, collaboration, cooperation and reflective practice – as well as exploring the creation and negotiation of digital identities and personal learning networks.

iCollab has developed through five stages (see Figure 1) based on the CoP concepts of boundary crossing and brokering (Wenger 1998). The first four stages were establishing a core community of practice, brokering participation, nurturing participation and brokering practice. These were defined and elaborated in an earlier article (Cochrane *et al*. 2013) and are only briefly summarised here. In this article, we focus on the fifth stage: the evolution of iCollab into a global network. MSM has been utilised at all stages for scaffolding and sustaining interaction, both locally and globally.

Stage 1. Establish a core community of practice

The global core group of iCollab participants was established over the course of four years (2011–2015) with the initial group of four growing to eight educators across seven institutions in six countries.
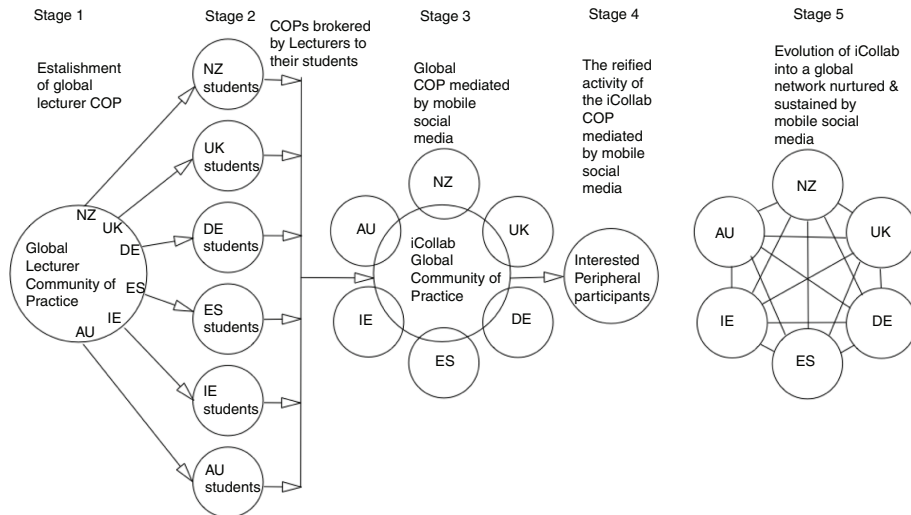
Figure 1.   Five stages of iCollab development (2011–2015).

Stage 2. Broker participation

In the second stage, students and lecturers, in their respective course cohorts, explored together the concepts of CoP, networks, collaboration, cooperation, social media, digital identity and personal learning networks (boyd 2010; Downes 2010; Rajagopal, *et al.* 2012; Rheingold 2012; Wenger 1998). Lecturers and students together identified activities relevant to their respective modules that would be good candidates for collaboration with a global CoP.

Stage 3. Nurture participation

In the nurturing participation stage, lecturers intentionally and explicitly modelled participation within the CoP. Lecturers occasionally participated as remote contributors on selected topics in one other's classes. Students were encouraged to choose their own topics, develop their own research questions and create cross-institutional and international teams to investigate and collaborate on these. Students presented and shared their work via synchronous and asynchronous mobile video streaming. MSM was leveraged for communication, curation and open sharing of student-generated content.

Stage 4. Broker practice

In the fourth stage, the focus was on sharing reflections and learning as outcomes of the CoP through collaborative reflective scholarship shared via conference and journal publications (see iCollab Bibliography) as well as a range of social media tools. Projects across consecutive years of courses and student cohorts are visible in student blogs and curated collections of student artefacts, accessible via the #icollab hashtag. These collections comprise a record of pedagogical change and students' learning over time (Cochrane *et al.* 2013). Although not the focus of this article, reflections by students emerged in students' own web spaces, for example: 'I was

exposed to a broad range of technologies including apps, hardware, and social networking and marketing tools. The course provides a good platform for enhancing an online presence, which is vital to creative professionals in a competitive market'. (Student blog post 2011); 'Thanks to this project I have transformed my understanding of social media usage, I understood how powerful it is'. (Student blog post 2012); 'I have learnt that social media/social networks are not just to be used as a distraction for not getting work done but can be used as an aid to get the work done. Social media/social networks can provide useful tools to help with academic learning'. (Student Google+ post 2012). iCollab has used the collective activity of the global CoP for brokering the concept to a wider audience of interested peripheral participants, including some within our own institutions and local networks, resulting in the development of a fifth evolutionary stage of the CoP.

