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Keep it simple: Introducing information and communication technology to early childhood education student teachers

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Information and communication technology (ICT) is described as a tool that can be effectively utilised in teaching and learning in all subject areas. This article investigates the impact of hands on ICT experiences on student teachers' attitude towards ICT integration. This paper explores the best possible ICT experiences for early childhood student teachers, and how these experiences may influence their attitude and beliefs towards ICT integration in teaching and learning.

The hands on tasks at the initial stage were based on common applications such as Publisher and Microsoft Word to compile meaningful and interesting learning/teaching stories that are frequently used in early childhood settings. The feedback from student teachers was positive, highlighting a keen interest to learn ways to utilise ICT as a tool. The next step in this approach will be to repeat the tasks and to compare the feedback.

Introduction

'ICT is here to stay' is the common end point for conversations on ICT. Information and communication technology (ICT) is all around us. We live in a fast growing technological age and ICT has become part of our daily lives. Children born in the digital age, 'Digital Natives' as coined by Mark Prensky, seem to be born with the know-how when it comes to technology. Yelland (2006) also states that "the very nature of our work and leisure time has been transformed, due to the presence of Information and Communication Technologies" (p. 12).

There is much debate on both positive and negative influences of technology use with young children (Edwards, 2005; Haughland, 2000; Stephen & Plowman, 2003; Anderson, Rooney, & Vincent, 2007; Elkind, 1996; Healy, 1998; The Alliance for Childhood, 2000) and the role of the teacher that has a significant influence on ways ICT can be integrated within the learning and teaching environment (Zevenbergen, 2007; Edwards, 2005; Visser, 2000). Some early childhood teachers hold very strong views on the benefits and disadvantages of ICT exposure at an early age (Edwards, 2005; O'Rourke & Harrison, 2004: Patterson, 2004; Visser, 2000). However minimal research has been undertaken in this area, with few definitive conclusions drawn. In 2005, the early childhood ICT framework was launched to support and guide the use of ICT to enhance learning within the early childhood education sector. The

incorporation of ICT within the early childhood education curriculum seems to have emerged even before the Ministry of Education ICT framework was introduced in 2006-07. The framework proposed a vision to improve learner achievement in the education sector from early childhood to tertiary and ongoing learning.

The early childhood education sector has recognised the need for ICT integration within the ECE curriculum and the ICT needs of the fast growing digital age (Zevenbergen, 2007). However, even though ICT skills are recognised as important, such skills are not freely integrated, applied or utilised in the early childhood education curriculum (Lindsay, 2006). This could be linked to the lack of ICT-literate educator/professionals (Madden, Nunes, Mcpherson et al., 2007). Drenoyianni (2004) states that ICT literacy has also been misinterpreted in the past, and describes ICT literacy as: "…using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society" (p. 2). Previously, ICT literate meant understanding how to use the equipment, rather than recognising how the social practices and learning through ICT can be extended to other curriculum areas in an early childhood education context (Lee & O'Rourke, 2006). Knowing how to use a range of equipment and integrating the learning that takes place within other early childhood curriculum areas is now an essential in promoting ICT capability.

The challenge is to identify how teacher trainers can most effectively influence the training experience of student teachers towards ICT use with young children. Student teachers need to be encouraged to use ICT equipment appropriately and to think outside the box/screen to extend their learning to other curriculum areas. Future teachers must gain the knowledge, confidence, and competence in ICT use to engage with children and their digital environments in effective and meaningful ways. Many authors (Yelland, 2006; Ramsey, Breen, Sturm, Lee, & Carr, 2006; Bolstad, 2004; Visser, 2000) emphasise the critical role teachers play in implementing ICT in learning environments.

Rationale for choosing hands on ICT tasks

Teaching ICT skills cannot be achieved overnight. Bümen (2012) highlights a three stage process coined by Hixon and Buckenmeyer (2012) for ICT skills development. The first stage is where ICT is not used at all, the second stage is where ICT is considered a necessary tool to be used in teaching, and finally considering ICT as an instrument to support learning and teaching. Early childhood teachers seem to have demonstrated a neutral perception in relation to ICT use in early childhood settings (Jimoyiannis & Komis, 2007), therefore resting somewhere between stages one and two.

Teacher attitude appears as the main factor enabling the positive integration of ICT in learning and teaching (Bullock, 2004; Kersaint, Horton, Stohl, & Garofalo, 2003; Galanouli, Murphy, & Gardner, 2004; Karagiorgi & Charalambous, 2006). Along with attitude, cultural background, individual beliefs, availability of resources, and the expectation of the caregiver/parent should also be considered as influencing factors in this situation.

Russell, Bebell, O'Dwyer, and O'Connor (2003) emphasise that the teachers' beliefs must change in order for teacher's use of technology to change. The belief that ICT is not important in an early childhood setting is common and strongly held by some practitioners and student teachers alike. Many personal conversations have ended with the statement that children have access to enough ICT in the home environment, and that therefore it is not an essential component of ECE.

Some authors emphasise the need for extended exposure to ICT to cultivate a positive attitude and to become confident and keen users of ICT (Albion & Ertmer, 2002; Brown & Warschauer, 2006). One cannot ignore the fact that tertiary education programs come with inherent time constraints, and that the lecturers/instructors have to do their best during available time. Therefore, it is imperative for tertiary education staff to make the best possible attempt to give the students the understanding, experience and confidence of utilising ICT and create a 'can do' attitude through the teaching and experiences we plan.

