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Little experience with ICT: Are they really the Net Generation student-teachers?

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ABSTRACT

The aim of this study is to investigate the complexity of past experiences with ICT, pedagogical beliefs, and attitude toward ICT in education that the Net Generation student teachers have about their intention to teach and learn with technology. This study has a particular focus on their lived experiences as school students where ICT related policies were actively enacted in Korea and Singapore for the past decade. To unpack the profile of the Net Generation student teachers, we selected six factors (i.e., past ICT experiences, personal computer use, constructivist belief, computer efficacy, attitude toward computer in education, and prospective computer use) related to ICT use and examined them empirically with 225 first- or second-year student teachers in Korea and Singapore. Overall, our findings indicate that student teachers in both countries tend to hold fairly constructivist beliefs and positive computer efficacy and attitude; attributes that teacher educators can tap on. Student teachers' perceptions about their use of computers for personal purposes and their past experiences with ICT were not relatively high compared to the other variables examined. This study also provides empirical evidence that students teachers who hold constructivist beliefs, have strong computer efficacy, and show positive attitudes toward computers in education are more interested in using computers in future teaching practices. As a conclusion, we argue that the profile of the Net Generation student teachers shows a more heterogeneous composition than we initially expected, and that teacher educators need to be cautious about making generational assumptions solely based on the structural and technological changes.

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1. Introduction

In this paper, we attempt to unpack the characteristics of a new generation of student teachers entering teacher education programs, often described as the Net Generation (Tapscott, 1998, 2009) or Digital Natives (Prensky, 2001). General observations about the Net Generation and Digital Natives often lead to the argument that they think and learn differently from the older generation. Given that the Net Generation has been growing up surrounded by digital technologies, many assumptions have been made about their preferences and perceptions toward technologies and learning. For instance, prior research indicates that the Net Generation students can search and process information fast (Oblinger & Oblinger, 2005) and are good at multitasking and task switching (Carrier, Cheever, Rosen, Benitez, & Chang, 2009). Regarding learning styles and preferences, some researchers (e.g., Barnes, Marateo, & Ferris, 2007; Oblinger & Oblinger, 2005) have reported that the Net Generation students prefer to discover in which they can learn actively and have high autonomy in their learning process. Additionally, they are argued to be social and prefer interactive communication and collaboration as a mode of learning.

In the area of teacher education research, attributing to the extended period of "new experiences" (Levin & Wadmany, 2006 p.172) and new environments where young people can easily relate themselves to a set of technologies, general observations have been made in this line of literature that student teachers these days appear to be proficient and active in using technologies (Baltaci-Goktalay & Ozdilek, 2010; Teo, 2008). Further, in a technology-pervasive environment where young people have constant access and exposure to emerging technologies, it may be easy to assume that they have better proficiency to teach with technology than the earlier generation of teachers.

As explained in the rest of this paper, however, we argue that this claim underlying generational differences is more problematic than it appears, calling for a need to employ more holistic views beyond the technological determinism. We expect that the larger ecological

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contexts interact with the development of personal beliefs about the nature of teaching and learning with technology that a new generation of student teachers holds to some degrees. This holistic, ecological view is more complete when we consider the interplay of structure, human agency, and identity. From a personal trajectory perspective, student teachers in their first year of teacher training are in a unique situation of transforming their identity from an expert student to a novice teacher. Further, research has shown that student teachers come to teacher training programs with extensive experiences and tacit knowledge learned from an "apprenticeship of observation" (Lortie, 2002) as a student, and that the personal, lived experiences have shaped their lay beliefs about what are good teaching practices and how they work in classroom situations (Holt-Reynolds, 1992). When this phenomenon is applied to the context of teaching and learning with technology, it may be possible that personal beliefs and tacit knowledge about ICT (information and communication technology) integration that the Net Generation student teachers hold may have some relationships with their lived experiences as school students receiving and participating in ICT-related learning activities for the past ten years.

