Chen, W. et al. (Eds.) (2017). Proceedings of the 25th International Conference on Computers in Education. New Zealand: Asia-Pacific Society for Computers in Education

Developing Pre-service Teachers' 21st Century Teaching Competencies via Digital Storytelling

Wan-Lin YANG
Center for Teacher Education & Institute of Education, Cheng Kung University, Taiwan
wlyang9@mail.ncku.edu.tw

Abstract: This qualitative study attempts to explore the potential of digital storytelling for developing pre-service teachers' 21st century teaching competencies. Digital Storytelling is used as a means to understand pre-service teachers' professional identity in the current wave of education reform as well as to unpack its potential in the development of pre-service teachers' abilities of critical reflection and critical technology integration. Findings may provide insights for teacher preparation programs for designing courses that aim at developing pre-service teachers' 21st century teaching competencies.

Keywords: Digital storytelling, professional identity, critical reflection, teacher education, 21st century teaching competencies

1. Introduction

Current education reform in Taiwan advocates learner-centered learning and digital classrooms. This advocacy leads to the demand for transformation of pedagogical design that supports the development of 21st century skills, such as critical thinking, collaboration, communication, creativity (namely 4Cs), ICT literacy, and life and career skills (Partnership for 21st Century Learning, 2002). Although a considerable number of studies have been made on how to foster students' 21st century skills, little attention has been given to how teachers can be educated to become qualified 21st century teachers. In response to this paradigm shift and new demands placed upon teachers, teacher education should step further to tackle on what approaches best facilitate teachers to develop 21st century teaching competencies.

2. Objectives of the Study

Using digital storytelling (DST) as a tool, this research attempts to investigate pre-service teachers' professional identity in the current wave of education reform as well as the potential of DST in the development of pre-service teachers' abilities of critical reflection and critical technology integration.

According to Sachs (2005), teacher's professional identity stands at the core of the teaching profession. It provides a framework for teachers to construct their own ideas of 'how to be', 'how to act' and 'how to understand' their work and their place in society. While educational reform reshapes what we understand professional knowledge and good practice, it is essential for pre-service teachers to reflect on how they see themselves as a teacher in the 21st century educational current. However, in the field of education, we often encourage students to reflect on their learning experiences without providing tools for reflection. Therefore, one of the research objectives of this study is to use DST as a reflective tool to understand pre-service teachers' professional identity in the current wave of education reform.

Besides, as emerging technology is introduced and promoted in educational settings, educators nowadays need to have skills and competencies to design, develop, implement and evaluate technology-enhanced curriculum that reflects the needs of 21st century learners. However, research has shown that teacher preparation programs in Taiwan tend to focus on teaching functions of computer software without introducing how technology can be appropriately integrated into instructional design (Chang & Weng, 2006). This often leads to an overemphasis on the introduction of the tool itself rather

than on the potential of the tool to stimulate knowledge construction, meaningful learning, critical thinking, or reflection. Therefore, in this study, pre-service teachers were situated in a technology-enhanced, collaborative learning environment to explore new technologies, to think critically on the affordances of tools, and to reflect on their learning experiences. Another objective of this study is to investigate the potential of the DST curriculum for nurturing pre-service teachers' deeper understanding of the educational value of DST as well as their competencies of critical technology integration.

In short, the research focus of this study lies in an understanding of pre-service teachers' perceived professional identity in the current wave of education reform as well as the potential role of DST for the development of their critical reflection, and technology integration competence. Such understanding is pivotal in the search of effective approaches to nurture pre-service teachers' 21st century teaching competencies as well as serving as a usable basis for designing and developing teacher education curricula to prepare pre-service teachers to become 21st century practitioners.

3. Literature Review

The concept of meaningful reflection has been highly addressed by teacher educators and researchers in the field of teacher education. There has been a growing literature on reflection in the context of teacher education associated with the discussion of portfolios, both the traditional portfolios (e.g. Campbell et al., 2004) and e-portfolios (Wetzel & Strudler, 2006). However, there is a limited body of literature illuminating the use of new technologies to facilitate pre-service teachers' reflection in the process of their development of their 21st century teaching competencies. Moreover, according to Graham & Phelps (2003), the idea of reflection has been addressed in the field of teacher education, but it is often referred to as reflection on classroom experiences and instructional competencies. It is rarely used as a means for the purpose of self-conscious understanding of oneself as a teacher. Kearney (2011) also argued that learner-centered digital video production often emphasize on technical aspects when developing guideline for educators; however, important educational issues, such as teacher roles, peer learning structures and support for reflective processes, are less the focus.

There are many definitions of digital storytelling. In this study, the researcher refers to the form defined by the *Centre for Digital Storytelling* in Berkeley, California (Lambert, 2002). This model weaves text, images (e.g. photographs), video, audio recordings of music and narrative together into a 2-6 short multimedia-based artifact with an emotional content to convey personal stories or to transfer knowledge and values. According to Boase (2008), the process of making digital storytelling involves judgment on what and how the story to be presented, that includes a critical selection of or omitting certain information, creating a sequence, and conveying message from a particular angel. This process of comparing, selecting, inferring, arranging and revising information implies the skills of critical thinking and communication that the storyteller needs to have in the creation of the digital storytelling. As in the process of making digital storytelling, one needs to make sense of one's life experiences before sharing personal narratives, DST can be utilized as an effective approach to access to pre-service teachers' cognitive process of the development of their teaching profession. According to Tendero (2006), DST allows learners to reconstruct meaning through the process of reflection on experience, therefore, it becomes a powerful tool for self-discovery, self-reflection and for investigating issues of identity.

