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The use of ICT tools in the communication between students and academic teachers

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Abstract

The growing popularity of information and communication technologies has a significant impact on the way that academic teachers perform their duties. However most of the publication are limited to the applications of ICT in teaching (multimedia, e-learning, etc.) and to the obstacles hindering the application of these solutions in practice. The issues related to communication itself are rarely raised. The aim of this paper is to examine the available possibilities of using Information and Communications Technology (ICT) in the communication between students and academic teachers, together with assessing the usage rate of individual solutions. Communication here means not only as an exchange of information, but also as access to important announcements or learning resources (uploaded to various types of websites). To that end, content of various websites (academic teachers websites, department and faculty websites) was analyzed using the example of a single faculty of the Wrocław University of Science and Technology; that analysis was coupled with a survey run among the students of that faculty, aimed at learning their preferences as to how to maintain communication with the teachers, their opinions on particular tools and the usage rate of individual solutions. Research results pointed to problematic issues caused by a multitude of available tools used for communication purposes and the unused potential of some of these tools. This research should be considered preliminary, the extended research is planned to cover universities from wide range of studies (i.e. artistic, humanistic, economic, environmental, etc.).

communication tool, university, website content

Introduction

The impact that information technology has on our daily lives is constantly increasing; so is its influence on the process of communication between people. The market witnesses the arrival of ever new communication devices (computers, tablets, smartphones), yet the ways that the available devices are used is changing even faster than the new ones emerge. A smartphone is a good example: younger people slowly cease to use it to make phone calls or send standard text messages, but at the same time use it actively for communicating with others via messaging applications.

A change in communication is also noticeable at universities, in the communication between academic teachers and students. Ten to fifteen years ago, office hours were the only way for a student to contact a teacher. A telephone call, although theoretically available, was considered not quite appropriate. Even though this is a description of a relatively recent status quo, we have witnessed a capital change. The development of information and communication technologies led to a situation where a emails or messages sent through course support IT systems are considered a standard solution for student-teacher communication. Some universities have even adopted social media for communication purposes, although this is not considered common practice.

Although many articles have been published on the use of information and communication technologies in the education industry, most of them are limited to the applications of ICT in teaching. The issues related to communication itself are rarely raised. Therefore, the goal the author set for this article is: firstly, to identify the available student-teacher communication tools, and secondly, to explore the ways they are used and their usage rate. For this purpose, the author examined the content published on websites developed for students. These included the homepages of academic teachers, and faculty and department websites of one of the faculties of the Wrocław University of Science and Technology. The next step of the study was a survey conducted among students of that faculty, aimed at learning their preferences as to how to maintain communication with the teachers, their opinions on particular tools and the usage rate of individual solutions.

1. ICT and its significance for the learning process

The term “Information and Communications Technology” (ICT) was first coined in 1997 by Stevenson in the report on the use of computers in education, the document prepared on order of the UK government The term ICT means all communication media, equipment

allowing information processing, tools that enabling its recording, as well as all applications and IT systems supporting data processing (Stevenson, 1997).

The significance of information and communication technologies for the learning process was also highlighted in December 2006 by the European Parliament and the Council of the European Union, which issued a recommendation on the key competences in the process of lifelong learning. These competences were defined in Official Journal of the European Union (2006) as "a combination of knowledge, skills and attitudes appropriate to the context." The necessity of key competences for "personal fulfilment and development, active citizenship, social inclusion and employment" was also emphasized. Among the eight key competences listed in the document, one are digital competences which "involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT."

2. Literature research

The list of publications on the use of ICT in teaching is extensive and authors approach this subject coming from different positions and addressing various aspects. Part of the publications focus on school level education and the possibilities of multimedia application in teaching (Szczeszek & Posłuszna-Lamperska, 2018). Other authors discuss e-learning and distance learning (Kołodziejczak & Roszak, 2017), also in the context of equalizing educational opportunities (Sarkar, 2012). Some authors present a broader view of the role of ICT in teaching, perceiving it not only as a way to develop education, but also as "a way of socio-economic development of the nation" (Sarkar, 2012).

