Mobile learning in early childhood education: A school-university partnership model

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Chapter 1 The Research Defined

1.1 Introduction to mobile learning (mLearning)

This research explores the implementation of mobile learning (mLearning) in early childhood education (ECE) at two public schools in the metropolitan area of Perth, Western Australia, through the lens of school–university partnerships. The partnerships require pre-service teachers (PSTs) from a local University to deliver lessons using mLearning to early childhood children at partner schools.

The term mLearning (sometimes spelled M-learning) is a relatively new term because it is the fastest growing area of Information and Communications Technologies (ICT) in education (Traxler & Vosloo, 2014), and consequently definitions are continuously changing. Traxler (2005, p. 262) defined mLearning as “any educational provision where the sole or dominant technologies are handheld or palmtop devices”. For this research, mLearning includes devices that are mobile and readily picked up and moved by the student – for example, tablet computers and Bee-Bots.

According to the Organisation for Economic Co-operation and Development (OECD) (2015), mLearning is ideal for the early childhood setting and has been shown to have a positive impact on student learning. Pegrum, Oakley, and Faulkner (2013) supported this premise in a study of Western Australian independent schools, where they found that mLearning improved both student motivation and overall learning.

The ICT revolution in education has vastly increased the breadth of mLearning resources available to facilitate the teaching and learning process (C. Clark, Zhang, & Strudler, 2015). Touch-screen devices, such as tablet computers, are widely available,
combine many functions in one, and support play-based, creative and individualised learning. Schools are also increasingly seeing the potential for using mLearning devices in addition to computers or laptops (Lock, 2015). In the classroom, mLearning devices provide the greatest potential for transformational change (Ally, 2009). However, mLearning is not widely used in the early years of education (Blackwell, Lauricella, & Wartella, 2014). Despite the inclusion of technology in the Western Australian curriculum, a common societal view is that mLearning is not necessary at this early educational phase (A. Simon, Gingold, & Schoendorf, 2014). This limited observed use of mLearning in early childhood education suggests a need for research to investigate why teachers have been slow to utilise mLearning in early childhood settings.

This research involved early childhood practising teachers and PSTs, academics, school leaders and parents and carers working collaboratively to develop collective knowledge on mLearning implementation in the early childhood setting. The researcher hypothesised that many practising teachers have sophisticated pedagogical knowledge (PK) but may not have been exposed to the latest developments in mLearning. Early childhood PSTs at a Western Australian University (the University), however, might have well-developed technological knowledge (TK), learnt through engaging with specific ICT integration units offered as part of their teaching course. This research sought to determine the extent to which practising teachers and PSTs could help each other in the mastery of mLearning in the classroom for the benefit of student learning. The research adopted an interpretive approach, using a longitudinal case study design, to generate data over a three-year period.

In this chapter, the purpose of the research is presented first. The aims and objectives follow. Thirdly the research questions are presented. Finally, the significance of the research, followed by a delineation of the organisational framework of the thesis is provided.
1.2 Purpose of the research

This research set out to extend the currently limited research on mLearning in early childhood education, through examining mLearning interventions at two partner schools. As stated, mLearning is a relatively new phenomenon and few researchers are studying it in the early childhood phase of education. The early childhood phase of development is a pivotal stage in children’s learning and development (Australian Government Department of Education, Employment & Workplace Relations, 2012). The Early Years Learning Framework (EYLF) guides early childhood educators in Australia and indicates that children need to use ICT to investigate and problem-solve and that learning should be play-based. ICT and play-based learning are terms that few researchers have investigated together (Hesterman, 2013).

Recent rapid advances in mLearning resources in schools have made the need for this sort of research urgent. If schools have mLearning resources available in early childhood education, then research is required to examine the extent to which these mLearning resources are educationally beneficial to children. This research did not focus exclusively on any particular mLearning tool, although it is acknowledged that the main mLearning tool available in schools is the tablet computer, which in most cases in Western Australia is the Apple iPad. iPads were released in 2010, and the education sector was responsible for 60% of the iPads purchased (Gentile, 2012).