4. Research Questions

This study attempts to answer a big question: what is the potential role of DST for 21st century teaching competencies? To arrive at the answer to this research question, four sub-questions will also be addressed:

- What are pre-service teachers' professional identity in the current wave of education reform?
- What are pre-service teachers' experiences of using DST to explore and to define their professional identity?

- How does the DST project impact pre-service teachers' ability of critical reflection?
- How does pre-service teachers' DST experience impact their competence with technology integration in education?

5. Research Site: The Learning Environment, Curriculum and Pedagogy

This research was conducted in a technology integration course in the Center for Teacher Education in Taiwan. The objective of the course is to prepare pre-service teachers for critical technology integration in their future instruction as well as to develop their higher order thinking ability, such as collaboration, leadership, creativity, and the ability of critical thinking, decision making, problem solving and critical reflection. In this course, 6 types of multimedia software (e.g. web development tool, animation software, graphic editing software, video editing software, screen-capture video tool, assessment software), 3 educational software packages (e.g. mind mapping software, a learning management system, an interactive whiteboard), one inquiry-oriented instructional strategy (WebQuest), and one instructional tool (digital storytelling) were introduced by the instructor. Digital storytelling on related educational issues is one of the projects students need to complete throughout the whole semester. Classes had face-to-face meetings for two hours per week for 18 weeks. A Learning Manage System (LMS) was used and served as an extended learning opportunity for interaction, connection, communication, peer feedback, information/resources sharing, and disseminating their finished projects.

A successful technology-enhanced curriculum designer should be able to articulate the interrelationship among affordances, learning theories and pedagogy. To achieve the aforementioned course objectives and to immerse pre-service teachers in a reflective learning context, each educational tool introduced in this course was not taught as separate and independent domain. Instead, the affordances of each tool for teaching and learning was also explored, discussed and modeled, in the hope that such curricular and pedagogical design can help to develop pre-service teachers' understanding of the complex relationships between pedagogy, content, and ICT. Eventually, they will be comfortable and confident to integrate emerging technologies in meaningful ways to support their future curriculum objectives and pedagogical activities. Throughout the whole training process, pre-service teachers were constantly reminded to be attentive to the questions regarding the affordances of the tools, what they are using, why they are using it, and how they are using it. These questions are crucial to develop 21st century teachers' competencies of technology integration, and the ability of critical reflection.

6. Research Procedure

In the first week of the course, a reflection paper was assigned for the enrolled pre-service teachers to jot down their thoughts in terms of their teaching philosophy, what constitutes good teaching and their perceptions of technology integration for pedagogical purposes. During the semester, the concept and features of digital storytelling were introduced through demonstrations of different examples of digital stories. Students were asked to identify strengths and limitations of each example, how it can be improved, and how digital storytelling might be used in real classrooms. Pre-service teachers had ample opportunities to explore other educational software and technology-enhanced instructional approaches throughout the whole semester. Toward the end of the semester, they were asked to revisit the questions handed to them in the beginning of the semester again. Then they used DST as a tool to reflect on their changes with respect to the question of "**how do I see myself as a teacher in the 21st century educational current?**"

PowerDirector 15 was taught to assist pre-service teachers to create their DST project. Pre-service teachers were then asked to write a script, and locate graphics, images, and music they need for the creation of their DST project. Pre-service teachers needed to present their digital storytelling project, to explain the major concept they want to convey, to identify the affordances of the technologies that were involved during the production, to share challenges they encounter, to elaborate

on strategies that they used to solve the problems, and to reflect on what they had learned from this learning experience. Peer evaluation and self-assessment were conducted in a group discussion format.

The DST project aims at unpacking the pedagogical potential of DST by having pre-service teachers answer the question of "how do I see myself as a teacher in the 21st century educational current?" In the process of developing the DST project, pre-service teachers were involved in a series of learning that include reflecting critically on their perceived professional identity, reflecting on their learning experiences; adopting educational tools and instructional approaches to critical implementation of technology for pedagogical purposes; a critique of taken-for-granted assumptions regarding teaching and learning, self-evaluation and peer mentoring. The process of making story from experiences for the purpose of reflection can be a heuristic way to help learners to explain, understand, make sense of and make meaning for their experiences. When the story is shared and disseminate, it can also serve as a means to communicate, interact, and connect with others. Ultimately, by engaging pre-service teachers in the creation of the DST project, they will have the opportunity to develop their 21st century teaching competencies.

