

## ICT Competences as a Necessary Part of Professional Qualities at the Latvia University of Agriculture

Natalia Vronska Dr.paed.

Latvia University of Agriculture, Faculty of Engineering

Institute of Education and Home Economics, Latvia

[Natalja.Vronska@llu.lv](mailto:Natalja.Vronska@llu.lv)

**Abstract:** The submitted contribution focuses on the question of information and communication technology (ICT) competences as a necessary part in education and professional qualities of both a teacher and a student. It is known that nowadays ICT plays an increasingly important role in people's lives, as appropriate technological literacy will soon become a functional requirement for people's work. Students will need computer and communication technology skills if they want to live successfully in a knowledge-based society. The efficient use of various information communication technologies in the learning process has become inevitable for students. It is obvious that by using modern information communication technologies students can retrieve required information within a short period of time. They can access and disseminate electronic information such as e-books and e-journals. Moreover, they can improve their learning by using different modern ICTs in the form of wireless networks, the Internet, search engines, databases, websites, and web 2.0 technologies. UNESCO has presented the ICT competence standards for teachers combining the requirements for teachers and students in today's world and emphasising the current importance of ICTs. The aim of the article is to describe a range of ICT competences and their important role in the teaching profession as well as for a student in the so-called information society. The SPSS computer program has been used for mathematical processing and data analysis. The main use of ICT tools is as a means of obtaining information, and according to students, they make a legal and responsible use of the ICT tools. These results suggest developing strategies promoting the effective use of technology resources for both students and teachers.

**Keywords:** ICT competence, higher education, professional qualities, teachers, students.

### Introduction

The rapid changing of life requires a support for continuous learning and creation of new skills and ideas. The lifelong education is becoming a necessity in tomorrow's world. The Internet has changed the education process significantly in the last two decades. We are now entering a world in which we all will have to acquire new knowledge and skills on an almost continuous basis. The Internet and ICTs have greatly expanded into the field of education recently. The global adoption of new technologies into education provides an opportunity for its modernisation (Virtič, 2012).

Teachers are a vital link in the education line, and to truly respond to the needs of the twenty-first century, teachers must play a central role in linking technology, and in particular, using old and new Information and Communication Technology (ICT) devices in both teaching and learning processes (Danner, Pessu, 2013).

One question of the survey "Internet Habits" was: *How often do you use the e-mail, online chat, Skype, Twitter and Facebook?* The answers frequency from respondents about mutual communication (e-mail, online chat, Skype, Twitter, Facebook) via the Internet (regularly every day, once a week, several times a week, once a month, several times a month, rarely) can be seen in Figure 1.

UNESCO has presented the ICT competence standards for teachers' professional qualities combining the requirements for teachers and students in today's world and emphasising the current importance of ICTs (ICT competency..., 2008).

R.M. Gras reports the results of the research that was conducted in Spain among 5169 students. It was concluded that ICT changed all aspects of social life but University students and digital illiteracy was almost non-existent (Gras, 2009).

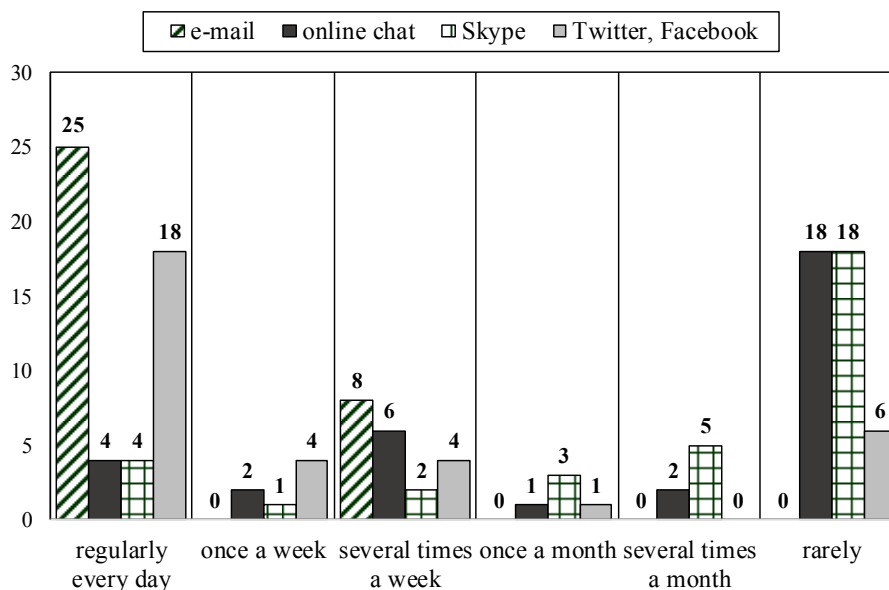


Figure 1. Mutual communication via the internet.

