



ICT-SUPPORTED EDUCATION AT CZECH AND POLISH UNIVERSITIES: A COMPARATIVE STUDY

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Abstract

The comparative study defines the terms electronic learning environment and smart learning environment with their components and contribution to university education. Moreover, it introduces identified trends that are expected to emerge in the next five years. The research on a representative sample of the University of Ostrava students and the University of Silesia students, which was carried out within the scope of the 7th RP IRNet project, was aimed at how the individual components of the electronic learning environment can be used, the reasons for their use and the related needs of students.

Keywords

electronic learning environment, smart learning environment, development trends, research of students' opinions and needs

Introduction

Electronic learning environment at universities provides university teachers and students with technical, information and pedagogical environment for effective study, research, administrative and leisure time activities. It contains several basic components which are being further elaborated in accordance with the development in the ICT field, general teaching theories, university pedagogy and andragogy, pedagogical evaluation in education and other fields. The diversity of this environment with the many naming versions (which sometimes lack clarity and even seem redundant) has led to the formulation of the assessment criteria and their implementation and further development. As far as the development of this environment at universities is concerned, the trend is to ensure its contribution regarding the quality and equality of study. In order to adjust it to the needs of the current “digital students” (Švaříček, Zounek, 2008) and to reach its new development qualities (such as the “smart learning environment” or the “personal learning environment”) a questionnaire research, the results of

which are presented in this article (it contains the results of Czech university students), was conducted in each of the nine countries of the research consortium. The questionnaire research was conducted within the scope of the 7th EU framework program called IRNet (*International research network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences*).

Generally, three main influences of ICT on education are postulated (Pickett)¹. These have the potential to be enhanced in some way via the use of some technology. Technology can be leveraged to:

- 1) Present content in a more effective or engaging manner.
- 2) Facilitate collaboration or interaction with/between students in a more effective or engaging manner.
- 3) Provide feedback, or to assess/evaluate students in a more effective or engaging manner.

Neumajer (2013) identifies several main trends in the development of ICT in education: cloud computing, a phenomenon when the students bring their own devices (BYOD – Bring Your Own Devices), freely available study materials and DUMs, reverse education, massive open online courses (MOOC), the creation of the personal learning environment (PLE) or electronic textbooks.

Electronic learning environments and their development versions and contributions

There are various designations for electronic learning environment, which can represent its development phases or its potentially or actually used functional possibilities.

eLearning environments (ELE) are most commonly associated with the LMS Moodle, which can save files containing study materials, realize communication between the teacher and the students and between students, plan studies, assign and evaluate tasks, evaluate other students, test, save study results, etc.

Some authors use the term “virtual learning environments” (VLE) or “institutional learning environments” (ILE). However, these are difficult to tell apart; in fact it can be said that the two terms refer to the same environment.

As far as the so-called “smart learning environments” (SLE) are concerned, the term should reflect the interconnection of pedagogy and technologies. In the smart environment, pedagogy is represented by learning and assessment paradigms, social factors and policy. Technology includes emerging technologies, innovative uses of mature technologies, adoption usability and standards, and emerging/new technological paradigms (open educational resources, cloud computing etc). This initiative is supported by the established IASLE (International Association of Smart Learning Environments), which also holds conferences.

Hwang (2014) summarizes the potential contributions of SLE in three points:

¹ Alexandra M. Pickett, Associate Director SUNY Learning Network (USA) <http://sln.suny.edu/>

- 1) A smart learning environment is context-aware; that is, the learner's situation or the contexts of the real-world environment in which the learner is located are sensed, implying that the system is able to provide learning support based on the learner's online and real-world status.
- 2) A smart learning environment is able to offer instant and adaptive support to learners by immediate analyses of the needs of individual learners from different perspectives (e.g., learning performance, learning behaviors, profiles, personal factors) as well as the online and real-world contexts in which they are situated. Moreover, it can actively provide various personalized support to the learners, including learning guidance, feedback, hints and learning tools, based on their needs.
- 3) A smart learning environment is able to adapt the user interface (i.e., the ways of presenting information) and the subject contents to meet the personal factors (e.g. learning styles and preferences) and learning status (e.g., learning performance) of individual learners. The user interface is not necessarily a conventional computer. Instead, learners can interact with the learning environment via mobile devices (e.g. smartphones or tablet computers), wearable devices (e.g., Google Glass or a digital wristwatch), or even ubiquitous computing systems embedded in everyday objects. Therefore, it is a challenging issue to adapt the user interface to meet the learners' needs in a smart learning environment.

Another way of approaching the ICT applications in education is the creation and use of the so-called "personal learning environments" (PLE). Schaffert and Hilzensauer (2008) argue that contrary to the traditional learning management systems (LMS), the PLE systems were very well received and have the potential to change the paradigm of education. They identified seven aspects which reflect these changes in the most significant manner. Briefly speaking, studying within the scope of the PLE leads to the following changes: (1) the student has the role of active and self-directing creator of the content, (2) personalization as a result of the information and support of the members of the particular community, (3) the study content as an immense "bazaar", (4) social involvement playing a key role, (5) the ownership of students' data, (6) the significance of self-organized study for the culture of educational institutions and organizations, (7) technological aspects of the use of the social software tools and the collection of various sources. Johnson et al. (2006) summarized some of the critical objections to LMS systems, one of which concerned the inability of many institution-based LMS systems to afford the opportunity of greater peer-based pedagogy.

Milligan et al. (2006) argue that the PLE uses tools that would allow the learner to:

- **Learn with other people:** manage and create relationships, forming connections between contacts that are not part of a formal learning network.
- **Control their learning resources:** allow them to structure, share, and annotate resources they find or have been given.
- **Manage the activities they participate in:** provide opportunities for them to create as well as join activities that bring together people and resources.

- **Integrate their learning:** allow them to integrate learning from different institutions and sources, re-using evidence of competency and making links between formal and informal learning.

According to Malamed (2014), “A personal learning environment (PLE) is a solution for keeping up with the rapid pace of knowledge change. Some say it is a concept, while others say it is a technology”. She offers the following definition: a self-directed and evolving environment of tools, services and resources organized by a person seeking a way to accomplish lifetime learning, to create, and to connect with others of similar interests. Because it is personalized, everyone’s PLE will be unique. Because it is collaborative, information may be continually created and shared. In the workplace, designing a personal learning environment has the potential to partially replace conventional courses.

