

Selected aspects of conditions in the use of new media as an important part of the training of teachers in the Czech Republic and Poland - differences, risks and threats

Łukasz Tomczyk¹  · Rene Szotkowski² ·
Artur Fabiś¹ · Arkadiusz Wąsiński³ ·
Štefan Chudý² · Pavel Neumeister²

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Abstract The paper presents the complex problems of preparation of pedagogy students to work as teachers in the context of their readiness to use ICT in the didactic process. The complexity of this subject matter has been proved by the current, ongoing, discussion about the direction of the expected transformations of contemporary schools and the prospective teachers education system in the age of prevalent digitization. Considering the complexity of conditions, the main research problem has been formulated as follows: Conditions of what type affect the preparation of prospective teachers

✉ Łukasz Tomczyk
Tomczyk_lukasz@prokonto.pl

Rene Szotkowski
Rene.szotkowski@upol.cz

Artur Fabiś
Af.gwsp@wp.pl

Arkadiusz Wąsiński
Arkadiusz.wasinski@gmail.com

Štefan Chudý
Stefan.chudy@upol.cz

Pavel Neumeister
Pavel.Neumeister@upol.cz

¹ Pedagogical University of Carcow (Uniwersytet Pedagogiczny w Krakowie), 30-060 Kraków, Poland

² Pedagogická fakulta Univerzity Palackého v Olomouci, Univerzita Palackého, Žižkovo nám. 5, 771 40 Olomouc, Czech republic

³ Wyższa Szkoła Pedagogiczna im. Janusza Korczaka, ul. Katowicka 2, 40-173 Katowice, Poland

to use new media in learning and teaching process?. Thus, the empirical analysis conducted in the paper focuses on the following issues: the style of using new media by students, identification of students' attitudes towards media, subjective (from the students' point of view) assessment of how university level schools are prepared to shape modern media competences among their students and self-evaluation of media and IT competences in the group of prospective teachers. Czech and Polish students, despite being the so called digital natives, do not present homogeneous styles of using new media. They also reveal different attitudes toward applying digital solutions to the didactic process. Factors such as: low evaluation of one's own competences or lack of evaluation in this area, lack of creative approach to the use of new media, lack of education in the area of new applications, lack of skills necessary to handle basic digital tools (e.g. interactive board, e-learning platforms) negatively affect, in most cases, the attitude toward the active use of ICT tools in future didactic work. On the basis of the gathered empirical data and inductive qualitative analysis a typology of students attitudes toward new media was developed. It consists of four categories: techno-optimist, techno-realist, techno-pessimist and techno-ignorant. The whole of analyses has the character of comparative research and involves two neighboring countries of the Visegrad Group: Poland ($N=466$) and Czech Republic ($N=168$).

Keywords New media · Students · Teachers · ICT in education · Czech · Poland · Universities · Curriculum

1 Introduction

Poland and the Czech Republic, as two biggest countries in the Visegrad Group, adopted in the mid-1990's a strategy of intensive inclusion of new information and communication technologies into their education systems. This process, though with different dynamics and in the atmosphere of new social expectations, has been continuously progressing what results in the steady equipping of schools with modern information laboratories. In the majority of schools, fast Internet connections became a standard element of their equipment, which in the previous decade was unattainable, and did not mean the higher quality of the whole educational process realized mainly in the traditional form. Change dynamics in this matter have been increasing along with information society development (Zacher 2005; Walotek-Ściańska et al. 2014). This process is considered in the following aspects:

- a) infrastructural – in the context of the rapid development of the global network of internet connections characterized by increasing data transfer capacity; equipment, connected with the creation of new generations of digital devices with improved functional, mobile and web capacities;
- b) software – connected with modern educational software adjusted to both stationary and mobile digital web devices.

Information society generates new forms of educational activity for children, young people and adults. New educational possibilities are, however, connected with unknown educational challenges faced by students, pupils and teachers. **From the**

didactic point of view, the undeniable advantage of digital devices (usually web and mobile and education e-applications) is not just a possibility to make the didactic process more attractive, but also to inspire one's own methodological search and support for the development of competences difficult to shape when based on traditional methods. The factor which initiated the consideration of inclusion of new information technologies into the didactic process is the developing life experience of the young generation of pupils and students for whom activity in cyber space becomes increasingly significant (Parola and Ranieri 2011).

This way information society permanently generates digitally mediated, new forms of activities addressed to children, youth and adults. However, new educational opportunities supported by services and tools of information society are connected with unprecedented challenges that pupils, students, teachers and - in wider perspective - institutions now face. Of course, the older generation of teachers (so called digital immigrants), though having totally different experience connected with the analogue world, is still becoming more and more aware of the social changes that occur and are, in turn, connected with changes of attitudes of the succeeding generations of pupils and students towards new media. This creates new educational needs and expectations which should be met by the teachers on practically all levels of school education. However, the effective implementation of information technologies requires from the teachers a readiness to abandon the traditional role of the practicing teacher who prefers expository methods, and instead to adopt the role of the teacher who coordinates and moderates the educational process rather than teaches textbook knowledge. The new role of teachers is connected with their openness to the new, subjective character of participation of pupils and students in the educational process which involves wide forms of formal education along with non-formal and parallel education. Thus, this is connected with combining the potential of pupils with the educational possibilities of new web media (Alvarez et al. 2013). The changes determined in the educational sphere are a source of new professional challenges for teachers, namely to improve media-information competences and the necessity to develop them in professional work.

The formation of the information society reality was one of the reasons why teachers who are new technologies enthusiasts started to search for innovative solutions in the realm of educational methodology. Along with the gradual changes in education practice, a number of research and scientific work were carried out. Their aim was to analyze the quality and scope of this process from the point of view of its meaning for cognitive and social development of pupils as well as reaching educational results. Since the beginning of XXI century in Polish (Juszczak 2003; Siemieniecki 2008) and Czech literature on the subject of pedagogy science (Kubiak 2013; Kubiak et al. 2011; Dincer and Sahinkayasi 2011; Szotkowski 2013; Kopecky 2006) one can notice an extreme growth in the number of publications on the issue of educational innovations that integrate the information and communication technologies. This period is also characterized by the application of new system solutions based on a mandatory inclusion of content from the matter of information technology into higher education curricula at social faculties – especially pedagogy.

