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THE ROLE OF ICT IN EDUCATION – ROMANIAN EXPERIENCE

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Abstract

The rapid evolution of ICT in recent years has an important impact on the whole society, and also on the education system. The current article aims to look to the current state of integration of ICT in the school education in Romania in order to determine its role in educational activities. The research was conducted on a sample of 538 people (school principals, teachers and students) selected from four schools in Ilfov county, Romania, two urban and two rural. The methods and data collection tools were: survey-based questionnaire, interview and analysis of documents. The results of this research provides insights into the opinions of teachers and students regarding the use of new technologies in education, the extent to which the new technologies are used in the education process, the training of teachers and students in the use of multimedia, the modalities of integration of new technologies in teaching, the degree to which teachers and students use online sources of information and educational software. The conclusion is that although the use of new technologies in teaching is beneficial for both students and teachers there is no relation between 1) the level of how much IT equipment exists in schools (in Romania this level varies significantly between schools) associated with the level of the training of teachers in informatics (not every school in Romania has well trained teachers) and 2) the willingness of students to use new technologies in their learning activity.

Keywords: ICT, Education, ICT Skills.

1. Introduction

The rapid evolution of ICT (Information and Communication Technology) in the last two decades is reflected in the whole society, including the pre-university educational system in Romania. The most

important changes are determined by the rapid evolution of technology in the world and in Romania. For the new education of 21 centuries, ICT is one necessary component. It is good this education to be reconsidered in relation to: 1) the new technical possibilities and 2) the requirements of the companies (that may use this technology). The main challenge of ICT in schools in Romania is to create an environment for learning in which those technologies to play a crucial role in the transition from a classical learning environment towards a student-centered environment.

Romanian school reflects the society in which it operates. The current student is a future citizen. In this context, it is important that school next to the academic, moral and civic skills helps children to acquire ICT skills. The ICT equipment and software should be integrated in the teaching of the different disciplines that will lead to a better teaching and learning. The teacher will be transformed from an information transmitter into a learning facilitator by reinventing his/her teaching strategies through ICTs.

There are few studies in Romania regarding the use of ICT in education. Therefore, more research is needed in this respect. The current article aims to look to the current state of integration of ICT in the school education in Romania in order to determine its role in educational activities. The results of this research provides insights into the opinions of teachers and students regarding the use of ICT in education, the extent to which the new technologies are used in the education process, the training of teachers and students in the use of multimedia, the modalities of integration of new technologies in teaching, the degree to which teachers and students use online sources of information and educational software.

2. Paper Theoretical Foundation and Related Literature

ICT in Education - ICT can motivate children to learn and make the connection between school education and practices. It is a factor that can lead to a changed and better education. It can enrich, accelerate the acquisition of skills (Yusuf, 2005).

According to Stevenson (Stevenson, 2008) there are at least four metaphors attributed to ICT: a) resource for teachers and students in teaching and learning process; b) tutor - ICT is designed to meet the learning needs of students; c) environment - a small universe where students and teachers can explore the information; d) tool - which is used to perform a certain learning task.

The teachers should be well prepared to integrate ICT in educational process. It is well known that teachers' attitudes and use of ICT in teaching and digital skills influences significantly student achievement. To achieve successful integration into the educational process there are at least two solutions, namely: a) postgraduate courses for teachers, and b) short in service courses focused on specific integrated uses on ICT.

ICT in Education in - Globally, efforts to integrate ICT in education vary. The degree of integration is different from North America to South America, Europe, Asia, Africa, and the Australian Pacific region (Whittier & Lara, 2006). In a study conducted in EU countries in 2012 on the integration of ICT in schools, it was found that there are between three to seven students per computer (Wastiau et al., 2013). In the same study (Wastiau et al., 2013), the researchers discovered that in the schools there are used interactive boards, data projectors, laptops, tablets, and laptops. We have to mention that the percentages regarding how well are equipped the schools in EU countries are very different. Whether for countries as Finland, Sweden, The Netherlands, France, schools are highly equipped, there are countries

such as Romania, which are less than 20% equipped with the new technology in the schools. Globally, there are many countries where schools are well equipped with ICT equipment, such as US for example (Mulkeen, 2003). Schools that are highly equipped with ICT tools have a tendency to integrate more ICT in learning and teaching.