The main reasons for using ICT in education is the desire to expand educational opportunities for students and improve the quality of education (Nakaznyi et al., 2015, Zając & Witek, 2011). However, ICT can be more than an aid in the teaching process: it can be a solution that supports school and university students by influencing their motivation, skills and knowledge (Grabe & Grabe, 2007).

Many authors emphasize that despite the undoubted benefits stemming from the use of ICT in education, there are still many limitations hindering the application of these solutions in practice (Balanskat et al., 2006, Bingimlas, 2009). These barriers can be categorized in various ways, depending on the aspects selected. One of the most common, is the division into school-level barriers (sometimes also referred to as extrinsic) and teacher-level barriers or, more broadly, barriers connected to all staff members (hence also referred to as intrinsic). Among the reasons that prevent teachers from using the solutions available at a given institution, the

authors list: lack of competencies, lack of confidence and resistance to change and negative attitude (Balanskat et al., 2006). In turn, school-level barriers are: lack of time, lack of effective training, lack of accessibility and lack of technical support (Korte & Hüsing, 2007). Bingimlas (Bingimlas, 2009) considers competencies, confidence and accessibility to be critical to the use of ICT in education.

The topic of ICT use in higher education was taken up by many authors. Nakaznyi (Nakaznyi et al. 2015) investigated the beliefs and opinions of academic teachers on ICT-aided learning, as well as problems hindering the use of such tools. The author emphasizes that universities need to develop a systemic vision of the role of ICT in the context of informatization of education, and to raise academic teachers' qualifications in the use of information and communication technologies. The growing popularity of information and communication technologies has a significant impact on the way that academic teachers perform their duties. Stachowiak (Stachowiak, 2012) distinguishes three basic areas of activity in which these technologies can be found useful by university employees, namely: teaching, research and activities classified as other.

Although most authors focus on the teaching aspect, it should be emphasized that aside teaching support, ICT offers also unprecedented opportunities for effective communication between the teacher and students, as Dawes (Bingimlas, 2009) emphasized almost twenty years ago. This aspect is, however, relatively rarely discussed in publications. Stachowiak (Stachowiak, 2012) mentions selected functionalities of course managing applications among other systems in teaching area.

The importance of communication competences of an academic teacher and how they relate to the use of information technology is discussed by Warzocha (Warzocha, 2016). Uroda (Uroda, 2014) emphasizes the importance of the intuitive, functional and integral IT tools that should be offered to support the process of two-way communication on the student – higher education institution line.

It is becoming a standard that universities, or even individual faculties, have profiles in social media. Yet, research conducted in 2014 by Koszembar-Wiklik (Koszembar-Wiklik, 2014) among students of the Silesian University of Technology showed that although students are aware that the university has profiles on social networks such as Facebook, Tweeter or Youtube, only half of the students have ever visited that Facebook profile, and only every fourth student is a regular visitor. In the case of the Tweeter or YouTube, the results were significantly lower. Students were also asked about the willingness to communicate with academic teachers

via Facebook. Only half of the respondents were interested in this possibility (Koszembar-Wiklik, 2014).

3. Communication tools at the Wrocław University of Science and Technology

At the Wrocław University of Science and Technology, several solutions are used to facilitate communication between university employees and students. Some of them are connected with simple sending messages, while the others give the possibility of uploading learning resources and of presenting information about academic teachers, their office hours and their courses. All the tools will be described in details in this chapter.

3.1. Social media

The Wrocław University of Science and Technology has Facebook, Twitter, Snapchat, Instagram, Youtube and LinkedIn accounts. The most popular social medium is obviously Facebook with more than 28,000 followers. The social media profiles are mainly used to share announcements on organized university events and later reports from these events. In spite of their popularity and seemingly revolutionizing impact on the lives of young people and, above all, the way they communicate, social media have no significant contribution to the communication between students and academic teachers.

