CONTEMPORARY LEARNING WITH ICT

Trudy-Ann Sweeney
Flinders University, South Australia

Ruth Geer
University of South Australia

Abstract

This study explores: What should high quality contemporary learning look like for our students, what technology would support this and what knowledge do we need to develop to achieve this? This qualitative study examined the perspectives of three school leaders and six educators in one primary school over a three-year period. The findings highlight the increasing problem for demand of ICT resources exceeding availability and the value of building a school’s ICT capacity by strategically investing in the development of teachers’ technological, pedagogical content knowledge and supporting the application of this knowledge to practice through co-planning teams.

This paper investigates the development of school leaders’ and teachers’ perceptions about what high quality contemporary learning looks like, the technologies they believe support it and, the skills and knowledge that teachers need to make it an embedded feature of their practice. The findings are derived from a larger three-year Contemporary Learning with ICT Project with the Department of Education and Children’s Services in 2008-2011.

The results of the study are significant for three main reasons. Firstly, high quality contemporary learning is what schools and the broader society believe we should be aiming to achieve (MCEETYA, 2005). Secondly, the day where every student has his or her own personal computing device to support high quality contemporary learning is not far off. Education systems are struggling to bridge the gap between how students live and how they are expected to learn in schools. Thirdly, given that the educational community has converged on the idea of technological pedagogical content knowledge (TPACK) (Mishra & Koehler, 2006), there is a need to investigate how teachers are applying this framework to their practice. This framework is not prescriptive and requires teachers to understand the relationships between technology, pedagogy and curriculum content knowledge and how these intersect. This is important given the mismatch between many leaders’ vision for technology integration and the way most teachers use digital tools. This mismatch appears to stem from technology integration planning that often begins “with what’s most unfamiliar to many teachers: the technologies themselves … and unfortunately this approach does not ensure that educational technologies will be well integrated into instruction that is keyed to specific content-based learning goals” (Harris, Mishra & Koehler, 2009, p. 393).

Method and School Selection

A qualitative research approach was used in this interpretive study. Data were collected via individual and focus group interviews conducted each school term with nine participants including the school Principal, ICT Coordinator and Year 6/7 teacher, Year 6/7 teacher and Acting Assistant Principal (Curriculum) for 12 months, and six teachers of Reception to Year 4 students. Interviews were audio recorded and adhered to ethical protocols approved by all project partners. In addition, regular project partners’ meetings were held each term involving school leaders and there were several classroom observations. The data were analysed and categories and recurring themes that emerged were identified. The following research questions served as a framework for the interpretation of the data discussed in this study.

1. What should high quality contemporary...
learning look like for our students?
2. What technologies support high quality contemporary learning?
3. What knowledge do educators need to develop to achieve high quality contemporary learning?

The school that participated in the project was selected because the school’s Site Learning Plan identified a focus on technology, pedagogy, curriculum and professional learning communities. This approach was consistent with the TPACK framework and the importance of reflection, inquiry, collaboration and sharing (Borthwick & Pierson, 2008). This plan focused on the establishment of teacher co-planning teams and these were tasked with the development of six, inquiry units of work. The development of these units aimed to help teachers gather evidence to support their judgment of student achievement and reporting to parents required with the implementation of the National Education Agreement in 2009 (COAG. 2008).

A cohesive leadership team focused on curriculum development and assessment, and supported the teams (particularly during the first year of the project prior to changes in staffing). Support included substantial release time for co-planning teams using a template developed as a result of the leadership team’s participation in recent professional development activities. The team included two Assistant Principals, the ICT Coordinator and teacher-librarian. The units of work aimed to support the development of a common approach to planning and assessment that drew together recent teachers’ professional learning related to 21st Century learning, the NSW Quality Teaching Framework, Assessment for Learning, ICT, and curriculum planning using the Backwards by Design approach, and inquiry learning.

Findings

What should high quality contemporary learning look like for our students?

During the interviews held mid-way through the project, participants identified the following characteristics as being critical to high quality contemporary learning:

- There is a focus on the achievement of high quality learning outcomes
- Learning is dynamic and evolving
- Inquiry learning approaches are used that foster independence, interdependence, critical thinking and problem solving
- High interest and engagement of students occurs by using current, relevant and meaningful contextual material
- Student capacity is developed to pursue lifelong learning beyond the classroom
- Learning intentions and outcomes are made explicit to students so they know what must be achieved
- There is personalisation of the curriculum to cater for the varying needs of students.
- Students are not all doing the same thing at the same time as a whole class.
- Opportunities are provided for students to show individual growth of knowledge and understanding
- Cooperative collaboration and ‘learning as a partnership’ (student/parent/teacher) are fostered
- Teachers are seen as learners
- There is flexibility in the use of space and access to technology (including the latest)
- There is valuing of what students bring to the learning through knowing the students
- Students have ownership of their learning, as well as accountability
- Students are encouraged to take risks
- Learning is integrated rather than segmented
- There is an emphasis on emotional wellbeing and encouragement through a ‘you can do it’ mentality
- Students are prepared to be citizens of today’s world
With regard to what high quality contemporary learning looked like with students using technology, the Acting Assistant Principal and Year 6/7 teacher commented:

ICT definitely needs to be embedded as a tool and used to support student learning as global citizens. ... It is about students developing the skills to access knowledge, knowing where to go, what resources are available, how to use these and think critically about what they are accessing.