According to other sources (IMAILE, 2015), the PLE are “systems that help learners take control of and manage their own learning. This includes providing support for learners to: a) set their own learning goals (with support of their teachers), b) manage their learning, both content and process and c) communicate with others in the process of learning”. The consortium of solvers of the project of the same name considers the following to be its main contributions:

- A personalized learning environment increases the students’ motivation and creates a learning situation where they can control their own learning at their own pace.
- It allows students to actively design their own learning strategies
- PLE enables better contact between student/teacher, and the education is less teacher-centered.
- PLE and modern technology together create a customized learning environment that suits the development of the 21st century classroom.
- The technology of today makes it possible to create PLE solutions which are developed to suit the demands from both teachers and students.
- PLE in combination with technical tools increase the students’ interest in STEM (Science, Math and Technology) subjects, which is important as there is a growing demand in STEM related professions.
- The young generation of today primarily learns by being interactive. This requires interactive classrooms with personalized ICT solutions.

Taraghi, B.; Ebner, M.; Kroell, C. (2012) describe the development of the PLE and the emergence of the specific solution based on the web 2.0 technology at Graz University of technology in 2010. The main idea in using a Personal Learning Environment is that there are many resources distributed on WWW that are driven in the learning process of the learners directly or indirectly. Nowadays universities and higher educational institutions provide their students with many online services such as LMS to enhance the learning performance and simplify the sophisticated learning process. At TU Graz a PLE has been launched that relies on mashup of widgets. Widgets represent independent resources, services and applications that are all integrated within PLE. Users can select widgets from a pool of widgets (widget store or widget boutique), arrange them as they prefer and configure them to their actual needs and

interests. As a result of the implementation of the solution, the number of its users increased by 400 % compared to the original version.

In 2004-2008, within the scope of the iCLASS project, which was part of the 6th EU framework program², the so-called intelligent and knowledge-based open educational system and environment adapted to students' individual needs were created.

In 2010-2014, within the scope of the iTEC project³, which was part of the 6th EU framework program⁴, six factors of the successful use of ICT in education were defined: 1) Access to reliable and sufficient infrastructure, 2) Appropriate school ICT policies, 3) Pedagogical and technical support of teachers, 4) Teacher, pedagogical and digital competence, 5) Positive attitudes at all levels toward change, 6) Suitable digital learning resources. The number of factors demonstrates the experience of many schools and countries concerning the necessity to solve a number of related questions (mainly the support and training of teachers) when implementing ICT innovations.

When describing the contribution of the ITEC project, Lewin and McNicols (2014) argue that during its course a number of prototypes of new tools have emerged for the support of education (e.g. TeamUp for dividing students into teams); for learning design (Scenario Development Environment (SDE), which takes into account the user's profile (e.g. the school level and subject) and which can recommend sources such as applications, actions, widgets and lectures); or for cataloging of study resources (The Widget Store).

Lewin et al. (2013) also summarize the influence of the project on the ICT application field: "Detailed meta-analysis of the evaluation data over the first three cycles of iTEC shows that there is a positive impact on *students*' knowledge, skills and understanding – in particular 21st century skills, their motivation, engagement and attitudes and their learning practices. iTEC has also had a beneficial effect on *teachers*, impacting positively on their technology-supported pedagogy, digital competence, and their motivation, engagement and attitudes. Moreover, iTEC is seen as scalable, having the potential to support pedagogical and technological innovation, to increase the effective use of ICT and to encourage experimentation with innovative technologies and tools" (p. 7).

The example of new tools is illustrated by the expected development in the field of "personal" or "smart" learning environments, which will be continually updated with these and other tools in order to become more integral and user friendly toward teachers and students. The annual NMC (New Media Consortium) Horizon Report: 2014 Higher Education Condition formulated six key trends in the field of university education. The first two of the so-called "rapid trends" and the sixth "long-term trend", which deals with the development of online education, are from our area of research. The trends are as follows:

- 1) Growing Ubiquity of Social Media
- 2) Integration of Online, Hybrid, and Collaborative Learning

² <http://www.scientix.eu/web/guestteacher> pedagogical and t/resources/details?resourceId=2918

³ <http://itec.eun.org/web/guest;jsessionid=AB1CBBA7B95A31E98EF78D7777C133A6>

⁴ <http://www.scientix.eu/web/guestteacher> pedagogical and t/resources/details?resourceId=2918

- 3) Rise of Data-Driven Learning and Assessment
- 4) Shift from Students as Consumers to Students as Creators
- 5) Agile Approaches to Change
- 6) Evolution of Online Learning

The significance of ICT tools in university education, which brings a certain degree of standardization of resources, is supported by the authors' critical view of underappreciation of teaching activities at universities. They argue that *“According to the Times Higher Education's World University Rankings methodology, research and citations account for 60 % of a university's score, while teaching is only half that. There is an overarching sense in the academic world that research credentials are a more valuable asset than talent and skill as an instructor. Because of this way of thinking, efforts to implement effective pedagogies are lacking”* (p. 26).

The LMS Moodle has been used at the University of Ostrava for almost 10 years. Therefore, it is logical that the respondents were evaluating this environment and working in it. The LMS Moodle is a system for the management of education, which – despite its relatively short existence – is unrivaled as it is the world's leading system of its kind in the field of school and business education. Therefore, we can argue that Moodle is the most widespread LMS system both worldwide and in the Czech Republic. Through this system the standard procedures, which occur in common education, are being continually electrified – these are mainly students' educational processes managed by textbooks and study texts.

Moodle enables the creation of simple courses, which consist of a collection of study texts, as well as the most elaborate interactive courses, which use all the available technologies that today's computers and eLearning offer. The creation of courses has six levels:

- 0) The course contains only the basic information about the subject, it contains no study materials, such a course is sometimes called an “empty” course
- 1) The teacher posts study materials (mainly texts and presentations) which the students can browse or download
- 2) The course contains communication instruments (discussion forums, chat, e-mail, blogs, etc.), which enable students to communicate with the teacher or with their fellow students and thus present their opinions
- 3) The teacher can manage the education process, assign tasks, test students' knowledge and evaluate them
- 4) The course contains interactive, multimedia and dynamic aspects such as animations, video sequences or computer simulations of the discussed phenomena
- 5) The teacher can manage the activity of individual students and individualize it; on the basis of the student's previous results, the teacher can, for instance, influence which tasks they should solve.
- 6) The students can actively add their own notes or resources to the study materials and thus modify the entire course.

Nowadays, the Pedagogical Faculty of the University of Ostrava mainly offers the level 4 courses and some level 5 courses.