Stage 5. Evolution of iCollab into a global network

As the iCollab CoP has grown and matured, it has created a foundation for an ever-evolving global network of educators, students and graduates. Members of the lecturer CoP continue to collaborate with one another and with others, beyond the iCollab project. The activity of the iCollab CoP from 2011 to 2015 is briefly summarised in Table 1 (for more details on the 2011 to 2013 iCollab CoP activity, see Cochrane *et al*. 2013).

As shown in Table 1, beginning in 2013 the iCollab CoP began growing beyond a single collaborative project to encompass several different activities by 2015. The iCollab network now provides a supporting framework for innovation in education across a variety of projects and course contexts. This network includes the 2013 Mobile Augmented Reality Movie workshop (MARM workshop) facilitated at AUT University and at the 2013 Ascilite conference by iCollab members, both face to face and virtually, several elective projects in 2014 and 2015 (Cochrane and Antonczak 2014, 2015a, 2015b; Cochrane, Antonczak, and Guinibert 2014), a two-year national project across six New Zealand higher education institutions (NPF14LMD) (Frielick *et al*. 2014), development of a lecturer professional development cMOOC (Cochrane, Narayan, and Burcio-Martin 2015) and MoCo360 mobile film-making collaboration (Keegan 2014). Thus the fifth stage of the iCollab CoP has resulted in the development of a model of an ecology of MSM resources for supporting a global educational network (Figure 2).

Table 1.   Evolution of iCollab iterations (2011–2015).

|	2011	2012	2013	2014	2015
Project title	icollab11	icollab12	iCollab and MARMW	iCollab, NPF14LMD and AUTMSM	NPF14LMD, Mosomelt cMOOCand Mobime
Project hub	Wikispaces	Wordpress	Wordpress Google+	Google+ Wordpress	Google+ Wordpress
Participants	70 students 7 lecturers 5 courses 4 countries	70 students 5 lecturers 4 courses 4 countries	340 students/ participants 6 lecturers 5 courses 5 countries	1060 students 40 lecturers 7 courses 6 countries	140 students 45 lecturers 1 course 4 countries
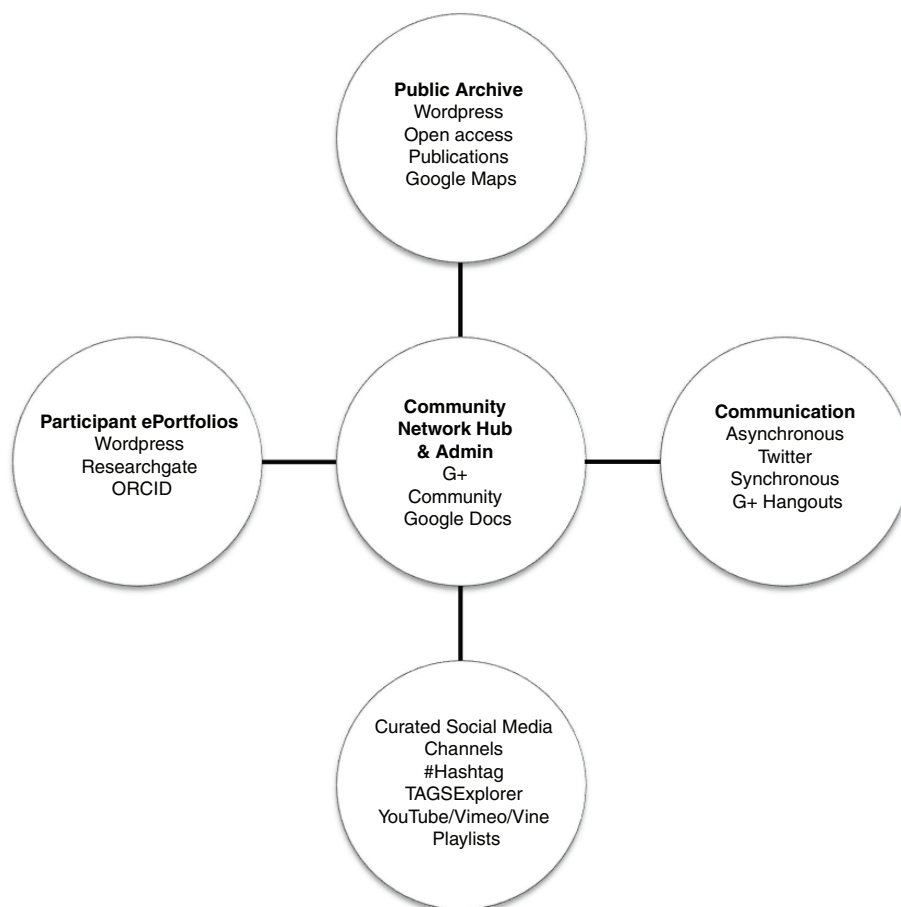
Figure 2.   An ecology of MSM resources to support a global educational network.