The ICT Coordinator and Year 6/7 teacher described what high quality contemporary learning looked like in the context of his classroom:

Students use Edublogs as an integral part of the units of work. Students have a clear purpose to use them. For example, they may reflect on discussions, which they have with their parents on a particular topic relevant to the unit. All class members have their own blog which is linked to a class blog. The class blog provides links to resources and outlines what the class is doing in their learning so that parents can also see what is happening. The blogs are public but are not searchable by Google and no photos or real names are used on the blog. Each student has their own pseudonym, which is known by other class members.

I gain insights into students’ learning through their blogs while also gaining insight into what is happening in their personal lives as students use their blog for communication during the holidays. There was some dilemma for the teacher about personal information that might be posted as well as concerns about inappropriate postings. Generally, this has not been a problem and when it did occur, it was turned into a learning experience for all. The blog helps students develop a sense of responsibility in a safe environment while learning how to be good digital citizens.

Ideally, each student would have a mentor who can respond to their posting and challenge them. As it is very time consuming for the teacher to provide comments on all the students’ postings parents were invited to regularly visit the blogs and provide comments. Initially some parents responded but this has dwindled (September, 2009).

In summary, according to these participants, high quality contemporary learning looks like learning that is active, emotional and part of a social process where the teacher guides students to increasingly take control of their learning and make meaningful connections across learning areas. The role of the teacher is to stimulate student engagement and facilitate students to formulate questions and guide students to achieve outcomes that are explicit and personalised to meet their individual needs and interests. The role of technology in high quality contemporary learning focused on the need for teachers to use a range of ICT tools, especially new technologies, video-streaming and the Internet to engage students, support inquiry learning and develop students’ information literacy and digital citizenship knowledge and skills.

What technologies would support high quality contemporary learning?

Prior to the project, the school had invested heavily in interactive whiteboards (IWBs) and personal laptops for almost all classrooms and teachers. This focus came about primarily because teachers saw this as a way to develop interactive, ‘just-in-time’ learning supported by computers connected to the Internet in their classrooms. Although this initiative had the positive impact of bringing online digital resources into the classroom when and where they were needed most and supporting the development of teachers’ personal ICT skills; the improvement to teachers’ use of the IWBs appeared to have stagnated based on the transition framework developed by Sweeney (2008). Indeed, the Principal felt that the IWBs were being assimilated into teachers’ didactic teaching practices rather than acting as the catalyst for a pedagogical transformation that was envisaged. As a result, the school was now seeking to “deliberately put technology in the hands of students” and strategically direct resources to teachers that were prepared to “put in the extra effort required” to align their use with student-centred pedagogies and identified curriculum learning outcomes. The Principal stated:

I don’t get caught up in the equity issue about the availability of the same technologies for all teachers. ... We move people out of classrooms who have not used their IWB and remove laptops if they have not been taken out of their bags. ... It is important to build the relationship with teachers and strategically direct appropriate resources and support to where they are needed most (March,
In 2009/10, the school had access to:

- Two 1:1 lap-top trolleys for the two, Year 6/7 classes to share
- One lap-top trolley of 14 for the five, Year 3-5 classes to share
- 10 ACER netbooks to share between the two, Year 3 classes
- LCD TVs in classrooms as visual display devices rather than IWBs and projectors

The Principal explained that the Year 3-5 students were given the choice “between having twice as many netbooks or half the number of laptops and they opted for the laptops because the netbook screen was too small for them to work together on it”. Following a trial of the netbooks in the Year 3 class in 2010, this view about their unsuitability was reiterated. Consequently, the netbooks were considered best suited for the younger R-2 students however they also said “the netbooks are too small and students don’t want to share … they get frustrated waiting for their turn and there are arguments”. The R/1/2 teachers also noted: “We had no access to computers in 2009 due to the rebuilding of the library and we only just got wireless access” (October, 2010).

