
Title	Pre-service teachers' ICT knowledge, attitude and use of ICT for learning and teaching
Author(s)	Ng Chiew Hong and Koh Noi Keng

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FINAL REPORT



Pre-service Teachers' ICT Knowledge, Attitude and Use of ICT for Learning and Teaching/ SUG 07/16 NCH

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Ng Chiew Hong and Koh Noi Keng

Date:

National Institute of Education

Singapore

Part II

EXECUTIVE SUMMARY

Purpose / Research Question

The SUG 07/16 study explores pre-service teachers' knowledge level, attitude and the use of ICT for educational purposes as well as the challenges faced in using ICT.

The research questions are:

1. What are pre-service teachers' perceptions about their current ICT knowledge, skills and competence?
2. What are pre-service teachers' expectations regarding courses to facilitate ICT integration in teacher education?
3. What are pre-service teachers' views and attitude regarding effective integration of ICT in education and impact on their practices?

Background

There has been some research into ICT in pre-service teacher training (see Aslan and Zhu, 2014; Teo, 2009; Yücel, Acun, Tarman & Mete, 2010; Aslan & Zhu, 2014). In investigating 1230 Singaporean pre-service teachers' ICT competencies, pedagogical beliefs, and their beliefs on the espoused use of ICT, Chai (2010) affirmed the link between the pre-service teachers' ICT competencies, their pedagogical beliefs and their espoused use of ICT. However Chai (2010) has also highlighted the need to do further research as 'the relationship between teachers' level of ICT skills and how they would use ICT in classroom is however an area that has not received much attention' (p. 388).

Participants

50 preservice teachers with 74% in the 23 to 25 age range and 24% in the 26 to 30 age range. These preservice teachers were from the HSSE and ELL AGs and they were completing their Postgraduate Diploma in Education.

Research Methodology / Design

Research instruments:

- 1) Administration of a survey which asked participants to self rate their ICT skills as well as the frequency and their confidence levels in the use of technology based activities for learning and teaching of ICT through NIE ICT and pedagogical courses.
- 2) Administration of semi-structured interviews to get an in depth understanding of the link between their perceptions and their teaching practices.

Data collection:

The questionnaire was administered to 50 pre-service teachers and eight preservice teachers volunteered to be interviewed.

Data analysis:

The participants' responses to the questionnaires were collated in terms of frequency. Thematic coding was used to analyze the interview data in terms of the themes related to the three research questions.

Findings / Results

Research question 1: 66% of the participants agreed that they possessed good ICT skills and they rated themselves as excellent in browsing the internet (50%), use of chatting platform as a form of social media (48%), use of word processing (Microsoft Words), search engine, and e-mailing (46%).

Research question 2: For pre-service teachers' expectations regarding courses to facilitate ICT integration in teacher education, "ICT for Meaningful Learning" was deemed the default ICT training course in NIE by 76%. 76% felt they had been prepared to teach using ICT by NIE and 68% agreed that courses at NIE had increased their confidence in using ICT. Participants had learnt how to integrate ICT into their CS1 (62.0%) and CS2 (70.0%) while more than half of the participants had confidence in using ICT as a tool in teaching for CS1 (58%) and CS2(60.0%).

Research question 3: The pre-service teachers were positive about the integration of ICT in teaching. 76.0% believed that ICT facilitates student learning while 62.0% felt that the use of instructional technologies increases the interest of students toward courses. In terms of impact on their practices, 62.0% felt that ICT in education changes the teachers' role to that of a facilitator rather than an instructor.

Conclusion

Though the preservice teachers in the study were generally confident about their competence in their ICT skills and had learnt how to integrate ICT into their teaching of both CS1 and CS2 through courses in NIE, the interviews revealed the participants' reservations and concern about being effective in integrating ICT to ensure student learning.

Keywords

PRE-SERVICE TEACHERS; ICT; KNOWLEDGE, ATTITUDE

Part III

INTRODUCTION

The objective of this study was to explore the knowledge level, attitude and the use of ICT for educational purposes possessed by pre-service teachers and to investigate the obstacles or challenges faced by pre-service teachers in using ICT.

