THE INTERDISCIPLINARY USE OF BLOGS AND ONLINE COMMUNITIES IN HIGHER EDUCATION

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Abstract

With online learning developing rapidly in higher education we have experimented with methods to embed blogs and online communities into our courses to enhance learning for staff and students. In this paper we provide a critical analysis of the approach used to analyse multi-sensory content on blogs and communities whilst demonstrating how they have been utilised across the Initial Teacher Education Division at The University of Northampton in the United Kingdom. We show how blogs and communities have enhanced interdisciplinary subject teaching, staff development and student engagement. By sharing a series of case studies we model the strengths and limitations of the practices adopted and demonstrate how reflexivity, communities of practice and the adoption of 21st century teaching and learning strategies fuel learning. We demonstrate how learning models can be applied and analysed within higher education institutions to enhance provision in progressive digital learning, and we draw conclusions about how tools can be used in combination to support learning.

The Digital Journey Towards the Use of Blogs and Communities

As an Initial Teacher Education (ITE) division we experiment with the digital tools we embed in our courses. This desire to be innovative began by replacing assessed e-portfolios with the use of online blogfolios in a primary computing module and went on to explore the use of blogs and Google+ communities, both singly and in combination. Research suggests blogging can provide participants with an opportunity to respond to their digital world (Collins & Ogier, 2012), allowing them to build content to share socially (Deng & Yuen, 2013; Farmer, 2006) and enabling them to develop through engagement with each other's work (Churchill, 2009). Research also exists to demonstrate how blogs enhance learning in higher education (Williams & Jacobs, 2004; Wheeler, 2010). Blogs have been found to help build learning communities (Yang, 2009), promote active collaboration (Ruepert & Dalgarno, 2011) and increase learning ownership (Farmer, Yeu & Brooks, 2007). Within ITE, blogs can function as reflective devices for students (Deng & Yuen, 2011). We sought to question how this occurred in our setting, and the five cases presented in this article demonstrate how this approach to learning has been explored at our institution.

We carried out a preliminary thematic analysis of five case studies, which used blogs and communities singularly and in combination, and we suggest a theoretical framework, which might be adopted to analyse their multi-modal content (see Tables 1 and 2). We became interested in how multi-modal content might be analysed to acknowledge the visual culture in which we all teach and learn (Heaton, 2014). This drove our trial to identify how learning

occurred through blogs and communities across disciplines but also made us consider the most effective way of analysing multi-modal content in research. We share our experimentation, but acknowledge that our model is developmental and that multiple approaches exist to analyse multi-modal content (Banks, 2007; Pink 2012).

Blogs and Communities Within ITE

The following five cases demonstrate the diverse ways blogs have been implemented within our ITE division. Together, our case studies model the different ways participants' accessed learning and demonstrate how they developed to become change-makers in their digital realm (Hood, 2008; Martinez, 2012). Case 2 provides a deeper insight into our methodological structure for blog analysis, in an attempt to share how our conclusions have been drawn. By conducting research into our online practice we hoped to find out what common threads enhanced or impeded learning when blogs or communities were embedded within education modules and continuing professional development (CPD) projects. We looked at how our case study blogs and communities enhanced teaching and learning by analysing them against five coding themes, identified by analysis of the case study samples by two researchers. Our key coding themes looked at how blogs and communities demonstrated *reflective learning* (Schon, 1983), facilitated the creation of *socially shared content* and *learning communities* (Deng & Yuen, 2013; Yang 2009), encouraged *self-directed learning* (Farmer et al., 2007), and provided evidence of the participants immersing themselves in *21st century learning practices* beyond the original tool (Sharples et al., 2014).

Case 1: A Module Blog in Art Education

Through our first case we model how a whole group blog was implemented as a non-assessed course component on our ITE art specialism course (see Case 1 overview). In this case it was evident that student learning was influenced by the participants' ability to become co-producers of content (Deng & Yuen, 2013), as the blog enabled them to express their artistic and educational license. Although the participants did not write all of the blog posts, as the course tutor created some, participants did provide the visual content and made comment on session posts, showing reflective engagement. By engaging with the blog they became aware of what it meant to share their practice as an artist teacher in a public domain (Parker, 2009; Stanhope, 2011). And as their familiarity with the blog developed, they began to generate discussion surrounding their content, demonstrating creative design cognition through their digital narratives (Tillander, 2011).