3.2. Messaging applications

The first tool is, of course, the e-mail: every university employee has an e-mail address with the login being the first name and surname of that person (firstname.surname@pwr.edu.pl). Apart from that, the university uses two IT systems that support the course of study: Edukacja.CL and JSOS (pol. *Jednolity System Obsługi Studentów* – Uniform Student Service System for the students of the Wrocław University of Science and Technology) that will be described later in this chapter. An employee is notified of a message received through any of these systems with an e-mail sent to the employee's e-mail address. However, to read the original message, they must log in to the appropriate system. This solution is extremely uncomfortable and some of the teachers ask students to contact them via email only.

If the teacher initiates contact, the situation looks similar. He or she can use e-mail, as every student has an e-mail address made of their course record book number. However, this solution is inconvenient when a message needs to be sent to multiple users, since all addresses must be entered manually. In turn, both the Edukacja.CL and JSOS systems give the possibility

of sending group messages to students. The main difference between them is that messages sent using Edukacja.CL go automatically to all students in a given course group, while JSOS allows to select recipients within a given group. Like the teachers, the students receive information about an incoming message to their e-mail accounts, but can open that message only after logging into one of the two systems.

3.3. IT systems: Edukacja.CL, JSOS and ePortal

While the primary functions of the Edukacja.CL system is to allows the student to enroll in classes and message the lecturers, JSOS offers many more functions, the most significant of which is perhaps the possibility to view the final course grade and approve it or submit a complaint. Students can also view their class schedules and import them into a smartphone or computer calendar. There is also the option to display a weekly schedule that covers the type of the week (even or odd), as well as different types of holidays and one-off changes to the schedule caused, e.g., by the teacher rescheduling missed classes. JSOS also gives the option to: check the schedule of any lecturer, read incoming messages from the lecturers or the dean's office, and to initiate contact with them. It also allows the students to submit electronic versions of applications, check fee payments for repeated courses, as well as to complete course evaluation surveys for the courses attended in the previous term.

From the academic teachers' point of view, majority of the functions available in the Edukacja.CL system are doubled in the JSOS system. Both offer the possibility of viewing the course enrollment lists, printing attendance lists, exporting student data to, for example, Microsoft Excel. Other functions offered include: entering grades, notifying students about the grades, grade approval, receiving information about grade complaints and reacting to these complaints, as well as sending and receiving messages. The lecturer can also view course schedules from previous semesters and the grades assigned in the respective course groups. In addition, the JSOS system offers the ability to change the grade approval code. Other functions mirror those available to students, that is, viewing individual schedules in general or weekly view, as well browsing the schedules of other lecturers or checking the occupancy of didactic rooms.

ePortal is a system used to submit and share various types of course and training resources intended for a wide range of recipients, for example, video materials with lectures from the Mathematical analysis or Physics courses, conducted by selected lecturers. There are also e-learning courses available for all interested users, designed to help acquire new pieces of knowledge or consolidate the already learned information. E-learning OHS training resources

are obligatory for all incoming students. The ePortal may also be used as a space where lecturers upload learning resources and a platform for some online tests. It also allows he students to submit files with course work (e.g., seminar presentations or reports).

Apart from resources upload, teachers can use the system to keep attendance lists with the points assigned for in-class tasks or other types of class activity. They also have the option of viewing files uploaded by students in the system – each file is assigned to a specific student, which significantly facilitates and speeds up the assessment process.

3.4. Academic teacher information

There is no global, uniform model of presenting employee information at the Wrocław University of Science and Technology – both individual faculties and people hired within the same organizational unit have total freedom in this regard. This applies to both the type of information published and the place it goes. Academic teacher information can be found on faculty websites, department websites or on websites of units included in the department, such as workshops or specialized teams. Another source of information are teachers homepages hosted on outside university servers.