ICT in Education in Romania - If before 1990 we could not any talk about the Internet in Romania, after this period of isolation, things have changed so much that, after 25 years - more precisely, at the end of 2015, at a population of 19.861.408, the Internet usage rate was 56.3%. Although the number of Internet users increases every year, the opportunity to learn ICT remains an elusive target for many schools in Romania, especially in the rural areas. The positive impact of ICT programs in Romania depends on the degree to which teachers, students, researchers, and decision makers will collaborate to implement these technologies in the educational process (Istrate, 2010).

In Romania, as in any European country, the social, political, and economic context influences the educational process, not only on infrastructure but also in terms of ICT in the education used in schools both in urban and rural areas. Development and use of ICT in schools is a challenge but also a cultural phenomenon for the teaching, learning and assessment processes. Thus, the digital competencies are part of the set of the eight competencies that will lead to useful skills for today pupils and tomorrow citizen, proposed by the European Community (Otten & Ohana, 2009).

Programs like SEI (The IT-based Educational System) and AeL (Advanced eLearning) are a good help for teachers in the educational process. A study conducted in 2008 in Romania (Potolea et al., 2008) regarding the implementation of SEI program showed that new technologies in education are of a great help both for teachers (96,3%) and students (95,1%). At the same time the use of computers and related software is more useful for teaching subjects that are not related directly to computers – such as *Geography, History*, etc. (in rural areas - 59.1%, in urban area - 62.6%) than for the disciplines related directly to computers (rural - 23.9%, urban - 39.3%). Results of this study show that 78.7% of teachers use ICT in lessons at least once a semester - similar rural and urban.

Similar results are shown in another study. Intel Teach study, conducted in 2009 in Romania (Toma et al., 2009), highlights a number of changes in educational practices in the pre-university education system of this country in recent years. It notes that over 50% of teachers say that they in preparing lessons and in the class often use this technology. ICT makes presentations more attractive and it facilitates the approach of an active, participatory teaching-strategy. A percentage of 70% from the respondents mention the student active involvement in solving homework of the lessons related to ICT, and 75% from teachers appreciate that ICT influence their professional development facilitating the development of the digital competences used in the teaching – learning process (Toma et al., 2009).

3. Methodology

The research aimed to identify how ICT was used in the pre-university education in Romania for determining its role in the learning and teaching process. It looked especially to: What is the opinion of teachers and students on the use of this new technology in education? To which extent the schools are equipped with this new technology? How ICT can be integrated into teaching? Are Romanian teachers prepared to use ICT for educational purposes? What are the advantages and disadvantages of using this new technology in education?

The study was done in 2016. It used purposive sampling. The research was conducted on a sample of 538 participants selected from four schools in the county of Ilfov / Romania, two urban (Voluntari, Schools no. 1 and 2) and two rural (Dascălu and Ştefăneştii de Jos). The sample consisted from 480 students, 54 teachers and 4 head teachers - 51% urban and 49% rural. The methods and data collection tools used were survey-based questionnaire, interview and analysis of documents.

4. Results

The use of ICT in education - teachers 'and students' vision - Teachers from our study know the benefits of the ICT integration in education - 83% are very interested or interested enough in this field. Meanwhile, it was found that 61% of teachers think that school today is not in agreement with the society it serves. The main reasons are related to the fact that schools are not sufficiently equipped with modern technology. At the same time 100% teachers from the schools consider that the use of ICT in education facilitates the relationship with the new generation of students, as confirmed by the large number of students (85%) who wish to use the school computer. The results show also that almost half of the students do not know how to select the information found on the Internet. This result is alarming and shows that many students do not know how to use Internet.

