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**ICT AND PRESERVICE TEACHERS. SHORT CASE STUDY ABOUT CONDITIONS OF TEACHER PREPARATION IN: DOMINICAN REPUBLIC, ECUADOR, URUGUAY AND POLAND**

**Lukasz Tomczyk**

Pedagogical University of Cracow, Poland, lukasz.tomczyk@up.krakow.pl

**Darwin Muñoz**

Universidad Federico Henríquez y Carvajal (UFHEC), Dominican Republic, dmunoz@ufhec.edu.do

**Julio Perier**

Universidad Federico Henríquez y Carvajal (UFHEC), Dominican Republic, jperier@ufhec.edu.do

**Magali Arteaga**

Universidad del Azuay, Ecuador, marteaga@uazuay.edu.ec

**Gabriel Barros**

Universidad del Azuay, Ecuador, gbarrosg@uazuay.edu.ec

**Mariana Porta**

Centro de Estudios de Frontera, Universidad de la República, Uruguay, mportagalvan@gmail.com

**Enzo Puglia**

General Coordinator of Digital Technologies, Departamento de Tecnologías Digitales y Formación en Educación, CFE, Uruguay, epuglia@cfe.edu.uy

**Abstract:** The paper aims at presenting the most important indicators teacher preparation in the context of the developing information society. The text was written as part of the SELI project. It is the international study which seeks to answer the question about the factors determining the efficient use of ICT among the pedagogy students. This theoretical study joins the debate on the curricula and local, national and global conditions related to the education of teachers of the future. The text presents data from three countries from Latin America and the Caribbean region and one from Europe.

The development of Information and Communication Technologies (ICTs) is key for any society that wishes to develop and face the local and global challenges that arise every day. However, teachers play a fundamental role in ensuring that these technologies are taught and reach the entire population adequately. During this process, an important number of challenges and problems must be faced, as a result of the current context in which the Dominican Republic, as a developing country, finds itself. In the present work we make a brief description of the main challenges and defies faced by ICT teachers.

In the section referring to Ecuador, a general outline of the academic education for preservice teachers is presented. The numeric data are presented about the education system and the preparation of future teachers. The legal grounds have also been described. While discussing the conditions in Ecuador, the authors focus on the technical aspects of education, like the use of e-learning technologies. They also refer briefly to the need for lifelong learning.

The purpose of this paper is to provide an overview of the way the challenges of ICT are approached in preservice teacher education in Uruguay. Initially, some background information is provided about how preservice teacher education is organized for at the different levels. Secondly, the focus is on the way Information and Communication Technologies (ICT) have been included in the preservice teacher education and training curricula and the changes that this inclusion is undergoing. The overview shows a transitioning process, from a rather disperse and fragmented approach with a variety of courses, projects and programs, to a more consistent and centralized one. The article finishes with a few conclusions and ponders some Uruguay perspectives, joining an ongoing debate around unanswered questions and identified challenges.

The Polish section presents several important changes associated with the reform of the education system, which affects the professional teacher preparation. The authors also present the examples of the academic curricula for Information Technologies and Media in Education courses carried out in the Pedagogical University of Cracow.

Based on the short analyses, we have noticed that despite the geographical, language and cultural differences, teacher preparation in the area of ICT use shows many common features which are the global challenges. These shared elements include: legal systems preparing teachers to perform their profession, the development of digital literacy, modernisation of the academic curricula and technical infrastructure, and motivation to use ICT solutions among the preservice teachers.