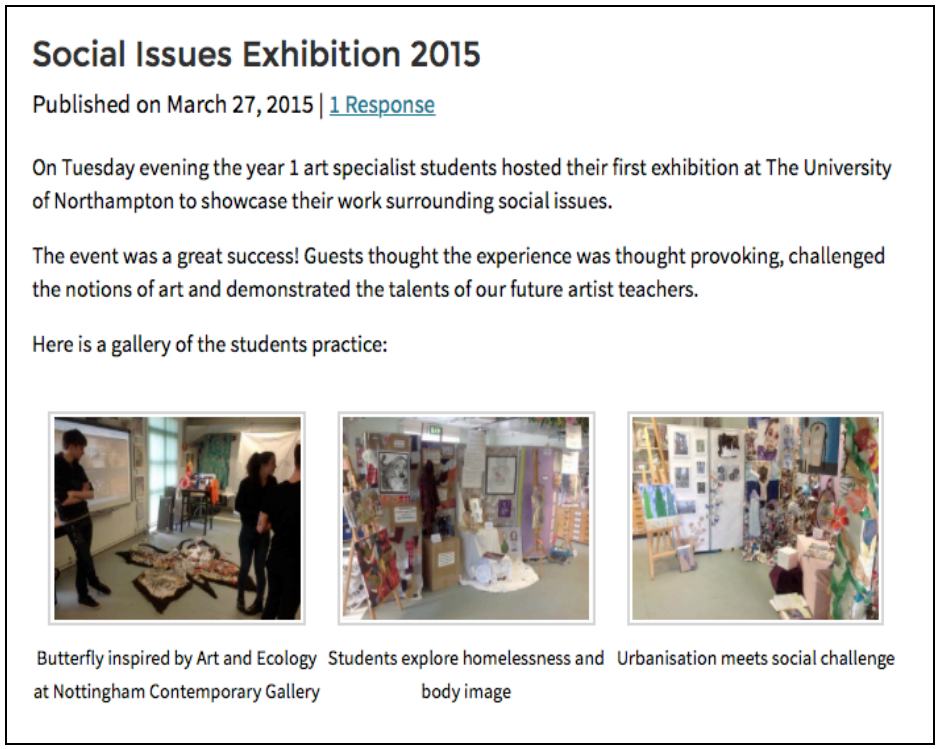
Case 1: A module blog for students in art education

Learning intentions:

· To use a blog to support communication and criticality between the students.

· To create a space where students could showcase their art practice identifying how learning events contributed to idea development.

Case Overview: This blog belongs to our first year BA ITE 2014 art specialist students. Its main uses have been to document learning events such as exhibitions, school and gallery visits. Students have mainly engaged through contributions of visual work, commentaries on posts and by accessing session materials.



Social Issues Exhibition 2015

Published on March 27, 2015 | 1 Response

On Tuesday evening the year 1 art specialist students hosted their first exhibition at The University of Northampton to showcase their work surrounding social issues.

The event was a great success! Guests thought the experience was thought provoking, challenged the notions of art and demonstrated the talents of our future artist teachers.

Here is a gallery of the students practice:

Butterfly inspired by Art and Ecology at Nottingham Contemporary Gallery

Students explore homelessness and body image

Urbanisation meets social challenge

Figure 1. A sample post from the art specialism 2014 blog.
Blog url: http://mypad.northampton.ac.uk/artspecialism2014/

Learning Outcomes:

- Students were given a multi-sensory voice; they began to generate an identity as an artist teacher. The blog demonstrated how they drew parallels between different aspects of their identities.
- Research, resources and artists practice was shared in a central space where discussion could be generated beyond the learning events planned.

An initial barrier to learning in this case was the disparity in student confidence to engage with the blog, but as Muncy (2014) stated, this developed when the students' familiarity with the blogging process grew.

When the blog was used as a tool for discussion and content sharing in taught sessions, a model of interaction was provided by the tutor, who also provided a safer scaffolded environment for students before independent engagement with the blog occurred. This blog highlights the importance of analysing visual or multi-modal contributions, wherein the visual content represents the voice of the learner. This finding sets the stage for the analytical approach we adopted in Case 2.

Case 2: Student Group Blogs to Explore Learning Outside the Classroom Pedagogy

Through this case we provide a second example of group blogs supporting learning in ITE, in this instance as an assessed piece of work, entirely produced by groups of four students. This case was developed into a fuller analysis, which has informed our review of all five cases shown here. We share this to showcase the complexities of blog analysis and demonstrate our emerging methodology.

In this case, blogs were used as an assessment tool to demonstrate how PGCE students applied learning outside the classroom (LOC) approach to study foundation subjects in the UK National Curriculum (DfE, 2013). The students created blogs in groups of four over the course of an academic year documenting reflection on their own learning experiences of LOC practices. The LOC practices shared included generation of short and long term plans, and examples of their application of ideas to practice. Over time, the students' reflection occurred both in action, on action and for action (Schon, 1983; Cowan, 2006) as they refined ideas through site visits, on campus and during school placements. They documented this ongoing development through regular journal postings on their blogs and used the page options on the blogs to present summaries of their learning in the form of a theoretical rationale and group presentation.

Case 2: Student group blogs to explore learning outside the classroom pedagogy

Learning intentions:

· To use a blog as an assessment tool to demonstrate learning across the foundation curriculum.

· To use blogs as a reflective tool to unite theory, pedagogy and practice.

Case Overview: The group blog provided here demonstrates an example of student practice. The blog has acted as a tool for the students to communicate their knowledge and understanding of creative approaches to learning. The students have been able to add and reflect on each other's contributions whilst creating innovative learning opportunities that they can now take forward into their professional practice.

Figure 2. Sample page from a learning outside the classroom blog.
Blog url: http://mypad.northampton.ac.uk/parkrangers/

Learning Outcomes:

- Peer to peer learning has occurred and evidence has been provided that student learning has been developmental throughout the year spanning pedagogy and practice.
- The use of the blog as an assessment tool has been effective to demonstrate group contributions and critique of practice; the students have also been able to produce a variety of media within the assessment.
- Learning has spread across multiple institutions. The students have been able to draw on pedagogy in different school settings and have shared this collaboratively to alter practice in different learning domains.