iCollab in action

The iCollab project began and grew by creating a flexible environment for collaboration and cooperation between several groups of lecturers and students, all involved in higher education courses in different contexts, but wanting to engage in open, creative and collaborative learning. The formal structures of seven different courses with seven different term schedules meant that activities could be synchronised at only four or five points in a given year. We used the ability of social media to attach the #icollab hashtag to all project-related content and communication, thus creating and curating a stream of iCollab resources and conversations. Each course group dipped in and out and contributed to the project stream as it fitted their time schedules and course priorities.

A wide range of social media tools was used, including an open Google+ community, WordPress, Twitter, Google Maps, Wikitude, YouTube, Vine and Bambuser. We also used several mobile-friendly hashtag curation tools to curate project-related activity, including TAGSExplorer, Flipboard, ScoopIt and Tagboard. Collectively, use of the #icollab hashtag across multiple tools and platforms helped to establish a sense of virtual community. All streams were linked within the project

Google+ community, which served as a project hub. Figure 3 is a snapshot of a map of the 2013–2014 iCollab participants.

- iCollab Google+ community: www.bit.ly/1fT1WW3
- iCollab blog: www.icollab.wordpress.com
- iCollab participant map: www.goo.gl/maps/rKLjA
- iCollab contributor map: www.bit.ly/1fuq4t6
- #icollab network activity (TAGSExplorer): www.bit.ly/19O0cpp
- #icollab TAGBoard: www.tagboard.com/icollab/15606

Students and lecturers were collaborative editors in this map, linking their online profiles to a geographical context. The map included 138 collaborators and attracted 6791 views in 2014, illustrating the breadth of interest in the project.

One of the most important tools used by our global asynchronous CoP has been Twitter. In 2013–2014, there were 153 Twitter nodes (active participants) and 756 edges (conversations) associated with the #icollab project. Figure 4 illustrates Twitter activity using the #icollab hashtag during November 2013, generated using TAGSExplorer[1].

The establishment of significant nodes of conversation can be observed in this network diagram. While initially these were predominantly iCollab lecturers, over time several students gained confidence and a significant voice within the virtual community, thus providing role models and mentorship for other students. The project also attracted a number of lecturers, researchers and others, not directly members of the CoP but interested in the conversations, media artefacts and/or impact of the project. This provided multiple opportunities for focused Twitter chats during which students could engage with academic staff[2], authors whose work we were reading[3] and more.

Example iCollab project

Collaboration within the iCollab community of practice typically takes place among two or more cohorts for specific, purposeful learning activities. Students use various
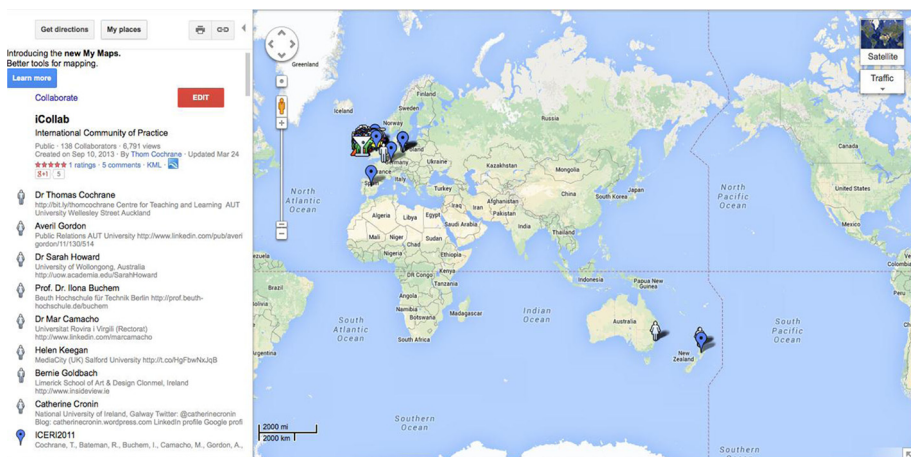

Figure 3.   iCollab participant map 2014.