4. Research methodology

In order to evaluate the use of ICT solutions in the academic environment, an initial study was conducted at the Wrocław University of Science and Technology. One of its faculties was selected for in-depth analysis. It is one of the largest faculties at the university, with a considerable number of students and academic teachers, centered around several fields of study. At the same time, it is the author's home faculty, which facilitated the course of the research, since the academic teachers, their academic subjects, as well as the students are familiar to the author.

The elements analyzed included the methods of sharing information with students and the type of information shared. The first step was an analysis of the content of websites that can be used by academic teachers to share information and resources with students. The research concerned the content of all (eight) department websites within the analyzed faculty, all teachers homepages and all teacher info cards on the faculty website (over 200), as well as all ePortal courses pages (over 250). However, in the case of ePortal, the only elements that could be included in the analysis were the title of the course and course owner, as most of the courses required a password to log in and see the content.

The second step of the research was a survey conducted among students of the selected faculty. A questionnaire survey was conducted among students to learn about how they assess the available ways of communication with the teachers and the information they share. The research goal was the identification of websites used for the communication between students and academic teachers, the analysis of their content of those websites and the student's usage rate of individual communication solutions. It was also planned to verify the hypothesis that the field of study as well as the "advancement" of a student (i.e. which year he/she is) influence students' use of individual communication solutions.

The questionnaire was short to encourage students answering and consisted of 10 questions, most of them close-ended, with ordinal scale. After verifying the questionnaire in a pilot survey and introducing necessary changes, the main survey was conducted. The diversity of respondents was kept high to identify as many potential differences as possible. This is also why the author decided to question students of two subject fields, with one of the fields being more technical than the other. Moreover, half of the respondents was first-year students, while the rest was third-year students. The purposive sampling was chosen and the survey was carried out in a group of 100 respondents.

After obtaining the results of the survey, some initial interviews were conducted with the academic teachers from other faculties to check, whether there was a possibility to generalize the results. According to the information gathered, the situation at other faculties was similar. Even though the research object was a single faculty of the Wrocław University of Science and Technology, it could be presumed that the research encompassing the whole university would produce analogous results. However, the author plans to extended research with faculties from other universities. The crucial issue will be the selection process: the faculties should cover a wide range of subjects (artistic, humanistic, economic, environmental, etc.).

5. Discussion and results

5.1. The content of the websites

The faculty webpage includes a list of employees that teach classes. After selecting a particular name, one is redirected to that employee's info card. The card has a standardized design and contains basic information, such as: professional or academic title, e-mail address, organizational unit, street address, room number and telephone number. After logging in, the employee has the option to edit the content of the card by adding any type of information or

even adding tabs that organize information on various topics (e.g. about the courses taught by that lecturer – learning resources).

Although all academic teachers at the faculty have their info cards, the content of those websites varies widely. Over half of the employees (57%) shares only standard information, entered for them by the faculty. Analysis of the content added by the employees themselves shows that office hours are the most common extra information – they are found on 38% of homepages (sometimes in a separate tab). Academic interests (36%), lists of the most significant recent publications (34%) and references to the DONA database containing all publications (34%) are presented with almost equal frequency. It is much less common to post photos (15%) or a link (for example to the department website, teacher's homepage or to the ePortal page) (9%). The feature used least often – only by 7% of employees – are tabs. Most common is using only one tab that contains office hours information or a link to another website.

The "Employees" tab available on the faculty website includes a link to the list of all employees, along with the dates and locations of their office hours. Academic teachers are not able to make any changes here (e.g., canceling office hours or making one-off changes to the schedule) on their own. As a consequence, the list tends to be outdated, inaccurate and inconsistent with the information presented on the employee's info card or homepage.

The faculty comprises seven departments and one institute, and each of these organizational units has its own website. One can go to the department and institute websites from the faculty homepage (Home> About the faculty> Structure) or by simply typing the right address in the browser. However, it should be noted that these addresses are all but intuitive – they start with a two to four letters abbreviation or acronym of the name of the unit.

Both the design and content of the department and institute websites are not unified, however, there are some tabs that are present on all of them, i.e.: "Department" ("Institute") and "Research". The "News" and "Contact" tabs appear on seven and "Studies" on five out of eight websites.