The National Institute of Education (NIE) as the sole pre-service teacher education provider in Singapore has a key role in preparing the pre-service teachers for all Singapore schools. In line with the series of IT Masterplans by the Ministry of Education, pre-service teachers have to learn to integrate technology into their teaching so it is also important to find out about their knowledge, skills and competence in technology integration for teacher training. The importance accorded to the integration of Information and Communication Technologies (ICT) into teaching can be seen in the setting up of the ICT Integration Task Force in NIE to provide evidence-based research about the multi-faceted phenomena of ICT integration in Singapore, generate new forms of pedagogy in education such as creating technological, pedagogical and content-driven artefacts to enrich and transform classroom learning: policies that set strategic direction; infrastructure that encompasses the hardware, services and support systems, school-based teaching and learning frameworks, departmental scheme of work; and research and development of ICT-enabled pedagogies and innovative professional development models (National Institute of Education, n.d.). The present study contributes to the ongoing study of ICT integration into teaching locally in the context of NIE and MOE and even internationally in the field of teacher education.

RESEARCH BACKGROUND

For education to truly respond to the needs of 21st century, teachers play a central role in leveraging technology, in particular, using Communication Technology (ICT) devices in teaching and learning (Danner & Pessu, 2013). Though ICT seems to be an important tool to support new ways of teaching and learning (Drent & Melissen, 2008), 'successful integration of ICT in teaching-learning process is highly dependent on the preparation of teachers' (Singh & Chan, 2014, p. 874). In this regard, teacher education programs play a significant role in training pre-service teachers to integrate ICT into teaching through acquiring the skills and knowledge essential for ICT use and applying them in their pre-service education period and in their professional life (Yapıcı & Hevedanlı, 2012). Aslan and Zhu (2014) found that pre-service teachers' pedagogical knowledge, their gains from ICT related courses in their teaching program and their perceived ICT competence significantly predict their ICT integration into teaching practice (see also Teo, 2009; Yücel, Acun, Tarman & Mete, 2010; Aslan & Zhu, 2014). Curricula in teacher education programs for pre-service teachers also need to develop and transform to enhance educational technology skills and knowledge as well as improve pedagogical knowledge for pre-service teachers' future job as teachers (Kojima, 2014, p. 10). This study thus aims to explore pre-service teachers' knowledge level, attitude and the use of ICT for educational purposes as well as investigate the challenges faced by pre-service teachers in using ICT for teaching. The findings can be used to enhance the teacher training curricula in the area of integrating ICT into teaching practice. Recent research into this area has highlighted the need. For instance, in investigating the relationships among 1230 Singaporean pre-service teachers' ICT competencies, pedagogical beliefs, and their beliefs on the espoused use of ICT in relation to traditional transmissive view of teaching and constructivist view of teaching, Chai (2010) confirmed that

the pre-service teachers' ICT competencies and their pedagogical beliefs are significantly related to their espoused use of ICT. Besides, according to Chai (2010), 'the relationship between teachers' level of ICT skills and how they would use ICT in classroom is however an area that has not received much attention' (p. 388).

METHODOLOGY

The participants of the study from HSSE and ELL AGs were 50 student teachers completing their Postgraduate in Diploma programme. The study involved two research instruments. Firstly, the descriptive survey method investigated pre-service teachers' knowledge level, attitude and the use of ICT for educational purposes as well as the challenges faced in using ICT to teach. The survey consists of closed and open ended questions and data collected from the participants' responses were summarized to draw inferences in terms of the three research questions. The survey instrument was applied to 50 preservice teachers with 74% in the 23 to 25 age range and 24% in the 26 to 30 age range. The questionnaire asked participants to self rate their ICT skills, the frequency of the use of technology based activities for learning and teaching, their confidence levels in the use of ICT tools in teaching and their learning of ICT through NIE ICT and pedagogical courses. Secondly, interviews were conducted with eight volunteer pre-service teachers. The interview questions were semi-structured mirroring the questionnaire to get an in depth understanding of the link between their perceptions and their teaching practices. Thematic coding was used to analyze the data and the themes related to the three research questions: current ICT knowledge, skills and competence, their expectations and perceptions regarding NIE's ICT and pedagogical courses and their views and attitude regarding effective integration of ICT in education and impact on their practices.