The Faculty of Ethnology and Educational Science conducts research tasks in the field of pedagogy and ethnology. The staff conducts projects within both these disciplines. The faculty is situated in a border town and in the heart of multicultural Cieszyn, Silesia region is the main determinant of the research profile. The Faculty educates 3 000 students of pedagogy. The process of academic education comprises such courses as e.g. multi- and intercultural education, computer science and information technology. Students make use of the faculty distance learning platform, based on the MOODLE system, which enhances future teachers' preparation for applying e-learning in their work and for undertaking the function of a tutor.

Research on use of electronic learning environment by University of Ostrava and University of Silesia students

Research objectives

The subject of the research was the use of the electronic information environment (EIE) by the university students. The goal of the research was to collect and analyze data about the current situation concerning the use of individual components of the electronic information environment and learn whether it varies in various forms of study.

Research problem and research questions

The authors of the study formulated the basic research problem as follows: There are no relevant data concerning the University of Ostrava students' (RC) and University of Silesia's students' (PL) use of electronic information environment instruments, which kinds and why the students of the particular university use them and what their needs and expectations are as far as this area is concerned. The formulated research problem was further specified by the following research questions:

- 1) Which components of the electronic information environment do students use?
- 2) What are the reasons for students' use of the electronic information environment?
- 3) What could have a positive impact on students' activity concerning the use of electronic information environment and which parameters of the environment could influence this activity?
- 4) Should be students' personal needs taken into account when developing the sources of the electronic information environment? If so, which are they?
- 5) Which components of the electronic information environment can influence a student's choice of university the most?
- 6) In students' opinion, in which way could some of the instruments of the electronic information environment influence the planning of their study activities?

Research file and data collecting

The students of the Pedagogical Faculty of the University of Ostrava were the first part of research file of this research. All of the students were asked through a bulk email to fill out a questionnaire, which was compiled by a consortium of project solvers. 171 (5.4 %) out of the total number of 3161 students who studied at the Faculty in the 2014/15 academic year filled out the questionnaire in the Google electronic environment. Considering that students' participation in the questionnaire research was voluntary, the selection of respondents was random. Furthermore, considering the portion of the total number of students and the approximately same number of DA and CS students (1761 (55.7 %) DA students and 1405 (44.3 %) CS students are studying at the Faculty), the sample can be considered representative

In Poland, the research was conducted at the Faculty of Ethnology and Education (in Cieszyn) of the University of Silesia in Katowice. In total, the studies comprised 100 people. The respondents were students of pedagogy. What is not presented due to the homogeneousness of the group are the analyses taking into account the variables associated with the division of students.

Results and their interpretation

The research results were processed using the statistical program and are being presented in the order of the sequence of the research questions.

Research question 1 results: Used components of the electronic information environment

The students answered the question “Which information resources do you use most often when solving assignments, conducting a research, writing papers?” Yes or No in all of the 8 variants: 1) search engines (Google, Yandex, etc.) – a keyword search, 2) printed publications (books, journals, guidelines, etc.), 3) electronic scientific databases of the university library (the database of electronic journals, full-text electronic resources, etc.), 4) digital libraries on the Internet, 5) Open storages of electronic educational resources (repository, WIKI), 6) video channels (YouTube), 7) file sharing, torrent, 8) webinars, podcasts. The data presented in Graph 1 show the following:

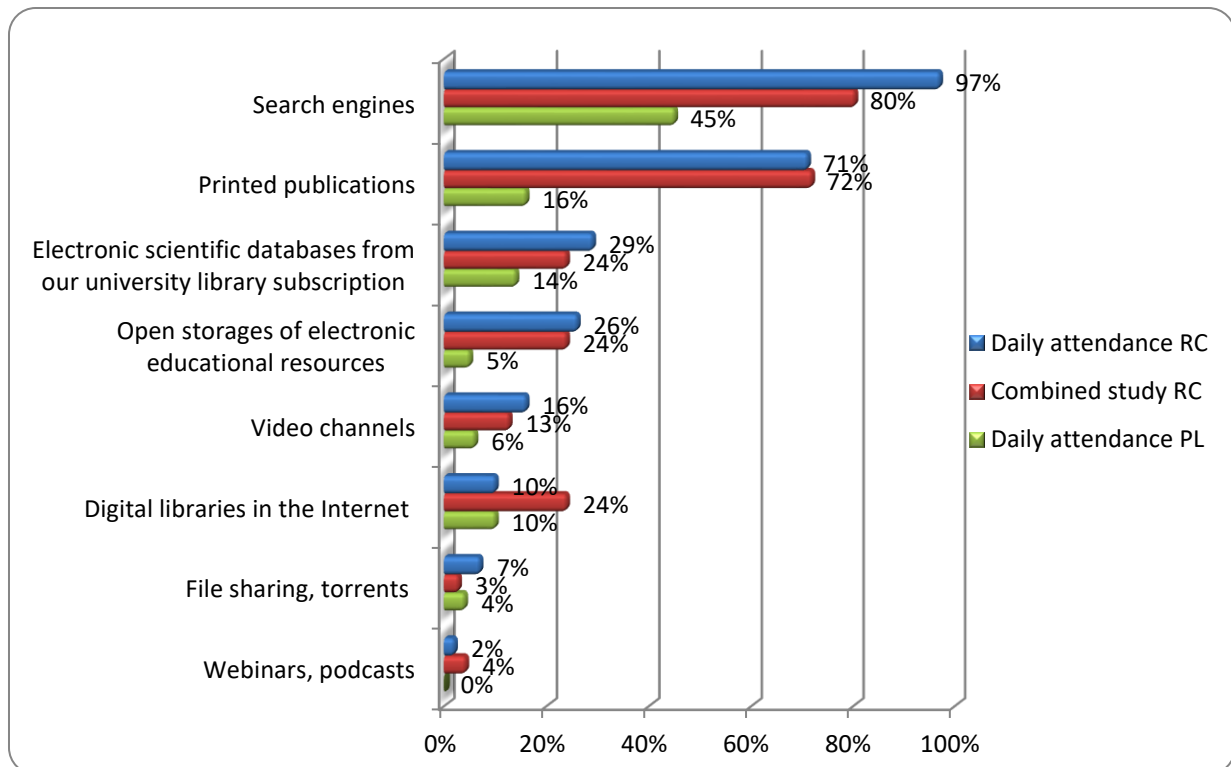


Fig. 1: EIP components used by university students in the Czech Republic and Poland.