Websites of all organizational units present information about their employees, but also here the content is largely diverse. Most often, employee info is organized in a list of names – each with a link to the employee's homepage. Another common solution is to couple the name with a link to the already discussed info cards on the faculty webpage. 47% of faculty employees have a homepage link and about 14% have a info card link. However, it should be noted that homepages often contain very brief information (usually limited to office hours information). It may seem surprising that two department websites still contain links to homepages hosted on a server that has been shut down for over a year. The same applies to homepages of as much as

8% of all academic teachers. Public sharing of information about employees' social media accounts is also not common. Only eight academic teachers (all from one department) have published links to their LinkedIn accounts with one of the teachers sharing also a link to their Twitter account.

Websites of three organizational units show broken links to general office hours list or to outdated information (e.g. not concerning the current academic term). An analysis of employee information presentation and its content shows that three out of eight units have adopted their own standards (unfortunately, not uniform), while the other five have no other global solutions.

The analyzed faculty has a Facebook account, which is its only social media account. It has more than 4,000 followers, however, the presented content concerns mostly events or faculty student council updates, which doesn't contribute to the type of communication analyzed in this paper.

5.2. ePortal courses

Faculty employees use the ePortal to provide students with course information. The vast majority are courses from the course list of a given faculty. That list has 20 main categories with names usually corresponding to their subject areas (however, there are also categories that relate to the faculty names and then there is the "Other" category). There are over 200 courses (although sometimes a lecture is presented separately in a course, and all extra course classes conducted by different employees are presented separately, too). In addition, there are about 30 unclassified courses on the site. The vast majority of courses are not made available to the public, meaning that in order to gain access to their content, one must get access information from the course teacher. Despite the fact that both the courses within a category and the uncategorized courses are listed in alphabetical order, it is initially rather difficult to find a course (for example, the "Other" category includes almost 30 items).

5.3. Research among students

The objective was to determine the steps that students take when searching for desired information, the websites they visit, as well as the communication tools they prefer using to contact the teachers. In addition, the students were asked about activities that could improve the communication process between students and lecturers.

The first question concerned the method of contact with the teachers. As shown in Figure 1, the most popular solution is e-mail, which is used often or very often by almost 59%

of respondents. As far as the JSOS and Edukacja.CL systems are concerned, significantly fewer students choose them to communicate with the teachers, with respectively 17% and 12% using the systems often or very often. The collected data also show that first-year students message the lecturers via JSOS or Edukacja.CL more often, while their older colleagues usually send e-mails (probably knowing that a large part of the teachers prefer that solution as more convenient – it does not require logging in to a separate system).

