Developing digitally: A secondary school's progress to BYOD

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Abstract

In order to work out how to become a BYOD school, at least one New Zealand secondary school has developed a BYOD implementation plan in order to trial a variety of tools and technologies to discover what works and what doesn't to suit its educational context. In a fast-changing educational digital landscape, schools increasingly grapple with what it means to learn and teach in a digital context, and the eLearning group in this school decided to experiment with a small group of staff. The subject contexts consisted of foreign languages, sciences, music, mathematics, and Art. A key aspect of the trial was working with an external researcher to support the investigation. The project was in its third year in 2015. During the third year, volunteer teachers incorporated Chromebooks or iPads and had free rein on how these devices were used with students. Experiments included Google Classroom, Edmodo, online interactive physics simulations, music Apps on iPads, or combinations of Apps and web-based tools.

This presentation focuses on this third year of the project and fits with the conference theme of *Rings around Practice* in that it centres on a school wanting to close the gaps between the goal of BYOD and and its implementation. Key findings broadly include: greater confidence in using unfamiliar tools, greater student concentration, greater collaboration among students, and faster learning particularly in the physics classroom and music. Students expressed greater confidence in learning content when learning occurred with these technologies, and teachers felt a guarded sense of satisfaction.

Introduction

BYOD, or bring your own device, is a consequence of greater mobility and connectivity. In New Zealand, schools will have become connected to Ultra Fast Broadband network. Schools will then have unlimited and uncapped internet access. This feature means that schools can no longer ignore what Pachler et al (2010) call the 'mobile complex'. With so much public money invested in connectivity, the urgency for addressing students' mobile learning needs in secondary schools is pressing. Around the world, schools are adopting BYOD. There is anecdotal evidence that at least a few schools have leapt into BYOD without much preparation or thinking, leading to some unexpected problems, such as the ability of the IT infrastructure to cope with large numbers online simultaneously, teachers knowing how to integrate mobile technologies into practices, and the availability of cross platform resources such as Apps that work as well across Android and IOS devices. Then there is the issue of equal access to the devices themselves.

The large urban secondary school decided that it would develop a plan to implement full BYOD in 2017. To that end, they devised a plan to trial a class set of iPads and later Chromebooks to

examine the value of either across aspects such as ease of use, technical competence and support, teaching and learning, and anything else that they didn't yet know.

The problem being addressed

The purpose of this paper is to present a snapshot of what the teachers experienced, what they learned and what they make of their developing expertise. Questions guiding this paper include: How do their experiments with digital technologies inform their practices? What do these mean for the wider school's provisions, policies, practices and infrastructure?

In taking a snapshot of the project and examining what has been learned, this presentation provides a window into a school's approach to embedding digital technologies into learning. To this end, it may illuminate or suggest common issues and solutions for other schools travelling a similar path.

Study design/Approach

The longitudinal qualitative study began with a focus on iPads - the school wanted to investigate what using a class set of iPads would mean for the school. How do iPads work as a shared device? (Wright et al, 2013). This project expanded from the initial three staff in 2013-2014, to seven in 2015. The mathematics teacher, however, one of the foundation group, experienced severe connectivity issues and could not use wifi in her usual classroom, and continually swapping classrooms to get wifi connectivity was untenable and unsustainable, and so she was unable to develop her knowledge and practices in 2015. Her connectivity issues, however, point to potentially damaging effects on potential learning for her students.

In order to examine the use of digital technologies with the group, each staff member identified a digital focus and an inquiry question to guide their experimentation. On a regular basis (fortnightly) the researcher observed what happened in their chosen class using a protocol developed for the study. Data were then analysed thematically and coded according to the categories of pedagogical design, tool, student learning and teacher learning. The latter list was defined during the post-lesson debriefs.

