Apps For All: Education App Integration

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Abstract

The increased use of technology in today’s schools has created new possibilities for teachers and their students. Rather than limiting the use of technology based on student ability, it is now possible for teachers to develop integrated multi-literacy lessons. Technology in the form of apps for iPads, iPods, and desktop computers enable teachers to achieve this goal; however, teachers’ perceptions of technology and teacher self-efficacy in relation to technology may influence whether technology is integrated into their lessons. This paper examines primary/junior pre-service teachers’ self-efficacy and perceptions of technology before and after developing app based multi-literacy lesson plan.

Keywords: multi-literacy, technology, self-efficacy, forth keywords;

1. Introduction

Multi-literacy has evolved through the realization that literacy can no longer be viewed as simply the act of reading and comprehending printed material. Literacy within the 21st century must embrace its multiple technological forms because the consumption, production, evaluation and distribution of text has changed the way individuals interact with text, as well as the nature of the text itself (Borsheim, Merritt & Reed, 2008). Due to these changes, literacy is no longer a linear process. Therefore, teachers need to provide students with the opportunity to interact with multimedia and multimodal texts, which requires students to read text from a variety of directions and through a variety of dimensions. As a result, the assumption that there is just one way to interpret a text is rejected as students are interpreting the text from different vantage points (Ajayi, 2011). The challenge then for teachers is to embrace a literacy that is freed from past pedagogical restraints.

A distinguishing factor in whether a teacher will embrace a multimodal and multimedia approach to literacy is the level of teacher self-efficacy, which is distinct from teacher efficacy. Teacher efficacy refers to the belief that one’s actions will affect a given outcome while self-efficacy refers to one’s belief that he can perform a certain action in order to achieve a given goal (Bandura, 2006, Browne, 2009; Teo, 2009). In terms of multiliteracy, a teacher’s self-efficacy refers to a teacher’s belief that he/she has the ability to work effectively with technology. If a
teacher’s self-efficacy is low, the teacher will become easily frustrated and less likely to persevere when faced with technological difficulties. Thus teachers’ self-efficacy is a predictor of a teacher’s use of technology (Anderson & Maninger, 2007; Kumar, Rose & D’Silva, 2008; Teo, 2009). Research conducted by Lambert and Gong (2010) indicates that pre-service teachers who participate in a technology-enhanced teacher education program are less anxious about computers, their belief in the value of using technology to enhance teaching and learning as well as their self-efficacy toward integrating technology in the classroom all significantly improved.

With each new technological innovation that is introduced in the classroom comes the belief that it will transform teaching and learning. Research has demonstrated (Garcia & Friedman, 2011) that the integration of technology into the curriculum is beneficial for the development of critical thinking, problem-solving skills and the support of 21st century skills. Within the integrated classroom environment teachers are faced with the challenge of meeting the learning needs of all students regardless of ability. Further, teachers report a lack of understanding of the relationship between the educational curriculum and the expectations of new literacies (Garcia & Friedman, 2011). It is essential that teachers feel confident and comfortable in their understanding of the connection between the use of technology and differentiated instruction before any changes can be made. One way to effect change toward the use of 21st century classroom applications of technology would be to include a more advanced technology-focused curriculum in teacher education programs.

In order to develop pre-service teachers’ knowledge and awareness of the importance of multiliteracy within the classroom, teacher education programs must integrate the technological skills and perspectives that pre-service teachers currently hold with pedagogical practices (Ajayi, 2010). One way to accomplish this integration is by encouraging pre-service teachers to analyze the technology and media to determine how it can support and expand learning opportunities within the classroom environment. Such an approach would enable pre-service teachers to formulate new and innovative approaches to enhance literacy development through multi-modal learning environments. “‘Multi-modal learning enables educators to provide strategies for different learners in a range of learning environments” (Brown & Lockyer, 2005/2006, p. 175). Through multi-modal learning, students develop the cognitive processing and critical thinking skills necessary for lifelong learning.

Ajayi’s (2010) research examining pre-service teachers’ attitudes and perceptions towards teaching multi-literacies found that pre-service teachers are aware that the nature of literacy has evolved to correspond with technological development. In particular, the pre-service teachers acknowledged and accepted that accessing and reading information from multi-media technologies are part of the literacy skills necessary for success in the 21st century. Despite this acknowledgement, Ajayi’s participants reported that they were concerned about their preparedness to teach in a multiliteracy classroom. Ajayi’s findings correspond to other research (i.e., Judge & Simms, 2009; Teo, 2009), which indicates that training is one of the key barriers integrating technology into the classroom.

Through the application of the Technology Acceptance Model (Davis, Bagozzi & Warshaw, 1989) teacher’s use of technology within the classroom may be increased. Teo (2009) applied the Technology Acceptance Model to 475 pre-service teachers. Teo found that “perceived usefulness, attitude towards computer use, and computer self-efficacy have direct effect on behavioural intention to use technology, while perceived ease of use, and technological complexity, and facilitating conditions affect behavioural intention use indirectly” (p. 309). Based on Teo’s findings he suggests that pre-service teachers be provided with an opportunity to develop their technological knowledge and skills as part of their training program.