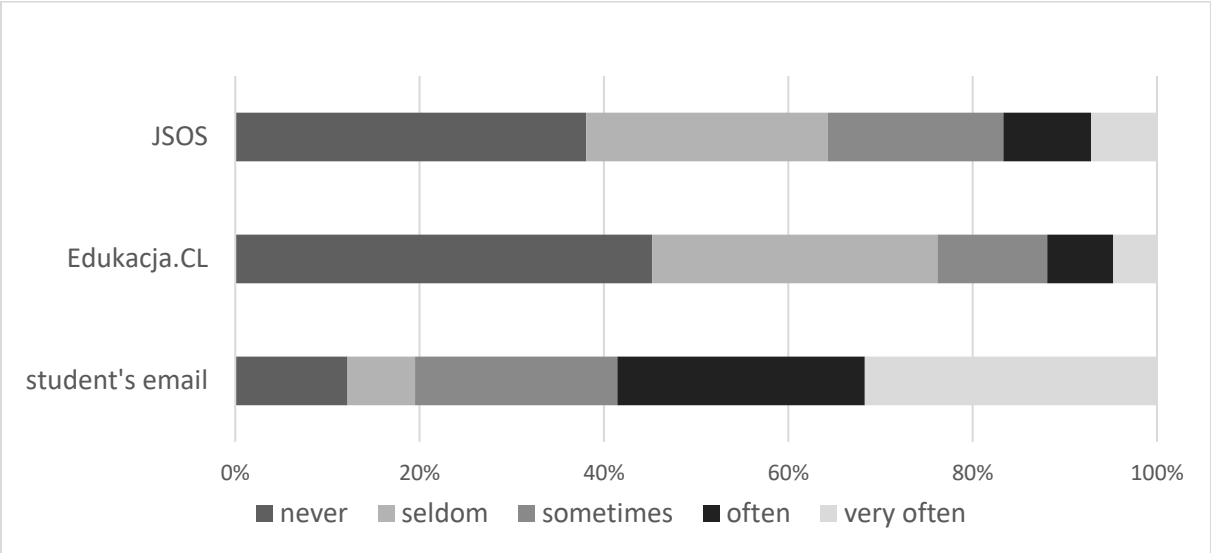

Figure 1. The use of individual solutions to contact the teachers.

The respondents were also asked whether they call the teachers during their official contact hours (the info cards, list of office hours and the employees' homepages all include business telephone numbers). As predicted, this method of contact was not popular – 73% respondents have never tried it, and others did it seldom.

The purpose of the next question was to determine how the students receive messages from the teachers. According to the respondents, most academic teachers prefer sending e-mails directly to student accounts. Respondents receive almost 75% of messages that way. However, it should be reminded here that group messages are much easier and more convenient to manage via the JSOS and Edukacja.CL systems.

Students were also asked about the percentage of unanswered outgoing messages. The results were quite diverse: over half (54%) of respondents selected the 0-10% range, 15% of the responders reported the 11-20% range, and almost the same number (13%) pointed to the 21-30% range. It might be baffling that some of the surveyed students reported significantly

higher percentages of unanswered messages – e.g., the range of 70-80% was indicated by as much as 10% of respondents.

The next question was designed to identify how students search for specific information (Figure 2). For instance, when the office hours or the e-mail address of a teacher needs to be checked, half of the respondents visit the faculty webpage, while the other half goes to that teacher's homepage.

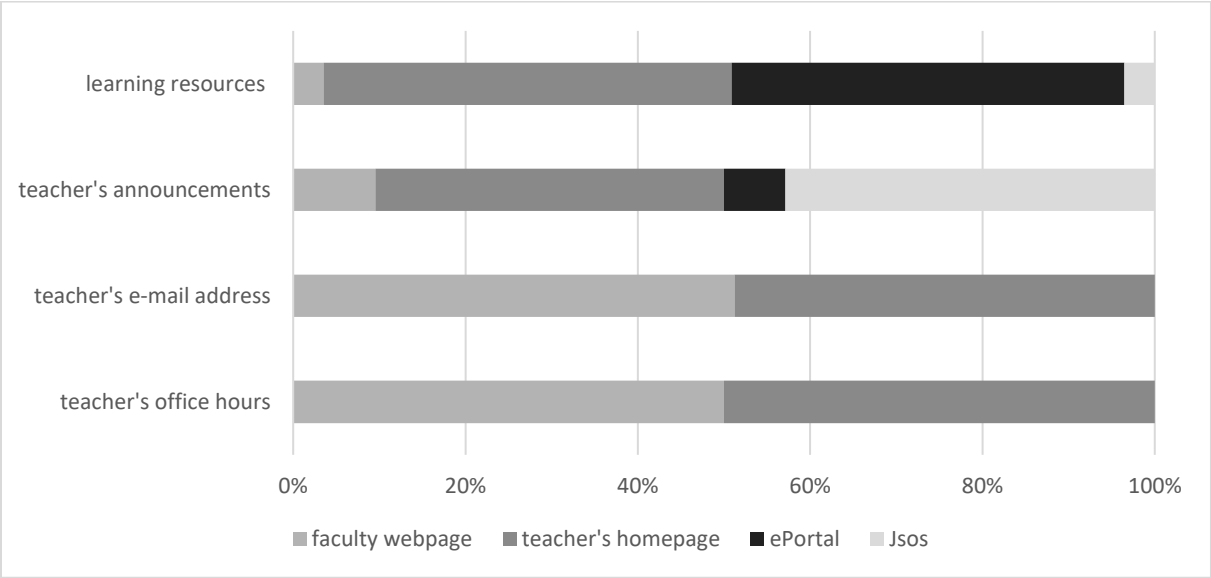

Figure 2. Places visited by students in search of information.