**Keywords:** teachers ICT, new media, Internet, preservice teachers, attitudes, Dominicana, Ecuador, Uruguay, Poland

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**INTRODUCTION**

According to the UNESCO representatives, implementation of ICT in education serves primarily the development of the teaching staff who can use ICT to process information in a fluent and creative way. ICT should be used to solve problems and facilitate generating new knowledge, help the citizens to acquire up-to-date knowledge and develop resourcefulness and support effective life management as well as full and satisfactory social participation. The use of ICT should also involve encouraging all the citizens to active participation in the society and positively influence their decisions which, in turn, would lead to the improved quality of life. Other important aspect of using ICT in the globalisation era, is facilitation of the intercultural understanding and peaceful conflict resolution (UNESCO, 2011). UNESCO postulates result directly from the present civilisational and technological transformations. Rapid scientific and technological development imposes numerous changes in all areas of private and professional life. These permanent processes transform habits and the quality of life of both, individuals and whole social groups. In these circumstances, computer and Internet have infiltrated all areas of life: economics, education, leisure, family, health. As children and youth in the today's society acquire information mainly through the digital media, the question is how can we prepare them to live in the present world? The answer requires positioning school and teachers as one of the key predictors (Arsić, & Milovanović, 2016).

The results show that teachers are interested in the implementation of information and communication technologies into learning and teaching process. Using computers and the Internet can surely help them to cover the content of their curricula. However, the truth is that many teachers declare they are still insufficiently trained to be able to use ICT effectively. This is not only the matter of their motivation but the result of the academic education and informal support they receive. Teachers often emphasise that they do not have adequate pedagogical and methodological competencies as well as sufficient digital literacy. They are also afraid to experiment. They also mention numerous limitations caused by the poor quality of the didactic equipment in their schools (Veličković, & Stošić, 2016). Despite all these barriers, many teachers use ICT successfully. However, according to UNESCO analyses, for example "THE UNESCO ICT COMPETENCY FRAMEWORK FOR TEACHERS", ICT implementation is a complex issue. The authors of the framework emphasise that the primary goal of the ability to use ICT in education is effective learning. In the next stage, ICT should be used to deepen the knowledge, thus allowing the students to obtain solid information about the school subjects and solve the complex, real-world problems. The third and final stage is the development of the new knowledge which helps students, citizens and the workforce to improve the quality of their life, making it more harmonious and fulfilling. This is also connected with creating more prosperous societies (UNESCO, 2011).

The above mentioned report and its postulates have inspired us to present the assumptions regarding the conditions of preparing the preservice teachers in Europe and Latin America. It is the lifelong learning of the existing teachers and the preparation of the next generations of educators in the age of constantly transforming information society, that determines the ways and the quality of ICT use in education. In this paper, the following research problem has been formulated: What factors determine the use of ICT by the preservice teachers in Dominican Republic, Ecuador, Uruguay and Poland? To provide the synthetic answer to this question, we used the technique of document analysis and expert pedagogical hermeneutics.

**1. DOMINICAN REPUBLIC**

At present, digital gap between ICT teachers and the advances that are taking place in the world in this field is still quite wide. Similarly, teachers face other challenges such as: low salaries, poor conditions of precarious classrooms, lack of adequate laboratories, among others. Despite this reality, important steps are being taken to improve this situation, through different programs and initiatives. One of the initiatives with the greatest impulse and scope is the Digital Republic Program (República Digital, 2019), which has within its components the subject of education, both for students and teachers.

Innovation must be understood as a transforming and integral process. Hence, very important steps have been taken to update study plans by competencies, as is the current worldwide trend in education. This process includes both undergraduate and graduate programs. Teachers play a key role in ensuring that this process culminates successfully and allows the Dominican Republic to make an important qualitative leap in this vital issue for its development.

**Challenges for Teachers**

One of the global challenges today is for university teachers to provide a quality educational service (Acento, 2015). Similarly, another important point is the training in Master's and Doctorate courses (National and International Scholarships, 2019). Although national and international scholarships are available for teachers to increase their educational levels, there are economic situations and the way in which teachers work in universities in the Dominican Republic (ICT in Education: The situation of Dominican Republic, 2019). Professors are not exclusive

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to one university and work from one university to another day after day. This situation is a serious problem because they do not have time to dedicate to improve their knowledge, as a result of the low salary they receive. The latter is one of the reasons why there is evidence of poor performance in science and mathematics in our country (Diario Libre, 2019), and as is well known, science and mathematics are the basis for understanding how ICT functions.