According to the assumptions of social function based on modern ICT technologies, it is anticipated that there will be a continuous development of many ICT competences

in one's lifetime. The specific answer to socio-technological challenges is the education of new teachers prepared for the new school system reality (Ciolan et al. 2014; Ivanović 2014; Clift et al. 2001; Pantic and Wubbels 2010). However, this postulate causes problems concerning methodological and system solutions:

- What methodological solutions should be applied as patterns for realizing the subject *media in education*?
- What competences, outside of using digital devices and computer applications, should mandatorily shape university level schools¹ that prepare future teachers?
- In what way should academic curricula be constructed with consideration to the growing significance of ICT technology in modern society?
- Which of the applications should be considered in the canon of the basic content for the realization of subjects (courses) which substantially cover the content connected with practical abilities to use media (information technologies) in education and education for new media?

The above questions are strictly connected with the expected competences of academic teachers responsible for the preparation and realization of content included in the syllabus of *media in education* or similarly-named academic courses. In this case, new media are also a potential source of challenges that will have to be faced by the staff implementing the didactic process in pedagogy studies at universities. In this article the assumption was made that students of teaching faculties should possess knowledge in the following areas:

- a) technical-instrumental, connected with skills of ICT use and knowledge about the functioning of these devices;
- b) methodological, used for the realization of didactic courses with the use of ICT;
- c) organizational, referring to the organization and management of the didactic process supported by web communication and information technologies (Aesaert et al. 2015).

The above mentioned components of these competences also include the critical skills to receive the information included in new media (Morbiter 2007; Lee et al. 2015) and knowledge and proper methodological preparation that assures the safety of young people online (Pyżalski 2012; Tomczyk and Wąsiński 2014).

In this case, school practice is crucial not only in connecting the theory with teaching practice, but also to give students the opportunity to verify the methodological effectiveness of selected devices, applications, and digital materials, as discussed in, for instance, the subject *media in education*. Moreover, pedagogy students have the opportunity to verify their own experience of their favorite educational applications with the reception of the latter by school pupils in the classroom and to gain new methodological experience in the reality of direct educational contact with the pupils (Kynaslahti et al. 2006; SüleymanNihat and Göktaş 2014). This situation requires them

¹ University level education is realized in the Czech Republic and Poland after receiving certificate of secondary education (state exam at the completion of secondary school). Academic education in both countries can be completed in state and private universities, in stationary and non-stationary (weekend) mode.

to change their way of thinking to that of the pupil, and his/her educational needs and expectations. Preparation of authorial didactic lesson scenarios that include new information technologies is, in this context, a challenge that encourages creativity among students.

An interesting form of creating interest in innovative solutions in media education among pedagogy students are discussion forums moderated by the teachers who already have a certain professional experience in this field (Ryan and Scott 2008). In the Polish and Czech web space, there are numerous groups of services that touch upon the problem of media education addressed to beginning teachers and teachers with lower media-information competences. Their goal is to provide substantial support and inspiration for teachers to search for professional development independently. Internet forums of this type create and update the sources of practical knowledge and this has a direct application in work with a school class and non-lesson forms (Grynienko et al. 2013; Kołodziejczyk and Polak 2011; Knol-Michalowska 2013). They are attractive not only for teachers with higher seniority, who have a number of concerns regarding the use of new media during classes, but also for teachers who are just beginning their careers and are looking for effective educational solutions and their own teaching style.

New technologies, due to their properties such as: interactivity, stimulatory character, inclusive character (Walotek-Ściańska et al. 2014) favor encouraging teachers to conduct an open dialogue with their students, and to re-formulate the teaching process into the common discovery of different aspects of reality. Moreover, it shapes in students an attitude of independent search for information that interests them, of gaining and extending knowledge, shaping competences, and gaining the awareness of responsibility for the course and results of their own education (Ernest et al. 2014). Of course, the set of factors that are crucial for a complete transformation of the institutional education system is complex. Thus, the entire process should be analyzed from the perspective of a few decades. Nevertheless, the process involves system solutions with reference to curricula both on pedagogy studies as well as at social and humanistic faculties. The results and teaching content in the matter of media in education are currently becoming crucial categories for preparing students of teaching studies for didactic work. In this preparation new forms and work methods based on information technologies are used.

At present, Polish and Czech education system is slowly re-oriented in terms of systematic introduction of digital devices into schools as their equipment and including digital solutions in teaching. This re-orientation involves systematic supply of modern digital devices to schools, increasing teachers' competences in digital didactics and creating modern ICT-based learning environments. Change of universities' educational offer is also an important element. Academic centers refer to the requirements of contemporary times, tightly connected with the development of services and tools of information society. An example of these activities are numerous trainings in the area of digital didactics addressed to teachers and financed from the European Union funds or from teacher training budgets managed by school directors. The shift of paradigm which involves even more frequent engaging digital solutions in education is also revealed through the massive use of free e-books which change teachers' attitudes toward the digital resources. Institutions responsible for preparation of future teaching staff also undergo transformations. Developing information society forces academies that educate

prospective teachers to take the abovementioned technological and social conditions into consideration. This is done, among others, by current analysis of attitudes and skills of prospective teachers in the area of ICT. Changing well established patterns of didactic behavior at various levels of education system happens slowly but surely. One of the main factors - apart from the previously mentioned technological determinism that causes change in the Polish and Czech education systems - is the young generation of teachers who replace educators that exercise established behavior patterns. Thus, it seems interesting to analyze the attitudes toward the use of new media in educational process among the potential, prospective teachers.