ICT integration into education depends on complex teachers' readiness. As to this, there arise many questions, e.g. how will teachers use ICT, how will they be able to make the best of them, how will they implement them into education process, which ways of teaching will they use to stimulate their students, how will they develop the components of a student's personality (Kubrický, Částková, 2015).

The use of ICT, especially its positive influence on teachers' education has been widely studied and documented (Kay, 2006; Murray, Nuttall, Mitchell, 2008; Vronska, 2012).

The document Action Plan for the implementation of the "Strategy of Information and Communication Technology in Education for the period 2009 - 2013" sets two essential conditions for reaching the aims of innovation process in education. Particularly, it talks about reaching the aims by means of the modification of teaching practices and a teacher's role. The teacher has to go through certain phases, from which teacher's professional qualities and competences with direct link to the use of ICT have to develop and become more precise. The phases of this process can be summarised in the following way:

- necessity – this is mainly accepting the necessity to know ICT, which are generally possible to be used in education and teacher's profession;
- mastery – the choice of more effective strategies, better teaching models and freedom from ICT specialists enabled by increasing technical knowledge;
- empathy – technology is not the aim but the means; the range of usable technologies is broadening;
- innovation – the achievement of functional creativity, own adjustment of education aims, plans and practices (Akční plán..., 2009).

Competences in ICTs can be classified as:

- the core competences of digital literacy, which are related to the use of ICTs in the classroom presentations and activities, and involve the use of digital tools to obtain information, and the use and development of materials obtained from various online sources;
- the implementation competences, which are related to the use of skills and knowledge to create and manage complex projects, solve problems in real-world situations, collaborate with others, and make use of information and experts networks;
- the ethical competences, which are related to the ethical, legal and responsible use of ICTs (ICT competency..., 2008).

The aim of the article is to describe the ICT competences and their importance for the work of a teacher or student in the information society.

## Methodology

The purpose of this survey was to identify the level of ICT competences of Latvia University of Agriculture students and compare the results with the level of ICT competences of students from Mexico and Hungary. The instrument for data collection was a survey adapted from C.A.T.Gastelú, G.Kiss, A.L. Domínguez (2015). The target population was Latvia University of Agriculture master students (30) of the Institute of Education and Home Economics of Faculty of Engineering of Latvia University of Agriculture. The research type is quantitative.

The instrument of ICT competences levels of students is composed by twelve items. The design of the instrument included Likert scale with four categories: "None, Few, Quite and A lot". For purposes of this study it has been assumed that students have a certain level of competence and levels has been shaped by the categories "Quite" and "A lot". Meanwhile, the absence or deficiency in competence categories has been represented by "None" and "Few". To analyse the data obtained the Statistical Package for Social Sciences (SPSS) version 21 has been used.

## Results and discussion

In the Table 1,  $\chi^2$  test results show the level of ICT competences of Latvia University of Agriculture students. It also shows the level of ICT competences of students from Mexico and Hungary.

Table 1

$\chi^2$  test result of the levels of competences

Item	Students from Latvia	Students from Mexico and Hungary
You use the main informatics and network resources	0.000	0.000
You use the applications in a productive way	0.178	0.798
You apply the digital tools to obtain information from varied sources	0.020	0.006
You select, analyze, and makes an ethic use of the obtained information	0.078	0.001
You communicate in an effective way the information and ideas, using a variety of media and formats	0.002	0.088
You make use of models and simulations to explore complex topics	0.020	0.015
You interact and collaborate with your partners, using a variety of digital resources	0.103	0.001
You solve problems, and make decisions using the appropriate tools and digital resources	0.020	0.000
You plan and organize the required activities to solve a problem or make a project	0.001	0.742
You make a rational and responsible use of the information through ICT	0.178	0.398
You value ICT as an instrument of permanent learning	0.000	0.389
You value ICT as a medium of collaboration and social communication	0.009	0.385

The similar differences found in the test include items: *You use the main informatics and network resources*, *You apply the digital tools to obtain information from varied sources*, *You make use of models and simulations to explore complex topics* and *You solve problems, and make decisions using the appropriate tools and digital resources*.

In relation to the items of general results *You communicate in an effective way the information and ideas, using a variety of media and formats* (68.2%), *You plan and organize the required activities to solve a problem or make a project* (63.6%), *You value ICT as an instrument of permanent learning* (86.4%)

and *You value ICT as a medium of collaboration and social communication* (81.8%) it can be seen that the students of Latvia University of Agriculture are competent with ICT.

ICT skills are purposeful, qualitative and wilful application of ICT searching and evaluating information according to the set objectives, aims and demands as well as purposeful, qualitative and wilful usage of ICT basic skills and extended skills (Vronska, 2012).

