

Continuance theory and teacher education

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Continuance theory is usually related to the regular use of technology in the business/industry area. It attempts to explain why people either continue to use specific technologies in their work, or not. Essentially, it links to the perceived value to individuals' ability to work effectively, however that is understood in their workplace. In the profession of education, particularly schools and teacher education, the perceived value of continued use is not about individuals and their work, but about individuals' work with groups of students and what happens to learning when these digital technologies are used. Continued use is contingent on their students' positive responses to these technologies supporting learning. I examine, in the light of continuance theory, what happens when student teachers in an initial secondary teacher education programme report on including digital technologies on practicum. This includes reporting on the effect students' responses have on their subsequent attitudes and practices regarding digital technologies in learning contexts.

Keywords: continuance theory, digital technologies, initial teacher education, learning

Introduction

Continuance theory is usually related to the regular use of technology in the business/industry area. It attempts to explain why people either continue to use specific technologies in their work, or not. The technology acceptance model/continuance theory that Bhattacharjee (2001) reported on, for example, centred on business customers of a bank's online banking system. The bank designed an online banking system that customers used remotely. The bank then wanted to know how likely it was that these customers would continue using it. Was the tool easy to use, and did it support positive bank/customer relations? Continuance theory was used to describe the phenomenon of why the banks customers continued to use the technological solution.

In educational contexts, there is a growing awareness that 'customers' of the educational business – students – are quite ready and able to use systems and technologies and/or affordances as tools in their learning. Teachers can also be considered as 'customers' of the educational complex, but their use – and continued use – of technological tools in classrooms contexts is not clear-cut. Their behaviours, attitudes and perceptions range from enthusiasm to resistance, self-efficacy to aversion. These behaviours and attitudes persist even in the face of a plethora of technologies or affordances available, according to elements such as context, topic, concept, student group, level and access. With the advent of ultrafast broadband being rolled out to schools, this availability is growing, as is the expectation of use as part of learning. While this variety of provision and greater potential openness differs from the singular approach or system a bank is most likely to create for customers, it can exacerbate teachers' approaches to using digital technologies because of the potential for failure – of the technology itself, of the school's ability to supply appropriate infrastructure (robust broadband/wifi, technical support), and of the perceived threats to their preferred pedagogical approaches (Wright, 2010a, 2010b).

The variety and openness of the affordances and potential of digital tools for learning purposes, links to Pachler et al's (2010) socio-cultural analysis vis a vis young people's continued, and sometimes continuous, use of digital technologies. These researchers suggested that young people appropriate the tools for their own cultural, identity and meaning-making practices in daily life and treat them as normal accessories for living. This is not necessarily true for many teachers, whose own backgrounds may not have included similar technological tools, given the average age of about 44, of the teaching population in New Zealand (Engler, 2008). While students entering schools (whether primary or secondary) have mostly grown up in a world infused with digital and mobile technologies, teachers have not, and so are often learning from scratch what the potential is for these devices and affordances. Continuing to use tools that have not formed a natural part of one's pedagogical toolbox is therefore, for many teachers, a challenge. However, given that teachers will often experiment with how they provide learning, it is likely that they will develop regular digital technology use in classrooms if students' learning responses are positive. When teachers see their students concentrating on and completing tasks to a higher level than they might otherwise, they are likely to repeat using such approaches, resources, tools, even when they may be fully aware that trying out new things may be risky (Wright, 2010b). This paper identifies some emerging ideas about these points that may support teachers to develop their experimentation with, and continued use of, technological tools in classrooms.

Context and study design

The data generated from which the emerging findings arise, consist of initial teacher education (ITE) students' Moodle postings about their secondary school practicum experiences in which they used some kind of ICT

(information communication technology) tool as part of a lesson. This lesson required students to plan a teaching as inquiry question to link to this ICT use, incorporating some means by which they gauged students' responses to this intervention, and sought to find out how well students retained learning from that lesson in subsequent ones. Because the past some ITE students were reticent about asking students for their feedback, some examples of how this gathering of feedback could take place were provided. These examples ranged from suggesting giving students Post-It notes to write response on (then attach to a large sheet of paper with the relevant question at the top as they left the room), to students working in small groups to make feedback notes, to individual questionnaires, or posting blog/discussion thread notes as appropriate. Some methods were thus more formal than others. All meant that the ITE student was in a position to gather in and review the responses and draw some conclusions from. They were also expected to note their associate teacher's response to this lesson.