In this case study, we took a triangulated approach to the blog analysis. Our curriculum team conducted pre- and post- learning questionnaires and pre- and post- focus groups with our students and analysed these to generate key themes. Open coding was used to determine the focus group themes. We then analysed the findings from these against their blog contributions to determine how their learning developed. When analysed against their blog contributions, a sequential three-stage process was used. Table 1 documents the coding phases used and the key learning themes generated as a result of the questionnaires and focus groups. It provides a small number of examples to model how this evidence was identified on the student blogs.

Table 1

Example Framework for Blog Analysis to Include Multi-Sensory Content

Coding Phases	**Coding themes identified**					
Phase 1: Theoretical Coding	**Reflective learning (Schon, 1983)**	**Socially shared content (Deng and Yuen, 2013)**	**Learning communities (Yang, 2009)**	**Self-directed learning (Farmer, Yeu and Brooks, 2007)**	**21st century learning practices. (Sharples et al. 2014)**	
Evidence on blog	Updates of information Transfer of learning to a new setting or scenario	Creation of resources/ lesson plans for other students Presentation software used	Students reviewing information Delegating roles within a group Working in partnership with museums	Application of LOC principles to teaching Relating practice to theory	Use of external e-tools e.g. thinglink, QR codes Uploading and manipulating own digital content	
Phase 2: Blog content compared with the themes of the questionnaire findings	**1.Articulating understanding of the foundation subjects**	**2.Sharing confidence to develop children's skills**	**3.Sharing beliefs**	**4.Articulating the value of LOC principles**	**5. Discussion of progress towards the blog assignment and awareness of digital literacy**	**6. Shared different learning strategies**
Questionnaire findings	Confidence increase	Increase in all subject areas	Foundation subjects should be taught separately and together	Increased, less guidance now required	Student acknowledgement of the blog impacting learning has decreased	Confidence to use these has increased
Evidence on the blog that correlated with the theme.	Updates of subject knowledge Adapting their own teaching Learning transfer	Maps of skill progression Application of principles to teaching	Narration in posts Imagery selected	Reiterated throughout all content: narrative, visuals, multi-modal content	Blog reveals students adopting LOC principles and digital literacy in their teaching but students' acknowledgement of the blog assisting this has decreased.	Range of learning strategies modeled through blog content, e.g. socio constructivist
Phase 3: Blog content compared with the open coded themes of the focus group	**1. Learning through the foundation curriculum shared**	**2. Learning outside the classroom principles articulated**	**3.Technology enhanced learning discussed**	**4.Organisation of learning articulated**		
Focus group findings	Shift from learning about the principles to modeling in practice	Students identify LOC practices enhancing pupil learning	Student value of technology increased	Students share value of blogging		
Evidence on the blog that correlated with the theme.	Principles modeled in practice: digital content/ plans	Visuals Plans/ Evaluations	Use of in own teaching/ blog content	Evidence in narrative		

To reflect on the blog analysis process shown in Table 1, we now think that theoretical coding should have been utilised as an approach throughout all data forms to maintain consistency instead of open coding. The strength of the approach was that blog analysis revealed additional findings to the questionnaire and focus group, as it was able to take account of the multi-sensory content. The blog content also helped to substantiate students' comments increasing data validity.

The reflective process used by the students in the blogs enabled a cyclical process of learning to occur (Kolb, 1994). The students were able to use the blog to reform their thinking around LOC practices and implement new actions as a result. As academics we also engaged in reflective learning, maintaining empathy with the students' growing integration of theory and practice. As a result, the blogs documented the growth of students' confidence and understanding of LOC practices and digital media over time, and enabled students to review and adapt their learning in response to influences from scholarly material (Brown, 2004).

As with the blog in Case 1, the research revealed an initial reluctance to engage in blogging. However, by the end of the assessment process students could see how their blogs had enhanced their understanding of LOC practices and identified that blogging would be valuable to their learners. And as academic practitioners we recognised that the learning process might be enhanced if students were taught how reflexive dialogue could enhance learning. Reflexive dialogue can create fluidity in articulations (Scott & Morrison, 2005) and aid expression of cause and effect experiences (Spry, 2001). Academic staff also took account of how blogs gave a more central role to student voice, positioning the students as educational change-makers (Hood, 2008). By extending our use of blogs as a HE assessment tool, staff and students have been able to enrich their teaching and learning.

Case 3: Northampton Inspire: A Teacher CPD Blog and Google + (G+) Community Spanning Geographical Locations

The combination of a blog and a G+ community in Case 3 provides an example of how school pupils, university students, teachers and academics can engage in collective knowledge-building around a common purpose: in this case, the creative exploration of technology and the arts across subjects. This blog extends the learning practice shown in Case 2, as it demonstrates the use of blogs and communities in tandem to support a dispersed group of teachers who are engaged in developing and evaluating their practice. The blog and community were formed as a response to the need for an online space for a network group of teachers to develop and exchange successful strategies for using digital technology to enhance learning. The blog provided a connected environment in which the emergent professional development community could build an evidence base of best practice in teaching with technology by archiving their learning experiences. This was complemented by the community space as a fertile ground for ongoing discussion and quick ideas sharing. An advantage of using two online spaces in this way was the facility for educators to build upon each other's ideas and strategies. To look at one example, the idea of using a *light trails* app was picked up from a network meeting, applied in one primary school to support science, in another as an art project, and in a special school to promote multisensory learning. Teachers' reflections on this approach were recorded at a TeachMeet and on Twitter, and subsequently shared on the blog as a video recording and a Storify.