A main limitation of both Ajayi’s (2010) and Teo’s (2009) research is that the pre-service teacher’s were not part of technology based teacher education program. In one northern Ontario University, technology (e.g., Smartboards, computers, iPads, assistive technology programs and devices) is integrated throughout their entire education program. By providing pre-service teachers with the opportunity to explore and use technology both within their courses and while on practicum, it may influence their perception and self-efficacy with integrating technology into their lesson plans for the purpose of multiliterate instruction.
2. Methodology

2.1. Participants

The participants consisted of 143 pre-service teachers (age range 22-44; male = 21; female = 122) enrolled in the primary/junior division of a northern Ontario university’s Bachelor of Education degree program. The participants were recruited from their mandatory Special Education/Educational Psychology class. All of the participants owned a MacBook Pro computer, 61% owned an iphone, 77% owned an iTouch, and 1% owned an iPad. Participants reported spending an average of 46 hours per week on the computer and an average of 8 hours per week on iTunes. All participants completed an assignment for the course that required the pre-service teachers to create a multiliteracy-based lesson that incorporated one or more special education App with one or more curriculum-based App (e.g., language, geography, science, math, etc.).

2.1.1. Task

To determine the pre-service teachers’ perceptions and self-efficacy with integrating technology into lesson planning for the purposes of multiliterate instruction, the pre-service teachers who participated in the study completed a 63 five-point Likert-scale questionnaire. The five-point Likert scale was broken down into the following categories; (1) not at all; (2) not really; (3) undecided; (4) somewhat; (5) very much. The questionnaire was administered prior to completing the assignment (November, 2011) and upon completion of the assignment (December, 2011).

3. Results

Results were compiled from both the pre- and post questionnaires. The results of the most relevant questions are listed in Table 1.

Table 1. Summary of mean responses to the Apps questionnaire

| Questions                                                                 | Pre-Test Mean | Post-Test Mean |
|---------------------------------------------------------------------------|---------------|----------------|
| 1. How computer literate do you believe you are?                          | 4.11          | 4.23           |
| 2. I am aware of a variety of subject-specific apps.                      | 2.54          | 3.38*          |
| 3. I feel confident that I could find apps that I can use in my teaching. | 3.25          | 3.70           |
| 4. I feel confident that I could describe 5 software programs (apps) that | 2.88          | 3.53*          |
| I would use in my teaching.                                               |               |                |
| 5. I believe that a variety of technologies are important for student    | 4.33          | 4.41           |
| learning.                                                                 |               |                |
| 6. I believe that incorporating technology into instruction helps students | 4.34          | 4.39           |
| learn.                                                                    |               |                |
| 7. I believe that student motivation increases when technology is         | 4.30          | 4.29           |
| integrated into the curriculum.                                           |               |                |
| 8. I believe that I can integrate computer activities into the curriculum | 3.73          | 4.10           |
| whenever possible.                                                        |               |                |
| 9. How confident are you that you can use technology to focus classroom   | 3.75          | 4.02           |
| activities on the needs of each learner?                                  |               |                |
| 10. Technology helps me meet the individual needs of a variety of students| 3.71          | 4.05           |
| in my classroom.                                                          |               |                |
| 11. How well do you believe you could use technology to address needs of  | 3.80          | 3.99           |
| students with exceptionalities?                                           |               |                |
| 12. I am aware of a variety of apps that address the needs of students    | 2.44          | 3.77*          |
| with exceptionalities.                                                    |               |                |
Paired t-tests revealed a significant increase in the mean Likert scale scores in the post questionnaire (see Table 1). Specifically, the questionnaire data showed that pre-service candidates were more aware of subject specific Apps (t (89) = -6.901, p<0.05) and are able describe five Apps that they would use in their teaching after completing the assignment (t (141) = -7.023, p<0.05). Additionally, teacher candidates reported a greater ability to identify Apps that would address the needs of students with exceptionalities (t (142) = -10.588, p<0.05) and the use of these Apps in their teaching (t (142) = -7.486, p<0.05). Finally, with respect to the use of technology, teacher candidates reported a significantly greater awareness of a variety of assistive technology devices for students with exceptionalities (t (142) = -5.784, p<0.05).

4. Discussion
This study has contributed to the growing body of research regarding teachers self-efficacy and ability to integrate technology into their practice. The results of this study demonstrated the value of including an assignment involving the creation of a multiliteracy-based lesson that incorporated one or more special education App with one or more curriculum-based App(s). Completing this assignment resulted in greater awareness of available technology to assist struggling students and higher self-efficacy scores with regard to technology integration. Similar to the results of Anderson and Maninger (2007), this study revealed the importance between self-efficacy and the intentions of pre-service teachers to incorporate technology into their future teaching. This research has the potential to inform teacher preparation programs and in particular, suggests that a more advanced technology-focused curriculum is warranted in order to continue to meet the evolving needs of all students in the 21st century.

5. Conclusion
It is important to note that there are two main limitations in this study that prevent generalizations from being made. First, the participants in this study were not randomly selected. Second, there is a potential for bias in the participants’ responses. Bias may be present due to the use of a self-reporting questionnaire and from the fact that one of the researchers was the participants’ professor.

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| 13. I am aware of a variety of assistive technologies for students with exceptionalities. | 2.99 | 3.77* |
| 14. I am aware of how teachers might use technology and particularly Apps in their teaching. | 3.13 | 3.67* |
| 15. I feel confident that I could find Apps on my own that could help me teach a subject matter in an integrated manner with technology. | 3.44 | 3.76 |

* represents significantly different p<0.05
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