2 Methodological note

The key aspect of the project “Externalities in the use of modern technical teaching resources and applications in learning as an important part of the undergraduate training of teachers in the Czech Republic and Poland - their differences, risks and threats”, which is financed by the Polish Ministry of Science and Higher Education and Czech Ministerstvo školství, mládeže a tělovýchovy was to carry out empirical research among Polish and Czech students of pedagogy studies with a special consideration to teaching specialties. The research was carried out over a few stages. The first stage was based on four study visits²: two in Poland and two in the Czech Republic. Their goal was to familiarize the researchers with the academic education system on pedagogy studies in both countries. During exchanges, the academic staff had the opportunity to participate in the study visits at schools, in which new media had been used for a few years in the educational process.

The research layer of the paper has been focused on the significance of new challenges for universities that prepare prospective teachers within the scope of implementation of digital media into the teaching and learning process. In this paper the main research goal has been formulated as follows: Conditions of what type influence the preparation of prospective teachers to use new media in learning and teaching process? Based on study visits, exchange of experience and curricula analysis, the following research questions of a comparative character were developed:

- In what way are new media used by students of pedagogical studies?
- What level of information-media competences is declared by students?
- What kind of attitude towards the educational applications of new media is presented by students?
- In what forms of their own activities do students use new technologies?
- What knowledge about media experience and preferences of the youngest generation of students (so called digital natives) do pedagogy students have?
- What kind of websites that support the education of students in primary schools, lower secondary schools and higher do pedagogy students know?

² The term ‘study visit’ means an organized visit in a educational institution in order to familiarize oneself with the didactic solutions functioning in that school. While preparing this article the authors visited those schools in Poland and Czech Republic in which ICT are used as one of the leading didactic tools. The visits were carried out in a manner that did not interrupt the didactic process.

- How do students evaluate the level of preparation of their academy (lecturers, curricula) in the matter of new media applications in the education process?

The research questions that were asked drew the attention of the researchers to the specifics of the process of implementing the multi-aspect new information technologies to the educational process in Poland and Czech Republic. The comparative expression determined in such a way was considered substantially appropriate due to the fact that both countries are similar not only geographically and culturally but also due to the level and pace of information society development (Koltay et al. 2011).

The research was carried out with the help of an online survey questionnaire prepared by an international team of academics from Polish and Czech universities. The tool was prepared in two languages. Questions and the tool design were validated through a pilot study. The questionnaire consisted of 35 questions and an imprint. Most questions were given a closed form with the use of a modified 5-level Likert scale. The tool also contained 7 multiple-choice questions and 5 open questions, which then underwent qualitative analysis. The universities included in the research were chosen intentionally, since there was a research assumption based on the comparison of education models in public (state or council) and non-public (social or private) systems. Such a choice made it possible to spot significant differences in the preferences of students studying in the stationary mode (daytime) and non-stationary (external, weekend). The questionnaire was anonymous, and the selection of the tested groups from particular academies was randomized.

The age structure of Polish and Czech students, which were included in the research, is presented in Table 1. The average age of students included in the research was around 23 years in the Polish group and 22 in the Czech group.

In terms of population, Poland (with 36 million citizens) is three times bigger than the Czech Republic (10,5 million). Similar proportions can be noticed among student population in both countries. Therefore, during random sampling the researchers tried to keep this proportion in terms of the number of respondents. The research in the Polish groups of students was carried out between October 2014 and January 2015 in Silesia and Lesser Poland regions. 466 questionnaires were analyzed. 86.44 % of those surveyed were women ($N=408$), whereas 13.56 % ($N=64$) were men. The research covered various types of university level schools such as the Pedagogical University of Cracow (45.02 %), The State School of Higher Education in Oświęcim (18.12 %) and one non-public school – Janusz Korczak Pedagogical University in Warsaw, Socio-Pedagogical Studies Department in Katowice (36.86 %). The majority of those surveyed were at the undergraduate level (62 %), whereas a master's degree was presented by 38 % of the respondents. More than 50 % of students had begun their first degree (master's – Polish *magister* or bachelor's – Polish *licencjat*). Among the specialties

Table 1 Age structure of the research sample

	Average	Median	Trend	Size-trends	Minimum	Maximum	Standard deviation
Poland	23.22	22	19	101	18	50	5.89
Czech	21.97	22	22	72	20	26	1.10

which were included in the survey, specialties connected with early school dominated (slightly over 15 %), followed by childcare (guardianship) pedagogy (slightly over 15 %), resocialization (12.29 %) and other specialties such as: professional consulting, childcare pedagogy and therapy and social work, occupational therapy, and health promotion and prevention.

In the Czech Republic, the research covered 168 pedagogy students at Palacký University of Olomouc. The research was carried out between December 2014 and January 2015. 74 % of those surveyed were women, 96 % were studying for their bachelor's degree. Those Czech students who took part in the research represented the following specialties: Czech language, history, health education, technical education, special pedagogy, and music and art education. The specifics of education in the Czech Republic differ significantly from Polish solutions, since the authority to teach sciences, environmental or technical studies is granted upon the completion of pedagogical studies.

3 Research results presentation

The comparison of the level and the extent of information technologies and education process on pedagogical specialties in both countries is connected with a necessity to consider the structural differences in the teacher education systems. Students of pedagogical studies in the Czech Republic gain a basic pedagogical education that allows them to be teachers of a particular subject. This kind of solution is connected with the separation of higher studies, whose goal is to gain teaching qualifications, from those that are carried out in separate departments within particular branches of science and are to prepare students for work within the specialization or to continue science work.

The systemic solution for teacher education in Poland is entirely different. It is based on the separation of the education of kindergarten teachers and the primary educational stage as well as educators of all specialties from education of teachers of particular subjects taught at further stages of school education. The first group mentioned study pedagogy as independent studies, whereas the latter group study within the departments that are connected with their branch of science e.g. mathematics, environmental studies, philosophy etc. They realize teaching specialties, which include in the curriculum the psycho-pedagogical content that is mandatory according to the regulation of the Ministry of National Education which determines the detailed qualifications that teachers must have. A solution of this kind is connected with the pressure on the education of students who, by choosing their studies, have afterwards the possibility to make decision about their potential training for professional work as teachers. However, they maintain the possibility of professional work in accordance with their specialty in the fields outside education.