We found that educational policy changes happened in Korea and Singapore for the past decade are particularly relevant to examine this generation-related assumption and ICT use. As shown in Table 1, those students entering teacher education programs in recent years in Korea and Singapore had gone through schooling experiences when nation-wide ICT policies were actively enacted in schools to build strong IT infrastructure. This means, as school students, the Net Generation student teachers were likely to have more access and exposure to computer labs, personal computers and other ICT related applications. Pedagogical changes in the two countries are also important to understand the profile of the Net Generation student teachers. One common phenomenon observed between Korea's and Singapore's ICT policies was a shift in focus from technological to pedagogical issues in the early 21st century. Both the national-level guidelines for ICT utilization education (2000) in Korea and the Master Plan for ICT in Education II (2003) in Singapore emphasize that the essence of ICT integration lies in teacher knowledge about how to use technology for what purpose, content, and context. Thus, the emphasis on pedagogical training and support observed in both countries was a natural move to encourage ICT use from teaching basic skills to deeper learning.

Drawing from the ecological context where ICT-related policies were actively enacted in Korea and Singapore for the past 10 years, the research reported in this paper aims to examine the complexity of beliefs, attitude, and self-efficacy that the Net Generation student teachers have about teaching and learning with technology. With a particular focus on lived experiences of the Net Generation, we examined student teachers in their early years of teacher education programs in the two countries and their perceptions toward a set of important factors revealing personal history, beliefs, and attitudes regarding teaching and learning with technology. In this study, the Net Generation student teachers are defined as those (a) whose birth years were after 1985 at the time of the study and (b) had some Primary schooling experiences (at least 1–2 years) in and after 1997. This is to reflect our study's focus on student teachers' past experiences with ICT during the schooling period. While some prior research seems to define the Net Generation as those who were born after 1980 (e.g., Bennett, Maton, & Kervin, 2008; Oblinger & Oblinger, 2005; Thinyane, 2010), we applied a more conservative measure to ensure that this study includes student teachers who had experienced Primary to Post-secondary schooling during the period of 1997 and 2009 when national-level ICT policies were enacted, as indicated in Table 1. As more Net Generation student teachers are entering teacher education programs, there is a need to better understand the nature, notion, and profile of the Net Generation and adequately identify implications for teacher education. The following key research questions guide this study:

1. What is the profile of the Net Generation student teachers in Korea and Singapore? And are there any similarities and differences between the two groups?
2. What are the Net Generation student teachers' past experiences with ICT and how are they related to their pedagogical belief, attitude, personal computer use, and prospective use of ICT?

Table 1
Major ICT policies in Singapore and Korea since 1997.

Year	Korea	Singapore
1997	The Ministry of Education announced the 7th national curriculum.	Launch of the first Master Plan for ICT in Education. Focus on laying the infrastructural foundation in schools as well as the mass training of teachers in the use of ICT. The Master plan was implemented in a three-phase approach beginning with 22 "demonstration schools."
2000	National-level guidelines for ICT utilization in education from 1st grade to 10th grade were recommended for implementations. (The percentage of adoption of ICT in school curriculum to be 10%; one-hour ICT education required for 2-h optional courses).	About 250 schools were on board and the training of teachers in basic ICT skills was completed.
2001/2002	Teachers' training was shifted from ICT basic skill to ICT adoption on each subject.	Achieved increased access to computers: Primary school student-computer ratio 6:1, secondary/junior college student-computer ratio 5:1, teacher-computer ratio 2:1.
2003	Improved student abilities for self-motivated learning by promoting the digital school libraries utilization plan.	Master Plan for ICT in Education II, focus on the use of ICT for engaged-learning; customized professional development on infusion of ICT in curriculum.
2004/2005	National-level guidelines for ICT utilization education was revised (with focus on fundamental principles, problem solving, programming and cyber ethics).	Strengthen use of ICT through the setup of the Learning Sciences Lab at the National Institute of Education.
2006	Teacher training courses in ICT use are systematically operated based on the teachers' life cycles and capability levels.	Initiated baseline ICT standards for schools, strengthen use of ICT through LEAD ICT@schools program.
2007/2008	In 2007, Revised national curricula announced; National-level guidelines for ICT utilization education was terminated with the launch of the national school autonomy plan.	Strengthen use of ICT through the FutureSchools@Singapore program.
2009	In 2009 Revised national curricula announced; 3-h creative experiential activities to incorporate ICT education in elementary schools.	Master Plan for ICT in Education III, focus on the 21st century learning skills, especially self-directed learning and collaborative learning; integration of ICT in early planning stages for curriculum.

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