Not all schools in Romania are equipped with sufficient ICT equipment for educational purposes. Some rural schools have ICT equipment only in certain places, for example in the computer lab. On the other hand, urban schools are equipped with computers and projectors in every classroom, which allow a good use of ICT in the education process. It was also found that secondary-level students are already very familiar with new technologies. At this level, less than half of the teachers (43 %) are willing to use ICT in the classroom. At the primary school level, teachers have different attitude, 95 % of them using ICT in education, especially in urban schools.
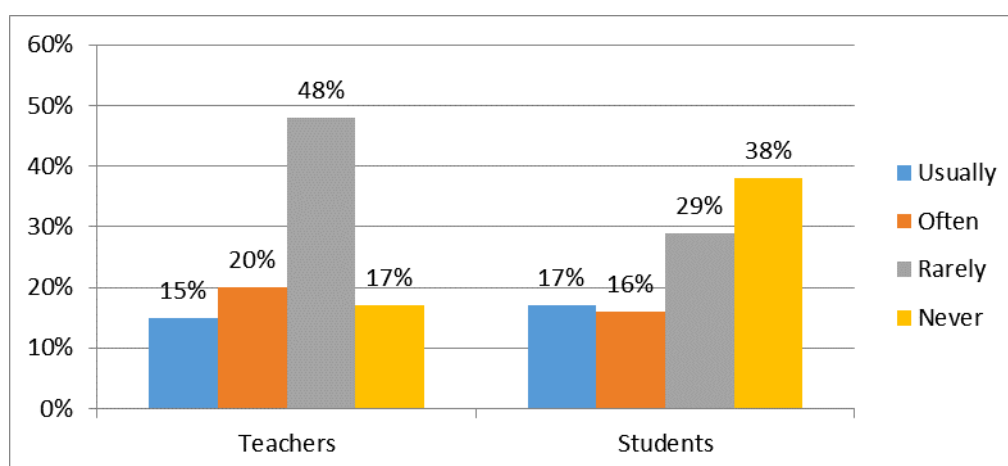

Figure 1. The practice of using ICT in the classroom

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Usage of ICT - The equipment that is used the most by teachers is: computer, laptop and projector. Regarding ICT software, the first is PowerPoint followed by Internet. Educational software's is not in the top of the list. Both teachers and students showed preferences for the usage of information resources in teaching and learning. Thus, in the first places the following are listed: Facebook, YouTube, Google and didactic.ro. Another aspect of this research was investigating the extent to which teachers use educational software. Although study shows that there are enough resources in urban schools, only 12% of teachers reported using educational software.
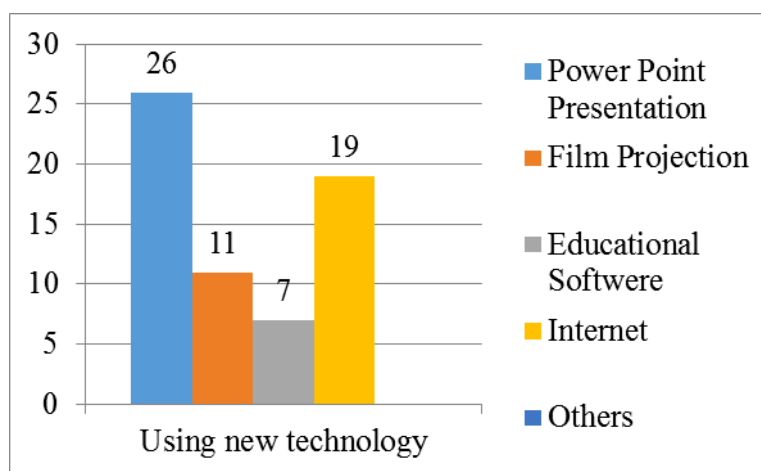
Figure 2. Using New Technology

Advantages and disadvantages of using ICT in education Following responses from interviews, the advantages / disadvantages of using ICT in education are outlined below. Among the advantages mentioned we highlight a few: strengthen students' motivation in learning because the computer provides learning through play - learning new things without the student to make a special effort and without getting bored or distracted easily; ICT facilitates the understanding of difficult concepts because the use of ICT can provide visual aids and support auditory learning, and it can model and simulate phenomena that cannot be observed in reality; ensure active participation of students in learning; supports students in enhancing their knowledge and practice their skills; offers the possibility of testing the level of knowledge reached by a student - the test results are provided in seconds and usually they are accompanied by recommendations on how a child can improve performance; supports students with special educational needs by adapting learning activities; access to information is much faster; allow differential treatment of students and it offers respect for their own learning pace; curbs absenteeism by rapid parents information through the online catalog; offers attractive activities for pupils; enable collaboration between schools, at home and abroad through social networks; it offers possibilities for promoting the image of the school.