### **Challenges of ICT in education**

The scheme of study programs and teaching practice on the part of teachers must take into account their recipients. In the same way that is pointed out in the Iberoamerican project for Educational Goals for 2021: the training we pursue for the new generations, the investigation of youth cultures, is necessary to face the challenges of an education that reaches all students and in which they experiment in order to actively integrate into society. This does not necessarily mean that the objectives and the teaching compendiums should be conditioned to the students' benefits, but rather that it is necessary to take them into account in order to develop the students' motivation (Rivas & Martín, 2018) and to ensure that a greater number of young people at high risk of abandonment are kept in the classrooms for the required time. For the achievement of the objectives, the incorporation of ICT in the instruction of each young person is a strategy that must be strengthened.

The primary task is to enable students to improve their education through the use of ICTs. This presumes to shape a different context in the interactions between teachers, students and the contents of teaching, as well as in the assessment of the teaching-learning process. It is difficult to make changes in the way of educating, for this reason, the training of educators so that they achieve the necessary competencies that allow them to incorporate ICTs naturally into their teaching practices is vital.

### **Study Programs**

With regards to Study Programs, in a general sense, they have been improved steadily and public policies (OEI, 2017) have been created for these improvements and the different study programs have been brought to teaching by competencies. The Dominican Republic, at the request of the Ministry of Higher Education, Science and Technology, has begun a vertiginous and integral process so that all study programs are redesigned taking into account the competency-based model. Careers in education, engineering, and health sciences have begun, but the goal is to cover all programs in no more than five years.

### **National Program for Digital Literacy**

The Dominican Republic is a country that is still in the final phase of overcoming illiteracy, hence there are still multiple challenges to overcome, including the digital gap. Hence the importance of the Digital Republic program, cited above. This has changed and we have found new niches for the teaching of ICT in the Dominican Republic (Digital Republic, 2019), which implies a challenge for teachers to use more inclusive methodologies in their classroom programs.

### **Challenges and Recommendations**

As can be seen, the challenges for the Dominican Republic are many, but we are working resolutely to overcome them in the short and medium term. Both the Ministry of Higher Education, Science and Technology (MESCyT), as well as the Digital Republic program, are taking concrete steps to complete what is missing.

Within the framework of education reform and the 4% allocation (Diario Libre, 2013), the sectors that signed the Education Pact (EDUCA, 2014) advocated for quality education for all ages. This collective will is reflected in the text of the Pact, declaring that "Education is the most suitable means for the social cohesion of the Dominican Nation [...] we are willing to put the supreme collective interest above individual and sectoral interests, in order to guarantee the fundamental right of all children, young people and adults to receive quality education" (Observatory of Social Policies and Development, 2019). The problems of education in the country are systemic and range from the basic level to the higher level. Work is being done on all fronts to change the current reality.

We recommend accelerating the process of accreditation and evaluation of Higher Education Institutions (Regulations, 2015) carried out by the MESCyT, so that the entire Higher Education system has teachers equipped with the necessary skills to teach in a general sense and in the case of ICTs that can assume the competencies established by UNESCO (UNESCO, 2019) for the teaching of ICTs. In the same way, it is necessary to look not only at teachers and the study plan they teach, but also at the quality of the teaching processes, the evaluations of the required competencies and the learning obtained, in such a way that they respond to the demands of these times and of the educational model by competencies.

## **2. ECUADOR**

### **Teacher preparation Programs**

In Ecuador, 37 universities and colleges offer around 286 majors in education. Among these institutions, the university that was specifically created for training teachers is UNAE (as per its Spanish acronym), National

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University for Educators, which offers training in Basic education. That is, a degree in teaching students aged between 6 to 12. Early education, which aims at teaching how to teach children aged 0 to 5 years of age. Other majors include Intercultural Bilingual education, Special education, Experimental Sciences education (12-17), Arts and Humanities Pedagogy and Languages Pedagogy. In-service teachers are offered Teacher Professionalization and Postgraduate education in this university.

