

# Electronic communication channels at Czech universities

J. Sedivy, J. Chromy

**Abstract**—The paper describes the use of communication tools of modern mobile devices and the Internet in education. Of course, we can assume some of the advantages and disadvantages of internet services from the subjective factors and objective view of the educational process. The article presents the results of authors own research, which focuses on the practical use of mobile devices and communication channels of internet that are typical of the research, student respondent sample. Research was conducted in the university environment in the Czech Republic.

**Keywords**— communication activities, web communication, mobile devices, facebook, second life, web pages, feedback.

## I. INTRODUCTION

**T**HE primary goal of computer networks and the Internet is to share and deliver data in a short time and together at a great distance. Generally can be part of computer networks and other devices that make up the means of information and communication technology ICT. They can be as mobile phones, iPod, iPhone, etc., which are fundamentally different group.

For certain simplicity in this section we will talk only about computers. The most heterogeneous networks, it is the Internet. Some selections use the Internet as Internet phone, interactive television, virtual supermarket, etc. In terms of teaching will be more interested in an overview of the basic functions and possibilities of the Internet (computer networks in general) [1]. For use in the classroom can be summarized to:

- Information - is available to a wealth of communication
- Presentation - anything-can present yourself, your company, school, but also study materials, the results of scientific work, etc.
- Communication - it is possible to create an enabling environment for all participants to communicate with each other in real time. Participants will hear and see, they can write and draw on shared whiteboard, they can exchange ideas, help each other. If necessary, they can also control each other.

The didactic use of Internet features and capabilities is necessary for teaching the use of certain capital assets to ensure transmission of information between the sender and recipient [1]. The basic software tools called Internet services.

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## II. BASIC INTERNET SERVICES - WEB SITE IN COMMUNICATION

To use the service each loop there are programs of varying quality from various authors. Activate the programs use the services required. In the communication and in activities that relate to it, every teacher must have a certain amount of support. This support is characterized by being individualized, and must allow a relatively wide range of activities. See for example [1]. In analyzing the functions this support should fulfill, it is necessary to begin with the main activities that make up the instructor's total teaching experience. Consequently, it is necessary to combine the various functions of support for the teacher's activities into one system that will be interactively available in all the required moments. [2]. It describes this as Computer Managed Instruction (CMI). See also for example [2].

Representative of older hypertext documents (web pages) are the programmed textbooks, recommending that students go to other parts, such as by the accuracy of answers to given questions, as described in [3]. Programmed instruction was established in 1954 and is considered the founder of [4]. Programmed learning thus avoided the Internet (Arpanet network was 1969). At present, we can say that, conversely, the Internet, especially websites provide very effective support of programmed learning. Websites were at the origin of e-learning and blended learning, which will also be addressed. Very special web pages are analogous to electronic journals designated e-zine or book called e-book. Electronic text can be defines as a digital file with specific content that is not merely a text file. It may contain in addition to text and image content and navigational aid. The benefits include:

- Low cost - issuance of electronic textbooks and publications is economically feasible even if a small circle of readers, while sometimes printed publications are not sold out despite the small load.
- Simple publishing - authors can self-publish e-publication and distribution of the costs are significantly, lower than in other forms and publications.
- The availability - electronic publication may be available via the Internet anywhere in the world. You

can ensure effective protection of copyright by software.

- Support for media - educators can prepare students for a tailor-made texts textbooks, and can classify them into multimedia applications (various media and interactive links). The publication can place links to other resources located externally, such as on the Internet.
- A benefit for handicapped - can enable the computer program controlling a mouse or voice, reading a written text for the visually impaired using a computer program, etc.

The list of benefits suggests that the benefits of e-books are essential and can be the basis for a positive prognosis for their future development. In this context, it should be noted that the electronic text, which is possibly equipped with a multimedia extension, it is really powerful and effective tool in the hands of teachers, but it is advisable to ensure its inclusion in the process of teaching. In any case, it can't not be considered and proceed without prior definition of the concept of teaching. In terms of communication are the foundations of web pages rather one-way communication. The minimum two-way communication is necessary to adjust Web sites such as the inclusion of at least one optional element that will be the sender of a communication means to evaluate. This can be a traffic count at least part of individual web pages or the inclusion of simple questionnaires using closed answer. It already is not only possible using the BASIC programming language HTML (Hyper Text Markup Language).