On the other hand, excessive use of technology in education can have a number of disadvantages such as: the trend of the students to call the computer for any activity and retrieve information from Internet, without them passing through the filter of their own thinking can lead to passivity in thinking,

superficiality, the temptation to copy-paste; decreased interest in reading books; Excessive computer use both at school and at home can lead to addiction; human relations are affected, students may come to prefer communicating in the virtual environment to the detriment of face to face communication; surfing the Internet without adult supervision or guidance can be dangerous; not all information published on the internet is true and this can lead to misinformation; the long time spent at the computer, to the detriment of play and movement activities can lead to health problems; ICT cannot solve the socio-emotional needs of students.

Level of teacher training in using ICT - Research shows that 95% of teachers attended at least an introductory course in ICT and 75% of them consider that such a training is useful. Half of the teachers, especially those falling after the age of 35, believes that students know more about using ICT than them and this can be considered one of the reasons why teachers do not feel comfortable with the usage of ICT in their classroom.

How to integrate the new technologies in school - The majority of the teachers consider that modern media can be integrated in all disciplines and in any type of lesson (teaching, review or assessment). ICT is often used in disciplines such as language, geography, physics and primary education. Whether or not teachers use technology in the classroom, surely students will use computers and Internet at home for homework - 80% of them confirming this.

From the qualitative study it can be concluded that although the use of new technologies in teaching is beneficial for both students and teachers there is no relation between 1) the level of how much IT equipment exists in schools (in Romania this level varies significantly between schools) associated with the level of the training of teachers in informatics (not every school in Romania has well trained teachers) and 2) the willingness of students to use new technologies in their learning activity.

5. Discussions

In the last decade, the interest of teachers in the Romanian schools to integrate new technologies in education increased. It was found that modern ICT tools significantly enhance the attractiveness of the educational process. In Romania, ICT in primary education is more used than in secondary education. In Romania, recently digital textbooks at primary level[1] were introduced, this being a reason to use ICT at primary level. At middle school level, teachers from the schools participating in our study are using ICT in disciplines such as Foreign Languages, Geography, and less in mathematics and Romanian Language. Those data correspond to those observed in the 2009 - study EduTic in which ICT usage in Foreign Languages and Geography was rated at more than 50% (Făt & Labăr, 2009). On the other hand, it contrasts with some studies from other countries (Li et al., 2013) where teachers used successfully mathematical games in math.

The level of ICT equipment in school is slightly different from urban to rural. Although Internet connection exists in all schools, not all rural halls are equipped with video projectors that facilitate the use of ICT in the educational process. The levels of the 1) teacher motivation and 2) teacher skills of ICT in rural and urban areas are not significantly different. The difference is given by their practice in using ICT

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[1] http://www.elearning.ro/etichete/manuale-digitale

in teaching. This conclusion is similar to the one drown by an US study on the use of ICT in schools in rural and urban environments (Goh & Kale, 2016).

The level of training of teachers in ICT is average. Students often have superior skills in this area. Advantages of modern integration are numerous, but disadvantages cannot be neglected. School libraries have basic educational software, sometimes being acquired from teacher contributions. Integration of ICT resources in education is beneficial and leads to an increase in school performances, provided that students and teachers have sufficient ICT knowledge. However, as a general conclusion, it can be said that schools do not fructifies all the advantages of using ICT. This conclusion is similar to a study conducted in Finland (Niemi, 2003).

6. Conclusions

The use of ICT in education brings substantial benefits for the Romanian education system. However, the present study shows that there are factors that hinder this as: a) endowment of schools due to lack of financial funds or managers uninterested in this field; b) insufficient training of teachers in the use of ICT in the classroom; c) reluctance by teachers in using ICT in education d) lack of people in schools that can solve technical problems.