Info on teacher announcements are primarily sought on teacher homepages and in JSOS (as selected by 40% of respondents). Few students check the info cards on the faculty website and ePortal profiles (10% and 7%, respectively). If students search for learning resources, they usually reach for the ePortal and the teachers' homepages (about 46%); faculty webpage or JSOS are a much less frequent choice (only 4% of answers).

The next question focused on the frequency of students' visits to individual websites. The most frequently visited are ePortal and teachers' homepages, which are visited often or very often by about 55% of respondents. At the same time, over 40% of respondents visit the faculty webpage at least often, while the least popular are department websites, visited often by only 10% of respondents (Figure 3).

The last close-ended question concerned the students' willingness to use social media (especially Facebook) to contact the academic teachers. The overwhelming majority of respondents (93%) did not accept this idea, however most of them didn't explain why. The rare

few explanations said that the existing communication methods are sufficient and there is no sense to introduce another one.

Students were also asked two open questions: the purpose of the first one was to find out the respondents' opinion on the usefulness of ePortal. Respondents highly appreciated the potential of ePortal, while noting that it remains highly unused, as there are too little regular users ("there are resources for only two out of the ten courses that we have each semester").

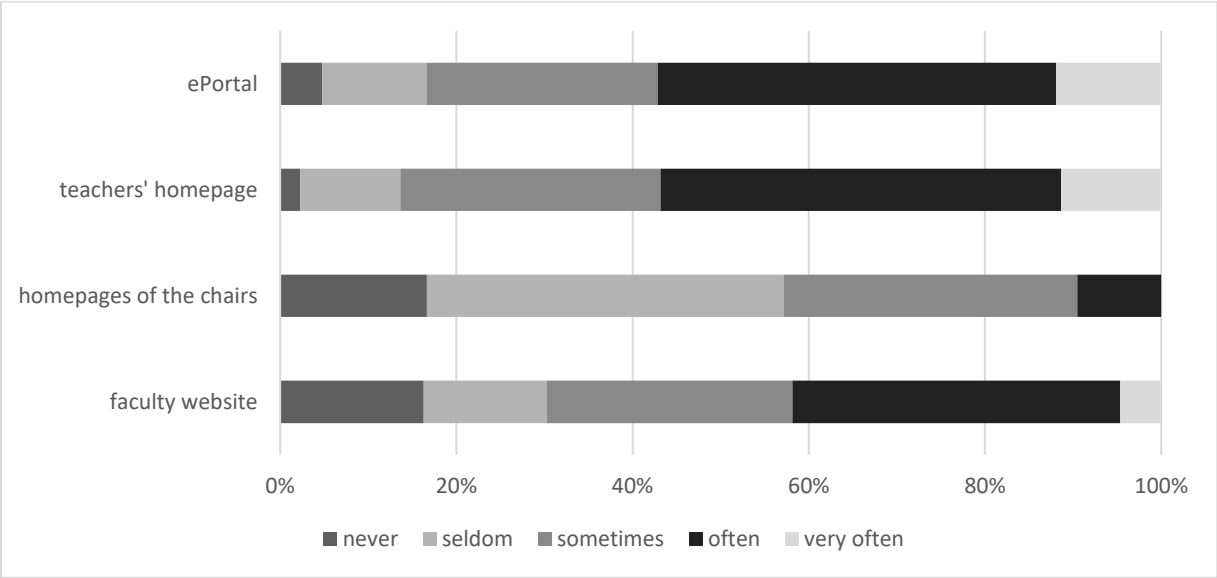

Figure 3. The frequency of respondents' visits to particular websites.