### **Pre-service teacher education**

Pre-service teacher training used to take 9 semesters (4.5 years approximately). However the new policy, which was approved this past march allows majors in the field of education to vary their programs in amount of hours, being 5760 the minimum number of hours required and 7200 the maximum to reach the degree (Consejo de Educación Superior, 2013). The total number of subjects to be taught is 54 subjects.

There are three modalities offered for teaching majors. They are: face-to-face classes, distance classes, and the European dual modality. The main fields in which pedagogy is offered are: Mathematics, Language and Literature, and Basic General Education.

All programs, offered by any university, must attach to the following lay out: face-to-face classes, which are classes students attend with the assistance of a professor; group work, which is the work done by students under the supervision of the professor, whether they are single or grouped activities; students autonomous work, which corresponds to the workload students carry out at home by themselves without the help of the professor; and finally the practicum. In the past the practicum was left to the final years of the major. However, the new changes in the policy demand this practicum to start as soon as possible.

By analyzing the layout demanded by law, we can conclude that even if it is not stated in the official curriculum, professors need to make use of ICTs to help their students work on their autonomous work. Thus, we can talk about a hidden curriculum here. It is not stated, but it is implied. Thus, professors tend to make use of tools such as moodle platforms, whatsapp, google classroom, google hangouts, and many other technologies or applications at hand to contact their students for any support they might need. For example, from a list of 43 universities, 38 have a moodle server deployed and other two have their own Learning Management System (LMS) installed. However, less information exists about the use of platforms already deployed.

This hidden curriculum brings up the term digital literacy to the everyday speaking of professors in Ecuador. Since the first semester, student teachers are trained to analyze, identify, and address challenges from the digital era in the Ecuadorian context. This is, student teachers learn to analyze the influence of factors such as society, family, community and educational policies on ICTs for education. In the same way, student teachers analyze multiple dimensions and educational systems within the country's context and diagnose potential issues.

This also happens because if a university wants to approve a career, not only in teaching, but in any field, the curriculum of the major must clearly detail how ICTs are included in the curricula students have to take. This requirement is evident in section 11 of the Reglamento de Régimen Académico (Consejo de Educación Superior, 2013), which states that the teaching process has to be organized through activities that include the time students work by himself on creating academic products or doing educational activities.

Further in their training, student teachers are instructed about current digital pedagogies and the use of ICTs in education. The purpose is for student teachers to first, interpret ICT technologies from critical, cognitive, holistic, and pedagogical comprehension. Second, use technologies to access valid and relevant sources for processing and generating new proposals for educational goods and services. Finally, design virtual teaching and learning environments to face digital era challenges, for example, flipped classroom. By using current technological alternatives and modalities from a projective perspective, student teachers are expected to boost the development of learning.

ICTs are presented as an instrument that articulates learning, information, and knowledge. In the same way, different types of technologies, communication platforms, and digital learning environments are introduced as interactive, collaborative, and knowledge transmission didactic strategies.

By browsing the majors offered in pedagogy (which is listed in every university web page), all universities offer at least one course related to the use of ICTs in class.

This training obeys to the principles of the "Good Living" (known in the past as Suma Kawsay) policy, which is the constitutional policy that states as its main goals the principles of inclusion to every single being to all the rights stated by the government, among these, education. Thus, no students can be left behind or denied from education if the student shows learning disabilities.

Studies carried out by Adam & Tatnall (2008); Obradović, Bjekić & Zlatić (2015) state that ICT helps in building a bridge to decrease differences in socially, cultural and economical matters.

