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# OPINIONS AND ATTITUDES OF STUDENTS TEACHERS' TOWARD ICT USE IN EDUCATION

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***Abstract****: The evolution of the Information and Communication Technologies (ICT) and their integration in the education lead to specific changes both in the pre-service and in-service teachers' training programs curricula developed during the last decades in Romanian universities. ICT in education is seen both as a necessity, since universities need to have well trained graduates integrated in the society and on the job market, and as an opportunity because it gives students access to significant resources at very low costs of time and money. Initial teacher training for Romanian primary teachers is nowadays accomplished by a three years program at the university. Starting with an analyze of the ICT student teacher training policies developed during the last two decades in several European countries, this article will discuss the main measures taken by the Romanian universities in order to integrate information and communication technologies in education and will present the results of a study which aimed to analyze student teachers' attitude regarding ICT use in education and their opinion regarding ICT access at resources in the faculty where they are enrolled. Involving 128 students from the Pedagogy of Preschool and Primary School from two Romanian universities, "Alexandru Ioan Cuza" University of Iasi (UAIC) and "Stefan cel Mare" University of Suceava (USV), our study also captures the main difficulties encountered by students when using ICT. In the end, we will discuss several implications of the results of this study on the specific information and communication technologies teacher training policies and strategies developed in the Romanian universities.*

***Keywords:*** *ICT attitude, Pre-service teacher training, Romania*

## I. INTRODUCTION

Information and Communication Technologies (ICT's) evolution and their integration in education have led to specific changes in teacher training programs, at both pre-service education level and in-service level. This paper presents the main strategies used in several European countries for pre-service ICT teacher training and analyze the results of a study involving students of Pedagogy of Preschool and Primary School from two Romanian universities, "Alexandru Ioan Cuza" University of Iasi and "Stefan cel Mare" University of Suceava.

At European level, ICT integration in pre-service teacher training programs started in the 80's. The programs were mainly focusing on computer literacy and technological literacy. Meanwhile, ICT's have become more complex, more accessible and there is a need to develop also digital literacy and specific skills to integrate technology in the educational activities. Technological literacy enables students to use technology to "*communicate, locate and use information, but also to support the learning content of other school subjects*" (McMillan Culp et al., 2005) and digital literacy to help them "*use technology applications and use technology to meet personal needs or collective*" (Erstad, 2009). Technological literacy emphasizes the knowledge of the ways in which hardware and software

work and can be used. Digital literacy emphasizes on the ways in which knowledge and skills could be applied to solve specific tasks (such as, for example, those in the educational activities). This, however, may not be possible without the ICT knowledge and the ICT skills developed during the prior technological literacy courses.

Researches in pre-service teacher training have highlighted the need to develop the ICT training programs for student teachers'. Learning with and by ICT will help them to easily understand what are the challenges and benefits of this kind of instruction on the student learning (Higgins and Kassen, 1997) and will help them to adapt to new roles developed in the context of the information society (cited Pelgrum Scrimshaw and Law, 2003). Students preparing for teaching careers have been exposed to technology throughout their entire existence, they've developed different ways of doing things and, over the years, have come to be known under the name of digital natives (Prensky, 2001) or Homo Zappiens (Veen and Vrakking, 2006).

Although students teachers' have been exposed to technology, Twidle, Sorensen, Childs, Godwin and Dussart (2006) have identified that they do not feel ready to use ICT in school activities because of the lack of technical skills (as cited in OECD, 2009). In Romanian education, technical skills training is done by introducing subjects like computer science, ICT or IT, developed both at the level of secondary education and in higher education. Student competences are evaluated at the end of the high school.

## II. ICT IN EUROPEAN HIGHER EDUCATION

The European Common Principles for Teacher Competences and Qualifications stated that teachers must be able to access, analyze, validate and transmit knowledge. The new skills developed during ICT teacher training must enable teachers to integrate ICT properly in their educational activities. In this direction, different strategies have been developed in European countries. These strategies have taken into account both the models that have proven to be beneficial for the system (see for instance the example of France which has a tradition of more than 30 years in the use of educational certificates and in 2004 introduced such a tool for higher education) or have developed measures that allowed the alignment of the national strategy at the measures taken at European level (like the introduction of the evaluation of digital competence assessment in our country).