Czech students

- largely use search engines in their work (90 % of students).
- they still work with printed publications (71 %).
- however, they use electronic scientific databases (26.9 %) and digital books (15.8 %) to a small extent. Every fourth student (25.1 %) uses stored data or saves their own data in open storages of electronic study materials. Every eighth student (14.6 %) uses video channels. Students hardly ever make use of webinars or file sharing.
- the DA students use the mentioned resources to the same extent as the CS students. The CS students work more with digital libraries and less with search engines. It can be said that the CS students have a more targeted approach to searching and using of study materials.

Polish students

- Comparing the data concerning the Czech Republic to the results obtained in Poland, it is worth noticing that in general the percentage of Polish students using internet resources for educational tasks is lower.
- Search engines (Google, Yandex, etc.) are used by 45 % of respondents.
- Printed publications (books, journals, guidelines, etc.) – by 16 %.

- Scientific database of university libraries (database comprising electronic journals, textbooks, full text resources, etc.) was indicated by 14 % of respondents.
- Open storage of electronic educational resources was indicated by only 5 % of the examined students.
- Video channels (YouTube) are not commonly used either – only 6 % indicated them.
- File exchange services (torrents) are not popular as well – 4 % of indications.
- Webinars and podcasts were not pointed out at all.

Research question 2 results: Reasons why students use the electronic information environment

Students answered to the question “Why do you (not) use those resources?” in order to learn the reasons for their (non)use of EIE instruments. The question could be answered by selecting one of the four offered answers: 1) I use them only if it is required by the teacher, 2) I use them because they make it easier to perform the tasks, 3) I do not use them because I don’t know how they could help me, 4) I do not use them and rather search for the alternatives on the Internet (e.g. massive open online courses, etc.). The data presented in Graph 2 (the results are classified according to the respondents’ form of study) show the following:

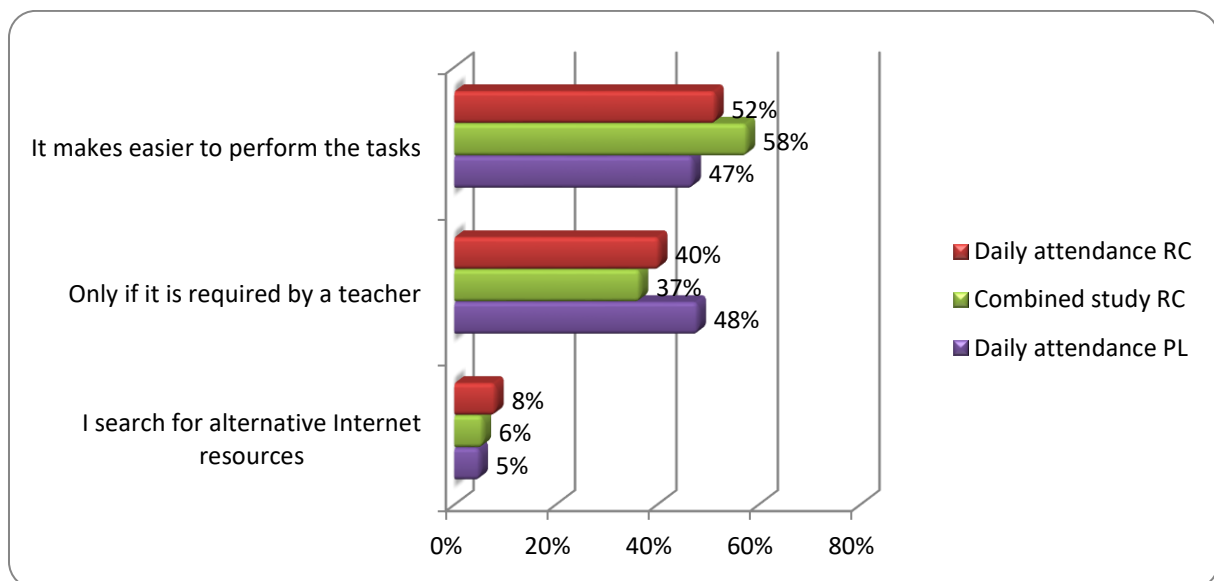


Fig. 2: Reasons for using EIP by students from Poland and Czech Republic.

Czech students

- For both forms of study, the EIE is used because it is required by the teacher (40.0 % and 36.6 % of students).

- The CS students use the resources more of their own will because they help them meet the requirements. Only one DA student stated that he/she did not use the resources and 5.6 % of the CS students search for the alternatives on the Internet.
- The similar number of both the DA and CS students states the reasons for their (non)use of the EIE instruments.

Polish students

- For 47 % of students from Poland, applying electronic educational resources is directly associated with assignments of the lecturer, who indicates such sources as indispensable for performing tasks.
- Only 15 respondents more (48 %) use these resources because of the benefits they provide in making tasks easier.
- A smaller percentage than in the Czech Republic (5 %) declares that they do not use electronic educational resources.

Research question 3 results: Factors potentially influencing students' activity concerning the use of the electronic information environment

The factors were being determined from the students' answers to the following question: "Which would be the two main reasons that would increase your interest in the active use of the university EIE resources?" The students were asked to choose two of the four following answers: 1) It would make you acquainted with the possibilities of their use, 2) Your using them would be reflected in your evaluation and grades, 3) It would enable you to perform assigned tasks at your own pace, anytime and anywhere, 4) It would help you find more diverse electronic resources. The data presented in Graph 3 show the following:

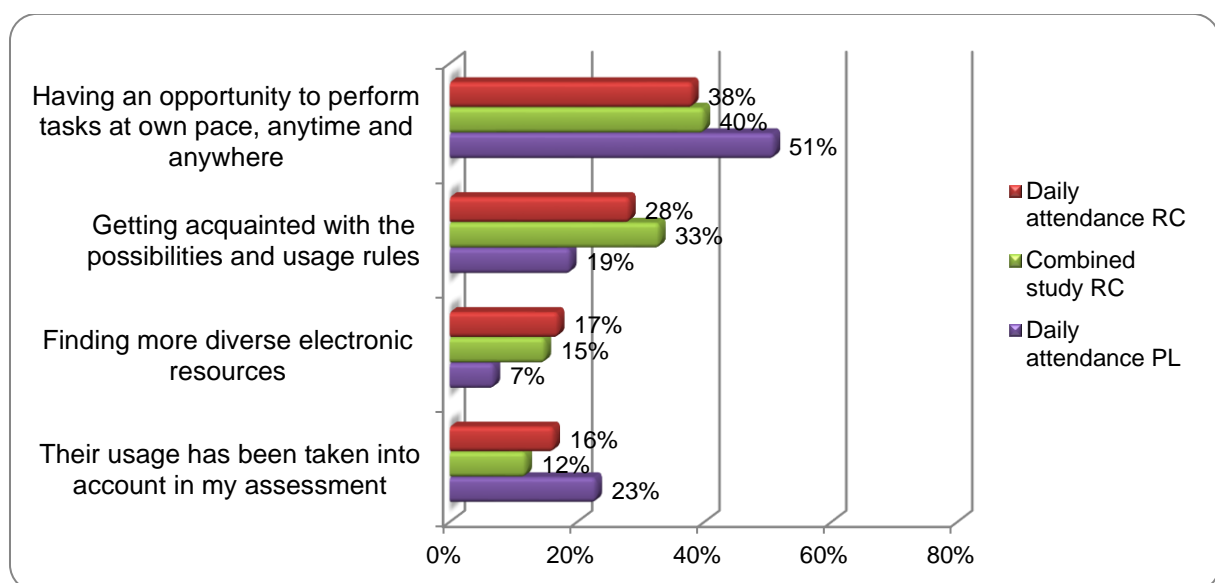


Fig. 3: The reasons of more active use of EPI indicated by students from Poland and Czech Republic.

Czech students

- Nearly 39 % of the 252 reasons stated by the students was the possibility to perform the assigned tasks at their own pace.
- Next in line (30 % of all answers) was the opportunity to become acquainted with the possibilities and advantages of their use. The remaining two reasons accounted for 15 % and 16 %, respectively of the answers. Therefore, one of the main advantages of the EIE was confirmed: a student's time flexibility when using it.

Polish students

- Also among Polish students the most frequent answer was making it possible to fulfil tasks in one's own pace in a more comfortable way – 51 % of declarations.
- Much more significance is attributed by Polish students to the situation associated with evaluation – 23 % indicated this as significant.
- For 19 %, it is important to be taught how to use properly the electronic resources of the university.
- The fewest (7 %) focused on the issues concerning the amount and diversification of the resources.

Deciding about the more active use of the EIE resources is connected to students' opinions on the functionality or availability of its instruments and components. The respondents could choose one of the six provided answers which would signal their preferred indicator for assessing the EIE: a) availability of Wi-Fi access points, b) opportunity to use their own gadgets, c) availability of electronic educational resources in different formats (video, audio, hypertext, etc.), d) university website with relevant information and easy navigation, e) availability of distance support for individual subjects (tasks in electronic form, electronic journals, course website or Moodle), f) immediate feedback from the teacher. The data presented in Graph 4 provide specific results:

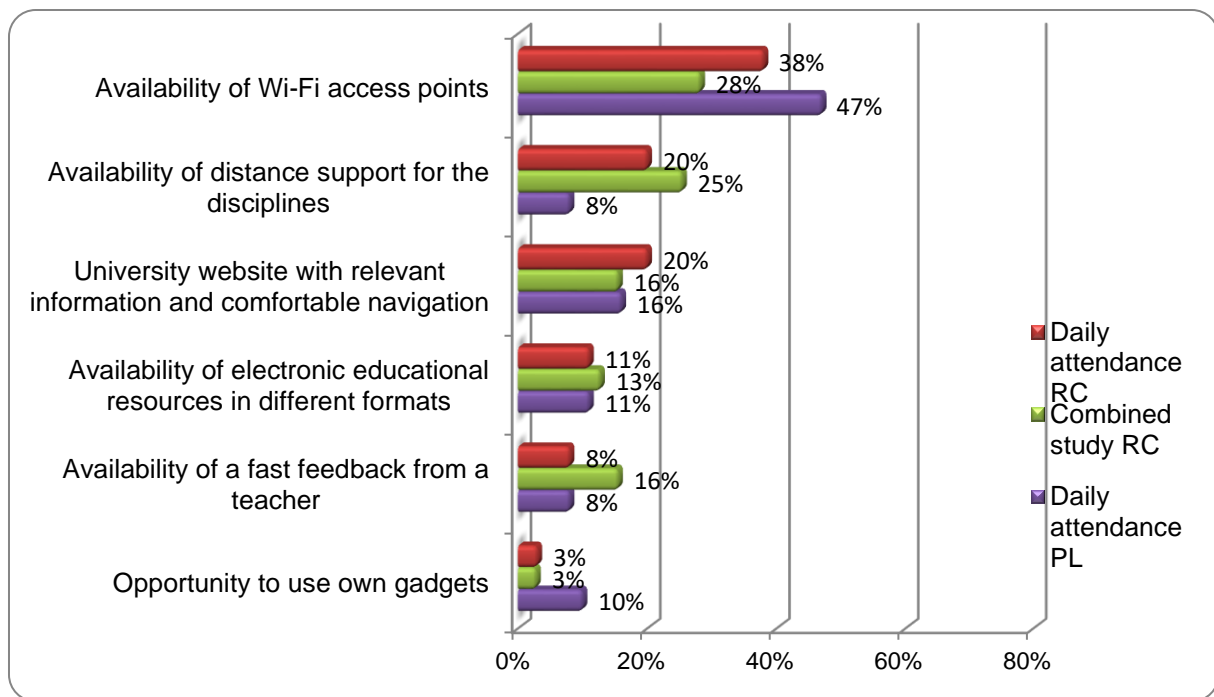


Fig. 4: Criteria of applying EPI by students from Poland and Czech Republic.

Czech students

- Students mostly prefer the availability of Wi-Fi access points (38 %), then the availability of distance support, e.g. in the form of Moodle (22.2 %), and a quality university website.
- The DA students, who spend more time at school than the CS students, find the availability of Wi-Fi access points more important than the CS students.
- The CS students, on the other hand, prefer the availability of distance support and immediate feedback from the teacher. It can be said that the CS students are more interested in the specialized EIE instruments than the DA students.
- Male students find the availability of Wi-Fi access points more important than female students and at the same time find the availability of distance support and immediate feedback far less important.

Polish students

- Students from Poland indicated the significance of Wi-Fi accessibility more often than students from the Czech Republic (47 %).
- Only 8 % of students from Poland pointed at the importance of the availability of electronic educational resources in various formats.
- For 16 % it is significant how the university website has been prepared – as regards both the information comprised here and the easiness of its use.