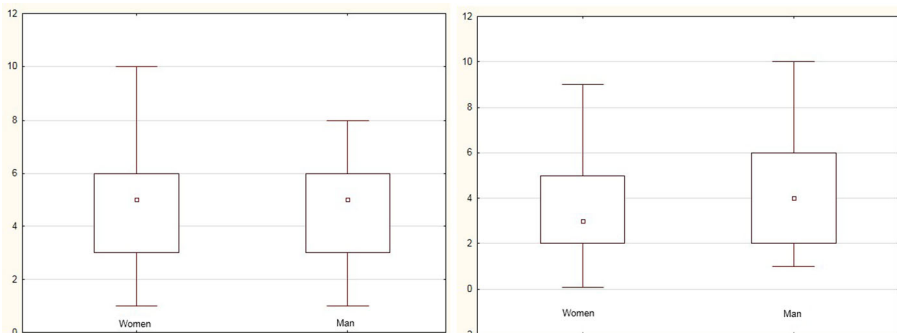
The structural differences connected with the entirely different teacher education system in both countries affect the cohesion of the teacher training process. Due to its organization the Czech preparatory model is integrated in pedagogical departments the principle of which is the homogeneous development of methodological actions in the school environment. However, in the Polish solution, this process is broken up as far as organization goes. Its practical organization is handled by departments that do not work together and that specialize in various branches of science, whose actions in the matter

of teacher qualifications are consolidated by legal acts but vary according to methodological solutions in their work with pupils. These two different visions of the organization of the pedagogical education system are connected with different images of students concerning the use of information technologies in practice and expectations from universities regarding the application of integrated solutions in the realization of higher studies curricula.

It should be mentioned that expecting the possibility of participation in modern forms of ICT-integrated education derives from the every-day media experience of modern students. People who do not use the Internet on a daily basis are very uncommon. In the group of Polish students, they account for only 11.65 % of the research sample, whereas in the Czech group – 7.9 %. Time spent on using new digital media in both research groups is similar. However, the median in the Czech group is slightly higher than in the Polish Graph 1.

The results obtained indicate that there is a range of factors that differentiate the understanding of the meaning of new media in the social and educational functioning of modern human by Polish and Czech students, and also the evaluation of one's own media-information competences as a result of the adaptation to the reality of the information society. The key differences are as follows:

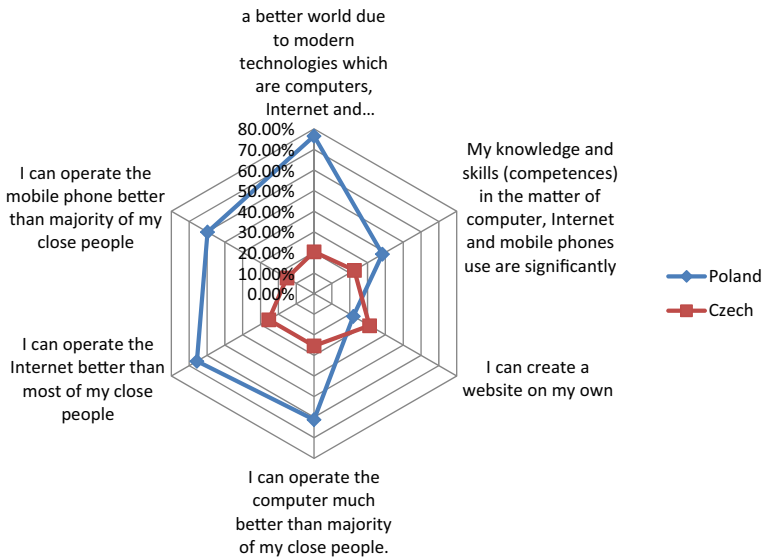
R1. The evaluation of one's own media-information competences is the criterion that differentiates both student groups most. Polish students give themselves much higher scores in this matter than Czech students. It should be underlined that the above mentioned evaluation includes the responses of students in regards to possessed competences which allow them to more or less freely participate in cyber space and their declared belief about their own level of technological advancement (level of competence) in the context of other e-users. Thus, in order to evaluate their own competences, two factors were taken into consideration: statements regarding what students can do (category A, Table 2) and how they evaluate their own competences in the light of the technological advancement of people from their social surrounding (Graph 2). In general, Polish students are convinced about their high level of knowledge and skills in the matter of information technology use. They claim that they are able to use computers, smartphones and other mobile digital devices and available Internet services



Graph 1 Time range devoted for everyday Internet use by pedagogical studies students in Poland and Czech Republic