In 2015, the Western Australian curriculum mandated digital technologies for pre-primary children. At the pre-primary stage of development, children are expected to develop computational thinking and to use digital systems. The Western Australian curriculum defined digital technologies as:

Any technologies controlled using digital logic, including computer hardware and software, digital media and media devices, digital toys and accessories and
This research used digital toys (Bee-Bots) and digital media (microscopes) to provide new knowledge on how these mLearning tools impact on children’s learning in the newly mandated digital technologies curriculum and other curriculum areas. This research provides early childhood educators and school leaders with some practices to assist with mLearning implementation, to support the digital technologies curriculum, and to inform learning in other areas of the curriculum.

1.3 Aim

The aims of the research were to investigate mLearning in early childhood education and to examine the school–university partnerships that were established for this purpose. The benefits and challenges of mLearning at the two schools were examined in terms of the following five considerations:

1. The level of engagement that children exhibited in working with mLearning technologies.

2. How the authentic experiences contributed to the learning of PSTs.

3. How the synergy between practising teachers and PSTs helped each to master mLearning for the benefit of student learning.

4. How the partnership contributed to the practising teachers’ technological knowledge (TK).

5. How the partnerships contributed to mLearning in the school and university communities.

The research was concerned with understanding educational change with regard to mLearning through a series of mLearning interventions in two school contexts. Through
these interventions which involved practising and PSTs, the research aimed to generate an in-depth understanding of the relative merits of:

- mLearning in early childhood education.
- Practising teachers and PSTs working together to build pedagogical and technological knowledge.
- Creating a school–university partnership model.

The research has generated a rich data set that can be used to inform decision-making by school leaders and teachers on the use of mLearning in the early childhood years of education. The research has the potential to bridge the perceived gap between the technological and pedagogical knowledge of the practising teachers for the benefit of early childhood students. The research outcomes contribute to knowledge in two ways: firstly, through investigating mLearning in early childhood education, an area of paucity in the literature; and secondly, through examining the effectiveness and sustainability of school-university partnerships.

1.4 Research questions

To achieve the aim of the research and to make knowledge contributions that may augment the existing literature, two research questions were developed to guide the conduct of the research:
1. What are the benefits and challenges for schools and the University of adopting mLearning in ECE?

This research question is complex. Any investigation into the benefits and challenges of educational innovations should consider a range of factors. The factors considered in this research were the use of mLearning technologies in the classroom, what impact they might have on young children, and how teachers’ technological knowledge and mLearning skills shift. PSTs at the University develop a high level of technological competence in mLearning as they progress through a degree, however, they lack experience in teaching. Conversely, practising teachers typically have sophisticated pedagogical knowledge, but not many have been exposed to the latest developments in mLearning (Koh, Chai, & Tsai, 2014). This research question investigates the nature of any synergy between practising teachers and PSTs using a partnership approach.

2. What are the impacts of mLearning implementation in schools on school-university partnerships?

This research question is about the benefits and challenges of the mLearning partnership model for school and university participants and community members. Parents and caregivers had access to the latest knowledge about the potential of mLearning as opposed to having to rely on unverified media reports on the benefits and challenges of mLearning. Partnerships between university and school communities have high potential in terms of sharing ideas, generating knowledge, and improving practices (Walsh & Backe, 2013). By investigating the process underpinning the conduct of the research and its relationship to sustainable change, other universities and their communities have a model to consider for implementation in their respective contexts.
1.5 **Significance of the research**

As noted earlier, research into mLearning as such is embryonic and so the literature on mLearning in early childhood is even more limited. In such a rapidly evolving environment, traditional methods of conducting and publishing research can seem protracted, particularly where professionals face a lack of knowledge. Research ought to provide a bridge between theory and practice in ways that are collaborative and mutually beneficial for both researchers and practitioners.

The rationale underpinning this research revolves around whether mLearning can be shown to broaden and enrich education in the early childhood setting. Children can only benefit from mLearning if those responsible for their education – namely, parents and carers, teachers and school leaders – have the necessary skills to guide them. This research enabled participants to increase their knowledge and skills, for example:

- School leaders had access to the latest pedagogical and technological knowledge and could use this to inform strategic planning.
- Practising teachers had access to a curriculum designed by PSTs specifically for mLearning in early childhood education.
- PSTs were provided with an authentic environment where they could teach using mLearning. They also had access to the input of practising teachers with highly developed pedagogical skills.
- Parents and carers had access to the latest knowledge about the potential of mLearning.
1.6  **Research design and methodology**

A collective case study methodology was chosen for this research because an intense focus on each case yields extensive and varied data. The data collected at each case site yielded thick verbal descriptions enabling the researcher to examine the characteristics of the mLearning partnerships. A longitudinal approach was used where the data were collected over a three-year period.