One of the most used and old Internet service is electronic mail. It represents an inexpensive, fast and convenient replacement for postal mail. Moreover, by e-mail can send files that contain only static media (text and images immobile), but also files containing dynamic media (audio, moving images). Audio and video recordings are now a common part electronic (e-mail) correspondence. A positive effect of such teaching is the ability to continuously monitor the specified seminar work and help students to focus on the issue, which is mainly in combined form of study for students invaluable. There are also easier using e-mail. For example regular sending of documents will enable students to prepare for teaching. This opportunity of educator is not suffer because only sends initial messages and get feedback from students to the classroom. Students can print documents need not be addressed in the course of teaching writing and drawing, and can focus more on interpretation.

Electronic mail provides one-way or two-way communication, but with more or less time-shifted feedback. Marketing Communications recommend different sources replying up to 24 hours. Also in educational terms, this delay considered acceptable. Length of the delivered message is not too limited, which means that messages can be sent encode enough to ensure proper understanding of the recipient, and this can reduce the development of communication noise. Use of electronic mail is now recognized as obligations of companies and offices use to communicate data box.

Electronic mail is used for interpersonal communication to institutional. Due to the fact that in the case of commercial communication by electronic mail may be a so-called spam (unsolicited communications), which is banned in some states, it should be the recipients communication request their consent to be included in the distribution list, see Act No. 480 / 2004 Coll. as amended.

It can be assumed that a similar form of mailing lists used by most of us. We are sending the message to the specified e-mail address and our message is automatically sent to all members based conference (see the above possibility distribution of study materials). In any communication for all members, the sender selects only the name of the distribution list and send the communication, incl. any attachments. In fact, the e-mail sent to all recipients in the distribution list. Similarly, the teacher can create and use a group distribution list (or grade) students.

Newsgroups or interest, discussion groups, are very similar to mailing lists. They differ but the overall procedure, as a way of registration and login and exploited environment. Newsgroups are usually used by websites. Newsgroups in education are a kind of accessory. There are other specific options, which we mention in the chapter on how other online communications. A typical example is a chat in newsgroups. In terms of lessons can be used as newsgroups to solve a task that is given a certain group of students and teacher can have control over communications in the solution. Can students in the procedure chosen to intervene, if only to monitor and evaluate the activity of individual students.

Telecommunication Network (Telnet) is a protocol that allows remote login to another computer on a network using the network architecture client - server. All programs that run will be performed by a remote computer (server), but input and output will be controlled from the computer you are currently (client). Basically, the monitor and keyboard on the remote computer then before us, while the computer you are currently working somewhere on the Internet, while we may not even interested in where. FTP (File Transfer Protocol) is a protocol that allows file transfer between two different computers over the Internet. Quite common example is transferring web pages from the author on the server where they are available. For teaching is also using this protocol too appropriate. The exception is teaching computer science, web pages, etc.

### III. ON-LINE COMMUNICATION

In teaching, and in activities that relate to it, every teacher must have a certain amount of support. This support is characterized by being individualized, and must allow a relatively wide range of activities. See for example [1]. In analyzing the functions this support should fulfill, it is necessary to begin with the main activities that make up the instructor's total teaching experience. Consequently, it is necessary to combine the various functions of support for the teacher's activities into one system that will be interactively available in all the required moments. [2]. It is describes this

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On-line modern communications are especially selected as follows:

- ICQ - can communicate in writing, voice calls or video calls.
- Skype - used mainly for phone call, which can be in the conventional telephone network. Calls on the Internet are free and can enrich the video transfer communicating.
- Social networks - Facebook - social networks are different from previous on-line communication by permanently connecting a group of people who interact and have a need to communicate together almost daily, to maintain certain links, such as family, on the basis of certain interests etc. For teaching can't recommend its use especially for excessive openness.
- Second Life - a three-dimensional virtual world. The potential user chooses your avatar that represents the virtual environment to user. Some Universities in Second Life set up your virtual auditorium or the

entire school. In the Czech Republic only Palacky University in Olomouc. The disadvantages of this environment include low quality graphics and paying for the use of virtual classrooms.

The online communication can be used for individual lessons. Another possible use is for consultation as students combined study. For learning groups, especially larger ones, are these options on-line communication virtually unusable.