Table 2 Evaluation of own media-information competences

Factors determining the readiness of students to apply didactic methods integrated with ICT		Yes		Not sure		No	
		PL	CZ	PL	CZ	PL	CZ
A	I submit music which I compose on the Internet, I submit my own pictures, blogs etc. to the web.	41.1 %	39.5 %	9.96 %	17.5 %	48.9 %	43 %
B	I experiment with new types of software	20.77 %	22.00 %	20.76 %	22.6 %	58.47 %	55.40 %
C	I'm afraid to use unchecked applications	57.42 %	52.00 %	20.97 %	26 %	21.61 %	22.00 %
D	Using new programs is difficult for me	33.68 %	25.40 %	22.25 %	42.9 %	44.07 %	31.70 %
E	Using new technical solutions (e.g. information equipment) is difficult for me	31.33 %	20.30 %	26.48 %	31.1 %	42.19 %	48.60 %
F	I can use the interactive board	44.70 %	56.40 %	28.82 %	22.6 %	26.48 %	21.00 %
G	I can use e-learning platforms (e.g. Moodle)	32.20 %	33.30 %	29.45 %	22.6 %	38.35 %	44.10 %
H	I will use modern technologies that support teaching without any problems	57.41 %	77.90 %	32.63 %	13.6 %	9.96 %	8.50 %
I	Teaching with the use of modern ICT is very interesting for me	34.11 %	68.90 %	48.94 %	23.2 %	16.95 %	7.90 %
J	In my opinion, during teaching supported by modern technologies (e.g. interactive board), students are more focused during a 45-min lesson than without the ICT support.	22.88 %	44.10 %	44.91 %	36.1 %	32.21 %	19.80 %
K	In my opinion, during teaching supported by modern technologies (e.g. interactive board) students are more involved during a 45-min lesson than without the ICT support	48.52 %	48.00 %	39.83 %	33.9 %	11.65 %	18.10 %
L	In my opinion, teaching with the use of new computer technologies makes it easier to focus students' attention on the topic of the lesson than in the traditional method.	73.73 %	77.40 %	18.01 %	15.8 %	8.26 %	6.80 %
M	Modern school needs modern information-communication technologies in order to support the learning and teaching process	79.88 %	71.70 %	11.01 %	19.2 %	9.11 %	9.10 %



Graph 2 The significance of influence of new media on social changes in the world and the evaluation of one's own media-information competences

faster than their family and friends. However, their evaluation changes in case of comparison with media-information competences possessed by modern children and youth. In turn, Czech students evaluate their competences much more critically which reveals that they are far more aware of their lack of knowledge about the use of modern technologies than Polish students.

- R2. The different perceptions of the meaning of the contribution of new media to the process of positive transformations in the modern world is the second criterion that differentiates both groups of students (Graph 2). The clue to the question was not the very statement that new media transform the social reality, which is hard to argue with, but the statement that these changes are evaluated positively. Thus, in times of the formation of the information society, the world is becoming better. Considering differences in evaluation of one's own competences, the attitude towards the quality of social transformations determined by technological progress deepens the differences between the two groups of students. In this context, there is a difference of attitudes towards new ICT technologies, which the authors of this research determine as techno-optimism and techno-realism. In their statements, Polish students express a techno-optimistic attitude. They almost unanimously claim that the world is becoming better due to modern media, which Czech students seem to argue with. Although they use new technology every day as is reflected in certain knowledge and skills in this matter, in the case of the positive evaluation of social transformations caused by technological progress they maintain a certain distance. Only a small percentage of those surveyed agree with this thesis. This leads to the claim that Czech students appear to be techno-realistic.
- R3. The third difference refers to the realistic media-information competences of students and verifies the previously expressed declarations in this matter. Polish students, despite the high evaluation of their own competences more frequently than Czech

- students, claim that using new programs and the next generation of digital devices is difficult for them (categories C, D and E – Table 2). This result implies that they are not so open to new technologies as was suggested in the declaration mentioned in point R1. This reluctance towards using new programs and devices causes a relatively low interest in educational software that is available online; however, even in this case there is a noticeable disproportion between the two groups of students. Only 55.51 % of Polish students declare that they know such services. The percentage indicator among the Czech students is much higher – 76.3 %.
- R4. Students show various levels of readiness to apply new technologies in school education practice. They present an opposite attitude towards educational practice supported by ICT than in the case of their self-evaluation of media-information competences, as was mentioned in point R1. With reference to the perspective of ICT use in school practice, Czech students become techno-optimists and Polish – techno-realists. Czech students show much higher readiness for didactic work supported by ICT than Polish students. There are characteristic differences in categories F, H, I, J in Table 2.
- R5. The fifth difference is slightly surprising in the context of the previous one, since it concerns the critical attitude of students towards the activity of pupils during lessons carried out in the form of teaching supported by ICT. As it turns out, according to a significant proportion of the students, using new technologies during lessons does not improve their concentration on the selected content. Moreover, their comparison to lessons realized in a traditional form turns out to be unfavorable.

The catalogue of similarities that occur in both groups of students is as follows:

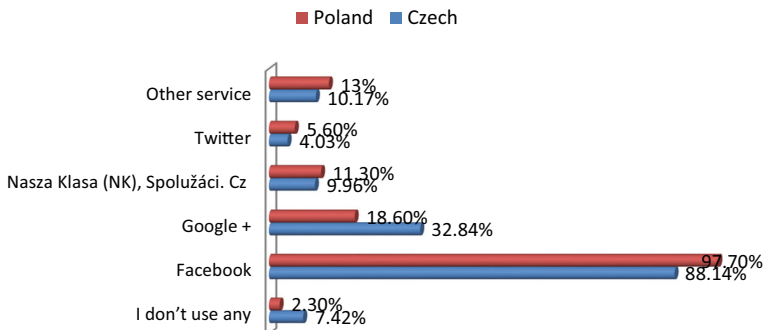
- P1. Students tend to be quite careful in the case of new and unknown applications. They consequently show concern connected with using such applications and, at the same time, are reluctant to experiment with them (categories A, B – Table 2). They prefer to work with programs that they are familiar with, that are predictable and will not lead to unwanted situations like loss of data. Taking such preventative measures may indicate a quite limited media-information competence level among the students. However, considering that their professional development goal is not IT but pedagogy, this prevention may be considered a careful methodological act with students in their future professional work. Before they use a random program or a device during the lesson, they will test it first so as not to experiment with the unknown didactic reality, but to meet their educational goals.
- P2. Czech and Polish students are characterized by a similar level of skills in managing their own website. Only a few of them declare having competences in creating websites with the use of CMS tools like Wordpress and Blogger (Graph 2). However, nearly half of them declare using the Internet to promote their own work in the form of blogs, pictures, music etc. (category A – Table 2). Although such experiences are not developed by about 60 % of pedagogy students, it should be underlined that they are an important area of activity which favors openness to new methodological propositions integrated with ICT. They are a part of the educational challenges of the twentieth century (Krejsler 2004), which clarify the expectations towards modern teachers to be not only consumers of the content available on the web. It is about the mental change in teachers, who should actively

create the online educational space for their pupils. It seems that this goal may be reached by developing the competences and gaining the experience independently along with the every-day use of ICT.