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Through this process, student teachers not only learn how to use technology as a teaching tool but also they learn to recognize the respective characteristics and contributions of teaching and learning in person and virtual spaces. In other words, student teachers learn the benefits and challenges of autonomous study and teaching applications through the use of digital, multimedia, and virtual resources. Finally, they learn to interact in collaborative works to improve learning in digital environments. In addition to the ICT and technological training provided for the Basic education program, early education student teachers are instructed on how to use learning environments for integral development and inclusive education.

#### **In-service Teachers Education and Teacher professionalization**

UNAE offers 5 semester programs (2.5 years) to in-service teachers. These distance education programs aim to strengthen teachers' training structure to develop skills that allow generating pedagogical praxis creating bridges between theory and practice. Similarly, continuing teacher education programs provide ongoing education for teachers and administrative staff, as well as training and updating programs for professionals and the general public. Its main objective is to support the development of specific skills needed to strengthen the community in the framework of the democratization of knowledge, training, and updating teachers as a contribution to the transformation of Ecuadorian education.

The national education system currently has 159,833 teachers, of which 15% have a fourth-level degree (specialization, master's degree and PhD.), 66% have a third-level degree, 13% have a technical, technological or pedagogical degree; and 6% are high school graduates, according to data from the Ministry of Education. The beneficiary population of these programs is public school teachers under 55 years of age, which results in a total of 21,191 teachers, distributed in the nine zones across the country.

### **3. URUGUAY**

#### **Background information**

Preservice teacher education in Uruguay is under the direction of the Education Training Council (Consejo de Formación en Educación, CFE) which is part of the National Public Education Administration (Administración Nacional de Educación Pública, ANEP). The CFE is in charge of teacher education and training of school teachers, highschool teachers, teachers at technical schools and social educators. The training programs provided follow the traditional teaching model, with the exception of some semipresence or blended learning programs that combine the use of digital platforms and classroom classes.

All these careers are organized in a variety of institutions, none of which has a university status. This means that all of the institutions created at different historical and political times, have focused on educating in teaching, leaving aside extension and research activities. As a consequence of this, teacher education and research on education take place at separate institutions and they do not necessarily feed each other's processes. The University of the Republic, the largest university in the country with 77% of university students of the country (MEC, 2017), does not offer graduate programs and degrees which enable teachers to find a position as school or highschool teachers.

It is important to highlight that while teacher education and training keeps on being fragmented in a variety of institutions separate from a universitarian context, a nationwide debate is taking place about the creation of a University of Education. This has been a profoundly political debate which has also generated a perspective for new paths in a variety of educational areas.

#### **ICT in preservice education**

Plan Ceibal ("Conectividad Educativa de Informática Básica para el Aprendizaje en Línea", Educational Connectivity/Basic Computing for Online Learning) is a connectivity plan, implemented in 2007 following the "one laptop per child" model. Every child and teenager who enters the Uruguayan education system (school and highschool), receives a computer for personal use with free access to the Internet. This Plan was created with the objective of introducing ICT in public education. Moreover, it provides connectivity to preservice teacher education centers throughout the country. It has also installed video-conferencing devices deploying a nationwide network. The Plan provides a digital mobile device to all students in their third year of preservice education and training programs. Also teacher educators in charge of the course subjects Informatics and Didactics have a mobile device provided by **Plan Ceibal**

As for the teacher education curriculum, the school teacher career offers a two year program in the area of ICT. The first year course is "Informatics". It focuses on more technical contents and it is geared towards the use of tools and devices. The second year course is "Education and ICT integration". It has been more recently created (2010) and it aims at teacher orientation. This subject allows for an opportunity to innovate on teacher education and ICT, which poses a great challenge to teachers in charge.



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Plan Ceibal, on the other hand, whose objective has been primarily to introduce ICT in public education in order to support public educational policies with technology, has taken a leading role in promoting teacher education and ICT throughout the country, with a varied set of programs and projects to be implemented at schools and highschools. But Plan Ceibal is not particularly oriented to preservice teacher education. Nonetheless, preservice students have benefitted from some of Plan Ceibal's initiatives.