McNair and Galanoli (2002) state that basic computer skill-focused courses fail to prepare teachers to use ICT to support teaching and learning, as individual student teachers' computer operating skills and proficiency are varied (Pritchard, 2001). The student's age and accessibility to ICT are also important variables. Bümen (2012) illustrates ICT proficiency as two pronged: cognitive proficiency and technical proficiency. Bümen also highlights that the novice computer user needs to be taught basic skills before tackling pedagogical uses of ICT.

Such evidence has initiated a review of ICT course content to prepare and equip student teachers to be competent and confident users of ICT in early childhood settings. Many researchers emphasise the importance of undergraduate courses that focus on the basic acquisition of ICT skills and application (Pritchard, 2001; Wang, 2002; Taylor, 2003). A set of guidelines recommended by Wong, Habibah, Ahmad, Kamariah and Tang (2003) for successful use of ICT has now been compiled along with existing teaching strategies. The main characteristics highlighted in the guidelines are:

1. The learning tasks are hands on and relevant to the field

2. Encourage problem solving

3. Student teachers are able to understand the connection between the tasks and real life application

4. The tasks involve information analysis, interpretation, and evaluation – appropriate use of data and information

5. Supportive, competitive but non-threatening learning environment

6. Work collaboratively towards a common learning goal, share ideas and enjoy themselves

The content and assigned tasks

An initial survey conducted with the new intake of students for 2014 at Whitireia NZ Bachelor of Teaching Early Childhood degree gauged the basic ICT knowledge of the applicants. Common trends noted were the competency in using the mobile phone, texting, snap chat, utilising a laptop/desktop for frequent access of Facebook and email. The age group of the course participants ranged from 18 to 50 years. The responses varied with younger participants citing greater exposure to technology compared to the older participants, who used a mobile phone only when needed.

It was noted that majority of students did not own any portable devices other than a mobile phone. Two students did not own a desktop or any other ICT tools other than a cell phone and had no access to ICT tools other than on campus. The degree program attracts students from a diverse cultural and economic range so that owning ICT tools is not an entry criteria as that may act as a barrier to attract able students from diverse cultural groups and low socioeconomic backgrounds. Just as adults (student teachers in this case), children at centres may not have access to ICT tools in their homes, debunking the common belief that early childhood centres do not require ICT as children have access to ICT at home.

A strategy employed to overcome the gap between students with and without personal access to ICT is to assign mixed groups to complete in-class tasks. The students are requested to form a continuum, with one end of representing students who believe they are technologically aware, and the other end representing students who need extra help with technology. The continuum is divided into three sections: experts, manageable and help needed. Class groups must consist of one student from each of the three sections of the continuum. This reduces the dependency on the experts and the tendency for experts to dominate the process, thereby promoting collaboration.

The ICT course consists of twenty, two-hour sessions, spread across the three year undergraduate ECE degree. The topic for each week was introduced, explained and the process was outlined in a classroom setting. Students were then requested to attempt the tasks in small groups at computer stations spread across the campus. The completed tasks were showcased at the beginning of each session.

Reflection

The tasks were completed by the groups within the allocated time. The students were requested to provide feedback on individual tasks and a generic evaluation of the module was carried out on completion. The students responded with interest and took part in class discussion of the usability, availability, and sustainability of the tasks carried out each week. The end of task feedback was mainly verbal and highlighted the learning that took place for individual students. Some students responded with awe at the possibility and simplicity of an application to create colourful and informative newsletters, a communication tool used at early childhood centres.

As the module progressed, the interaction between students in class appeared friendly and respectful. The interaction between young and mature students were more frequent than at the beginning of the module. Few ground rules were set at the beginning, such as equal involvement, participation and opportunity to every group member to work on the task, maintaining professional conduct in accordance with the class contract drawn up at the beginning of every academic year.

The perception that younger students are aware and able to use various ICT applications with competence was inaccurate. Both younger and mature students needed guidance when using Publisher, PowerPoint, and Photo Collage on a desktop computer. Above mentioned applications were chosen as these are utilised in early childhood settings to communicate with parents and *whanau*. The younger students were competent in using day to day applications such as Text, Snapchat, email, Facebook and Twitter. The applications used in class nudged the younger students out of their comfort zone. However, the students completed the tasks with interest and were keen to present their findings to their peers.

The students who did not have access to ICT tools at home were most enthusiastic to capture every detail on their notebook. These students may lose out on a professional experience if an ICT module of this nature was not offered as part of the teacher training course. A lack of exposure to ICT tools and how ICT can be used as a teaching and learning tool may hinder student teacher's competence in using ICT in their professional practice. They may also be unsuccessful in supporting parent, child and centre expectations in relation to ICT use as a teaching and learning tool.

A teacher's incompetence in using ICT tools may also disadvantage the children at their ECE centre. It would be wrong to assume that all children at a given early childhood centre will have ICT equipment in their home environments. Also, exposure and use of ICT equipment at home depends on factors such as access to equipment, supportive home environment that promote the use of ICT equipment and the interest and abilities of family members (Siraj-Blatchford & Siraj-Blatchford, 2006). An ICT knowledgeable teacher will provide equal opportunities with ICT tools to all children irrespective of their social and economic status.

Conclusion

The main focus of this study was to identify the uptake of a variety of tasks using ICT as a teaching and learning tool. The general feedback received highlighted students' keen interest in using ICT applications relevant for their profession. The group tasks created collaborative attempts to complete in-class tasks and led to the creation of sound peer relationships. The interplay between mastery and use of the application is an aspect that should be investigated in a future study. The informal feedback may not demonstrate and capture every aspect of students' feedback/views; however, written feedback at the end of each task was useful information. The next step of this process will be to investigate the impact made by the hands-on ICT tasks to student's attitude towards ICT use as a teaching and learning tool.

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