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Keywords

preservice, development, support, partnership, literacies, practices, teachers, digital, integrating

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Integrating digital practices: A partnership to support the development of preservice teachers' digital literacies

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Abstract

The importance of digital literacy well established, but it is unclear how this is integrated in teachers' practice. This paper presents a curriculum innovation and collaboration addressing this issue through development of digital products, in first-year teacher education subject. A key aspect of this initiative was providing students with home copies of appropriate software to support the task. Data was collected to investigate possible increases in students' confidence using digital media, as well as their beliefs about using digital products in their future learning and teaching. Findings suggest increased confidence and positive beliefs across the subject, but larger increases in students using the software at home. This suggests positive implications for the innovation and collaboration, but potential issues in relation to the increasing digital divide.

Keywords: teacher education, digital literacy, curriculum innovation, digital divide

Introduction

The importance of digital literacy in students' education is well established (Hague & Williamson, 2009), but it has remained unclear how these ideas are integrated in teachers' practice. A growing body of research has shown, while some students have high levels of digital literacy, it is by no means consistent across all students (Ng, 2012). Therefore, it is essential that the digital literacy of incoming preservice teachers is not assumed, and that teacher education provides opportunities for students to increase their confidence using digital media. This paper presents a curriculum innovation and collaboration addressing this issue through development of students' confidence and capability to create multi-media products in first-year preservice teachers, in an Education faculty at an Australian university in New South Wales (NSW). This was undertaken in collaboration with a major international software company.

The curriculum initiative uses digital portfolios to engage preservice teachers in the creation of multi-media digital products, while addressing the topic of the 'role of the teacher'. Through this project, preservice teachers would be beginning to develop the ability to create and evaluate multimedia products. The combination of these foci integrates aspects of emerging teacher identity and practice with the exploration of digital tools, resources and media. The initiative was designed to provide preservice teachers with the tools and time to develop confidence using digital media, such as working with images, video and audio, as well as communicating in a multi-media format. To do this, preservice teachers were provided with the tools to experiment with, and explore, different resources and media to support self-paced development of a digital product. Additionally, a goal of the initiative was to provide students with a positive framework through which confidence using various digital tools and resources could be developed. Research

has shown, that teachers and students show more positive beliefs towards technology if they have confidence using the tool or resource (Ertmer & Ottenbreit-Leftwich, 2010; Hague & Williamson, 2009).

Background

It is well known that even with dramatic increases in access to ICTs, comparable increases in the integration of technology in teaching practices have not been visible (Hew & Brush, 2007; Underwood & Dillon, 2011). Research has shown, that teachers in NSW have the necessary digital tools and resources to create digital products (e.g. digital portfolio, movie, podcast, etc.), but they do not frequently use this type of task for in-class work or assessment tasks (Howard & Carceller, 2011). In-service teachers' main reasons for this were a lack of confidence and skill using the necessary tools and resources, as well as uncertainty how to integrate and assess the digital products for learning.

The digital portfolio task

Creation of digital products was assigned as the second task in a 1st year teacher education subject, at a Faculty of Education, in an Australian university. The subject's main focus was on technology use in teaching. The task required students to use photo and video editing software to create a digital product of combined text, audio, images and video, to demonstrate and illustrate their view of the role of the teacher. This project was supported through partnership with a major software company. Video, audio and photo editing software were provided to the faculty computer labs, as well as licensing for each student to use the software at home. The software packages used in this task were Adobe Photoshop Elements 10, Adobe Premier Elements 10 and Adobe Acrobat Professional. It was not an explicit requirement of the task for students to use the software provided through the partnership nor that they download the software at home. Some students used iMovie and MovieMaker to create their digital products and edit video.

The task spanned over six weeks of a semester. Three of those weeks included direct instruction on how to use video, audio and photo editing software. Products were presented in class as a movie or as an interactive PDF. Most students chose to present the portfolio as a movie, as they were already using the video editing software for the project. As part of the presentation, students were required to engage in peer review of the products. The intention of this was to provide experience evaluating use of digital media and peer work. Final digital products were marked using a rubric designed for the task. Portfolios were independently marked by five tutors on a scale of 1-20 points, 10% were blind double-marked for reliability.

Methods

A two-phase evaluation of the initiative was conducted to identify if students' comfort level using the software increased through the task, as well as to explore their beliefs about using these tools and digital tasks in their future learning and teaching. The first phase of this evaluation included a questionnaire of students' experiences completing the digital portfolio, analysis of their work products and exam responses. The second phase of the evaluation will follow students in another subject. In this subject, they will be given the opportunity to complete tasks in the form of digital products.

The evaluation aimed to explore how the integration of digital products in preservice teacher training may impact on their digital literacy and conception of using digital tasks in future teaching and learning. This aim was investigated through the following research questions:

- 1) Do preservice teachers' experiences learning how to create digital products impact on their conception of teaching and learning?
- 2) Are preservice teachers able to critically discuss the use of digital products in relation to teaching and learning?
- 3) Do preservice teachers choose to produce digital products in future teacher education subjects?