Case 3: Northampton Inspire: A CPD blog and G+ community spanning geographical locations

Learning intentions:

· To use a blog and G+ community to support a dispersed network of teachers, academics and student digital leaders

· To create a space where technology and the arts projects and events could be archived

Case Overview: This blog and G+ community reflects the work of the *Northampton Inspire* network group, which is looking at the interdisciplinary coming together of technology and the arts in schools and university settings. Posts on the blog and community pages document face-to-face meetings, projects in schools supported by volunteer student digital leaders and the sharing of practice at TeachMeet events.

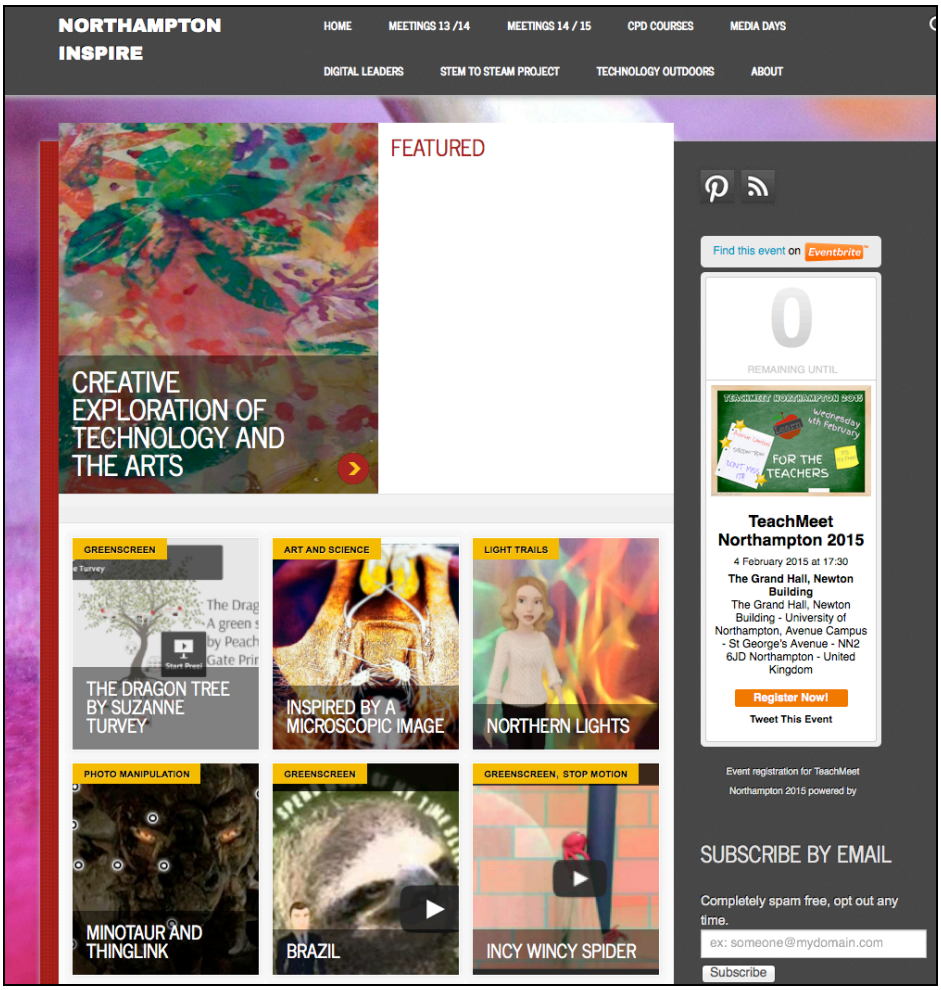


Figure 3. Sample page from the Northampton Inspire case study.
Blog url: http://mypad.northampton.ac.uk/inspire/
G+ community:
https://plus.google.com/u/0/communities/116085017840955911437

Learning Outcomes:

- The online spaces create a community of practice hub that is external to a particular educational institution and allow for peer-to-peer learning across the phase boundaries of schools and university, and between university students, academics and teachers.
- The blog creates an accessible interdisciplinary reservoir of resources and strategies representing collective knowledge building as the group applies themes in their learning contexts.
- The online spaces emphasise the application of knowledge to practice by drawing together three types of activities: presentations on recent classroom practice from students, academics and teachers at Teachmeet events; themed network meetings exploring practical applications; and projects in schools supported by student digital leaders.

Used together, the blog and community enabled teachers from a wide range of settings to discover common ground as they applied ideas to practice across varied contexts, a benefit suggested by Wick (2000), which is also modelled in the students' practices in Case 1 and 2. Researchers have noted a difference between the physical and virtual communities in the absence of *traditional group norms* and the levelling of social hierarchies (Palloff & Pratt, 1999). In Cases 1 and 3, contributions from students sit side by side with posts and comments by academics, cutting across formal structures and forging new understandings across educational sectors of the ways in which technologies can transform learning (Wenger, 2011).

Communities of Practice

As the concept of *communities of practice* is central to our findings, we will discuss it here. According to Lave and Wenger's definition, "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2011, p.1). Other definitions place a similar emphasis on applying knowledge to practice, viewing communities as "individuals united in action" (Liedka, 1999, p. 5) or as groups with similar aims purposefully solving authentic problems within a real world context (Wick, 2000; Johnson, 2001) as seen in Case 3. Since Wenger's original work on communities of practice in 1991 there has been a widespread increase in online learning, which has resulted in the adoption of the term *online communities of practice (OCoPs)* to describe "socio-technological learning environments" that facilitate knowledge construction (Ozturk & Ozcinar, 2013).