Preceding this practicum task, students participated in three four-hour workshops in which the teaching as inquiry as a process was outlined. Other topics in the workshops included a focus on critical thinking and the web, ways of helping students to express divergent and opposing points of view through technological tools, Twitter as feedback tool, and how GoogleDocs can be used for collaborative purposes. These workshop experiences were designed to demonstrate possibilities for students to adapt for their own pedagogical purposes while on practicum, linking directly to their assessment task.

Ethical clearance was gained via the formal faculty committee process, and all students indicated either their agreement or refusal for me to use their practicum posts as research data. It was made clear that this data would not be used before their work had been assessed. Even though one of the 80 students refused granting permission, the participant cohort is large enough to draw themes from. Thematic analysis of the data continues, whereby I note repeated occurrences, particularly about ITE students' own responses regarding their level of confidence in using technological tools for learning. What they say about their own knowledge and experience while using these tools, and what they say about repeating or developing such uses, is also of interest.

What follows is a snapshot of emerging findings, focusing on four areas of interest: ICT tools (also described as digital tools or digital technologies), pedagogy, ITE student teachers' self-evaluations, and issues of continuance.

Emerging findings

ICT tools

Schools are not equal in their provision, thinking, dispositions towards, and access to, digital tools and devices. Some schools for instance, do not yet provide wireless access for either staff or students. Some also house desktop computers in dedicated rooms, accessed via booking systems. Other schools have COWs (computers on wheels) to avoid classes having to change rooms. This also makes access more nimble, although booking procedures also exist. Some departments within schools have access to different tools. For example, some departments might use digital cameras and may desktop computers in their classrooms or close by. Others might have access to mobile tools, or expect students to bring their own devices (BYOD). Some classrooms include television screens and/or data projector facilities and are wifi-enabled.

Some schools engage in the laptops for teachers scheme (Cowie et al., 2008) and provide an adequate technological and organisational infrastructure. However, even in schools where technological provisions are up to date, it was not unusual for the ITE students to report that the most common use of laptops and data projection facilities was the repeated use of presentation software – mainly by teachers.

They also reported on the obstructions to using technological tools. For example, student feedback often complained of slow internet speeds, or broken equipment, or unreliable wifi, or issues with logging on to computers. These are likely to affect teachers' willingness to continue using digital technologies as a part of learning. They dislike wasting learning time fiddling with equipment to get it to work.

Pedagogy

Essentially, when teachers used presentation tools on a daily basis, they have not changed the learning dynamics – the teacher is still up the front, and communication is principally channelled through the teacher. Students are powered down (Gee, 2003) and possibly turned off. The ITE students noticed that they often replicated their associate teacher's technologies and pedagogical practices, partly because it felt safe and located control and management with them. On the other hand, when ITE students introduced something else (such as inviting students to use their own devices, or using moving image tools like YouTube or Xtranormal), the learning environment took on a whole new flavour, with students responding differently.

Perhaps the different responses reflected the novelty factor. Students, the ITE students reported, were often excited by the activity/tools being something else. What we cannot gauge is the extent to which the Hawthorne Effect was operating. Mitchell, Bailey and Monroe (2007) for example, note that, “Initial student excitement, if any, at an innovative technological approach may quickly fade when technology is the expected “normal use” from their [the students’] perspective” (p. 78). In other words, was the heightened student interest and focus because it was something different, rather than their learning being enhanced? Was the newness and novelty why students engaged more deeply or readily, or was it because they had a greater part to play in the learning complex? Without the ability to test this over time, we cannot answer that. However, it is worth noting Wright’s (2010) point when she says “if the new tools simply replace an old one (such as presentation software instead of overhead transparencies) with little else changing, then student engagement and interest will quickly revert to previous levels because nothing has essentially changed *for the learners*” (p. 11). In such cases, if student interest and engagement wanes and they become restless, then teachers may get disheartened and attribute this to the technology, rather than the sameness and predictability of the learning process. The more passive students are in a classroom, the more disengagement is likely to increase, and the more teachers may revert to known and safe practices and resources.