The following analysis includes results from the first questionnaire.

The students

Of the 337 students enrolled in the subject, 211 completed the questionnaire. The questionnaire, as a total scale, was determined to have sufficient reliability and internal consistency (15 items; alpha = .79). Of the responding students, 25.6% were male. This distribution is representative of gender in the NSW teaching population. Students participating were enrolled across three degrees in the Faculty of Education: 66.8% in the Bachelor of Primary Education, 28.9% in the Bachelor of Physical and Health Education, and 4.3% in the Bachelor of Early Years.

Table 1 presents students prior experience using video, audio and photo editing software provided in the subject.

Table 1
Prior experience using software

	<i>n</i>	<i>%</i>
Photo editing	86	40.8%
Video and audio editing	12	5.7%

Some students had previously used the photo editing software, but very few had used the video and audio editing package. Table 2 shows students' installation of the software at home.

Table 2
Installation of software at home

	<i>n</i>	<i>%</i>
Adobe Photoshop	140	66.4%
Adobe Premiere	132	62.6%

Most of the students installed Photoshop and Premiere (85.0%). Open-response feedback from students showed a preference to install from the software disks, rather than downloading packages from the internet. They found downloads to be slow and used a large amount of their home bandwidth. This is a significant issue in Australia, as most internet service packages have download limits.

Confidence using the software

Overall, on a scale of 1-10 (1 = 'Easy' to 10 = 'Impossible'), students rated the digital portfolio task as 'difficult' ($M = 4.76, SD = 1.84$). This result suggests the task and integration of software tools was appropriately challenging.

Students were asked to rate their confidence using each of the software packages introduced for the task (1 = 'I don't know what the software was or what it did'; 2 = 'I knew what the software was but I couldn't use it'; 3 = 'I could use this with help from someone'; and 4 = 'I could use this very well by myself'). Table 4 shows students' reported perceptions of their confidence using the software tools, before and after completing the assignment.

Figure 1

Students' perceptions of confidence using software tools

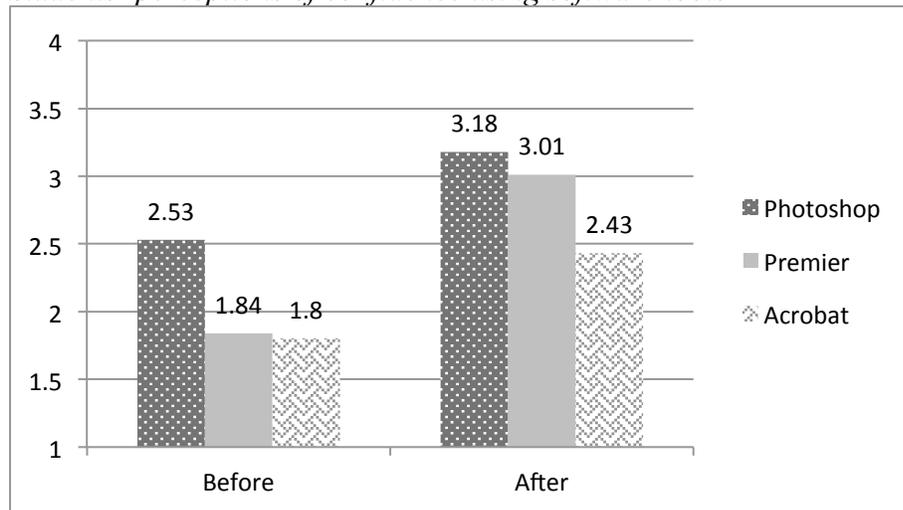
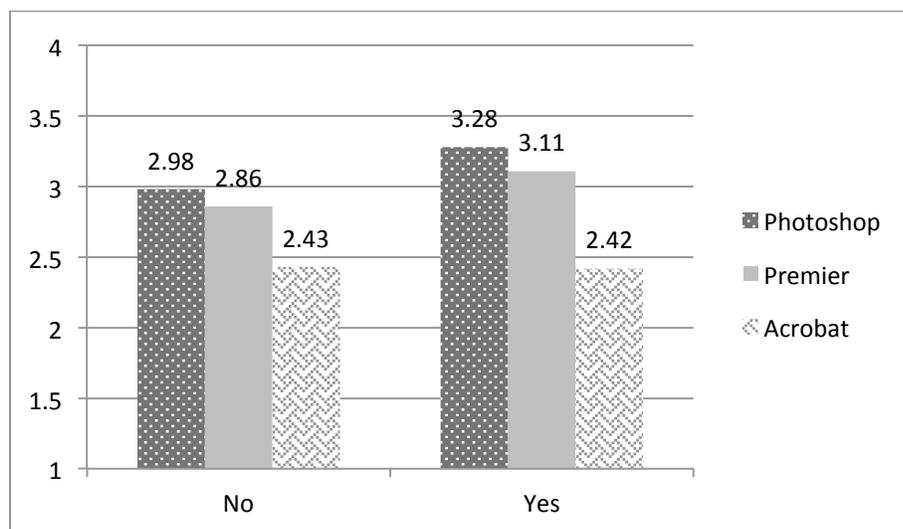