7. Participants Selection, Data and Analysis

Participants in this study are secondary pre-service teachers. Participants were selected by way of purposeful sampling (Bogdan & Biklen, 1998).Pre-service teachers whose DST project demonstrates deep reflection and better ICT literacy were chosen to be participated in this study. A multiple case study that involves eight individual case studies was conducted. Each individual participant is a pre-service teacher enrolled in the technology integration methods course, and each participant is considered as one case. A cross-case analysis was presented to inform per-service teachers' experiences with DST for the development of their professional identity and 21st century teaching competencies.

For the data collection, case study involves multiple sources of information. Therefore, data collected for this study includes a) interviews of the enrolled pre-service teachers; b) document analysis on the reflection paper and digital storytelling projects, which are considered as part of the course requirements, created by per-service teachers; c) participant observation on how those pre-service teachers present and reflect on their digital storytelling project; d) direct observation of the in-class discussion and peer-evaluation on each other's digital storytelling projects; e) document analysis on the instructor's teaching log. Such understanding is pivotal in unpacking what learning context or guidance needed to be provided when using digital storytelling as a learning tool to nurture pre-service teachers' 21st century teaching competencies.

For the analysis of the data, an in-depth description of each individual case (a holistic analysis) is included. Then the researcher focused on the emerging themes (analysis of themes) to have a better understanding of the complexity of the case. This was done within one case (within-case analysis), and then a thematic analysis across the cases was done (cross-case analysis) (Miles & Huberman, 1994).

8. Preliminary Findings and Conclusion

DST in this study was used as a means to access pre-service teachers' professional identity as well as to unpack its potential role for the development of pre-service teachers' 21st century teaching competencies. Findings specifically center on pre-service teachers' perceptions of and experiences with DST in assisting us to understand how DST impacts pre-service teachers' critical reflection, particularly on the construction of professional identity. In addition, in order to develop effective strategies to nurture pre-service teachers' 21st century teaching competencies, the researcher delved into pre-service teachers' perceptions of the DST curriculum introduced to them for designing ICT integrated lessons. Major findings were as follows:

- Pre-service teachers see themselves as facilitators, motivators, companions and inspiration for students in learning.
- Their experience with DST helps them to develop their professional identity.

- Developing a digital storytelling project helps pre-service teachers to organize their thoughts and to reinforce their motivation on being a teacher.
- Peer evaluation and self-assessment improve the quality of pre-service teachers' final products.
- Creating a digital storytelling project helps pre-service teachers to develop their critical reflection ability.
- Pre-service teachers demonstrate great interests in transferring their experiences of the DST project into their future classroom.
- This project helps pre-service teachers to develop their confidence on successful technology integration for pedagogical purposes.
- Pre-service teachers demonstrate a more critical perception of technology integration. They focus more on the complex relationships between pedagogy, content, and ICT.
- The critique and discussion on digital storytelling examples help pre-service teachers critically think about issues of technology integration (e.g. affordances of the tool, integration strategies, pedagogy).

Findings from this study may provide insights for teacher preparation programs for designing and structuring future technology integration courses that aim at developing pre-service teachers' 21st century teaching competencies.

Acknowledgements

This study was supported by the Ministry of Science and Technology, Taiwan, under the Grant Number of 106-2410-H-006 -058 -MY2.

References

Boase, C. (2008). Digital storytelling for reflection and engagement: A study of the uses and potential of digital storytelling. Retrieved 09/20/2016, from https://gjamissen.files.wordpress.com/2013/05/boase_assessment.pdf

Bogdan, R., & Biklen, S. (1998). *Qualitative research for education. An introduction to theory and methods*. Boston: Allyn and Bacon.

Campbell, D., Cignetti, P., Melenyzer, B., Nettles, D., & Wyman, R. (2004). *How to develop a professional portfolio: A manual for teachers.* Boston, MA : Pearson: Allyn and Bacon.

Chang, C-S., & Weng, W-T. (2006). A Survey on Taipei city elementary school teachers' technology integration competence. *Journal of Educational Practice and Research, 19*(2), 129-162.

Graham, A., & Phelps, R. (2003). Being a teacher: Developing teacher identity and enhancing practice through metacognitive and reflective learning processes. *Australian Journal of Teacher Education*. *27*(2), 11-24.

Kearney, M. (2011). A learning design for student-generated digital storytelling. *Learning, Media and Technology*, *36*(2), 169-188.

Lambert, J. (2002). *Digital Storytelling: Capturing lives, creating community*. Berkeley, CA: Digital Diner Press.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Partnership for 21st Century Learning. (2002). Framework for 21st century learning. Retrieved 11/28/2016, from http://www.p21.org/our-work/p21-framework

Sachs, J. (2005). Teacher education and the development of professional identity: Learning to be a teacher. In P. Denicolo & M. Kompf (Eds.), *Connecting policy and practice: Challenges for teaching and learning in schools and universities* (pp. 5–21). Oxford: Routledge.

Tendero, A. (2006). Facing versions of the self: The effects of digital storytelling on English education. *Contemporary Issues in Technology and Teacher Education*, *6*(2), 174-194.

Wetzel, K. and Strudler, N. (2006). Costs and benefits of electronic portfolios in teacher education: Student voices. *Journal of Computing in Teacher Education*, *22*(3), 69-78.