

PST Online: Learner voices guiding learning design

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Online teaching has become more pervasive throughout the 21st century, partly a result of new technologies allowing for interactive online learning environments and partly to meet the needs of students who cannot access traditional face-to-face classrooms for all or part of their schooling. Pre-service teacher education has lagged behind this uptake in online teaching, failing to prepare new graduate teachers for the possibility of teaching wholly online to students in a range of learning environments. Pre-Service Teachers Online is a website designed to address this gap by providing pre-service teachers with resources to assist in building online teaching skills. Current pre-service teachers' awareness of online teaching skills were sought, providing the foundation for the website. Presented is how the website was designed to meet identified pre-service teachers' needs allowing participants to reflectively consider how their current perceptions of teaching practices could apply in a blended or fully online classroom model.

Keywords: virtual schools, online teaching, pre-service teacher education, website design

Introduction

The ways in which students across all sectors (early childhood, primary, secondary and tertiary) engage in learning, both formal and informal, have changed considerably in the last few decades. Improvements in available technologies, the development of new technologies and an increased acceptance of online learning spaces have all contributed to this change. Online learning spaces are particularly important for distance education learning and the rise in virtual schools in the primary and secondary sectors is an indication of this. These schools and other online learning environments such as blended learning classrooms provide significant opportunities to deliver education to students who might otherwise be unable to pursue their studies due to a range of factors including isolation, mobility (such as with military families), health issues, imprisonment, or emotional issues such as bullying (Roblyer, 2006; Toppin & Toppin, 2015; Vasquez & Straub, 2012).

These changes in teaching and learning environments are occurring at a rapid pace. It has become increasingly important to reflect these new changes in teacher education courses. Teaching online has its own separate skillset in order to provide meaningful and rich learning experiences. Pre-Service Teachers Online (PST Online) is a website funded through an Office for Learning and Teaching (OLT) grant designed to assist in the development of this skillset. The website design, as a learning environment, was underpinned by comments from the pre-service teachers it is primarily designed to assist. Feedback from a survey conducted to pre-service teachers provided ideas for the content of the website. The themes emerging from the survey informed the design of an open source website with resources specifically addressing pre-service teacher defined needs.

Background and context

New South Wales implemented its first virtual high school, *xsel*, in 2010, catering for gifted and talented students in English, Mathematics and Science. *xsel* acted as a blueprint for its replacement, Aurora College, which was opened in 2015 (New South Wales Department of Education and Communities, 2013). Existing teachers were employed to teach the students virtually (wholly online). The authors, staff members of the School of Education at the University of New England (UNE), believed that the development of virtual high schools would require a change in pre-service teacher education to accommodate this new teaching environment and the skills that would be required to undertake this teaching. They received OLT funding in 2015 to explore resources required to assist in developing these online teaching skills and to build a website for such resources. The authors have a range of areas of expertise: Lecturers in Professional Classroom Practice and Information and Communication Technology Education, and an Educational Designer.

Literature Review

Online learning is increasing globally but research, teacher practices and learning design for virtual schooling is dominated by what is happening in the United States of America (U.S.A.). All 50 states in the U.S.A. provide some type of online learning opportunity for K-12 students and 26 states partially fund state-established virtual schools, with well over a million students learning online each year. Accordingly, the majority of research in relation to online or virtual learning emanates from the U.S.A.

In developing this project, the researchers drew on the currently available literature about best practice in online teaching. In Australia, very little has been written about such teaching in schools and it is necessary, for the Australian context, to draw on the literature around online teaching in higher education institutions (Downing & Dymont, 2013; Gregory & Salmon, 2013). The 2009, OLT “The Learning to Teach Online” project (McIntyre, 2011), was designed to assist academics with online teaching. Resources developed by McIntyre (2011) provided background and context to complement the suite of resources created in this research project.

An important discussion raised by virtual schooling is the capacity of the teachers to deliver in an online environment. Miller and Ribble (2010, p. 5) argue that not all teachers “have the skills or temperament to be online instructors. Just as some people are not destined to be classroom teachers, there are some who should not be online teachers as well”. The literature also intimates that teaching online necessitates a different range of skills from those currently covered in teacher education programs (Bull, 2010; Corry & Stella, 2012). Murphy and Manzanares (2008, p. 1070) argue that there are contradictions in moving from face-to-face teaching in a conventional classroom to teaching online and that teachers “may benefit from opportunities to develop new skills, techniques and strategies”.