At the global level UNESCO designed a competence framework for teachers (ICT-CFT), which was launched in 2008 to help educational policy-makers and curriculum developers identify the skills teachers need to harness technology in education (ICT competency..., 2008).

The Competence Standards were developed in cooperation with Cisco, Intel, and Microsoft, as well as with the International Society for Technology in Education (ISTE). The framework was created by crossing three approaches to ICT integration in education (Technology Literacy, Knowledge Deepening, and Knowledge Creation) with the six components of the educational system (Policy & Vision, Curriculum & Assessment, Pedagogy, ICT, Organization & Administration, and Teacher Professional Development). This is shown in Figure 2.

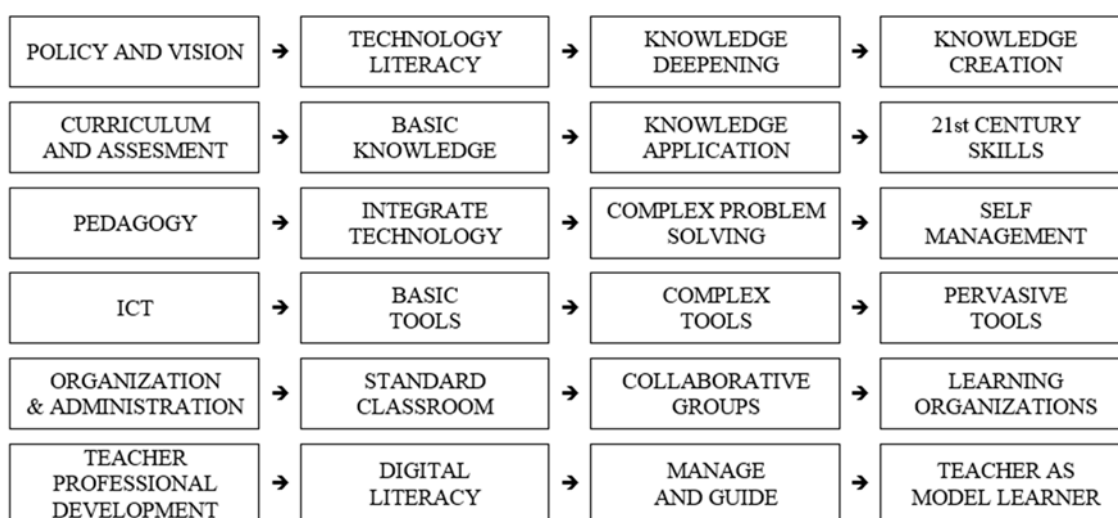


Figure 2. UNESCO ICT Competency Framework for Teachers (ICT competency..., 2008, 7).

The competences focused on the use of web pages for the development of students' independence and creativity proves the flexibility and variability of the web as an environment, which, if used efficiently, facilitates students' 'personality development and contribution to the quality and innovation of education' (Kubrický, Částková, 2015).

P. Kirschner and I.G. Woperies highlighted some major ICT competences that teachers might require. These competences are:

- making personal use of ICT;
- mastering a range of educational paradigms that make use of ICT;
- making use of ICT as minds tools;
- using ICT as a teaching tool;
- mastering a range of assessment paradigms which involves the use of ICT;
- understanding the policy dimensions of the use of ICT for teaching and learning (Kirschner, Woperies, 2003).

I. Jung considers that ICT teacher training can take many forms – teachers can be trained to learn how to use ICT or teachers can be trained VIA ICT. ICT can be used as a core or a complementary means to the teacher training process (Jung, 2005). Development of ICT skills for teachers is represented in Figure 3.

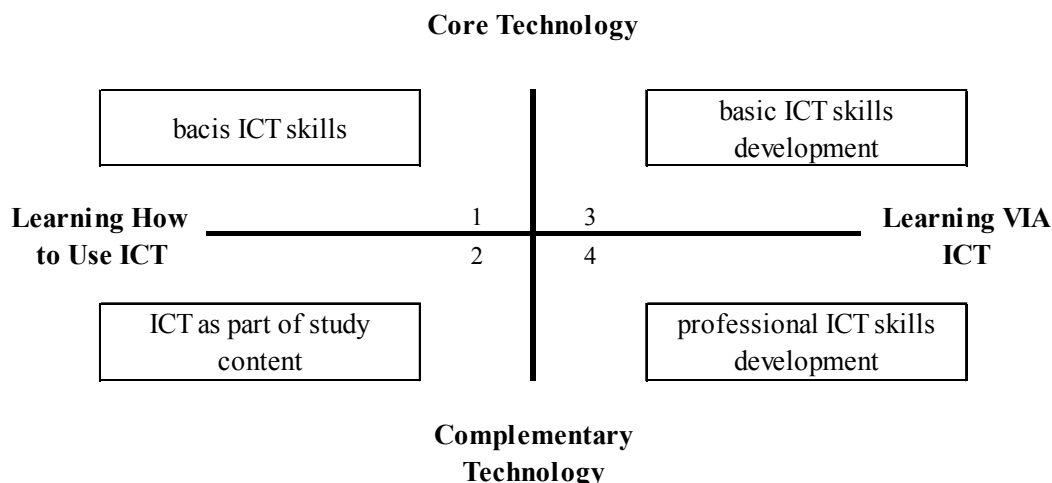


Figure 3. Categories for ICT in teacher training (Jung, 2005).