As well as helping to remove geographical and social boundaries, all three case studies outlined so far have enabled participants to belong to communities of practice with a shared common purpose. Within these communities they have co-constructed knowledge by documenting learning that took place in a number of different contexts: at teacher sharing events, at network meetings, in classrooms, and via hands-on activities. This makes a case for *multimodal learning,* which mixes physical interaction with asynchronous learning (Hammond, 1998). Contemporary communities of practice, such as we describe, can combine physical and virtual spaces

enabling the participants' learning journeys to move in and out of a number of *digital habitats*, a process which increases the opportunities for learning (Wenger, White, & Smith, 2009).

For example, by bringing together students, pupils, teachers and academics through a digital leaders programme in Case 3 and capturing their activities on the blog, we were able to add their different perspectives to curriculum development. Media projects using green screen equipment were developed by teachers who were supported by academics, then carried out in schools with pupils supported by digital leaders and later shared at TeachMeets from where they were captured on the blog as sources of ideas for future projects. This illustrates the way in which the *bottom up* and *top down* approaches to effective learning interact when expertise is shared informally through social online spaces and practitioner-led events (Sharples et al., 2014).

A Learning Extension: Combining Blogs With Communities

Through our first three cases we have shown that technology can facilitate situated learning by providing an environment in which learners can interact and share ideas using collaborative technologies. In Case 3 we have shown how a G+ community can enhance the use of blogs by providing a more immediate and responsive environment for exchanging ideas. Our online spaces can be seen as an example of situated learning taking place within a virtual community of practice or OCoP (Oliver & Herrington, 2000; Coppola, 1999), allowing for both synchronous and asynchronous communication. This gives learners control over the pace and place of their learning and engagement (Wenger et al., 2002; Gannon-Leary & Fonainha, 2007). In the next two cases we demonstrate the application of these ideas to a higher education context.

Case 4: The Ipad Project- A Blog and Community to Enhance Research and CPD in Higher Education

In Case 4 below, you can see that our growing community of practice involving academic and support staff across our university division has developed shared metacognition as outlined by Gunwardena (Gunawardena et al., 2009) around the use of apps for learning in a higher education context. Their metacognitive learning has been documented via a G+ community allowing them to quickly exchange ideas as well as a blog to archive their applications to practice as mini case studies. Mason and Rennie describe this type of learning shift as *group mediated cognition* in which "knowledge is created, shared, remixed, repurposed, and passed along" (2008, p.10). Our community demonstrates this as it documents the evolution of participants' use of a core set of apps for content creation over the course of a year with tools such as Thinglink, Skitch, Padlet, Rollworld, Explain Everything and Visual Poet being reused to meet a range of learning objectives across different subject areas within the group. A shared consensus has emerged that apps such as these can help make students' learning more visible. As the group solved problems together, sought help from each other, reused solutions and evaluated new apps, they developed a "collective competence" and a shared repertoire of resources and strategies (Wenger, 2011, pp1-6).

Case 4: The ipad project- A Higher Education (HE) blog and G+ community to enhance research and CPD in Higher Education

Learning intentions:

· To document and support the use of iPads by academic staff within the School of Education over the course of an academic year and provide a platform for sharing expertise more widely.

· To provide a Google+ (G+) space for academic staff to ask questions, share resources and ideas, and reflect on their practice during the implementation of the iPads project.

Case Overview: The G+ community and blog aimed to document the rollout of the use of iPads by academic staff in their teaching and learning. The project provided support for novice users who were able to seek advice from their peers, who shared what worked for them, until they gained sufficient confidence to experiment for themselves. New skills developed, supported by a collaborative team with a common purpose that tested and shared strategies and resources.