A national survey carried out by the National Institute of Educational Evaluation (Instituto nacional de evaluación educativa, INEED) asks teachers about how they evaluate the preservice education and training they have received. More specifically, they are required to answer in terms of strengths and weaknesses they find in the preservice program. Clearly, school teachers consider that the strongest and greatest emphasis of their education has been placed on the subject matter contents (Math, Geography, History, etc.) and on the didactic contents. On the other hand, the majority consider that the weakest aspects of their education are in the area of educational management of the center, on teaching disadvantaged children or children with learning disabilities, and on teaching with ICT. The figures for those teachers who claim that these are the weakest areas are: 77% for public school teachers and 74% for private school teachers. The same holds true for highschool teachers: 71 in public and 73 in private highschools, consider that their education and training on teaching skills with ICT has been deficient. (INEED, 2015, p.18)

In the article Digital technologies: Analysis of initial teacher training programs in Uruguay, (Cabrera C., Cabrera A., Carámbula S., Pérez A and Pérez, M, 2018) the authors present a comparative analysis of syllabi in Initial Teacher Training (ITT) in the years 2005 and 2008. The study shows a setback between current programs and previous ones in reference to the place assigned to digital technologies (DT). It also points out the lack of common criteria in reference to the way DT are approached in different syllabi. Also, no clear connection is found between the subject Information and Communication Technologies and the other subjects of the ITT program.

A situation analysis carried out by CFE authorities, revealed that up to 2016, the state of affairs of ICT integration to preservice teacher education could be described as follows: there were a variety of courses and programs -courses that were part of the teacher training curricula, programs created by Plan Ceibal and other initiatives. All of them provided education and training opportunities. However, these courses and initiatives were not unified or systematized into a single approach or standard about which digital competencies they aimed at, or at the way ICT should be integrated to teaching. This left teachers in charge of preservice education with the crucial role of developing their own approaches and methods within the framework of the syllabi. A variety of programs and projects addressed different aspects of digital technology inclusion in a rather disperse and fragmented, uncoordinated manner. Hence, a new perspective emerged with a focus on convergence of programs and projects in such a way that there could be an integration of technologies into teaching practices. This would allow for generating new outlook into the curricula unifying criteria and aiming at the development of a competency-based approach.

As a result of this process, in 2016 the Department of Digital Technologies and Teacher Education was created with the objective of activating and coordinating the integration of digital technologies in teacher education and training programs, under the direction of the Education Training Council (CFE). In order to meet the stated objective, the task entrusted to this Department was the organization and management of technological media and human resources. Since 2016, this department has supported and developed research, extension and teaching initiatives throughout the country, with territorial anchoring strategies. Many lines of work have been developed within the framework of digital competencies of the National Institute of Educational Technologies and Teacher Training (Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado, INTEF) of Spain. The lines of work created to address students, offer workshops on a variety of topics, depending on the needs assessment of each center.

Between the years 2016 and 2019, two teacher profiles were created in order to develop the work lines of the above named Department: one at the national level and the other at the center level. The first profile, the digital technologies articulating teachers (docentes articulador de tecnologías digitales, DAT) conformed a multidisciplinary team promoting actions at a national level. The second profile, the digital technologies orientation teachers (docente orientador en tecnologías digitales, DOT) would work at the different training centers with both teachers and students, developing the work lines agreed upon by the Department, on the basis of a territorial anchoring.

It is expected that by the year 2020 a project be implemented with a new curriculum, with competency based graduate profiles, both for school and highschool teachers. In these careers there should be room for digital competency development for teaching.

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**Perspectives**

This state of affairs of ICT education up to the year 2016, in the case of preservice teachers, was consistent with the highly fragmented character of institutions, organizations and programs in charge of preservice teacher education. This situation has been recently addressed by the creation of the Department of Digital Technologies and Teacher Education.

