

## Chapter 6

# Development of ICT Competency in Pre-Service Teacher Education

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### ABSTRACT

*Starting from the key competencies for a knowledge society, this paper examines the information and communication technology (ICT) competency needed by teachers for effective teaching in the 21<sup>st</sup>-century. The paper analyzes the existing pre-service education programmes for teachers' ICT competency in Lithuanian universities and colleges, self-evaluation of future teachers of their technological and pedagogical ICT competency, and comparison of these results with the course requirements for the teachers' educational ICT literacy, based on the existing Lithuanian requirements for teachers' pedagogical ICT literacy programmes. The paper is based on the data of the research study "Teachers' Training on ICT Application in Education" developed by the Institute of Mathematics and Informatics in 2009. Conclusions and recommendations of the study have been proposed to implement deeper content-based modules for pedagogical ICT competency and skills in all-level pre-service teacher education as well as in-service training courses.*

### 1. INTRODUCTION

Educational systems of various countries need to effect changes in the preparation of their citizens for lifelong learning in a 21st Century Knowledge-based or Information Society. Preparation of young people to successfully face the challenges

of the modern society has become an increasingly important objective of educational systems all over the world. Numerous international and national initiatives reflect the growing interest. A detailed work programme on future objectives of education and training systems up to 2010 has been elaborated (Commission of the European Communities, 2008).

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Predominant theories of the development of formal education (at least in the industrialised world) are based on the premise that learning is an epistemological problem involving individual psychological processes that lead to the acquisition of knowledge (Lave, 2008). Thus, an individual constructive view sees learners as active agents who construct knowledge in the form of their own internal model of 'the world', as a result of interactions within it.

There are many variations on how to define 21st century skills. A group of business leaders, educators and lawmakers in Massachusetts have elaborated five areas for the 21st century learner's education (Massachusetts Department of Elementary & Secondary Education, 2008):

1. *Core Academic Subjects*, reading, world languages, arts, math, economics, science, geography, history, government, and civics.
2. *Interdisciplinary Themes* to be woven into each subject include global awareness, financial, economic, business and entrepreneur literacy, civic literacy, and health literacy.
3. *Learning and Innovation Skills* including creativity, innovation, critical thinking, problem solving, communication, and collaboration.
4. *Information, Media and Technology Skills* required by today's students include information and media literacy, communications and technology literacy.
5. *Life and Career Skills*, needed to navigate in today's world, include flexibility, adaptability, initiative and self-direction, social and cross-cultural skills, productivity, accountability, leadership, and responsibility.

In order to summarize the debates on key competencies, the world institutions, such as OECD (Ananiadou & Claro, 2009), UNESCO (2008a, 2008b, 2008c), and European Commission (2005, 2007) launched surveys and settled several recommendations.

We have discussed the idea that 21st century students will learn to think both critically and creatively, be skilled at working collaboratively, and understand how to take risks constructively. They will learn and understand their connection to the world around them, use technology to pursue research and communicate with others, feel comfortable working in teams and will develop the strength and skills to assume leadership responsibilities.

Digital literacy, media, ICT and other modern technology-based skills are essential requirements for the 21st century learner's education. ICT competency and skills are important for every citizen in a modern society.

The fact that these skills have never been the focus in traditional education is a serious problem. Delivery and acquisition of these skills in teaching and learning to students of primary and secondary education will require a shift in what we teach, how we teach it, the tools we use and how we educate, train, nurture and retain our teachers and school leaders. The overarching challenge for all educators today is to rethink not only what they teach, but "how they empower students to use that information" (Murnane & Levy, 2004).

We cannot change how our students learn unless our teachers are equipped to teach in new ways. Research shows that a teacher's qualification has a significant effect on student's performance, more than any other variable (Barber & Moursched, 2007). It is unreasonable to expect that our students will ever gain the skills and knowledge to succeed in the 21st century, if they are taught primarily by educators trained using a model developed in the 19th century. It is necessary to rethink and overhaul the teacher training and professional development programs, in order to recruit and retain high achieving educators who have up-to-date knowledge of [omit –the] 21st century skills.

A recent study by McKinsey & Co. on the common characteristics of the most successful school systems highlights the central role of teachers, asserting that 'the quality of an education system

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