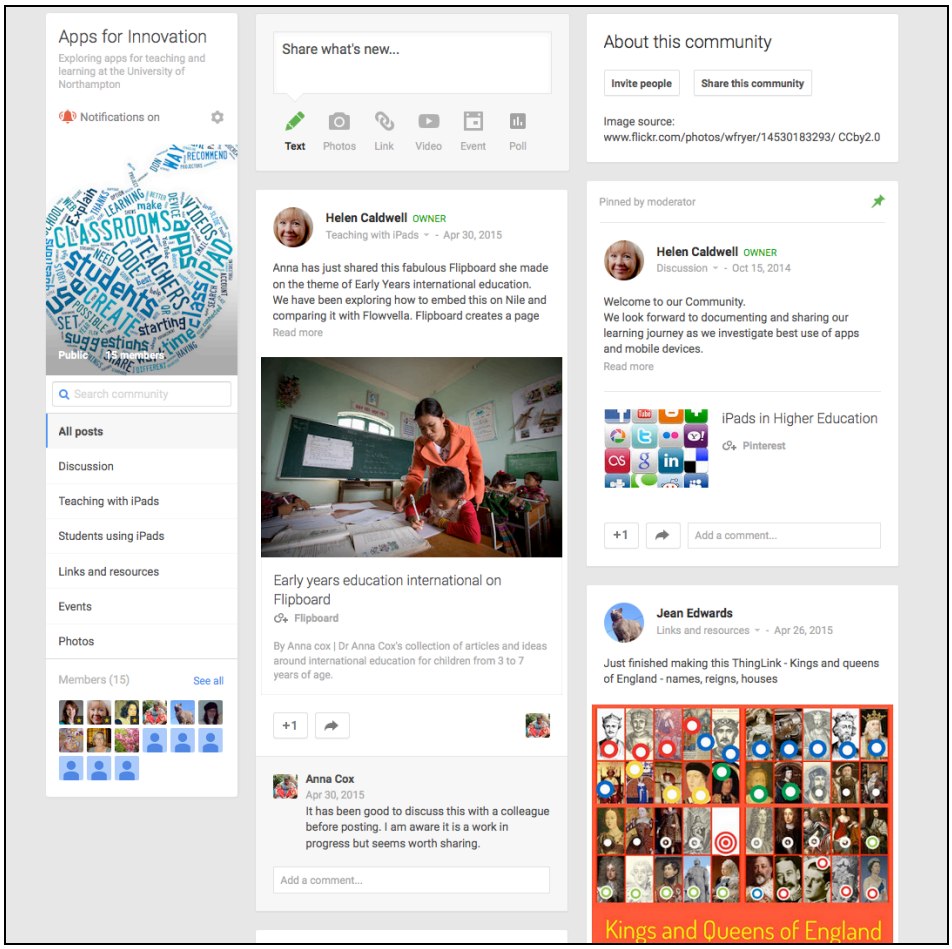


Figure 4. A sample of a Google+ page for the iPad case study.
Community URL: https://plus.google.com/u/0/communities/110218249780833007111
Blog URL: http://mypad.northampton.ac.uk/appsforinnovation/

Learning Outcomes:

- Knowledge continued to be transferred between novices and experts within the group outside of face-to-face meetings via the G+ community discussions.
- Over time, a core set of open-ended content-creation apps emerged as users trialled them for different purposes and recorded successes as mini case studies on the blog.
- Close links were made with other communities using social network tools, and between research and practice as people shared ideas from different perspectives and discovered common ground.

As in Case 3, we have combined remote and physical collaboration by mixing occasional face-to-face contact with connected conversations through social media. The blog and online community together provided a structured framework in which social learning could take place (Wenger, 2011). Our cases can thus be seen as *connectivist* learning environments in which participants make connections with people and resources, co-create ideas and make choices within an environment mediated by technology (Saadatmand & Kumpulainen, 2014; Downes, 2010; Siemens, 2005); "Connectivist models explicitly rely on the ubiquity of networked connections between people, digital artefacts, and content" (Anderson & Dron, 2011, p. 87).

Unlike face-to-face learning events where a cohort learns the same content at the same pace, an online community may have different types of participation and differing degrees of expertise. Knowledge transfer can occur at any time between experts and novices or from peer to peer (Bielaczyc & Collins, 1999) as the community generates "a common history" and its own "artefacts" (Lave & Wenger, 1998). And, as Johnson (2001) points out, individuals may move from the edges of the community to the centre as their expertise increases. Indeed, individuals may belong to a network of communities at any one time (Ozturk & Ozcinar, 2013) bringing a *new fluidity* to learning. Wick (2000) notes that collaborative teams might form and dissolve resulting in cross-pollination of ideas. In the community of Case 4, this can be seen around the apps for art activities bringing together the *app smashing* combination of Rollworld, Fragment and BeFunky, which has been independently explored by three academics and has resulted in several related posts and a series of comments on the blog and community.

A benefit of online learning is identified here; learning opportunities are multiplied as the collective learning potential of the group exceeds that of individuals working on their own and can thus lead to accelerated learning (Richardson, 2010; Hung, 2002). Johnson highlights this as a key idea when saying, "The learning that evolved from these communities is collaborative, in which the collaborative knowledge of the community is greater than any individual knowledge" (Johnson, 2001, p34). We would echo that this has been the major learning potential of the use of blogs and communities in our higher education courses.

Case 5: A Digital Community to Support SEN Education

Case 5 focuses on the use of a G+ community to support a student module in Assistive Technology. A key finding was that the presence of a commenting audience facilitates peer-to-peer learning. Case 5 illustrates how students contributed to the online community before, during and after our face-to-face sessions. Luckin et al. (2010) noted that this self-directed involvement by the participants is crucial to the success of the community and suggest that it can integrate formal and non-formal modes of learning by motivating learners to take a self-directed approach to managing their digital learning as they curate resources, reflect upon achievements and offer contributions to others.