ICT for educational activities are integrated either like a distinct course at the undergraduate studies, like a specific bachelor program at the faculty or during the master studies. This is the case of German universities in which ICT is introduced as an optional undergraduate level course and students who want to specialize in using technology in education can attend "Art and Media in Education" master program. In finish universities ICT is integrated like a specific bachelor program.

Worldwide, there was also a growing interest in developing national standards for ICT teacher training programs. In Europe, countries like Austria, Belgium, Denmark, Finland, France, Hungary and Norway have implemented such a system. Starting with 2007, the Austrian higher education has introduced the basic ICT skills permit. Being mandatory for student teachers', the knowledge acquired during these ICT courses is applied during the field placement. In France, there has been introduced the c2i, a certificate recognizing ICT skills of student teachers.

## III. ICT IN UAIC AND USV CURRICULUM

The rapid evolution of technology has led to the transformation of the labor market and brought new challenges for the universities. In order to acquire ICT infrastructure, Romanian universities were involved in national and international projects and have received support from the Ministry of Education, Research, Youth and Sport. For the transmission of ICT knowledge and skills changes occurred both at teaching curriculum and at the taught curriculum.

Analyzing the curriculum from Pedagogy of Preschool and Primary School program from UAIC we have identified the following issues:

1. During the first year students have access to an 5ECTS ICT course

which has the aim to help student acquire the knowledge of computer hardware and software applications (http://www.psih.uaic.ro/activ/I_licenta/programe/2008/eval-an_I-pipp.pdf, p.4).

2. During the third year, they have access to a course on Computer based Instruction

which will provide them with informations regarding e-learning tools, their use in the educational activities and de the development of ICT in education (http://www.psih.uaic.ro/activ/I_licenta/programe/2008/eval-an_III-pipp.pdf, p 12).

At the USV, student teachers' have access at two ICT courses as follows: in the first year 4ECTS ICT- computer-based training which is mandatory and in the second year a 2 ECTS optional on Art education assisted by the computer. Due to the lack of the electronically syllabus, we could not find more information regarding the contents and the aims of these courses.

As we mentioned above, due to the efforts of universities, students have nowadays access to ICT resources in the faculty. But most of them have access at computers at home and the level from where their ICT training should start should not be the basic one, where they learn what is a computer, how they can create a document, o folder, a presentation because al these competences have already been in the syllabuses from the secondary schools and have also been evaluated at the end of the high school, during the evaluation of the digital competences. Introduced by GEO 97/2009, this test assesses the following skills: basic concepts of computer systems, computing and organizing files, operating systems, word processors, presentations, databases and internet. The scores obtained at the test allows the classification of the student' ICT competences in one of the following categories: proficient user (75-100 points), advanced user (51-74 points), average user (26-50 points) and novice user (0-25 points).

Therefore, we notice that future students have not only specific ICT knowledge but they also have ICT skills that were already assessed and measured according to national and international standards.

In the part we present the results of a study involving Romanian student teachers' from Pedagogy of Preschool and Primary School.

## IV. METHODOLOGY

This study aims to identify student teachers' perceptions regarding to the access at ICT infrastructure, their attitude toward technology and the main difficulties they encounter when they use ICT at the faculty. The present research was conducted during May 2011-January 2012 and involved 120 female students enrolled in the second year in the Pedagogy of Preschool and Primary School Program at the "Alexandru Ioan Cuza" University of Iasi (UAIC, 34.2%, N = 41) and "Stefan cel Mare" University of Suceava (USV, 65.8%, N = 79).

### 4.1. Acces at ICT infrastructure

Only 72.5% (n = 87) of the students mentioned the ICT resources they can access at the faculty. The following resources were mentioned: **computers** (34,8%, N=81, $n_{UAIC}$= 35, $n_{USV}$=46), **beamers** (24,9%, N=58, $n_{UAIC}$=18, $n_{USV}$=40), **internet** (20,2%, N=47, $n_{UAIC}$=22, $n_{USV}$=25), **wireless internet** (3.9%, N=9, $n_{UAIC}$=7, $n_{USV}$=2), **ICT laboratory** (13.3%, N=31, $n_{UAIC}$=18, $n_{USV}$=13), **free access at international databases** relevant for the field of study(3%, N=7, $n_{UAIC}$=7, $n_{USV}$=0). Analyzing students teachers' options depending their age we noticed that the main important resource, the computer, was mentioned in the proportion of 74, 1% (n = 60) of students aged under 30 years, 16% (n = 13) of those aged between 31 and 40 years and only 7.4% (n = 6) of students aged between 41 and 50 years and 2.5% (n = 2) took it into consideration. A possible explanation can be seen in the fact that, overall, at this question only few students with the age over 40 years, most of them left a blank space, and so the percentage of those who really gave an example was not statistically significant (n = 8).

