ICT teacher competencies and related problems
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Introduction

The use of the notion of "competence" in the context of teacher's learning technology competencies raises some problems. For some people, the notion of competence deflects from a holistic view to one diminished to a list of skills and for others it represents a strategy for defining professional standards.

Some state systems have adopted the term "capabilities" to help educational communities understand the competency movement as a professional development strategy and not a testing mechanism. Teachers' learning technology competencies is usually used to embrace professional competence that teachers exhibit when engaged in learning technology processes, for their professional work, in their workplace and in classrooms. The term "Competencies" is used in most national and state government documents and international documents. From the general point of view the technology competence includes an understanding of the global and local contexts that surround schools and education. [1]

Teachers' professional development

Teachers' professional lives need changing if they are to provide children with authentic learning experiences. There is a risk that technological ignorance may prevent them from being able to critically observe and reflect upon the technological pervasiveness that surrounds their lives outside of schools. Criticism from outside the education systems begins to ask why people with such incomplete experience of society should be considered competent to teach children who are to face an information-based society. The reality is that few other people with the necessary educational skills and qualifications are ready to step into this role, leaving the responsibility on the existing workforce. Teachers need programs of professional development, which provide them with experience and understanding of the use of information technology and which provides frameworks for them to interpret their personal experiences. [1]

For some teachers, this issue becomes a source of internal and personal difficulty. Most teachers highly value their professional skills and are motivated to do all they can to provide their students with every opportunity to make the best of their education. When confronted with evidence that information technology can improve educational outcomes, and the expectation from employers or education systems that this technology will be used in their classes, these teachers feel a moral obligation to incorporate it into their practice. However, many are quick to realize that their low exposure to information technology has left them extremely poorly prepared to cope with basic computer operation. Even when they master these skills, the curriculum integration and pedagogical issues, which are involved in incorporating information technology in the classroom, remain to be mastered. For people without ready access to the necessary technology, technical support and professional development structures, the expectation that they will achieve competency is a difficult one to reconcile.

For many of these people, the existence of "competencies" represents a framework against which they fear. They will rate poorly and almost by definition be deemed "incompetent". Consequently, any attempt to define or mandate competencies will only gain acceptance with the profession if it is supported by provision of the necessary time, resources, equipment, support and professional development to allow teachers to gain competence.

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[1] Teacher Learning Technology Competencies, Australian Council for Computers in Education Discussion Paper, Revision 1.3 [cit 12.2. 2008], 1998. Dotupné na internetu < http://www.acce.edu.au/tltc/a-contents.asp>

Terms related to knowledge, skills and competencies

The terms "ICT competence" or "Digital competence" were taken as reference terms for different types of knowledge, skills and competencies that are needed for teachers to work with ICT in educational settings. These can be the competencies that are sought to be developed by teachers by the use of ICT in education (administration, preparation and to reach pedagogical purpose), the mastering of ICT tools and knowledge about ICT and its wider societal impact. The competencies were therefore grouped into four main categories each of them having a different emphasis ranging from: [2]

- technical knowledge; (ICT as a tool)
- the use of ICT for several purposes, (e.g. pedagogical, organizational, administrative) and in different (learning) environments (classroom, home, school);
- information handling;
- security and ethics.

Within each of these sections a variety of knowledge, skills and attitudes are covered such as "to use", "to understand", "to manage", "to evaluate", which points to different competency levels and stages of effective and qualitative integration of ICT in the learning process. The application of ICT to fulfil wider goals or aspirations is seen as being "ICT literate" or "competent". A set of various skills (e.g. technical to higher order thinking skills) are necessary to become "ICT literate" or "ICT competent".

Information literacy is the capacity to find, evaluate, organize and present information for a specific purpose or task by different media, old and new media. Digital literacy is information literacy applied to digital information. It is the capacity to find, evaluate, organize and present information that is presented in electronic format for a specific purpose, e.g. to participate in the society. Digital competence is related to logical and critical thinking, to high level information management skills and to developed communication skills. Competencies, information and digital literacy are regarded as key competencies to achieve the full involvement in the information age and the citizenship in a democratic society.