A consensual national approach to ICT in education has not been attained yet. We can conclude that this is related to the historical development of teacher education in Uruguay, the current political debate around education, together with the prospect and the ongoing debate around the future existence of a university of education, would be important variables to explain why.

Today, it can be asserted that there is a process that intends to create an integrated approach, to the development of digital competencies in the teacher preservice programs offered in Uruguay. That is the objective of the Department of Digital Technologies and Teacher Education.

Some of the new challenges are related to 1)guaranteeing the cross-disciplinary character of digital technologies, 2)counting on qualified teachers for the new teaching curricula of the new plan, 3)fostering multidisciplinary teamwork with orienting teachers and 4)connecting theoretical knowledge imparted in class to practical implementation and teaching in the actual classes in the territory.

A cross-disciplinary approach requires two components: on the one hand it should begin by making the why and how of technology explicit in the curriculum; on the other hand, it means counting on teacher educators using the technology in their own teaching, beyond the disciplinary content.

It is essential that teacher educators of CFE be qualified to work on digital competencies in the different curricula, that they be able to transcend historically defined roles assigned to technologies (such as computer labs) and start working with other teachers, on the basis of multidisciplinary approaches focusing on shared and collaborative teaching practices.

The role of the orienting teacher is very important for the development of digital competency of the center; thus, the challenge is to create opportunities (team planning, team teaching, etc.) for subject teachers to develop digital competencies in their practices.

Last, but not least, connecting student practice to theoretical knowledge, both at a discourse and at an implementation level is key to the consistency of the teacher education and training program.

**4. POLAND****Reforms and the quality of teacher professional preparation**

At present, the Polish system of teacher education has been thoroughly reformed. The reform is connected with the transformations of the higher education system. There are two types of academic units in Poland, preparing students to become teachers, that is, state universities and higher schools with the academic or practical profile. The first ones focus on the research (mainly universities) but they also educate students (including pedagogical studies). Units of the other type are mainly focused on the development of specialists-practitioners. Unfortunately, despite formal differences, both profiles are often combined and complementary. The attempts to systematise, order or clearly divide them have been made during the recent years, mainly in 2018-2019, through the reform of the higher education system introduced by the Minister of Science and Higher Education, Jarosław Gowin. One of the postulates within the new solutions is to increase the emphasis on the research quality (selecting the top universities), also in the field of social sciences (including pedagogy), and to increase the prestige of teaching as a profession. The last postulate is fulfilled by limiting the rights to train teachers (mainly among the universities which do not carry out research in the area of pedagogy and which do not employ adequate scientific and didactic staff). In addition, certain specialisations, like kindergarten and pre-school education (first stage of education) have been considered as the key ones and, consequently, requiring a uniform, 5-year long programme (no division into the first and second education cycle: bachelor's and master's degree). As the reforms are being implemented, there is an ongoing debate over the future of the teaching profession and the pro-quality solutions that need to be introduced in the universities and state higher vocational schools, as well as the top selected private universities.

**Examples of academic courses: Information Technologies and Media in Education.**

Universities in Poland enjoy the high autonomy in developing their academic programmes aimed at educating the preservice teachers. Save for several subjects which are obligatory in every university programme, academic staff members responsible for developing and supervising certain specialisations control the quality of the course, the number of hours and content distribution. All courses have curricula which specify the course objectives, content, evaluation methods, literature and references to the National Qualifications Framework. The last element presents the unified learning outcomes described using the following categories: knowledge, skills and social competences.

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Universities usually carry out two courses for the prospective teachers, which may have different names but in most cases have similar content (as they follow the guidelines set in the above mentioned National Qualifications Framework). In the Pedagogical University of Cracow, which is the biggest public university focused on teacher education, these courses are: Information Technology and Media in Education.