The beamer presence in the faculty was mentioned of 63.8% (n = 37) of students aged under 30 years and 22.4% (n = 13) of those aged between 31 and 40 years. 13.7% (n = 8) of students aged

between 41 and 60 years have pointed out the beamer. 66% (n = 31) of students under 30 also mentioned the internet and 25 of them mentioned the presence of a computer laboratory.

Almost two thirds of students from University of Suceava ($n_{Don'tknow}$ = 29, $n_{doesn't}$ = 31) do not know if there are enough computers in their faculty to be accessible to students, while only 19 of them consider that the college has enough computers so that each of the students have access to a computer. At the University of Iasi, from all those 41 students involved in the research, over half ($n_{Don'tknow}$ = 6, $n_{doesn't}$ = 20) were convinced that there were not enough computers or they didn't knew. The main places where students can access ICT resources at the faculty are, in the order of their choice, computer lab (55.5%), followed by the library (23%) and the classrooms (21.5%). There are differences between the groups of students from the two universities. For students from USV the main place where they can have access to ICT resources are computer lab (60.2%), the classroom (22%) and then the library (15.3%) while students at UAIC mentioned computer lab (29.7%), the library (22%) and, in the end, the classroom (12.7%).

### 4.2. Student teachers' attitude towards ICT use in education

The ICT attitude of student teachers' was measured by a scale including nine items whose answers suggested answers both openness and motivation to use ICT tools**.** Students consider that ICT has a high influence on the ways in which they learn (M = 3.73) and they are no longer able to prepare school activities without using this type of resources (M = 2.78). At the same time, while acknowledging the importance of the technology and the changes brought to their work, some students draw attention to the fact that they don't learn only using ICT (n = 22), they also have other resources that are important. Concerns about computer use were recorded at the students from 31-40 and 41-50 age categories, which are more pressed to adapt to the ICT changes and to integrate the technology in their work .While the student teachers' consider ICT resources to be better than traditional resources (M = 2.79) and identify them as being very useful in projects involving teams, more than half of the students pointed out that ICT use distract them from learning for exams activities (n = 71) or the faculty activities (n = 87). Regarding ICT attitude differences between the groups of student teachers' involved in the research, analysis of their responses revealed that there were no significant differences between students with different ages (F (3.116) = 1.471, p = 0.226) nor between students from different universities (H (1) = 0.005, p = 0.943).

### 4.3. Student teachers' ICT difficulties

More than half of the student teachers' involved in the study (60.8%, n = 73) considered that they do not encounter any difficulties when using ICT resources at the faculty. The difficulties mentioned by the remaining students from the two groups (39.3%, n = 47) were: **insufficient computers** (26.9%), **insufficient ICT training** (16.7%), **not enough time** (15.4%), **internet's week speed** (15.4%), **presence of old computers that work hard** (12%), various software programs in the different area of ICT access at the faculty (5.1%) and **too rapid evolvement of working programs** (7.7%). Significant differences between the groups from the two universities appeared regarding the hardware at the University of Iasi, since 27% of students indicated that there were not enough computers, while only 17% of student teachers' from the University of Suceava faced this difficulty. An interesting observation regarding the difficulties encountered by students is related to the fact that 72.3% (n = 34) of respondents aged under 30 years indicated most of the difficulties mentioned above, while older students have identify no problems using software equipment.