Case 5: A G+ community to support a student module in SEN education

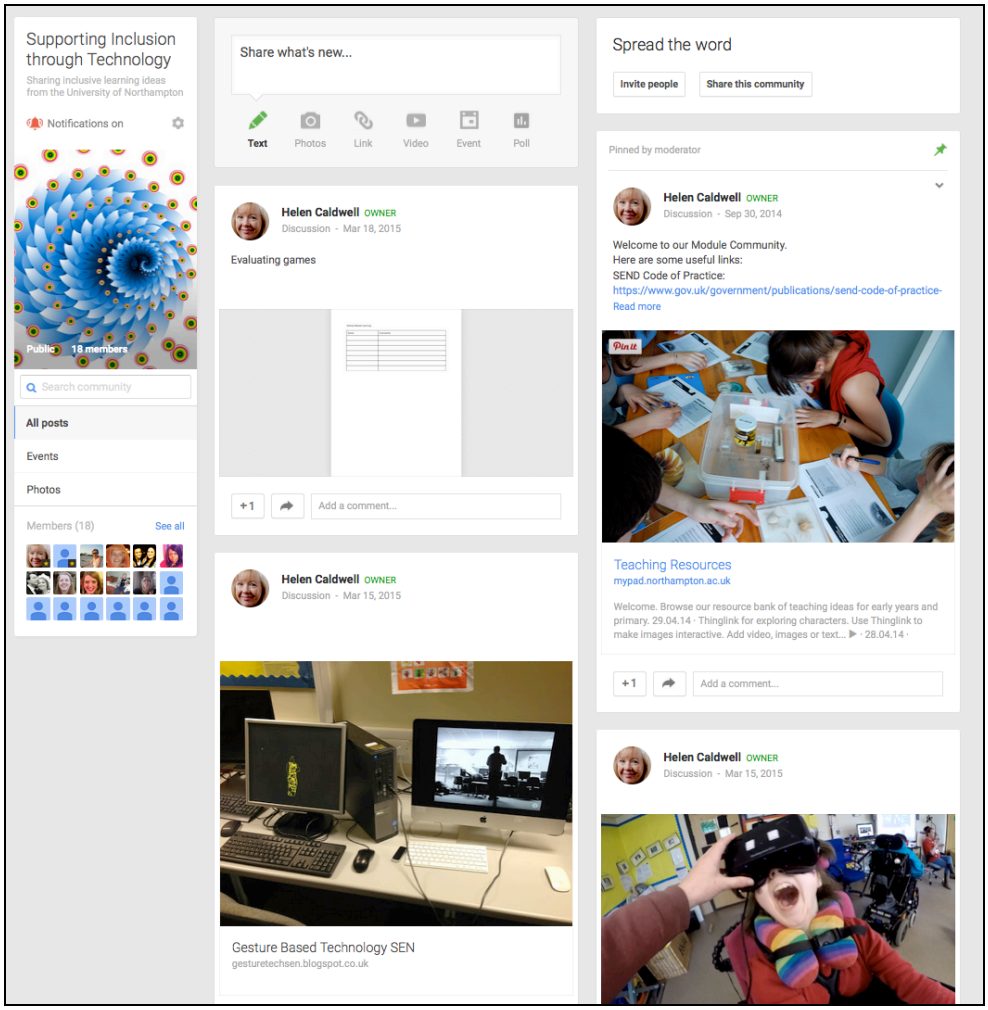


Figure 5. Sample Google+ webpage supporting the assistive technology case study.

Community URL:
https://plus.google.com/u/0/communities/105048363469375309187

Learning intentions:

· To help students explore the complex theme of assistive technology across all areas of need and all ages of users throughout a 24-week module.

· To capture students' developing ideas and understanding before, during and after sessions.
· To provide a space for reflection and review following a varied range of activities including visits, visiting speakers, practical application of skills and consideration of theory.

Case Overview: This G+ community was designed to provide a hub for students, visiting speakers and course tutors to share their ideas as they explored the theoretical and practical aspects of the complex topic of assistive technology and its application to a diverse range of needs and age groups over the course of a 24 week module.

Learning Outcomes:

- The online environment allowed interactions to occur outside of face-to-face sessions and so increased opportunity for student collaboration.
- The availability of content in different media increased students' choice over their learning pathways, facilitating self-directed learning, supporting visual and auditory access methods and alternative ways of expressing ideas.
- Student control over the time, pace, place and learning pathways was increased, blurring the boundaries between formal and informal learning.
- The use of the G+ community as a presentation tool and to capture learning during face to face sessions made for a more seamless connection between online and offline learning.

In Case 5, we aimed to create an online classroom where interactions occurred beyond the face-to-face sessions. We were keen to increase the availability of content in different media so that students had choice over their learning pathways and an option to make a more seamless connection between online and offline learning. We sought to capture ideas during sessions using collaborative tools such as Google Docs and Padlet so that there was a strong connection with students' face-to-face learning. We wanted to support students in trying to express their understanding in different ways by creating media-rich digital artefacts, as well as to offer visual and auditory access to topics. This was so that our students gained first hand experience of how these approaches might benefit the SEN/D users they would need to support in their future practice. We looked to increase student collaboration so that they approached each other for feedback rather than just their tutors. We hoped students would see the value in belonging to a community of practice in their field, in the same way as our higher education staff had identified through our iPads in HE project in Case 4.

Analysing Learning Themes Across Blogs and Communities

Over the course of our five case studies we sought to compare how they represented our five key coding themes, and how this differed across the blogs and G+ communities. Table 2 shows some examples drawn from both tools, colour coded to show examples from blogs and G+ communities.