The first subject (Tomczyk, 2019a) is usually taught in the first year of the bachelor's studies. According to the curricula and based on the learning outcomes, the purpose of the course taught in small, exercise groups is to provide knowledge about studying, professional work and personal intellectual development in the world of global information and communication, that is, to prepare the students to active functioning in the information society. The course also prepares the students to use IT tools during their studies and in their professional work to transform information (information search, selection, analysis and management) into useful knowledge – promote information literacy. The course also teaches how to use the IT and Internet tools in the professional work in a methodologically correct way, in particular to organise own workplace and cooperate with families and students, local and national government administration units and an interdisciplinary or a working team. Students also learn how to use IT tools, especially Internet, in self-learning (self-education). Other important aspect is raising students' awareness about the threats posed by digital media and Internet, and how to avoid them. The students who have completed the Information Technology course: know the terminology used in pedagogy and understand its origin and its application within the related disciplines such as media pedagogy; have advanced knowledge about the types of social relations and communication processes using traditional and modern means of communication; use the knowledge about the social relations to initiate and maintain interpersonal relations using the traditional and modern communication tools; are able to communicate in the traditional way as well as using modern technologies. They are ready to deepen their digital literacy. The course is implemented according to the European Computer Driving Licence (ECDL) standard and addresses the following topics: health and safety while working with ICT, text editors, spreadsheets, multimedia presentations and digital safety.

The Media Education or Media in Education (names used interchangeably) course prepares students to understand the mechanisms of media influence in educational settings and facilitates implementation of the selected applications in the teaching processes. The goal of the course is to: develop knowledge about the basic issues addressed by media pedagogy and related to the functioning of teachers and students in the computerised society; develop the ability to diagnose the threats posed by new media and the ability to implement software and websites in the didactic process. The learning outcome is also the knowledge of media as the means of a dual nature (positive and negative) and technical skills (operating dedicated software and e-learning portals (Tomczyk, 2019b).

Both courses are complement each other. Information Technology course focuses more on the technical aspects of ICT use whereas Media in Education has comprises of a very advanced skill component which allows to realise the opportunities paradigm in media pedagogy, that is ability to introduce hardware and software (including websites) into the learning and teaching processes. We should also point out that the curricula are constantly updated when new technological solutions or ICT-related social phenomena (i.e. e-threats) appear.

## CONSLUSION

Regardless of geographical location or cultural conditions, education of the preservice teachers in the transforming information society has some ICT-related elements (Potyrała, 2017). It is important to analyse the role of digital media in learning and teaching processes, as proved by the numerous research, conference publications, methodological meetings, re-organisation of the university programmes or educational strategies on the regional, national and global level. In many countries, media pedagogy has been also identified as a pedagogy sub discipline which analyses the issues mentioned in this paper (Kędzierska & Wnęk-Gozdek, 2015).

Using digital media in education is a complex process which involves the level of digital literacy of the preservice teachers, regional and national strategies to support implementation of ICT in schools and outside of schools, supplying schools and universities with hardware and flexibility of the academic staff in integrating IT innovations into their academic curricula (Eger et al., 2018). As shown in the analyses of the existing data from Dominican Republic, Ecuador, Uruguay and Poland, many areas still need some improvements. It is modernisation that drives the effective use of ICT by the prospective teachers. The ability to employ media in education depends on the users' habits, available applications and websites and economic challenges (education sector treated as priority) (Wyżga, Mróz, 2018). The data collected in the SELI project show that many countries, regardless of their geographical location, face similar challenges to the ones presented herein. In a relatively short time, due to the inevitability of ICT implementation in the education system, media pedagogy has become the sub discipline with a wide scope of theoretical assets and the growing number of research focused on the effectiveness of using ICT in schools. However, as we analyse these aspects, we should consider two opposing paradigms: risk (ICT-related threats) and



opportunities (greater teaching and learning effectiveness), which set the new areas of research and directions of modernisations within the education system (including the intentional training of the preservice teachers) (Pyżalski et al., 2019).

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