Figure 2

Students' perceptions of confidence if they downloaded the software at home



Results confirm that preservice teachers did not have significant experience using photo or video editing software, or using software to create PDFs, prior to this subject. Findings show significant increases in confidence using all three software tools (all $p < .001$). Students who downloaded the software at home reported significantly higher perceptions of their confidence using Photoshop and Premier after completing the task, than students who did not download the software ($p < .05$; see Figure 2).

Use of software in future learning and teaching

Students rated their agreement (1 = 'Strongly disagree' to 4 = 'Strongly agree') with following statements about using digital products in their future learning and teaching: how important students felt it was to work with these types of tools (a & b), their engagement when using the tools (c, d & e), and their beliefs about future use in learning and teaching (f, g & h). Table 3 shows their agreement on these items.

Table 3
Students' agreement with importance and engagement

	<i>n</i>	<i>M</i>	<i>SD</i>
a) It is very important to me to use with these types of products in my teaching	207	2.83	0.62
b) It is important for my future students to create these types of products	206	2.87	0.62
c) I think working with these types of products is fun	206	2.94	0.71
d) I liked creating these types of products because I was very interested	205	2.82	0.73
e) Time went by quickly when I was creating with these products	206	2.70	0.86
f) Given the option, to complete assessment tasks in other subjects	207	2.99	0.73
g) In my future teaching	206	3.05	0.63
h) For personal use	205	2.84	0.78

The strongest and most consistent agreement ($M = 3.05$, $SD = .63$) was with the likelihood that students would use these tools in their future teaching. Results showed a weak, but significant, correlation between confidence using the software tools after the task, and the belief that they would use the tools in their future teaching ($r = .238$, $p < .001$). As would be expected, students who found the task too difficult were likely to feel less confident using the software ($r = -.415$, $p < .001$) and they were less likely to use the software in the future learning ($r = -.297$, $p < .001$) and teaching ($r = -.286$, $p < .001$). Strong relationships did not exist between beliefs about use of tools in future learning and teaching, and use of the software packages at home.

Overall, the final digital products submitted by students exceeded the expectations of the subject. The average final mark for the task was 72.5% (14.5/20). This was significantly higher than average marks on other tasks in the subject.

Significance and conclusions

These findings suggest that preservice teachers had increased positive beliefs about multi-media products and confidence, after completing the task. This finding is expected, in that research has shown increased exposure and access to ICTs results in higher levels of confidence and engagement. Yet, while this finding reflects expected results, it also demonstrates the importance of providing consistent access to these tools in teacher training programs. It is important to note that students participated this questionnaire one week after completing the task and beliefs may change over time. Thus, it will be essential to follow-up with the students in another subject.

The high average mark for the task and positive beliefs about use of these products suggests this was a positive experience for the students. Increases in confidence working with software to create digital text, audio, images and movies suggests increases in literacies to create digital products, Students who downloaded the software packages at home indicated higher levels of, and greater increases, confidence using the tools.

Increased confidence and suggests possible gains in digital literacy from use of tools at home is the most significant finding from this investigation. On one hand it highlights the importance of providing students with self-paced opportunities to experiment with creating digital products. This suggests that unlimited home access to the necessary tools contributed to preservice teachers' increased confidence and possible literacy. Further, it is more likely that they will use these types of tools and resources in the future. This finding has serious implications for the broadening cultural digital divide. Full access to digital tools and resources, such as software or high speed internet, requires considerable resources and is therefore difficult to replicate in some contexts. Critically, if teachers do not have unrestricted access to these types of resources, it is difficult to support the experimentation and self-paced learning necessary to develop digital literacies. To gain a better understanding of these findings, the research will progress with the second phase of the study.

This project and partnership addressed an explicit need identified in NSW. From these findings, the curriculum innovation using digital portfolios was successful, and it was a positive experience for first-year preservice teachers. They felt their confidence creative digital products had increased and they exhibited positive beliefs about use of these products in future learning and teaching. The challenge is now to continue this momentum into other subjects in the Faculty of Education, with the goal of supporting students to continue to develop confidence and capability using these types of tools, that can extend beyond the university and into the schools. The sustainability of this type of project, to continue to provide all preservice teachers with the most current and relevant tools for teaching and learning, is dependent on strong partnerships between educational departments, universities and relevant industry leaders.

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