In addition, the school:

- Trialed the UK cross-curricular, multimedia learning site Espresso (subscription only)
- Configured a new Dual ISP Internet connection to significantly increased Internet speed. This was a challenge to the technician as the new system has taken much of the control of the blocking and unblocking of websites away from designated educators such as the teacher-librarian.
- Planned and established a new library and Year 6/7 classrooms in 2009-2010 as part of the Federal Government’s the Building Education Revolution. The Year 6/7 teachers opted not to purchase IWBs to replace those in their existing classrooms but to purchase data projectors so that limited funds could be used to purchase an additional laptop trolley. A laptop trolley was also made available in the library.
- The whole school was supported with wireless technology.
- Encouraged students to use USB drives to transfer files between home and school.
- Began investigating the feasibility of a ‘bring your own device’ laptop scenario for Year 5 students. This initiative was necessary as demand for ICT was exceeding availability and the school was unable to increase the ICT budget to support the Site Improvement Plan to achieve “daily use of technology”.

Overall, the school is well resourced compared to other State primary schools. New staff arriving at the school have described the high level of access to technology like going from “lost in space” to “Star Trek” meaning that at first it can be overwhelming but then it becomes an integral part of how the school operates.

**What knowledge do educators need to develop to achieve high quality contemporary learning?**

The Principal explained that her approach to developing teachers as leaders was influenced by the work of Wiggins and McTighe (2007). She explained:

> In a professional learning community, the ideal is that teachers see themselves not just as teachers of what is happening in their classroom but as curriculum planners for the school or the year level or whatever their responsibility is. They need to analyse kids’ work in order to inform their work and see themselves as continuous learners themselves and know that they will always be improving. Teachers that never take on anything more than what is only going on in their classroom are, to me, only being 70% of a teacher. … They need to contribute to the whole school. Being an Accomplished Teacher according to the Professional Standards means more than working in your own classroom and helping out others” (May, 2009).

Referring to the specific leadership needs at this school, the Principal highlighted that a priority had...
been the development of teachers’ pedagogical knowledge. She stated:

Prior to the project, some teachers could not articulate the pedagogical basis upon which they did things in their classroom. They did them because they had always done them and it felt right. In their experience they had very limited professional conversations around pedagogy. ... Teachers can access lots of technology but don’t necessarily have the depth of understanding about how to connect that with student learning (September, 2009).

The Principal described a “noticeable growing gap between those teachers who have embraced the technology and those that don’t put in the extra time required.” She noted that whilst “teachers wouldn’t disagree that technology is important, their level of passion for it is directly related to their capacity to embrace it” (March, 2010).

This view was supported by an R-1 teacher who explained how he became interested in increasing his knowledge only after the Principal convinced him to attend a professional development program that challenged his view of the value of ICT as a tool for enhancing student learning. He explained:

Through the Digi Kids program, I saw for the first time that ICT does not need to drive the curriculum but that ICT is there to support my teaching and the students’ learning. Since then I have used ICT to enhance and support teaching and learning across the curriculum ... the emphasis is no longer on teaching ICT skills (November, 2008).

Significantly, during subsequent interviews, this teacher emphasised that he had “suddenly made the connections come together” between the knowledge he had developed as part of his various professional development experiences.

I saw the connection between inquiry and curriculum planning! It was like the last piece of the puzzle! ... I suddenly realised that Constructivism is a theory of learning and not a theory of teaching! ... The teacher needs to be explicit to students about what the learning intentions are (September, 2009).

In contrast to evidence suggesting that teachers’ knowledge as a result of professional development was converging in meaningful ways, tensions were also evident related to inquiry learning and Backwards-by-Design curriculum planning. Teachers of the Year 6/7 students explained that they found it challenging to foster students’ engagement and deep learning through inquiry and at the same time follow the Backwards-by-Design curriculum planning process. One Year 6/7 teacher commented:

I like the fact that we have a [curriculum] Scope and Sequence, which identifies the outcomes for each unit, and we know where we are heading. I like the flexibility to work towards these. But the Backwards-by-Design approach states that you need to identify the assessment task first – I can’t do that. ... It is not until after the Tuning-in Stage that we get a feel for what students already know and what resources are available.

It was interesting to note that a Year 3/4 teacher taking part in this group interview remarked: “I find it easier to do it!” This led to a discussion about how the Backwards-by-Design process had helped to manage time for the units of work more efficiently. One Year 6/7 teacher remarked:

When we first started out, I think we were trying to make everything bigger than Ben Hur. ... Now we realise that we don’t need to thrash a dead horse! When students have the understandings, it is time to move on (September 2009).

In summary, it was clear that the Principal had provided leadership and support to develop teachers’ knowledge of pedagogy, curriculum and technology and that the development of the units of work was a focus for the application and convergence of their knowledge. It was noted that a relationship exists between teachers’ passion for teaching and learning with technology and their capacity to embrace this as part of their practice. Although there was evidence to suggest that teachers’ were able to make connections between their professional learning like pieces of a jigsaw fitting together and make improvements to the efficiency of their curriculum planning, evidence also suggested that there were tensions between how teachers applied this knowledge to their practice.