This research used qualitative research methods to construct meaning from social experiences that arose as a result of the school-university mLearning partnerships. Quantitative data was also collected in the form of Likert survey data and information from the schools’ official publications. The quantitative survey data collected in this research complemented the qualitative data collected in the semi-structured interviews, focus groups, field observations, memoing and surveys to provide rich descriptions of the cases studied.

The qualitative data was analysed using a series of steps to reduce the data so that meaningful representations could be made. The data was coded using open, axial and selective coding procedures. NVivo software which is a qualitative data analysis software tool was used to simplify the qualitative data through coding. NVivo was used to manage, shape and make sense of the qualitative data collected. The quantitative data collected in this study was Likert survey data which was collected using Survey Monkey and imported into Statistical Package for the Social Sciences (SPSS) (version 23). Exploratory factor analysis was conducted using SPSS (version 23) to reduce the data and group the survey items into themes with a shared variance.
1.7 Thesis framework

There are nine chapters in the thesis. Table 1.1 provides an overview of the chapters.

Table 1.1
Overview of the Thesis

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1.7.1 Chapter 1.

This chapter presents the aims and purpose of the research along with the research questions that guided the research. The significance of the research and an overview of the methodology is followed by an outline of the ten chapters that compromise this thesis.

1.7.2 Chapter 2.

Chapter 2 is a review of the literature surrounding the research topic, including the benefits and challenges of mLearning in early childhood education from school and
university perspectives. The literature review defines mLearning and early childhood education. The final part of the chapter examines school–university partnerships and the associated benefits and challenges. The literature review informs the research and frames the findings and subsequent implications of the research.

1.7.3 Chapter 3.

The methodology, introducing the theoretical framework that underpins the research is delineated in Chapter 3. There is a description of the research methods used, together with an outline of the specific qualitative and quantitative methods. The research was longitudinal using a case study approach with two public primary schools being the two cases examined. The chapter contains a description of the methods of data collection – namely, surveys, focus groups, semi-structured interviews, field observations and memoing. The description of the method of data analysis and the research limitations is followed by a discussion of the ethical considerations of the research.

1.7.4 Chapter 4.

Chapter 4 is the first of four chapters that present the results gathered from field observations, interviews, surveys, and focus groups with the practising teachers, PSTs, and lecturers. This chapter contains the findings pertaining only to the PSTs.

1.7.5 Chapter 5.

The results collected from the practising teachers are presented in chapter 5. The results were from field observations and interviews with the practising teachers.

1.7.6 Chapter 6.

The findings from the school leaders and community members, including parents and carers are presented in Chapter 6. The findings were collected from interviews and surveys,
and were considered under each of the cases studied. Results about leadership, professional development, technical support, and mLearning resources are presented in this chapter. Data surrounding the impact of the mLearning partnerships on the school communities are also presented.

1.7.7 Chapter 7.

The findings from the University academic staff and associated community are presented in Chapter 7. The findings, collected from interviews and focus groups and during field observations, reveal how the mLearning partnerships contributed to mLearning in the University community.

1.7.8 Chapter 8.

The interpretations and synthesises the findings from chapters 4–7, addressing the research questions are presented in Chapter 8.

1.7.9 Chapter 9.

Chapter 9 is the concluding chapter. It summarises the findings and presents the recommendations that arise out of the research.

1.8 Personal statement

The reason for undertaking the research on mLearning in early childhood education was because it is an area undergoing rapid change. It is also a controversial area of research as there is much media coverage on the negative aspects of young children and technology. The researcher had a personal interest in mLearning and felt that there was a gap in the technological knowledge banks of practising teachers and PST. Undertaking this research provided practising teachers, PST, parents and school leaders with the opportunity to see children using developmentally appropriate mLearning tools to support their learning.
Gauging the feedback from these participants contributed to the researcher’s passion for seeking new ways to enhance children’s learning.

1.9 Conclusion

This research aimed to track how school–university mLearning partnerships could assist with mLearning integration in early childhood education for the benefit of children’s learning. Ultimately, this research provides a platform for understanding how practising and PST can work together to share skills in technology and pedagogy for successful mLearning integration in early childhood education.