Figure 4.   TAGSExplorer Twitter #icollab analysis.

social media tools to share and communicate their work, ensuring both real-time and persistent visibility across multiple online spaces and audiences. Use of the #icollab hashtag facilitates curation of resources and the development of a body of work – and identity – over time.

As an example, during 2013–2014, students in Ireland and New Zealand collaborated within iCollab by sharing their work, in various formats, across several social media platforms. Second-year computer science and information technology students in Ireland designed, created, delivered and shared presentations based on IT-related topics of their choice. This activity followed class sessions during which topics such as digital identity, presentation skills, curation, copyright and Creative Commons were explored. Students created and shared their work using a range of social media applications – all using the #icollab hashtag as well as the class hashtag #ct231[4]. At this stage, postgraduate public relations students in New Zealand entered the #icollab activity stream, enabling peer-to-peer interaction and feedback. The public relations students were asked to identify, record and analyse the value of MSM activity as an integral part of a public relations campaign for a particular organisation. Students explored the affordances of MSM such as Twitter, Vine and Google+ – illustrated by examples of the Irish #ct231 student projects within #icollab. Projects were presented in class, live streamed, collated via TAGBoard and

linked to the #icollab Google+ community where they received feedback from students and lecturers in Ireland. This collaborative exercise was a way of not only teaching students about mobile media spaces and communication essential for both IT and PR, but immersing students in those spaces with current tools and modelling the use of social media and MSM for sharing and collaboration. The connections between students and lecturers in Ireland and New Zealand, via #icollab on various social media platforms, provided opportunities for peer-to-peer interactions, sharing and feedback across the two countries, exemplified via the sharing of student social media explorations using Twitter, Storify, Vine and Bambuser[5].

Example iCollab network activity

Based upon our iCollab experiences, the Mosomelt (Mobile Social Media Learning Technologies) cMOOC (Cochrane *et al*. 2015) was designed in 2015 as a framework for upscaling lecturer professional development. The initiative was based on creating a global network of CoP across universities utilising a connectivist Massive Open Online Course (cMOOC) as a framework. The Mosomelt cMOOC framework links iCollab participants as global experts into an authentic professional development experience via the integration of a range of MSM learning technologies, including a webinar series and linking to the iCollab CoP core participants' online social media profiles and activities as examples. The framework is designed as a series of triggering events over 24 weeks to support the development of participants' personal eportfolios and pedagogical practice that then can be optionally validated by external certified membership of the Association for Learning Technology (CMALT accreditation). Mosomelt models a critical scholarship of technology-enhanced learning (SOTEL) through open access publications and social scholarship practices. Mosomelt also models the use of an MSM ecology of resources to support a global network of lecturer CoPs[6].

Discussion

The iCollab lecturers who initiated and facilitate the iCollab CoP share a common understanding of higher education students, in all their diversity. We recognise that students, as networked individuals, enter higher education with existing identities, networks and practices – both digital and embodied. We do not ask students to leave these at the door (or the virtual door, in the case of VLEs). Instead, we invite students to join a community of practice that is itself networked, to reflect on and develop their identities, networks and practices within the iCollab CoP and to the extent that they wish, in wider networks to which the iCollab CoP provides visibility and access. iCollab is an example of a type of a pedagogical design described by Ryberg and Larsen (2008, p. 113):

> We wonder how networked learning systems would look if they were genuinely based on the metaphor of networks and intersections of weak and strong ties. For instance, one could imagine learning environments that took their departure in students' and learners' networks, interest groups and research projects rather than solely being constructed around subject matter and courses.

Social media can be a democratising platform, but democratic practices are not inherent in any technology or media. However, as part of a refocus upon students as

content producers and partners in negotiated learning outcomes, use of social media – particularly MSM – can help in empowering students with a sense of personal agency in the learning process (Cochrane *et al*. 2013; Dabbagh and Kitsantas 2012). This is particularly so if complex issues such as digital identity, privacy and data ownership are explored. If learner agency and empowerment is a goal of any pedagogy, those values must be established at the start, as was the case with iCollab. Since the inception of the iCollab project in 2011, increasing numbers of educators are using social media to engage with students as collaborators in open educational experiences, to broaden learning activities beyond the classroom and to model and practice networked learning (Costa 2014; Keegan and Bell 2011). Newer pedagogical models, using open networked technologies and collaborative web tools, perceive education in radically different ways, for example, beginning with the premise that education is a 'social and relational process that is distributed across and between physical and online spaces' (van Mourik Broekman *et al*. 2015, p. 29).