Table 2

Examples of Analysis of Themes Across Blogs and Communities

Overview of examples across blogs and communities	**Coding themes** **Communities** **Blogs**				
Theoretical coding themes	**Reflective learning (Schon, 1983)**	**Socially shared content (Deng and Yuen, 2013)**	**Learning communities (Yang, 2009)**	**Self-directed learning (Farmer, Yeu and Brooks, 2007)**	**21st century learning practices. (Sharples et al. 2014)**
Case Study 1: A module blog for students in art education http://mypad.northampton.ac.uk/artspecialism2014/	Reflecting on school/ gallery visits	Using blog tags, blogroll and categories to improve navigation Hosting an exhibition	Documenting a social issues exhibition Responding to discussion topics	Making connections between own practice and other artists' work during gallery visits	Pre-session readings and tasks: blended learning Digital making
Case Study 2: Student group blogs to explore learning outside the classroom http://mypad.northampton.ac.uk/parkrangers/	Updates of information Transfer of learning to a new setting or scenario	Creation of resources/ lesson plans for other students Presentation software used	Students reviewing information Delegating roles within a group Working in partnership with museums	Application of LOC principles to teaching Relating practice to theory	Use of external e-tools e.g. thinglink, QR codes Uploading and manipulating own digital content
Case Study 3: A teacher CPD blog and G+ Community http://mypad.northampton.ac.uk/inspire/ https://plus.google.com/u/0/communities/116085017840955911437	Reflecting on the creation of collaborative visual minutes of an event	Posting details of events Sharing Pinterest boards of ideas on session themes	Posting videos of event presentations Suggesting further applications of techniques	Posting digital artefacts created during CPD days Sharing personal explorations of programming techniques after CPD events	Crowd based learning at a TeachMeet event: event-based learning Documenting network meetings and providing pre and post meeting resources: flipped learning Creating animated gifs to demonstrate techniques
Case Study 4: A HE CPD blog and G+ community https://plus.google.com/u/0/communities/110218249780833007111 http://mypad.northampton.ac.uk/appsforinnovation/	Using the blog to write reflective posts after application to practice and identifying improvements and extensions	Making suggestions for extending participants posts on uses of apps across other subjects Suggesting questions to investigate and avenues for further research as part of blog posts	Responding to queries on the community Building shared strategies for re-using recommended apps in different learning contexts Posting in pairs to record discussions Creating screencasts to enable others to replicate app uses	Posting reviews comparing apps Taking recommended apps and applying them to own teaching Writing a blogpost that documents personal exploration of iPad accessibility options and generalising from the experience	Collaborating on a shared Prezi conference presentation Developing app flows combining tools to enhance app capabilities
Case Study 5: A G+ community to support a student module in SEN education https://plus.google.com/u/0/communities/105048363469375309187	Group evaluations of games based learning experiences, Group app reviews Posting reflections and images after visits to settings and visits from practitioners Capturing student debate	Sharing slideshows evaluating acoustic environments around the university Sharing images and evaluations of assistive technologies for the visually impaired	Posting and commenting on personal browsing on session themes Commenting on posts Sharing tips for exploring multisensory equipment with darkrooms	Creating applications for symbol-based learning Uploading reflections on wider browsing Sharing personal reviews of accessibility options across devices	Using collaborative Google Docs to record group discussions Making multimedia digital artefacts Using QR codes

Looking at Table 2, we would suggest that blogs and G+ communities are both useful tools for demonstrating reflective and self-directed learning, generating socially shared content within learning communities, and

promoting the use of 21st century practices. When used in combination, as in Cases 3 and 4, they can encourage reflection before, during and after the application of theory to practice, and when further supported by face-to-face events, they can promote continuous learning through active experimentation and sharing within the online community (Kolb, 1984; Schon, 1983).

Looking Forward

Online communities of practice in the form of blogs and communities, such as G+, can provide a fertile ground for social learning. Through our cases we have shown that social network tools such as blogs, Google communities and Twitter allow learners to join an online community where interaction, cooperation, and social engagement continue to prompt learning away from the classroom. Learning in these domains occurs naturally, arising out of social behaviour. Like their physical counterparts, our virtual communities of practice are characterised by a shared common purpose and by the application of ideas to practice. Our belief, supported by our findings to date, suggests that learning can be amplified and accelerated due to the number of opportunities learners have to engage with others who are exploring the same topics in different contexts, bringing together different perspectives and experiences.

We have taken some first steps towards developing a framework for analysing our multimodal blog and community posts. Our next step is to apply this methodology across cases in order to match learning themes and digital tools.

Our use of blogs and communities goes some way towards aligning educational practice with ways in which digital technology is changing disciplines outside schools. This practice has resulted in changing social interactions and online collaborations within the workplace (ETAG, 2015). We acknowledge the need to embed the use of technology in educational contexts through interdisciplinary approaches mixing physical, digital and social learning spaces. We see the need to link the use of technology with authentic real world contexts. And we recognise the potential to use digital technology to support individual learners in a personalised way, amplifying effects by seeking input from the community. The emphasis of our cases has been on active knowledge building using collaborative technologies, moving away from teacher-directed pedagogy to generate a flexible learner-directed approach (Hung, 2002; Markham, 2003). The Pedagogy-Andragogy-Heutagogy (PAH) continuum suggested by Luckin et al. (2010) offers a useful way of considering the redefinition of teacher-learner roles in this context.

Our longer term aim is to document fluid and continuous learning journeys across a combination of locations, times, technologies and social settings in higher education to identify their effect on student learning in an attempt to add further justification to the practices we model. We seek to identify ways in which research on technological learning communities could focus on life transitions, such as school to university or university to workplace, or on personal inquiries to demonstrate the impact of such practices on a learner's development beyond academia. Such a journey might start by using digital tools in a formal setting, continue at home or outdoors and then return to the

formal setting to present results in a space that cuts across boundaries and formal structures.

As the ETAG group suggests:
"Digital technology can and should bring joy and engagement: a delight in stellar progress, the exhilaration of unexpected challenges, some playfulness and the reaffirmation of a global audience" (ETAG, 2015, p. 3).

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