Findings

Important findings include the management of the technology itself (fitness for purpose, connectivity, device provision) and the level of experimentation, especially in terms of how risky it might be for teachers and learners. Of major importance however, is how students responded to using these digital tools. In the music theory class for example, some students were adamant that the iPads helped them learn faster and more easily than by pen and paper alone. They agreed that they concentrated for longer and made greater connections with the theory. Another key finding for this group was the affordance of meeting individual needs. One student used the iPad to compose music, while another recapped notation. In the physics class, students manipulated elements to test formulae and the action of forces (molecules, weights etc). This helped identify the implications of certain actions and their relationship to particular theories. The languages classes (French, Spanish) used combinations of browser tools (specifically Google ones and websites in the target language, such as TripAdvisor, travel destinations, or film reviews) for improving language facility and skills in making sense of unseen texts. Students quickly learned to be comfortable sharing

their work with their peers through peer critique. They also increased their vocabulary while using authentic contexts (such as the Spanish Trip Advisor site) to write in the relevant language. Without the digital tools, such lessons would not have been as authentic. Neither would these senior students have been exposed to native speakers' authentic language use. These kinds of practices made for challenging but interesting learning, for students, knowing their translations were visible to each other, supported and critiqued each other's work and strived for accuracy.

For the Science classes, some of the tools (such as the physics simulations) were browser-based, but some were made with Flash instead of HTML5, so the Chromebooks and iPads were unable to access these resources, seriously compromising the lessons. This cross-platform issue is important when students are using a range of tools to access resources the teacher has included in class activities. The tablet device scenario is also implicated here - Android and iOS do not always share the same kinds of Apps, or they may not work the same across both platforms.

A further finding is what students said about bringing their devices to school, identifying some key issues for them. The most important of these was how vulnerable students' devices were to theft when, for example, they were in a physical education class. This highlighted the need for the school to consider some safety measures, such as lockers that could be placed near the physical education area of the school, where students could safely store and possibly charge their devices while they were doing PE.

A second problem is for the school itself. If students bring their own devices, what will be the implications for sharing and access resources, especially across platforms? One of the options the school is pursuing is considering mandating a browser, since this may make it easier to access resources across platforms. If tools are cloud-based, this may mitigate the effects of potential device differences.

An additional issue was the problem teachers had on moving the class sets of devices from storage to classrooms. This might involve long distances around the school, heavy baskets, and uneven terrain. This also meant valuable time out of the classroom to collect and return the devices. These problems added unnecessarily to teachers' work, for it also involved, booking the devices in advance and checking that devices were charged and functioning properly.

On the positive side, a key feature of these classrooms was the evidence of adaptive help-seeking behaviours (Jarvela, 2011). When students struck problems, they sought help from peers first, then the Internet, then the teacher. This willingness to problem-solve collaboratively was a key feature of all classrooms using these digital technologies.

Discussion and conclusion

While the OECD report on digital technologies in education (OECD 2015) caused a media stir, the details suggest otherwise - that the pedagogical decision-making and lesson design that teachers plan for, as are as crucial to learning as ever. The evidence from the teachers' experimentation suggests that mobile digital technologies can *enhance* existing good practice and make it easier to connect students to authentic text types to meet deliberately designed learning goals. The affordance of robust wifi has been critical, as well as students' ready access to suitable devices to facilitate such learning opportunities. However, sharing class sets of devices can provide access for all students, but can also unnecessarily add to teachers' workloads, particularly in terms of the organisation, collection and return of these digital resources.

A key implication from this is that the school's move to a fully BYOD system is likely to be inevitable, but that the school will need to create a set of specifications for devices students own and bring to school for learning purposes. Another is that even if the school is fully BYOD, there remains a likely need for loaner-devices to support students from financially struggling families.

Finally, the slower process of engaging in trials with volunteer teachers over a reasonable time period has been highly valuable for both the individual teachers and the school. A range of infrastructure provision issues to device choices and safe storage options might not otherwise have been known without this trial. Knowing these issues in advance can help the school close the provision gaps. It may mean fewer stop-gap solutions once BYOD is fully launched that might not be sustainable and unplanned for in the annual budgeting. Lastly, the skills of the teachers in integrating digitally-mediated learning into their classroom practices remains a highly significant component, and will continue to be so (Koh, Chai, & Tai, 2014; Mishra & Koehler, 2006; Wright, 2015). Existing good pedagogical practices are enhanced by teachers purposefully using digital technologies. At the same time, students' levels of concentration, task completion and feelings of learning satisfaction can add to positive classroom relationships.

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