The UNESCO ICT Competency Standards for Teachers [3] also address six components of the educational system. It is important to note that the Standards do not merely focus on ICT skills. Rather, they include training on ICT skills as part of a comprehensive approach to education reform that includes:

- Policy,
- Curriculum and assessment,
- Pedagogy,
- The use of technology,
- School organization and administration,
- Teacher professional development.

Performance indicators for teachers

One example of performance indicators for teachers is given by NETS (National Technology Standards for Teachers) [4] All classroom teachers should be prepared to meet the following

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[2] ETS, Digital Transformation, A framework for ICT literacy. Report of the International ICT literacy panel, 2002. Dostupné na internetu <http://www.ets.org/research/ictliteracy/index.html>

[3] ICT Competency Standards for Teachers, Implementation Guidelines, Version 1, UNESCO, 2008, Published by the United Nations Educational, Scientific and Cultural Organization
7, place de Fontenoy, 75352 PARIS 07 SP

[4] *National Educational Technology Standards for Teachers (NETS).*[cit. 14.2.2008] International Society for Technology in Education, 1993, 1997 a 2000. Dostupné na Internetu <http://www.iste.org/inhouse/nets/cnets/teachers/index.html>.

standards and performance indicators:
- Demonstrate a sound understanding of technology operations and concepts.
- Plan and design effective learning environments and experiences supported by technology, design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
- Apply technology to facilitate a variety of effective assessment and evaluation strategies.
- Use technology to enhance their productivity and professional practice.
- Understand the social, ethical, legal, and human issues surrounding the use of technology in schools and apply that understanding in practice

ECDL/ICDL practical skills and competencies

ECDL / ICDL[5] are tests of practical skills and competencies and consist of seven separate modules covering computer theory and practice. To achieve an ECDL / ICDL certification, the candidate must successfully pass a test in all seven modules:
- Concepts of Information Technology (IT)
- Using the Computer and Managing Fines
- Word Processing
- Spreadsheet
- Database
- Presentation
- Information and Communication

BECTA [6] sets the framework for ICT teachers' competence. These competences are appropriate to ICT support assistants, technicians, network managers and others involved in this field. They reflect the most recent thinking on the deployment of support staff in schools, workforce reform and good practice in ICT.

The framework is divided into four main skill areas: Technology, Support, Development and Personal. Within each area are four levels A to D but it is not necessary, or in many cases desirable, for any school to have technicians at all these levels. Though we have used four levels these could be arranged in three or five levels if required to meet the local situation.

Use by teachers of ICT in class.

Europe's teachers have used ICT in class (74%) in the last year. Huge variations between countries exist, however, with for example 35% of teachers in Latvia and 36% in Greece, compared to 96% in the UK and 95% in Denmark belonging to the group of recent computer users in class. Two thirds are very confident in using word processors, while one third has the necessary skills to develop electronic presentations. 24% of teachers claim their subject is not suited for the use of ICT. In the UK and Denmark, almost all teachers use ICT as a teaching aid as supposed to countries such as Greece or Latvia where only 36% and 35% of teachers report doing so. It is clear that there is not a direct relationship between the first two indicators and the third. In France, for example, the generally high level of broadband and computers in schools is not reflected in the use of ICT by teachers in lessons, which is one of the lowest in the EU. [7]

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[5] *The European Computer Driving Licence.* ECDL Foundation. [cit 5.2. 2008]] Dostupné na Internetu
<http://www.ecdl.org/>.
[6] ICT Competences Framework, BECTA [cit. 12.2. 2008], dostupné na internetu
<http://publications.becta.org.uk/>
[7] Balanskat A.,Blamire R.: ICT IN SCHOOLS: TRENDS, INNOVATIONS AND ISSUES IN 2006-2007, European Schoolnet, June 2007.[cit 14.2. 2008] Dostupné na internetu
<http://insight.eun.org/shared/data/pdf/ict__in__schools_2006-7.pdf>

Motivation for and interest in using ICT in class still is a big issue in several European countries. In Europe, 16% of those teachers who do not use computers in class express the opinion that the use of ICT yields "no or unclear benefits". German teachers not using ICT in class seem to be by far the most skeptical with respect to the benefits which can be achieved by using ICT in class and reaches an extremely high 48% (or 10% of all teachers) – three times higher than the European average.[8]

Teacher-level barriers
Teachers' poor ICT competence and lack of confidence in using new technologies in teaching are two very significant determinants of their levels of engagement in ICT. These are directly related to the quality and quantity of teacher training programs.