While many iCollab students enjoyed international communication and peer feedback, building trust across networks is a complex process. Creating a real sense of connection between seven disparate groups of students around the globe and building a platform of trust was one of the key challenges associated with the iCollab project. While the iCollab lecturers model this process, a lack of student experience of building professional communities can be a significant cultural shift for students (Beetham and White 2014; Helsper and Eynon 2010). Students require support, specific feedback and opportunities for reflection on the artefacts they produce for assessment, of course, but also on the processes of collaborative and cooperative learning, building trust across networks and building personal learning networks.

Without a formal external influence mandating project milestones or set outcomes, the iCollab CoP tends to ebb and flow as participants' time pressures and interests allow. However, we observed positive outcomes and impact on student learning throughout the successive iterations of iCollab (Cochrane et al. 2013; Cochrane and Keegan 2012; Cronin and Cochrane 2014). As one lecturer in the iCollab CoP observed (Keegan 2012):

> Traditionally, we deliver modules/courses, neatly chunked into 12 weeks, with units of assessment, leading to grades, etc. and that's the way things are (generally) done. I'm not saying scrap *all of* that, but I do think that modules are best served as springboards to other things. Increasingly, students are connecting across levels and cohorts through Twitter and now we have ex-students getting together with current students, undergrads coming to postgrad classes (and vice versa) as they've connected online and have a genuine interest in getting involved in other groups/further curricula outside of their taught modules.

Since the inception of iCollab in 2011, the project has grown and evolved considerably. As shown in Table 1, there was no new iCollab project in 2015; however, successive collaborative activities that originated within iCollab continue to emerge and evolve. At the heart of all of these international collaborative projects is a focus on student-directed content and pedagogy; creation and sharing via social media, particularly MSM; and maximising the benefits of both communities and networks. Over the past five years, the iCollab CoP/network has produced nine international conference contributions, five journal articles and one book chapter describing, analysing and reflecting on iCollab pedagogical goals, designs and activities. The evolution of the iCollab CoP into a global network is reified in a number of

professional development strategies including the Mosomelt cMOOC and an explicit focus upon developing a global research network around the SOTEL.

Conclusions

Veletsianos (2015) makes a strong case for the creation of curricula that helps scholars to make sense of networked identities, societies and cultures. We agree with this and would argue further that *all* students require such curricula and pedagogy, regardless of their future paths. In networked publics, and through the use of social media, students and educators can move beyond the rigid role definitions often prescribed for them within higher education. The teacher–student relationship can become open to change, with students and lecturers becoming co-learners in networked learning spaces (Cochrane *et al*. 2013; Rheingold 2012; Stewart 2013). In networked CoP, it is possible for students and lecturers to have more equal roles in creating content, sharing resources, participating in conversations and starting conversations. Although the technologies themselves do not create democratic environments, educators who choose to engage with students in networked publics through the use of social media and other open tools and who engage in and model democratic practices can build CoPs and create spaces for powerful, student-driven learning.

Nurturing global collaboration and networked learning in higher education requires significant effort and commitment. Educators who make a commitment to this endeavour are, in many senses, 'building the raft while swimming' (Floridi 2014, p. 8). However, the mutual support of fellow networked educators helps when dealing with challenges that may arise. As iCollab participants, we have found that the benefits of becoming part of a networked community of practice have enabled a new level of creativity and the potential for authentic global and cultural learning experiences – for our students, for ourselves and for a widening global network of educators.

Notes

1. See live TAGSExplorer #icollab link for dynamic snapshot: www.bit.ly/19O0cpp
2. Student-staff Twitter chat: www.bit.ly/1MS8nsL
3. Digital identities Twitter chat: www.ct231.wordpress.com/2012/10/09/week-6/
4. CT231 student showcase: www.scoop.it/t/ct231-student-showcase
5. Students created Vine videos documenting their exploration of the city (www.vinebox.co/tag/icollab) and used Storify to share their experiences (www.storify.com/4Foursquare AUT/auckland-via-foursquare)
6. www.mosomelt.wordpress.com/about/

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