ICT competences are included in the educational standards that various countries have developed in the form of profiles in the United States, France, England, and in Belgium. It is important to note that all the previous standards describe a key point of the educational development of ICT-literate students. NETS includes: the ability to make Web designs, presentations, databases, and the ability to use graphics software, spreadsheets, online applications, e-mail, chat applications, and word processors (ISTE Standards..., 2015).

### Conclusions

The results referring to the Latvian students' perceptions about their competences in ICT show that they express a high level of competences in the use of ICT. The students got a high level of competence when using ICT as a permanent means of learning, as well as a means of social communication. The students indicated that they make a productive use of the various applications that are offered. These results suggest the need for developing strategies promoting the effective use of technology resources for both students and teachers.

### Bibliography

1. Akční plán pro realizaci „Koncepce rozvoje informačních a komunikačních technologií ve vzdělávání pro období 2009 – 2013“ (2009). (Action Plan for the implementation of the "Strategy of Information and Communication Technology in Education for the period 2009 - 2013 "). *Škola pro 21.století* (Schools for the 21st Century). [online] [18.11.2015]. Available at [http://www.msmt.cz/uploads/soubory/ESF/3\\_vyzva\\_1.3/Akni\\_plan\\_Skola\\_21.pdf](http://www.msmt.cz/uploads/soubory/ESF/3_vyzva_1.3/Akni_plan_Skola_21.pdf) (in Czech)
2. Danner R.B., Pessu C.O.A. (2013). A Survey of ICT Competencies among Students in Teacher Preparation Programmes at the University of Benin, Benin City, Nigeria, *Journal of Information Technology Education*, Vol. 12, p. 33-49.
3. Gastelú C. A. T., Kiss G., Domínguez A.L. (2015). Level of ICT competencies at the University. *Procedia - Social and Behavioral Sciences*, Vol. 174, p. 137-142.
4. Gras R.M. (2009). Internet Usage and Digital Divide Among Spanish University Students. *Revista Media E Jornalismo*. Vol. 8. p. 17-25.
5. *ICT competency standards for teachers* (2008). Implementation Guidelines version 1.0. UK: UNESCO. [online] [18.11.2015]. Available at <http://unesdoc.unesco.org/images/0015/001562/156209E.pdf>
6. *ISTE Standards for Students* (2015). International Society for Technology in Education (ISTE). [online] [18.11.2015]. Available at <http://www.iste.org/standards/ISTE-standards/standards-for-students>
7. Jung I. (2005). ICT-pedagogy integration in teacher training: application cases worldwide. *Educational Technology & Society*, Vol. 8 (2), p. 94-101.
8. Kay R.H. (2006). Evaluating strategies used to incorporate technology into pre-service education: A review of the literature, *Journal of Research in Technology in Education*, Vol. 38(4), p. 383-408.

9. Kirschner P., Woperies I.G. (2003). Pedagogic benchmarks for information and communication technology in teacher education. *Technology, Pedagogy and Education*. Vol. 12(1), p. 127-149.
10. Kubrický J., Částková P. (2015). Teacher's competences for the use of web pages in teaching as a part of technical education teacher's ICT competences. *Procedia - Social and Behavioral Sciences*, Vol. 174, p. 3236–3242.
11. Murray S., Nuttall J., Mitchell J. (2008). Research into initial teacher education in Australia: A survey of the literature 1995 – 2004. *Teaching and Teacher Education*, Vol. 24(10), pp 225-239.
12. Vrtič M. P. (2012). The Role of Internet in Education. 9<sup>th</sup> International Scientific Conference on *Distance Learning in Applied Informatics (DIVAI)*. Šturovo, Slovakia: Constantine the Philosopher University, pp. 243-250. [online] [09.03.2015]. Available at [http://conferences.ukf.sk/public/conferences/1/divai2012\\_conference\\_proceedings.pdf](http://conferences.ukf.sk/public/conferences/1/divai2012_conference_proceedings.pdf)
13. Vronska N. (2012). Development of prospective teacher information and communication technologies integration skills in Household and Home economics education. *Synopsis of the Doctoral thesis*. Jelgava, p. 74.