- The availability of distance support (tasks in electronic form, e-journals, websites of particular disciplines or distance learning system Moodle, or another LMS system) was indicated by 11 % of respondents and slightly fewer (8 %) indicated the significance of teachers' fast feedback.
- More Polish than Czech students (respectively 10 % and 3 %) indicated the possibility to use their own gadgets.

Research question 4 results: Students' personal needs concerning the EIE

Through the Yes/No question it was being determined whether or not "Should teachers take into account students' needs and interests while creating resources in the electronic environment (presentations, websites, tests, video lectures, etc.)? The question focused on learning the students' possible expectations concerning the creation and use of personalized/adjusted resources created by their teachers – the "No" part of the answer had a postscript which read "I can use the resources myself according to my needs" and the "Yes" part had a postscript that read "They should provide me with the resources adapted to my needs". Which resources adapted to their current needs the students would welcome in the EIE was learned from the additional question with 4 possible answers: a) foreign language study, b) acquiring another profession, c) information about start-up companies and the students' own business options, d) other.

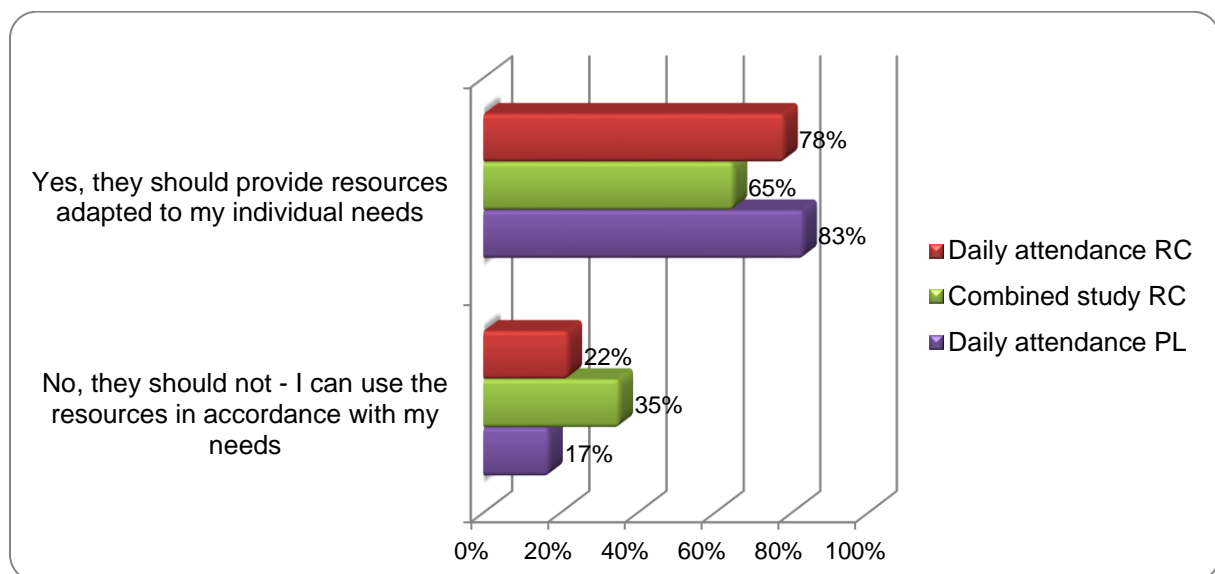


Fig. 5: Needs of EDP students from Poland and the Czech Republic.

The data presented in Graph 5 show the following:

Czech students

- Nearly two thirds of students (72 %) would welcome if the educational resources were adapted to their own needs. Male students would welcome this option even more (77 %).

- 78 % of the DA students answered this question in the affirmative. On the other hand, only 65 % of the CS students answered this question in the affirmative. The difference can be interpreted as follows: the CS students choose their own study resources, they are used to them and do not expect their teachers to create resources adapted to their needs.

Polish students

- Students from Poland more often pointed at the significance of individual treatment taking into account their needs and interests – 83 %. This aspect has no significance only for 17 %.

As far as the choice of possible additional study resources is concerned,

- 57 % of all Czech respondents would welcome resources for the study of foreign languages, 48 % for the acquisition of another profession, and 18.7 % for the information about start-up companies and their own business options. Due to their job responsibilities, the CS students are less interested in the information resources about other job possibilities and their own business options than the DA students.
- Most frequently, students from Poland pointed at the need for introducing additional educational services in learning foreign languages (44 %). Slightly more rarely, they chose the answer associated with obtaining an additional profession (36 %). What is important for 20 % is the information about newly created firms and the student's own firm.

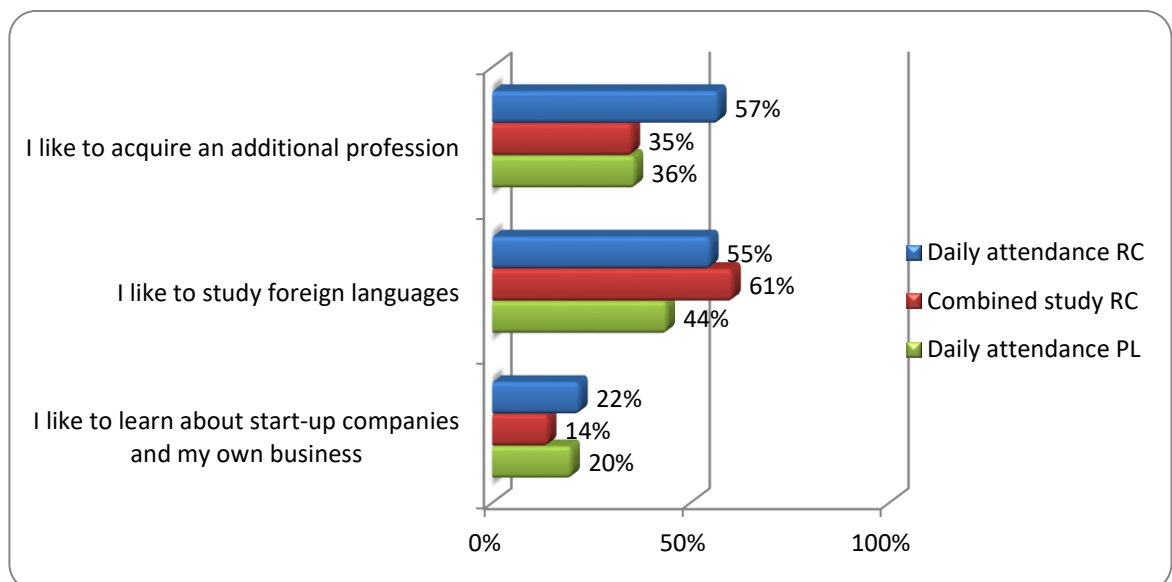


Fig. 6: Additional services within EDP indicated by students from Poland and the Czech Republic.