In the second question, the respondents were asked to share their ideas on how to improve communication with the teachers and access to information related to the course of studies. The question was answered in various ways, yet several main issues can be distinguished:

1) teachers should answer e-mails and messages regularly,
2) information presented on websites should be updated more frequently,
3) ePortal should be the main platform for sharing learning resources,
4) all teachers must have complete homepages ("I go to the faculty webpage to see which department a particular teacher works for, then I go to that department's website, then to that teacher's homepage, and I still know nothing...").

In addition, students criticized the chaos created by the excessive number of places where potentially necessary information and materials may be found (ePortal, homepages, faculty websites). They postulated introducing a unified communication system that would replace the e-mails and Edukacja.CL and JSOS messaging tools.

Two hypotheses were tested: one concerning the influence of the fields of study and one looking at the “advancement” of students (i.e. which year they are) as the potential factors influencing the use of individual communication solutions. Both were rejected – there were no significant differences between the responses in the analyzed groups of students.

Conclusion

Information and communication technologies are present in so many aspects of everyday life that their application has been qualified by the European Parliament and the Council of the European Union as one of the eight key competences in the process of lifelong learning. Therefore, it might seem obvious that these technologies are also eagerly used in the teaching process. The majority of the numerous publications on this subject, however, focus on the use of ICT in the learning process itself (multimedia, e-learning), while the use of ICT for the support of communication between the teacher and the student is much less often considered. Communication here means not only as an exchange of information (as in the case of e-mail or messaging applications), but also as access to important announcements or learning resources (uploaded to various types of websites).

The main objective of this article was to identify tools that can be used by academic teachers in the communication with students and to examine the level of use of individual solutions. A side objective was to gather students' opinions on the quality and effectiveness of the individual communication tools for maintaining contact with the teachers. The research object was one of the faculties of the Wrocław University of Science and Technology. The first step was an analysis of the content of websites that can be used by academic teachers to share information and resources with students. It turned out that there are several ways and platforms to do it: teacher info cards on the faculty website, department websites, teachers homepages, ePortal courses pages, and messages sent through the study support systems Edukacja.CL and JSOS. Teachers contact details and office hours may be found on at least three various websites. Employees are in no way obliged to post any additional information, not to mention resources for students, therefore, more than half of them have only basic information on their homepages. An additional problem identified during the analysis of the content of these webpages was the lack of updates.

The second step of the research was a survey conducted among students of the selected faculty. The objective was to determine the steps that students take when searching for desired information, the websites they visit, as well as the communication tools they prefer using to contact the teachers. In addition, the students were asked about activities that could improve

the communication process between students and lecturers. The most significant problems reported by the students were the lack of response to outgoing messages and the aforementioned lack of updated content on teachers homepages.

The most important conclusion arising from the two steps of research is that chaos, resulting from the disturbed flow of information between academic teachers and students, rules the communication at the analyzed department. The main reason behind the situation is that there are too many available communication tools and at the same time no procedures that would define how they should be used. In addition, the functionalities that are offered by particular communication tools should complement and not duplicate each other (as is currently the case) to create a coherent system.

It seems vital to establish uniform solutions recommended for the entire faculty, thanks to which students would know where to look for office hours during end-of-term examinations or where to find course resources. Training the employees in the use of available solutions that offer the widest communication possibilities (e.g., ePortal) also seems significant. The outcome might be rewarding for the both parties trying involved in the communication process: on the one hand, it would facilitate and accelerate the work of academic teachers, and at the same time increase level of student satisfaction with communication with the teachers.

Further research could identify the reasons that prevent teachers from using the solutions available at a given faculty. Moreover, the author would like to verify whether conclusions from this study are coherent with results of studies focused on other faculties from the Wrocław University of Science and Technology, but also on selected faculties from other universities. The extended research is planned to cover universities from wide range of studies.

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