This discussion on teacher capacity has raised further debate about pre-service teacher education for online teaching (DiPietro, Ferdig, Black, & Preston, 2010) which “prepare individuals for traditional classrooms, and they do so in isolated silos of pedagogy, content, field experiences, and to a lesser extent, technology” (Archambault, 2011, p. 74). These programs focus almost exclusively on face-to-face teaching with technology being a tool for learning. Given that online learning is increasing in the K-12 sector, teacher education programs will need to adapt to prepare pre-service teachers for this new milieu (Archambault, 2011). The design of the website, informed by pre-service teacher voices, is discussed more fully throughout this paper. In seeking to redress the gap through the development of an open source website of resources, the authors drew on aspects of web design that have been raised as important for educational websites:

Web designers should put high emphasis to ease users’ browsing experience by providing a good web navigation system. The educational website should also be appealing by appropriately manipulating multimedia elements including color, graphics, fonts and typography (Ng, 2014).

Method

The first phase of the project was a survey of pre-service teachers at UNE to gauge their awareness of, and readiness for, virtual schools and online teaching. In this way, the project team could respond to needs raised by the participants in their development of the project website and resources. The survey received ethics approval and an invitation to participate was sent to 2,567 students. Two hundred and thirty-one students completed the survey, a response rate of 9%. This low overall response rate could be due to the invitation coinciding with the end of trimester. However, the data collected was rich in detail and provided a snapshot of pre-service teacher understandings across a wide array of backgrounds, locations and subject areas.

A series of demographic questions such as age, gender, place of residence were asked in the survey, some questions in relation to their studies (ie year, mode) and some questions on a Likert scale questions to gain their perception of their technology skills, how often they use technology and how prepared they were to teach in online environments. Pre-service teachers were then asked some open ended questions in relation to their challenges in teaching online and resources required. Preparatory to commencing website development, the responses from the survey were manually coded for themes. Particular attention was paid to the concerns of the participants in regards to online teaching and also to the needs articulated. These concerns (or challenges) and needs then formed the basis for the website resources.

The website design formed the second phase of the project. The website, hosting a range of resources, was the main output of the project. This choice of output modelled the online teaching framework that the team wished to present. An open-access website also enabled a wider audience who could progress through the resources at their own pace. The hosting of the website needed to be cost effective, reliable and with an option for an extended length of time. The website domain name, <http://pstonline.info/>, was chosen to be short, evocative of the project purpose, and easy to remember.

Findings

While the main output for this project is the website, the findings from the survey provided vital data to enable the website to be relevant to pre-service teachers. Virtual schools are relatively new in Australia, although there is a long tradition of School of the Air, and the survey highlighted the lack of knowledge of these schools as well as some interesting attitudes to teaching in such schools. The findings have been reported elsewhere (Grono, Masters & Gregory, 2015; Masters, Gregory & Grono, 2015a; Masters, Gregory & Grono, 2015b), however, they are reported briefly to provide insight into the need to pursue online teaching skills in teacher education.

Four themes were clearly dominant based on the number of responses: engagement, technology, development of community/relationship, and teaching skills. A strong emphasis in the data across these themes was on making connections, using appropriate resources and activities to engage students and these main areas of concern became the main resource modules on the website (technology per se was outside the purview of the project). The participants demonstrated their concerns through comments such as:

The ability to ensure that students don't feel alone and isolated whilst using on-line technology to learn. As a student myself this can be a very hard hurdle to overcome (Participant).

How do you get to know your students? How do you find out how they learn in order to differentiate your lessons? How do you differentiate your lessons? (Participant).

Learning new online skills, and ensuring that the course is not impersonal (Participant).

The authors used the participant voices to provide a website that was relevant to their needs and which modelled ways of engaging students and facilitated finding resources. The following discussion about the design of the website demonstrates how the initial research translated into learning potential for preservice teachers.

Discussion

For the PST Online website, the decision was made to utilise open source software, in particular WordPress and Moodle, because of their customisation capabilities, zero cost, range of features and online support community. As free platforms they also model their features as easily accessible learning tools available to teachers. This focus on free-to-use tools that could be used by the learner to assist their own teaching was also applied to project dissemination through choice of social media and e-tools used, including YouTube for video hosting.

WordPress, an open source blogging platform, provided an intentionally uncluttered and quick to navigate 'homepage' to present the project. The website was customisable with the ability to include the project's logo and menu of project goals, dissemination, links and contacts.