Discussion and Conclusion

This study found that many characteristics identified by participants about high quality contemporary
learning were similar to the literature on 21st learning environments (CEO, 2009; MCEETYA, 2005; Partnership for 21st Century Skills, 2002, Partnership for 21st Century Skills, 2009). This was not surprising, given the high quality and quantity of professional learning experiences of the teacher participants focused on this and the fact participants were regularly reminded of these characteristics in their curriculum planning folders. Inquiry learning was identified as an essential pedagogy for 21st Century learning, especially for the units of work of the learning areas of Health, Science and Society and Environment.

With regard to the technologies that support high quality contemporary learning, a clear trend was evident towards the use of Internet enabled, mobile technologies in classrooms. This is consistent with the trends identified in the Australian Horizon K-12 Report (The New Media Consortium, 2011). The major issue confronting school leaders is the problem of demand for technology exceeding availability. Schools are finding it increasingly difficult to increase the ICT budget and are considering alternatives to support students’ daily use of technology as an integral tool for learning. The school in this study had an ongoing commitment to invest approximately $100,000 per year on personnel, services and hardware. Increasingly, schools are directing a significant portion of their funding towards Internet costs. Therefore, there is a need for affordable data access plans for schools as more devices are connected and more data required. An alternate model would be to move towards a user pays model such as that used in many secondary schools. Given the trend towards personal devices to support personalised learning, schools are seeking to control expenditure by adopting a ‘bring your own device’ model. However, these have serious implications for the systems needed to manage such a program. If the school was to specify the device as a particular laptop, parents need to be able to afford this and want reassurance that it was being used frequently in ways that support high quality contemporary learning in safe virtual learning environments.

Given the implementation of the National Professional Standards for Teachers and the Australian Curriculum, there is a need for teachers to develop a working knowledge of these documents. In particular, teachers need to know how to plan authentic learning tasks for students, which address the five interrelated elements of the ICT General Capability in the Australian Curriculum. These are: Applying social and ethical protocols and practices when using ICT, Investigating with ICT, Communicating with ICT and Creating with ICT and Managing and operating ICT (ACARA, 2012). Although the ICT General Capability statement was not finalised at the time of the study, it was evident that teachers’ had developed a sound knowledge of curriculum and pedagogy as a result of their access to high quality professional development opportunities and sharing of practice through their co-planning teams. However, their knowledge and confidence of technology and how to draw this together with content and pedagogy in the units of work was still developing. This was particularly evident in the younger year levels where access to technology had been limited due to building works and a high turnover of staff; as those with expertise left the school and teachers with a low level of ICT proficiency were appointed.

Difficulties drawing together technological pedagogical content knowledge were also evident by the unresolved tensions described by the year 6/7 teachers. Given the expertise of the ICT Coordinator, the challenge was not a lack of knowledge about the choice of ICT tools for knowledge building, convergent expression, or divergent knowledge expression (Harris & Hofer, 2009), but the tensions between technology and pedagogy, and pedagogy and content knowledge. The tension between technology and pedagogical knowledge concerned the use of blogs. On one hand the use of this tool was important to support the development of students’ understanding and safe use of online communication tools as the blogs were not visible to the public. This tool supported personalised reflective writing and encourage student participation to complement in-class dialogue. On the other, the teacher found it very time consuming to provide feedback to students and support from parents had dwindled. There were also concerns about responding to students’ posts when they wanted to write about their activities outside school.

A second related tension was described between pedagogy and content knowledge by the Year 6/7 teachers and this concerned the use of different assessment methods. Specifically, the blog formed a
It is clear that high quality contemporary learning requires teachers to continuously develop their technological pedagogical content knowledge (Mishra et al, 2006). Due to the rapid pace of technological change and new demands for teacher accountability and reporting, there is no static, universal knowledge base that can be identified for teachers. Rather, high quality contemporary learning requires teachers to develop a unique knowledge about specific curriculum content, pedagogy, technology and context. This position recognises that:

*Teaching knowledge has many influences and also influences other components of teacher learning systems. ... a body of teaching knowledge resides neither in the knower or outside the knower; rather, knowledge emerges from the recursive actions of knowers and other learning system elements* (Opfer & Pedder, 2011, p. 388).

In conclusion, the findings of this study suggests that the creation of high quality learning environments requires attention to the three overlapping and recursive systems involved in teacher professional learning: the individual teacher, the school, and the activity (Opfer & Pedder, 2011). These aspects were addressed in this study through the skillful leadership of the Principal who challenged stagnation in practice by building capacity in the school. In particular, she strategically invested in individual teachers, brought in new knowledge through external relevant professional development activities, and supported the application of this knowledge to teachers’ practice with the support of co-planning teams.

**References**