## V. CONCLUSIONS

The identified significant differences regarding the wireless internet and international databases access at the two faculties may suggest that students do not know about the existence of these two facilities in the faculty (not still) or do not know how to use them properly. Providing student teachers' access to international databases resources could support the knowledge of the latest research in the field, guiding them to the quality papers and researches. Such a resource is important also due to the rapid growing and changing of the scientific information in the educational sciences

research field. Correlating this conclusion with one of the difficulties mentioned by the students, that they do not know how to use certain programs, we suggest to organize introductory meetings where students will have the opportunity to learn about ICT resources available at the university and in their faculty and they will also have the chance to learn how to use this infrastructure. Such a measure will help them to integrate faster at the faculty. Regarding their work, such a measure will not only lead to greater access to information of the students but will support and increase the quality of their work (since they will have access to international resources, will know how and will be more inclined to use it) during the period of their studies. Also, the organization of such meetings / scientific seminars / workshops will help to familiarize students with research carried out both at home and abroad, contributing to their responsible orientation to the master on research.

We notice also that, despite the steps and efforts made by the universities, the access to ICT resources is still a problem. Though available, their obsolescence makes them unusable. Difficulties encountered by students can be grouped into four main categories: **problems related to hardware access** (insufficient computers, old computers), **difficulties related to ICT skills** (lack of ICT skills), **problems related to software equipment** (different programs, internet connection) and problems related to time resources (not enough time to practice). Difference in access at ICT resources identified between the two universities could be explained by the increased number of students from different programs developed in the Faculty of Psychology and Educational Sciences of the University of Iasi. While at this university, student teachers' for primary and pre-primary schools share the resources from other educational programs, such as Psychology, Pedagogy, Special Education, at the University of Suceava, student teachers' don't have to share these resources there is only one program, Pedagogy of Preschool and Primary School.

Greater exposure to ICT resources of students from these generation may be the explanation of the difference observed between students of different age groups categories in terms of difficulties. As part of the generation of "digital natives", youth under age 30 came into contact with ICT resources more often than the other categories, know how to use various software programs and they could tell exactly what problems encountered while older students in pointed mainly the hardware difficulties. In this case, it is necessary to rethink the strategy for addressing technological literacy in higher education. Need to professionalize the teaching staff have triggered a transformation in the age of students enrolled in courses from the Pedagogy of Preschool and Primary School Program. If for high school graduates during the first year ICT is no longer a challenge, being only an overview of knowledge and skills learned during secondary school, assessed and quantified, for older students' situation is different.

### 5.1. Further directions of the research

On the midterm this research will be extended to both first and third year of students from Pedagogy of Preschool and Primary School and on long term we envisage to involve also student teachers' for secondary schools.


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## References


[1] Common European Principles for Teacher Competences and Qualifications, 2010, Retrieved at: http://ec.europa.eu/education/policies/2010/doc/principles_en.pdf;

[2] Erstad, O., 2009, Addressing the complexity of impact – A multilevel approach towards ICT in education. In Scheuermann, F.and Pedro,F., *Assessing the effects of ICT in education – Indicators, criteria and benchmarks for international comparisons*. European Union/OECD, France, pp. 21-38;

[3] Higgins, C. J. and Kassen, M. , 1997, Meeting the technology challenge: Introducing teachers to language-learning technology. In: Bush, M. D. and Terry, R. M. (eds.) *Technology- Enhanced Language Learning. Lincolnwood: National Textbook Company*, 263–285.
[4] McMillan Culp, K., Honey., M., Mandinach, E. , 2005, A Retrospective on Twenty years of Education Technology Policy, *Journal Educational Computing Research*, Vol. 32(3) 279-307.
[5] OECD, 2009, ICT in initial teacher training:research review, EDU Working Paper No. 38, http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2009)17&docLanguage=En
[6] OUG 97/2009, Retrieved at: http://www.edu.ro/index.php/legaldocs/12797;
[7] Pelgrum, W., Law, N., 2003, ICT in education around the world: trends, problems and prospects, UNESCO: International Institute for Educational Planning, Paris;
[8] Pelgrum, W., 2009, Indicators on ICT in primary and secondary education: results of an EU study. In Scheuermann, F. and Pedro, F., *Assesing the effects of ICT in education – Indicators, criteria and benchmarks for international comparisons*. European Union/OECD, France, pp. 165-188.
[9] Prensky, M., 2001, *Digital Natives, Digital Immigrants*, MCB University Press, Vol. 9 No. 5, October 2001
[10] Veen, W. and Vrakking, B., 2006, *Homo Zappiens: Reshaping learning in the digital age*. London. Network Continuum Press