16% of teachers not using computers in class still express the opinion that the use of ICT reveals "no or unclear benefits". German teachers not using ICT in class seem to be by far the most skeptical with respect to the benefits which can be achieved by using ICT in class, at 48% this is three times higher than the European average. Only in four other countries are above average values achieved: these are the Czech Republic 25%, Finland 24%, France and Norway 22%. In all other countries substantially more teachers are of the opinion that ICT use in class brings clear benefits for pupils. There exists a correlation between this skepticism and a lack of motivation to use ICT in class with the age/amount of teaching experience of teachers: the older the teachers the more likely they will lack motivation to use ICT in class because they do not see benefits in its use for pupils.

Use of ICT in the classroom in the Czech Republic
Almost all Czech schools are equipped with computers and internet connection. 63% use the internet via a broadband connection. There is a large variation between school types: while only 55% of primary schools have a broadband internet connection, at 77% the penetration is highest among upper secondary schools. Rural areas also lag behind urban ones in terms of broadband access, with 56% of the former connected to the internet via broadband as opposed to 74% of the latter. 48% of Czech schools use computers in classrooms, with little variation across school types.

This compares to a European average of 62%. But when considering only the new member states, the figure is down to 30%. With this result, the Czech Republic ranks in the top one third of the new member states but still significantly below the EU25 average. Surprisingly little variation on this indicator can be found in this respect according to the subjects of teaching. The vast majority of schools use ICT in computer labs (91%). This seems to be the typical location where most pupils are confronted with ICT in schools. 36% of the teachers using computers use them in less than 10% of all lessons. A substantial 18% of Czech teachers (compared to 17% at the EU25 level) state, that they use computers in more than half of their lessons. Teachers in vocational schools use computers in class much more frequently than their colleagues in general education. 22% of teachers in the Czech Republic still do not use computers in class. Czech schools could probably also benefit from higher levels of integration of ICT in teaching subjects in class as opposed to mostly using ICT only in dedicated computer labs, although the intensity of ICT use in Czech schools is at a level above the European average with hardly any differences according to the age of teachers. Even older teachers belong to the group of ICT users in school. Compared to some other European countries, lack of motivation of teachers in using ICT still does not seem to be the

most critical issue for a wider uptake of computers and the internet in schools in the Czech Republic.

Conclusion

The changing curriculum frameworks, within which teachers build learning environments and activities for students, are changing the nature of teaching and learning. These frameworks represent the reactions to the changing demands on educational systems to answer national and global issues, most of which are caused by, or related to, information technology use in society. In using appropriate constructivist, student-centred pedagogical techniques teachers will provide learning environments that connect students to authentic contexts and situations. It is important that teachers are able to match learning technology processes to these demands for changing learning environments.

References:

[1] Teacher Learning Technology Competencies, Australian Council for Computers in Education Discussion Paper, Revision 1.3 [cit 12.2. 2008], 1998. Dotupné na internetu < http://www.acce.edu.au/tltc/a-contents.asp>

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[4] National Educational Technology Standards for Teachers (NETS).[cit. 14.2.2008] International Society for Technology in Education, 1993, 1997 a 2000. Dostupné na Internetu <http://www.iste.org/inhouse/nets/cnets/teachers/index.html>.

[5] The European Computer Driving Licence. ECDL Foundation. [cit 5.2. 2008]] Dostupné na Internetu <http://www.ecdl.org/>.

[6] ICT Competences Framework, BECTA [cit. 12.2. 2008], dostupné na internetu http://publications.becta.org.uk/

[7] Balanskat A.,Blamire R.: ICT IN SCHOOLS: TRENDS, INNOVATIONS AND ISSUES IN 2006-2007, European Schoolnet, June 2007.[cit 14.2. 2008] Dostupné na internetu <http://insight.eun.org/shared/data/pdf/ict__in__schools_2006-7.pdf>