There is a limitation of the possibilities for using ICT that can be bypassed only by maintaining an important role for the teacher in 1) the acquisition, processing and use of data, and 2) in building adequate practical skills. Training based on student-computer interaction (man-machine) requires a redefinition of the teacher's role and his/her proper preparation for this.

References

Făt, S., Labăr, V. (2009). Eficienţa noilor tehnologii în educaţie, Raport de Cercetare evaluativă, *EduTIC 2009*. Retrieved from http://www.elearning.ro/resurse/EduTIC2009_Raport.pdf

Goh, D. & Kale, U. (2016). The urban–rural gap: project-based learning with Web 2.0 among West Virginian teachers, Technology, Pedagogy and Education, 25:3, 355-376, DOI: 10.1080/1475939X.2015.1051490

Istrate, O. (2010). Efecte şi rezultate ale utilizării TIC în educaţie, *Conferinţa Naţională Virtuală, Ediţia a VIII-a.* Retrieved from https://www.academia.edu/3356979/Efecte_si_rezultate_ale_utiliz%C4%83rii_TIC_%C3%AEn_educatie

Li, Q., Lemieux, C & Vandermeiden, E. (2013). Are You Ready to Teach Secondary Mathematics in the 21st Century? A Study of Preservice Teachers' Digital Game Design Experience. *Journal of Research on Technology in Education,* 45, 4. Retrieved from http://files.eric.ed.gov/fulltext/EJ1010661.pdf

Mulkeen, A. (2003). What can policy makers do to encourage ICT? Evidence from Irish school system, *Technology, Pedagogy, and Education,*12, 2.

Niemi, N. (2003). Towards a learning society in finland: information and communications technology in teacher education, *Technology, Pedagogy and Education*, 12:1, 85-103, DOI: 10.1080/14759390300200147

Otten, H. & Ohana, Y. (2009). The eight competencies for lifelong learning: an appropriate framework within which to develop the competence of trainers in the field of European youth work work or just plain politics?, *IKAB: European Comission,* Retrieved from https://www.salto-youth.net/downloads/4-17-1881/Trainer_%20Competence_study_final.pdf

Owston, R., (2006) Teachers can make a difference: Professional development as a policy option for

improving student learning with ICT. *Paper prepared for the CEIRIS-Keris international Expert meeting on ICT and Educational Performance*, South Korea, October 16–17, 2007. *In* Wastiau, P., Blamire, R., Kearney, C., Quittre, V., Van de Gaer, E., Monseur, C. (2013). The Use of ICT in Education: a survey of schools in Europe, European Journal of Education, Part I

Potolea, D. & E. Noveanu, P., Velea, S., Botnariuc, P., Novak, C., Istrate, O. (2008). Informatizarea sistemului de Învăţământ: Programul S.E.I. *Raport de cercetare evaluativă*, Bucuresti: Universitatea din Bucuresti, Facultatea de Psihologie si Stiinţele Educaţiei, Retrieved from http://www.elearning.ro/resurse/EvalSEI_raport_2008.pdf

Stevenson, I. (2008). Tool tutor environment or resource: Exploring metaphors for digital technology and pedagogy using activity theory. *Computers and Education,* 51, 836–853

Toma, S., Găbureanu, S., Făt, S., Novak, C., (2009). Instruirea în Societatea Cunoaşterii: Impactul Programului Intel Teach în România, E-learning Romania, Retrieved from http://www.elearning.ro/resurse/Intel_Teach_Impact_2009.pdf

Wastiau, P., Blamire, R., Kearney, C., Quittre, V., Van de Gaer, E., Monseur, C. (2013). The Use of ICT in Education: a survey of schools in Europe, *European Journal of Education*, Part I, DOI: 10.1111/ejed.12020

Whittier, D. & Lara, S. (2006) Preparing Tomorrow's Teachers to use Technology (PT3) at Boston University through faculty development: assessment of three years of the project, *Technology, Pedagogy and Education,* 15:3, 321-335, DOI: 10.1080/14759390600923816

Yusuf, M.O. (2005). Information and communication technology and education: Analysing the Nigerian national policy for information technology, International Education Journal, 6(3), 316-321. Retrieved from http://files.eric.ed.gov/fulltext/EJ854985.pdf