FINDINGS AND DISCUSSION

1. What are pre-service teachers' perceptions about their current ICT knowledge, skills and competence?

66% of the participants agreed that they possessed good ICT skills while 24.0% strongly agreed that their skills in ICT were good. When they were asked to rate their competence in using ICT tools, 50.0% rated themselves as excellent for browsing the internet, 48% for use of chatting platform as a form of social media, 46.0% for use of word processing (Microsoft Words), search engine, and e-mailing. The interviewees also expressed similar confidence in their competence. When the eight interviewees were asked how they would rate their competency in the use of ICT for learning and teaching on a scale of 1 to 10, all the interviewees except for one rated their competency as high (7/8 out of 10) in terms of using ICT for learning. For instance, this was what Interviewee 8 had to say: "9 or 10 as I use ICT a lot in my learning. Common ones like Google Drive, Google Docs & Powerpoint". However, three interviewees made a distinction between competence in using ICT for learning and teaching with three rating their competency for using ICT to teach as 4/5 out of 10.

2. What are pre-service teachers' expectations regarding courses to facilitate ICT integration in teacher education?

Student teachers in NIE have to specialize in the methodology for teaching through Curriculum Studies (CS) courses which give them the pedagogical skills in teaching two specific subjects of their choice in Singapore schools. The first subject specialization course is termed CS1 and the second subject specialization course is termed CS2. They also have to attend a compulsory ICT course and 76% of the preservice teachers mentioned receiving "ICT for Meaningful Learning" as the default ICT training course in NIE. The interviewees

had different opinions about the course fulfilling their expectations. For instance for Interviewee 5, "I think the ICT course was really very good as it introduced me different types of ICT tools that I can use" and for Interviewee 2, "I was very lucky that I have a tutor who is very good in ICT and I learnt a lot from the course. As oppose to my peers, they find it useless as they see it as a form of self-learning".

In terms of fulfilling pre-service teachers' expectations for courses to facilitate ICT integration, 76% felt they had been prepared to teach using ICT by NIE and 68% agreed that courses at NIE had increased their confidence in using ICT. For learning about ICT integration into pedagogy, participants felt that they had learnt how to integrate ICT into their CS1 (62.0%) and CS2 (70.0%) through lessons from NIE. More than half of the participants agreed that they had confidence in using ICT as a tool in teaching for CS1 (58%) and CS2(60.0%).

3. What are pre-service teachers' views and attitude regarding effective integration of ICT in education and impact on their practices?

The pre-service teachers were positive about the integration of ICT in teaching. 76.0% believed that ICT facilitates student learning while 62.0% felt that the use of instructional technologies increases the interest of students toward courses. In terms of impact on their practices, 62.0% felt that ICT in education changes the teachers' role to that of a facilitator rather than an instructor. According to 60.0% of the participants, the usage of instructional technologies makes it easier to prepare instructional resources though 86% talked about the need to spend more time preparing lessons using ICT in the process.

The pre-service teachers highlighted certain obstacles and challenges in terms of using ICT in teaching in the interviews such as whether the use meets students' needs and whether ICT will enhance teaching effectiveness. When the interviewees were asked if having ICT competency is sufficient to ensure integration of ICT into teaching effectively, Interviewee 4 made this comment: "I think having competency will help but it does not guarantee it will integrate ICT effectively. It's about using ICT to teach the right thing, not a good to have if you cannot deliver the lesson effectively". According to Interviewee 6: "I think it's not enough though I know how to use it, but does it really help the learners? I actually very worried when I use ICT because, at the end of the day, do my students learn and what do they take away ... I think it has to be meaningful to the learners. So I am not confident using ICT in my teaching."

CONCLUSION

The preservice teachers in the study were generally confident about their competence in their ICT skills and had learnt how to integrate ICT into their teaching of both CS1 and CS2 through courses in NIE. They believed ICT facilitates student's learning. However, though they had high confidence in their ICT competence and in using ICT for their learning, the interviews revealed the participants' reservations and concerns about being effective in integrating ICT to ensure student learning.

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