- P3. Similarities in both academic groups can also be observed in the matter of preferences concerning the use of communication tools connected mostly with participation in social media (Graph 3). Similarly to other Middle European countries, students claim to use them – the most popular among them is Facebook (Fichnová et al. 2012).

To communicate with others, the students also use the following types of software: Instagram, snapchat, viber, messenger, skype, whatsapp, fotka.pl, myspace, hi5, photoblog, pinger. Most of the services enumerated provide a content-and-form limited but quick communication with other users. Moreover, they give the possibility of entertainment, creating one's own image or establishing new relationships. Among the services and applications that were mentioned by a small group of students was also snapchat, which became a subject of discussion for educators devoted to the safety of children and young people on the web.

- P4. Polish and Czech students declare knowledge of the preferred forms of web activity of students from lower levels of education. 60.5 % of students of the University of Olomouc and 59.96 % of Polish students possess knowledge of the software and websites and the ways they are used by the younger generation. Considering that they are pedagogy students who connect their careers with working with children and young people, a conclusion can be made that the knowledge connected with the life style, needs and expectations of the young generation is a very important factor of an effective teacher. It allows a teacher to operate a common language referring to the experience of students and also to plan educational actions in a valuable and attractive way which would meet their expectations and shape their competences of safe Internet use.
- P5. Both Polish and Czech students evaluated the academic ICT infrastructure similarly – just as the level of preparation of lecturers for realizing didactic lessons supported by ICT (Graph 3). Nearly half of the students positively evaluated the infrastructure of their university (equipment with computers and software, fast Internet connection, access to the web in university facilities) as well as academic staff who realize

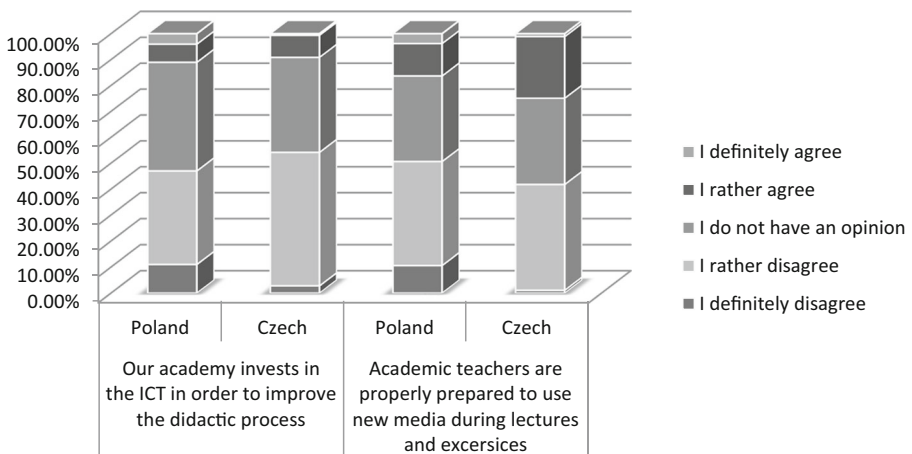


Graph 3 Attitude of students towards using social media

lectures indifferent subjects not connected with media in education. The results of students concerning the commonness of using ICT technologies (89.83 % of Polish students and 93.2 % of Czech students). The puzzling factor in this context is the almost equivalent number of people who keep their distance from evaluating both criteria, and the disproportion of results in the number of students who gave a negative evaluation to the level of preparation of lecturers concerning using ICT during lessons. Czech students were most critical and they were very much ahead of the Polish students. The most probable explanation for this disproportion is the critical self-evaluation of media-information competences among Czech students and better methodological preparation for realization of the didactic process at school with the use of ICT.

- P6. The similarities in opinions included in the research of students occurs also in the context of categories M and G (Table 2). The former is, in fact, a postulate to transform and adjust the school to the reality of modern learning based on an advanced education system, which joins solutions of the traditional forms of class-lesson education supported by ICT and alternative e-learning forms. The results indicated the mental openness of students to new technologies with a quite established awareness of their own deficiencies in the matter of media-information competences or teacher experience as indicated by the low experience of students connected with education in the e-learning formula. The relatively small number of students, both Polish (32 %) and Czech (33 %), declared their abilities to use an e-learning platform (category G). Favoring the continuation of the transformative process of the modern school derives mainly from the personal experience of students. The expectation of such change is connected with combining the traditional form of education with modern e-learning forms which promote learning at an individual pace, during independently-selected hours of the day, and a scope of content. Thus, it is connected with creating new areas of educational activity which are otherwise unknown to them (Graph 4).

The results analysis confirmed the following correlations of variables



Graph 4 The evaluation of the academy infrastructure in the matter of ICT and preparation of the lecturers for realization of the ICT-integrated lessons

4 Discussion

Table 3 presents an analysis with the use of the Chi-Square test and V-Cramer factor and an analysis of crosstab queries. According to the analysis, there is a high similarity in using new media, the attitude towards education supported by information devices and applications, and between Polish and Czech students. According to the analysis, students that:

- are afraid to use unfamiliar software do not experiment with those applications, what prevents them from being open to new technological solutions;
- do not experiment with new technologies are not able to properly evaluate their own competences connected with learning about the structure and function of new applications; thus, they are not really interested in new solutions concerning modern hardware and software versions;
- are not able to properly evaluate their own media-information competences by comparing them with the competences of their close ones who represent the younger media generation, usually evaluate themselves higher in the Polish group and lower in the Czech group, but the evaluation is inadequate to the individual creative activity realized on the basis of new media;
- are not able to properly evaluate their own media-information competences, are not able to determine the influence of media on the dynamics and course of socio-cultural and economic transformation in the modern world;
- are able to use the interactive board, much more often declare that the effective use of new technical equipment for educational purposes is not problematic for them;
- are able to use an interactive board, usually use an e-learning platform in the individually-organized self-education process;
- are able to use the interactive board usually declare that they will use new technologies in their didactic work when they become teachers;
- express the will to use new media in future professional practice are not fully-convinced about their positive influence on developing the ability of students to focus during the didactic lessons;
- declare the will to use new media in future professional practice are convinced of their positive influence on increasing the attractiveness of ICT-integrated didactic lessons, and on their increased involvement in active participation during lessons;
- declare the will to use new media in future professional practice also express the opinion that modern schools should develop modern forms of ICT-integrated education;
- confirm the higher quality of didactic courses carried out at universities, in which there are visible results of actions for the benefit of developing ICT-integrated didactic infrastructure;
- positively evaluate the didactic competences of academic workers at these universities, where there are visible results of actions for the benefit of developing the ICT-integrated didactic infrastructure.

Opinions expressed by Polish and Czech students allow to create a periodization of attitudes which reveal the attitude towards new media, and also readiness to use them in

Table 3 Correlations of variables obtained in four research areas

Research area	Poland	Czech
1. Ways of using new media by students		
There is a correlation between experimenting with new software and concerns connected with using unfamiliar applications	$X^2 = 69.19$. $df = 16$. $V = 0.194$. $p = 0.001$	$X^2 = 73.03$. $df = 16$. $V = 0.323$. $p = 0.001$
There is a correlation between the difficulty in learning about the structure and function of new software and experimenting with ICT technologies	$X^2 = 91.83$. $df = 16$. $V = 0.223$. $p = 0.001$	$X^2 = 24.11$. $df = 16$. $V = 0.393$. $p = 0.05$
2. Evaluation of own level of competence		
There is a correlation between the evaluation of one's own media-information competences compared to the competences of the representatives of the younger generation and an evaluation of the meaning of media in the process of the transformation of the modern world.	$X^2 = 63.77$. $df = 16$. $V = 0.186$. $p = 0.001$	$X^2 = 30.95$. $df = 16$. $V = 0.212$. $p = 0.05$
There is a correlation between the evaluation of one's own media-information competences compared to the competences of younger generations and an ability to create websites	$X^2 = 90.55$. $df = 16$. $V = 0.222$. $p = 0.001$	$X^2 = 52.93$. $df = 16$. $V = 0.274$. $p = 0.001$
There is a correlation between a lack of work carried out based on new media and not having one's own websites.	$X^2 = 26.59$. $df = 4$. $V = 0.240$. $p = 0.001$	$X^2 = 25.07$. $df = 4$. $V = 0.378$. $p = 0.001$
3. New media in the didactic process		
There is a correlation between the ability to use the interactive board and the evaluation of the level of difficulty of using new equipment.	$X^2 = 84.41$. $df = 16$. $V = 0.214$. $p = 0.001$	$X^2 = 43.36$. $df = 16$. $V = 0.248$. $p = 0.05$
There is a correlation between the ability to use the interactive board and ability to use an e-learning platform	$X^2 = 186.38$. $df = 16$. $V = 0.318$. $p = 0.001$	$X^2 = 56.57$. $df = 16$. $V = 0.285$. $p = 0.001$
There is a correlation between the ability to use the interactive board and the declaration of readiness to develop the skills in teaching supported by new media.	$X^2 = 114.53$. $df = 16$. $V = 0.250$. $p = 0.001$	$X^2 = 47.46$. $df = 16$. $V = 0.259$. $p = 0.001$
There is a correlation between a declaration of readiness to use new technologies in education and a lack of a belief about their favorable influence on the focus of the students during the lesson	$X^2 = 28.43$. $df = 16$. $V = 0.124$. $p = 0.05$	$X^2 = 74.59$. $df = 16$. $V = 0.327$. $p = 0.001$
There is a correlation between the declaration of readiness to use new technologies in education and a belief about their positive influence on students' attention during the didactic lessons.	$X^2 = 103.19$. $df = 16$. $V = 0.237$. $p = 0.001$	$X^2 = 83.47$. $df = 16$. $V = 0.344$. $p = 0.001$
There is a correlation between the declaration of readiness to use new	$X^2 = 125.15$. $df = 16$. $V = 0.261$. $p = 0.001$	$X^2 = 55.09$. $df = 16$. $V = 0.280$. $p = 0.001$

Table 3 (continued)

Research area	Poland	Czech
technologies in education and a belief about their positive influence on the attractiveness of the didactic process		
There is a correlation between the declaration of readiness to use new technologies in education and a belief about the necessity to implement them into the didactic process in the modern school	$X^2 = 114.96$, $df = 16$, $V = 0.250$, $p = 0.001$	$X^2 = 94.73$, $df = 16$, $V = 0.368$, $p = 0.001$
4. Preparation of the academy to educate the future educators with the use of new media		
There is a correlation between the academy investing in the didactic infrastructure integrated with new technologies and the range of their use in the didactic process by academy workers	$X^2 = 17.01$, $df = 4$, $V = 0.192$, $p = 0.01$	$X^2 = 18.11$, $df = 4$, $V = 0.323$, $p = 0.01$
There is a correlation between the academy investing in the didactic infrastructure development integrated with new technologies and the evaluation of effectiveness of their application in the didactic process by academic workers.	$X^2 = 241.89$, $df = 16$, $V = 0.363$, $p = 0.001$	$X^2 = 121.94$, $df = 16$, $V = 0.418$, $p = 0.001$

one's own educational and didactic work with students in the classroom. This periodization consists of four attitudes:

1. **Techno-optimist**, characterized by an enthusiastic attitude towards new media understood as sources of positively-evaluated transformations of life conditions of modern man, which have a positive influence on the quality and effectiveness of education. This attitude is connected with a belief that it is necessary to use ICT technologies not only in parallel, but also in institutional education. Of course, students who express this opinion have media-information competences, they are able to use applications and websites which are modern and attractive didactic sources, and they experiment with computer software and are not afraid of unfamiliar technological solutions. They also declare readiness for a continuous update of their practical skills of using new media for educational purposes.
2. **Techno-realist**, characterized by a certain distance towards new technologies, which does not mean a reluctance to modify their own style of working according to technological progress, but a careful, conscious openness to new possibilities which they carry. Such prudence stands in opposition to the thoughtless acceptance of everything that is new and unknown, but also to the rejection of everything that is new because of a sentiment towards traditional forms. A techno-realist needs to check the value of new media propositions, to test them in the context of their own

- criteria and expectations in order to accept or to reject them. Students who show this attitude are not able to evaluate their own media-information competences if they do not have the possibility to verify them in practice. Thus, very often they do so by comparing their competences with the competences of people from their surroundings. They do not want to discuss the influence of media on children and youth development being led by their own goals and educational functions. They expect empirical data in order to express an objective opinion. They are not interested in technological inventions and are neutral towards changes in that area. Techno-realists usually do not know the websites and software which may be used in the didactic process.
3. **Techno-pessimist**, characterized by a negative attitude towards new technologies and a belief that they are useless (in the moderate option) or unfavorable for human development and functioning (in the radical option). A techno-pessimist is not necessarily ignorant in the matter of knowledge and practical skills of media use, but he/she negatively evaluates the socio-cultural changes determined by technological progress. Thus, techno-pessimists may present a low level of media-information competence; in this case, they ignore new technologies in various areas of social and private life. Or they present a high level of competences; in this case, they have a need to convince other people about various types of e-threats. Students who express such an attitude are against using media in the educational process and consider them unfavorable for the intellectual and social development of students. In many cases, they have media-information competences to at least the average level, but they develop them only in selected areas of life. The dominant group in those surveyed were students who are not able to use the interactive board or modern online applications due to a lack of interest in such forms of education.
 4. **Techno-ignorant**, characterized by a lack of involvement in learning about new media. Such an attitude will be expressed through isolation from new information and communication technologies, the avoidance of learning about them and expressing opinions about them. Such students find it hard to understand the enthusiasm of supporters of new media due to their lack of knowledge about the latest technologies and the possibilities for using them in the didactic process. The lack of a clear evaluation of new-media-supported education causes ignorance and criticism towards any form of one's own technologically-supported development as well as towards using the latest technology in the education of children. A techno-ignorant person does not know much about how to use new information technologies and does not give themselves a chance to become familiar with them. They exclude themselves and potential students from participation in the information society and deepen their own lack of competences connected with IT, especially in comparison with techno-optimists.

Although Polish and Czech pedagogy students, according to their age, fall into Prensky's category of digital natives (Prensky 2001), they do not present a high level of media-information competence. The expectation that the younger generation of teachers considered to be digital natives would be leaders as far as the promotion of ICT-integrated innovative education methods are concerned, was inaccurate for a couple of reasons. Firstly, the progress of information technology is so fast that they

show the attitude of so-called digital immigrants which means a reluctance to experiment with new hardware and software because of the fear of unfavorable results of one's own creativity connected with data loss, sentiments towards previous solutions and functions adjusted to individual needs, and habits connected with using well-known software and hardware. As it turns out, there are many students among the surveyed groups, who present low and dissatisfactory level of competence in the matter of using basic office tools or online applications. These results correspond with research published by other researchers (Hatlevik and Christophersen 2013).

According to analysis of the research results, students within pedagogy faculties in both countries show many similarities in both the way they use information technologies and their expectations of a system of development of methodological solutions that integrate ICT technologies within the education process. These expectations refer to the education system at almost all levels – from primary to higher studies. Despite the differences in the level of competence of Polish and Czech students, all of them recognize the potential in new technologies and declare a readiness to develop their own teaching skills as far as the implementation of the available hardware and software solutions in the didactic process is concerned. Significant barriers of practical ICT technology use in the preparation of pedagogy students to use new media in future didactic work with pupils include these factors, as indicated by other researchers (Martinovic and Zhang 2012):

- Insufficient knowledge about the technical and methodological possibilities of applying ICT in didactic work in the school environment;
- Limited access to hardware sources at universities and schools, which reduces the possibility to develop media-information competence and gain didactic experience in that area;
- Ineffective use of new media or Internet services by the academic staff during classes which reduces the attractiveness and effectiveness of modern educational forms of work with a student;
- Stereotypical thinking about methodology integrated with ICT technologies, the course and results of such educational process;
- Non-constructive didactic experience of students e.g. derived from school practice, during which they did not have the possibility to use the ICT technology in the education process in direct contact with pupils.

5 Conclusions

The research results correspond with the conclusions of other researchers which indicate a certain regularity. The regularity is based on the fact that the consequence and quality of using ICT in the didactic process and gaining experience determine the greater readiness of teachers to implement innovative methodological solutions that connect the prepared forms of traditional work with a pupil with modern ICT applications (Peeraer and Van Petegem 2011; Valtonen et al. 2015). Thus, it is justified to construct curricula of pedagogy studies in such a way that would give students frequent contact with information technologies that would stimulate both their educational activity and methodological skills in working with students in classrooms. An interesting solution in terms of self-education of students is to

distinguish a topic path covering learning about new media as far as the equipment and applications are concerned, and – in the case of methodology - the preparation of innovative forms of didactic work with a student during pedagogical practice or study visits. The aforementioned solution determined a way of thinking as far as the academic education process is concerned, where there is a preferred change of emphasis from theoretical discussions concerning educational strategies with ICT-integrated technologies to practical forms of learning and working out one's own methodological solutions. Putting a stress on the practical aspects of shaping the individual didactic experience of students encourages them to independently search for the optimal forms of working with pupils based on their own media-information competences and habits of accommodating and adapting ICT technologies in self-education (Chai and Lim 2011).

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