Moodle, an open source Learning Management System (LMS), provided a suite of learning tools with which to build the learning modules. These were customised to suit the specific purposes of the project, and allow for the easy development of a range of self-paced interactive activities as the website expanded. This platform also allowed an optional approach to site registration for users. It provided the opportunity to access teaching modules and the information within, without registration to the site, therefore keeping the site accessible to everyone and unobtrusive. It also permitted the ability to register if individuals wanted to track their progress through the topics, engage in reflective activities and earn badges demonstrating that they had engaged in modules in relation to teaching online and receive recognition for their time. Moodle is used by many universities, including UNE, as well as being often the LMS used in schools. This meant that it had the advantage of being familiar for the designer, project participants and many other visitors to the site. Moodle also allows access to rich analytics and reports to track visitor access and progress to assist with further development after the project finished.

Originally, it was planned that the project website would house a range of files that provided information about online teaching as well as activities that visitors could complete to enhance their learning. It was decided that short videos addressing a range of topics would be more engaging for visitors. All academic staff in the school were invited, as experts in online teaching, to be recorded for uploading on the project website. Five academics (plus the project team) became the 'talking head' videos. The videos were recorded using an iPad as it was less intimidating for the person being videoed. Videos also took place in the academics' offices providing a known, and therefore more relaxed, environment. The videos were transcribed and included on the website for greater accessibility. YouTube's video platform was used for hosting. Again, modelling the use of free e-tools to pre-service teachers, allowed for embedding of videos and scalable video qualities to support users on both high and lower levels of connectivity. Further accessibility was also provided by including subtitles on the videos.

The videos, serendipitously, divided into three main themes: resources for teaching online, making connections online, and activities for online teaching. A decision was made to use these themes as the main modules for the website, with readings linked to the specific theme being included in the same topic block as the respective videos. The themes of the video blocks (sections) were mapped against the responses made by the survey participants in terms of their needs and concerns.

Each of the three blocks included a reflective activity for registered visitors to complete resulting in the award of a digital badge, utilising Moodle's support for the Mozilla Open Badges service. A final badge can then be awarded for completion of all three activities, allowing the earner to "demonstrate skill development" (Hurst, 2015, p. 185), and encouraging users to interact with all the modules available within the PST Online website. The graphic for each badge was designed to be clearly identified through the use of the website's logo and the name of the topic area (see Figure 1). The intent of the badges was to demonstrate that engagement around the topic of online teaching occurred and the participant had provided their own self-reflective response on the topic, rather than demonstrate a qualitative level of competence. This approach was taken to allow instant recognition and reward for the user, regardless of time or location, without requiring manual grading on the part of a marker. It is intended that as more resources are developed and/or found that these will be added to the website.



Figure 1: Badges awarded for completion of activities

The three main learning modules supplement several other Moodle blocks. These are:

- *Introduction* - designed to present an introduction to the concept of virtual schools.
- *Frameworks, Standards and Guidelines* - contains links to frameworks/standards for online teaching.
- *Professional Development possibilities* - Links to some professional development that is available.

Following the launch of the PST Online website, a focus group of interested pre-service teachers attended an evening workshop, including inclusive education and science specialists. The inclusive education teachers felt it was important that they know how to teach online because their students were those who appreciate the opportunity to learn with a 'level playing field', that is, they (their future students) would not be judged by their peers because their peers did not know of their disability. The science teachers felt that being able to teach online was important so that they could demonstrate experiments that could be harmful to undertake in a face-to-face environment. They also felt that there were many resources available that could demonstrate different scientific experiments better than they could through the use of YouTube or TeacherTube. It was evident that these pre-service teachers believed online teaching skills are important for their teaching careers and that they appreciated being able to find out more about online teaching.

Future directions

The analytics embedded in the website, via Google Analytics and ClustrMaps, in addition to Moodle's own inbuilt reporting tools, indicate the project has raised awareness of the development of virtual schools and of the need to gain expertise in digital pedagogies. Although the website is live and populated with a range of resources, there is scope for further development. The mapping of the pre-service teacher survey responses helped to frame the current modules. Over time, these responses will be used as the basis of future content, both new modules and additional sub-sections in existing modules in order to cover each area of need identified.

Another important direction is the intent to develop a follow-on project that will be a cross-institutional project in partnership with the New South Wales Department of Education and Training (DET). The new project will involve pre-service teachers practising their online teaching skills based on this project. This new project will be dependent on funding support and also the co-operation of the DET and other higher education institutions.

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