Research question 5 results: The EIE components potentially influencing the students’ choice of university

The main point of determining which EIE components of a particular university the students find the most important when choosing a university was to learn the students’ specific expectations concerning study conditions and the quality of the educational environment. The respondents were instructed to choose the most important of the following answers: a) university massive online courses, b) an attractive and user-friendly university website, c) university social network, d) transparent presentation of the university teachers’ achievement on the university website (awards, publications, etc.), e) transparent presentation of the university students’ achievements on the university website (awards, publications, etc.), f) information about successful university graduates and their achievements, g) collaboration of the university with schools, kindergartens, educational centers, firms, etc., h) participation of the university in social activities and cultural life (volunteering, charity concerts, exhibitions, etc.).

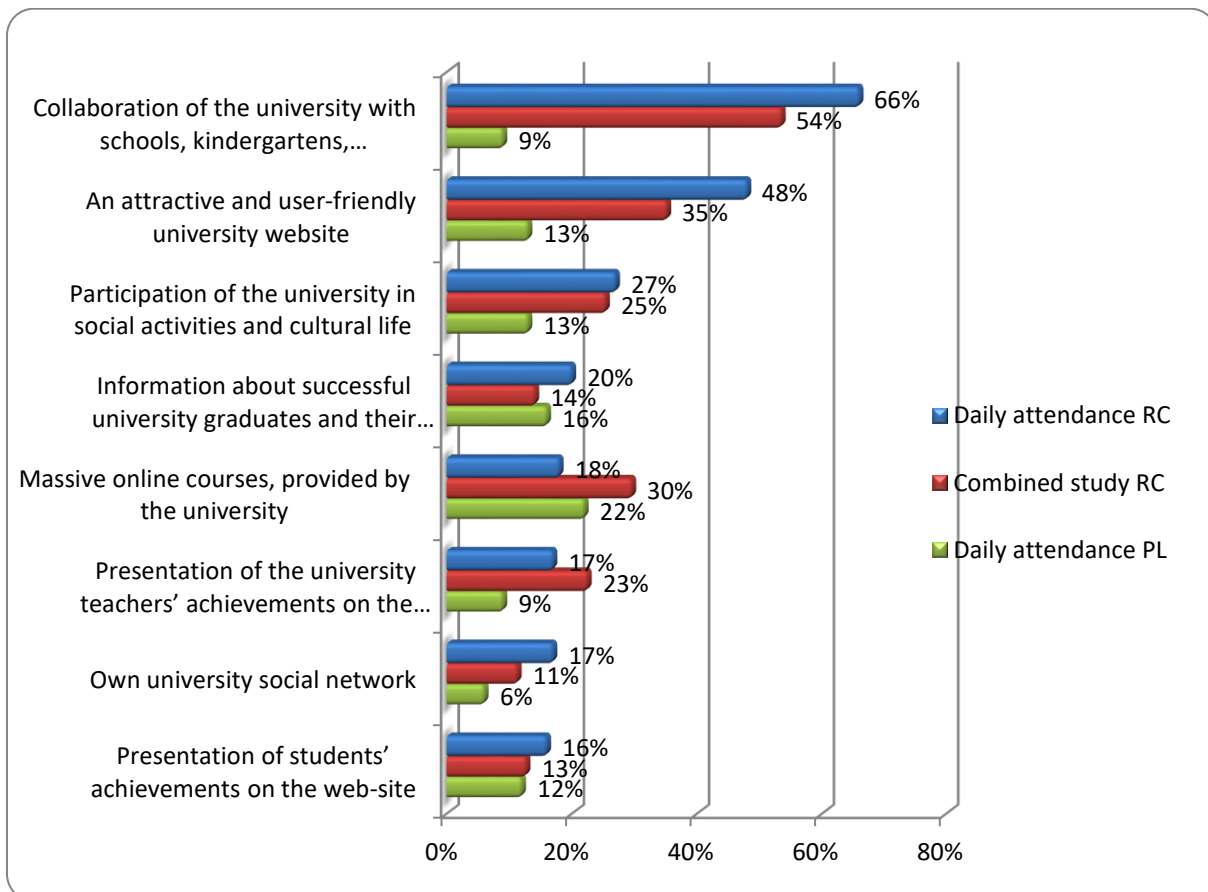


Fig. 7: Potentialities of EPI as the basis for choosing a university indicated by students from Poland and the Czech Republic.

Czech students

- It is surprising that the largest portion – 27.8 % - of the entire number of respondents' answers (374) representing their opinion on the influence of the factors on the choice of university was represented by the information about cooperation of the university with lower level schools. As far as the number of students who stated this factor is concerned, the portion is 60.8 %. It can be the result of 83.6 % of the research sample students studying in the teacher study program. 62.2 % of the teacher study program and 53 % of the specialized program students considered this factor to be the most important.
- An attractive university website is the second most important factor (19.5 % of all answers) followed by the participation of the university in social and cultural activities.
- As far as the DA students are concerned, the portion of answers preferring the influence of information about the cooperation of the university with lower level schools is higher (32.7 % of all answers) than the CS students' (29.9 % of all answers). Moreover, the DA students also appreciate the significance of an attractive university website more than the CS students.
- On the other hand, the CS students – as expected – stress the importance of the university massive online courses, the presentation of the university teachers' achievements and the participation of the university in social and cultural activities.

Polish students

- Students from Poland significantly more seldom indicated particular forms of the information space as determiners of their choice of a particular university level school.
- Most frequently (22 % of all respondents), students pointed at implementing online courses at university.
- Students' successes described in the information space are treated as important by 16 %. 13 % of indications appeared in the case of two answers – an attractive university website and functioning of the university own social network.
- Presenting the issues of social life and implemented activities (e.g. associated with voluntary service or charity actions) were indicated by 12 % of respondents.
- Students from the Czech Republic most frequently pointed at the presentation of cooperation between the university and schools, kindergartens or other environments which might hypothetically offer work for graduates (over 60 %), whereas this answer was indicated only by 9 % of students from Poland.
- The same number of indications appeared in the case of information concerning achievements of graduates.