ITE student teachers’ self-evaluations

A key requirement of the students’ postings was having to evaluate their students’ feedback against their own experience of the lesson and the technology. Many commented on their apprehension about seeking student feedback on the lesson, but were affirmed by many students’ positive responses to their questions. A key component of this was not only how they asked for feedback, but also what their questions were like. Some ITE students asked for feedback on levels of enjoyment (even though this was warned against) and therefore gained little of use that could help them rethink the lesson. Those who asked targeted questions about some aspect of learning, had a lot more to reflect on and analyse. As a consequence, those students learned more from the feedback experience.

One student for example, used an online concept map tool for her students to learn about the links between photosynthesis and cellular respiration. She then asked them the question “Are concept maps useful for your learning?” On response showed a good understanding of the students’ own ways of learning by saying “Yes, they helped me get a better understanding. It is easier because I am a visual learner”. Another said they were a “good way to remember what you have learned without looking at notes”. The ITE student was then able to decide on the value of such a task, and also learned how to improve for subsequent classes. This sort of feedback, where students had specific and useful comments to make, assisted the ITE students to be prepared to use such tools/affordances again on other occasions. This process of gaining student feedback may assist teachers in developing a continuance habit.

Issues of continuance

For teachers to continue to use technological tools as integral components of teaching and learning, reliable tools are key. ITE student teachers reported feedback similar to: “better computers/internet”, “have the Internet actually work”, or “the laptops not always cooperating”. Student teacher and school student frustration was noticeable across a broad range of contexts and lessons. Schools’ firewalls that blocked access to sites such as YouTube also frustrated the student teachers. It was not uncommon for them to report that lessons planned around YouTube clips had to be abandoned because they hadn’t known that the site was blocked, and they didn’t have the forethought to use a clip downloader in advance. Alternatively, the Internet speed was slow, affecting lesson timing and the ability to show the clip.

If teachers have to continually second-guess how to access sites, or cannot rely on Internet speeds, they are less likely to continue planning Internet-based lessons or using other digital tools. Other organisational factors can interfere with teachers’ desire to use these tools and affordances. For example, many schools ban mobile devices on campus. This precludes students using tools they already have and are used to using. This ban also means that it is difficult for student teachers to try out using mobile devices as learning tools without contravening school policies, and difficult for teachers in these schools to individually try out the potential of these devices.

Conclusion

As alluded to above, some tentative patterns are emerging about what continuance might look like in a school. Key factors affecting teachers’ use of technological tools as integral to learning include: unreliable Internet provision, outdated hardware, access to tools (for example, having to book dedicated rooms with fixed equipment), firewalls, overlaying digital tool use over unchanged pedagogy. Bhattacharjee (2001) attempted to

explain links between expectation and confirmation in continued use behaviours in bank customers. Teachers are entitled to expect that tools and resources will work as they are supposed to. When positive student learning confirms this, they are more likely to repeat and refine further use.

So, if it is possible to extrapolate from student teachers' experiences of using technological tools while on practicum to teachers' technologically enabled or disabled school environments, then some considerations linking to supporting teachers to develop habits of continuance with digital tools for learning purposes are pertinent. These might include thinking about the critical provision of robust and powerful broadband/wifi, allowing BYOD, and in-class access to the Internet and digital tools for everyone. If the infrastructure in a school is enabling, then it is probable that teachers are more likely to trust it.

Another critical layer is an extensive review of pedagogical practices that complement *students'* use of the tools, rather than being vested only in the teacher. The recognition that pedagogies which allow students to collaborate, meaning-make, concentrate on tasks and risk-take when learning with digital tools is important to address for teachers. Not knowing beforehand that the dynamics of classrooms may change can adversely affect teachers' sense of control and authority, possibly leading to an aversion to risk-taking and trials with unfamiliar tools, resources and practices. If teachers fully understand those factors, we may be in a position to predict that they will continue to use and integrate digital technologies as part of learning, particularly if they can expect that the tools are reliable, and that students' learning would be enhanced as a result.

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Please cite as: Wright, W. (2012). Continuance theory and teacher education. In M. Brown, M. Hartnett & T. Stewart (Eds.), *Future challenges, sustainable futures*. Proceedings ascilite Wellington 2012. (pp.1096-1099).

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