Research question 6 results: Students' opinions on the influence of the EIE on the planning of their study activities

Determining these opinions can be interesting from the point of view of time management, which is – with regard to the preparation of the majority of students for the teaching profession, which requires not only management of one's own time, but also of their students' time – a significantly important skill. The answer to the research question was obtained through the processing of four proposed answers to the questionnaire question “Would the information technology instruments (electronic diaries, planners, calendars, reminders, etc.) help plan students' educational and extracurricular activities?”. These are the four possible answers: a) no, they would not have a significant influence, b) yes, they would help me significantly with organization, c) my study activities are adequately coordinated by teachers and administration, d) I already use the tools, but I do not find them helpful.

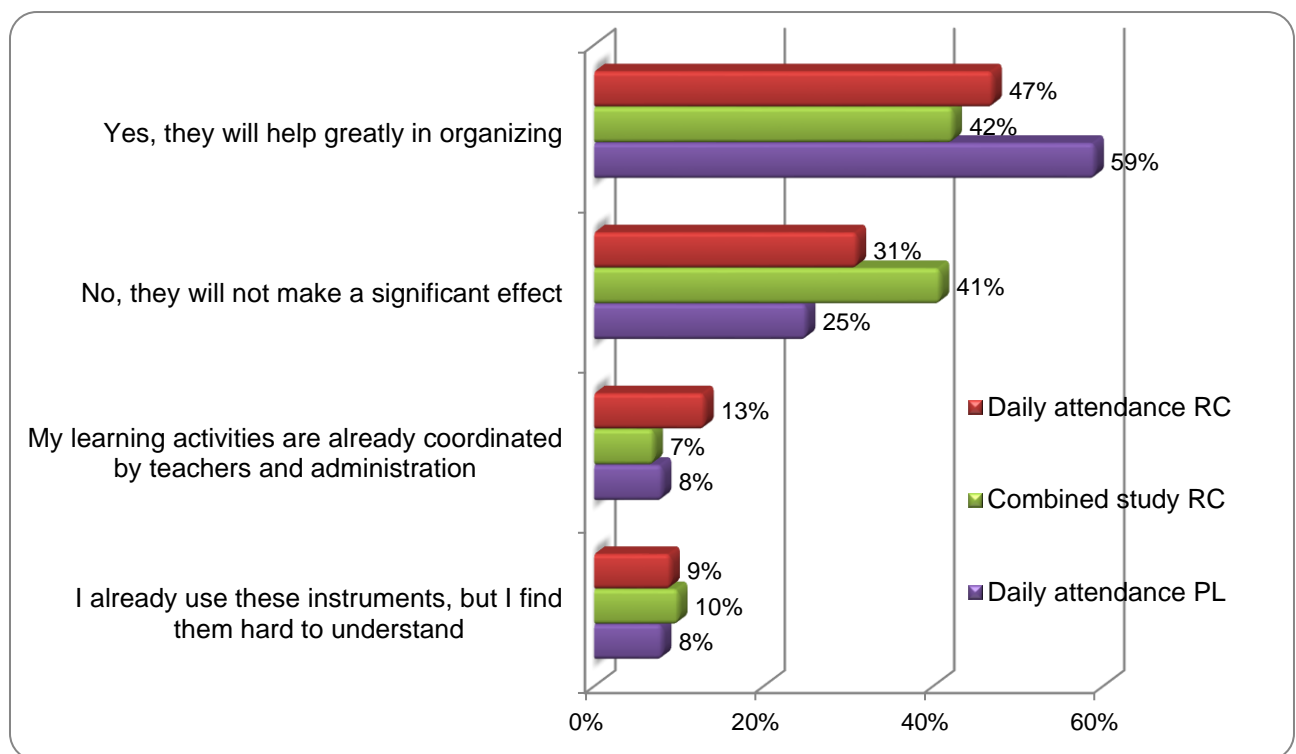


Fig. 8: Potentialities of EPI as the basis for planning indicated by students from Poland and the Czech Republic.

Czech students

- Nearly half of all the Czech students (45 %) think that the EIE instruments will help them in the planning of their educational and extracurricular activities.
- The CS students are more skeptical – every fourth CS student believes that the EIE instruments will not help them with time management. The fact that they have already chosen other possibilities such as classic recorders, diaries, etc. and do not intend to change their habits may be one of the reasons.

- Every tenth female student is not using the instruments yet, but 46.8 % of them are contemplating using them (more than male students).

Polish students

- The last question subjected to analysis concerned planning the own educational activities with the application of EPI. Both students from the Czech Republic and Poland (59 %) most often claimed that these tools helped them in organizing the educational activities which they implemented.
- However, for 25 % of respondents from the University of Silesia this has no significant influence.
- The other answers were indicated by 8 % of the respondents, who confirmed that their classes were coordinated by the teacher and that they already used these instruments – yet they were not significant for the examined students.

Conclusion

The aim of the comparative study was to find out (based on the questionnaire research results) if or to what extent the answers of the Czech and Polish students to research questions differ.

- Students from Poland did not use the Internet as an information resource as often as students from the Czech Republic.
- Students from Poland used ICT as a result of encouragement from teachers more often than students from the Czech Republic.
- Students from Poland stated the possibility to solve the assigned tasks at their own pace, anytime and anywhere to be the reason for the more frequent use of ICT more often than students from the Czech Republic.
- Students from Poland indicated the significance of Wi-Fi accessibility more often than students from the Czech Republic
- Students from Poland more often pointed at the significance of individual treatment taking into account their needs and interests than students from the Czech Republic
- As far as additional resources are concerned, students from Poland and the Czech Republic would prefer if they could use them when learning a foreign language.
- When choosing a university, students from Poland would take into account its selection of online courses more often than students from the Czech Republic. On the other hand, students from the Czech Republic considered the cooperation of the university with educational practice and a high quality website to be more important.
- Students from Poland expected ICT to help them plan and organize their educational and extracurricular activities more often than students from the Czech Republic.

The research results can help academic scholars evaluate the possibilities of influencing university students, particularly their use of ICT and its tools in education, their information needs and encourage them to use ICT applications for both study and extracurricular activities. This would help improve the level of the so-called digital literacy of university students, which is and will continue to be desirable and even necessary in professional life. The comparison of the questionnaire research results of students from two universities in two geographically close countries identified certain differences in the “digital behavior” of university students, which can be explained by either random factors resulting from different structures of the two researched groups or other factors, e.g. the length and content of students’ entry preparation concerning the use of ICT in education, the availability of ICT at the university, or students’ own ICT devices (and as far as the Czech students are concerned, also the form of study). Using statistical analyses, subsequent researches will examine the possible impact of those factors on larger research samples.

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