For Second Life is theoretically possible to mass communication and, therefore, can be organized as any frontal teaching large groups. The cost is probably worth teaching medium to large groups. Through electronic communication, especially some of the ways we are impoverished by the possibility of basic human communication, especially nonverbal enriched form. The aforementioned newsgroups service is a basic on-line communication when the sender and recipient are simultaneously present. This is followed by other service options that are separately and independently operated service. On-line communication, particularly selected as follows:- ICQ - can communicate in writing, voice calls or video calls.- Skype - is mainly used for phone calls that can be operated in the conventional telephone network. Calls within the Internet are free and can be enriched by communicating video transmission.- Social network - Facebook - social networks are different from previous on-line communication by permanently connecting a group of people who interact together and have a need to communicate almost daily, to maintain certain relationships such as family, based on certain interests For teaching, etc. It isn't recommend use mainly for excessive openness. Second Life is a three-dimensional virtual world. The potential user can choose your avatar, which represents a character in virtual environment users. Some universities have in Second Life set up their virtual classrooms or entire schools. In CR it is only Palacky University in Olomouc. The disadvantages of this environment include poor graphics and paying for the use of virtual classrooms. The online communication can be used for individual lessons. Another possible use is for consultation such as students combined study. For teaching groups, especially larger one is on-line communication virtually unusable. For Second Life is also theoretically possible mass communication, that can be organized as any frontal teaching large groups. The cost is probably worth learning for medium to large groups. For individuals, this option is totally unnecessary and teaching rather inappropriate. Through electronic communication, especially some of the ways we are to the impoverishment of basic human communication, especially nonverbal enriched form.

In particular, social networking, but also other possibilities of electronic communication, incl. play network games, also lead to a loss of most of free time, especially children, and consequently to their addiction. This time they have left on the innate way of communication, which could lead to problems in interpersonal relationships. Electronic communication, often with strangers, can lead to changes in the system of values,

loss of inhibitions, increased openness and the corresponding consequences. On the one hand, we do not know whether the one with whom we communicate is who they claim to be. This is supported by the use of nicknames, called nicknames. Under the appropriate nick knows the relevant user community but do not know his real name, even as sex. People who know the name of the contrary, you may not know the appropriate nick. This may partially lose their identity. On the other view for many people, which will to tell various important information from their life. Ignorance of naivety to some users, especially younger ones, leading to the publication of such details that are then not enough wonder who else will find it and how it subsequently exploits. On the basis of the information sent to the user of electronic communications become the victim of identity theft before which the real events warns police (<http://www.policie.cz/clanek/ztrata-identity.aspx>).

Some implications of electronic communication are manifested in text messaging, and hardly overlooked repression original literary language, such as using yet unusual abbreviations (pls = please, NC = no comment), often "czechism" new expressions. On-line communication offers many advantages, disadvantages, paradoxes and contradictions. For teaching purposes require careful consideration of all the connections and monitoring research, dedicated to this current phenomenon. If we were to use the on-line communication have decided we must respect the basic didactic aspects of teaching.

In the electronic environment can be used in addition to such other technologies that are specifically created for teaching using the Internet and computer networks. Examples are:

- LMS (Learning Management System) - includes features for managing the activities of students, evaluation, and monitoring their activities, etc.
- LCMS (Learning Content Management System) - contains functions for creating course content, their import, export and sharing. Vastness of the Internet and the huge number of available resources are prerequisites for its use in teaching. However, we must realize that when searching for important and informative information can also come across the pages of dubious levels, even downright illegal sites which may impair the mental and moral development, particularly youth (promotion of racism, violence, etc.).

Finding such sites may be a coincidence, but the lack of control by the teacher or parent can be even a deliberate search. The above relates to control delinquency. In educational institutions, etc. You can also prevent access to adult sites with inappropriate themes. Such a limitation but unfortunately will never be 100% reliable, because it develops both forms of protection, as well as systems for overcoming it. Some sites can like some computer games lead to a loss of ability to distinguish between the real world and reality, or extremely motivated, and thus lay the foundations for addictive

behavior when pupils neglect everything else. Prolonged sitting at the computer in the context of searching for information or communications on the Internet leads to restrictions on movement and thereby adversely affecting the spine, blood circulation, sight, etc. As in all other cases, instruction is also using the Internet for teaching important planning each lesson, when we have to realize basic didactic aspects of teaching and carefully consider the use of the Internet. It is necessary to emphasize the teacher's ability to find sources of information on the Internet and the ability to decide whether they are usable in the classroom. Educators must be able to show how to work with information as to evaluate how to communicate with other people, how to create new digital documents. This is only part of the requirements that determine the use of not just the Internet, but the media and multimedia in teaching at all. Interesting research on learning styles in relation to the files that contain hypermedia links describes M. Liu and WM Reed. They found him in the cognitive component of the student's learning style influences the way of learning, his path to the goal and the means which is used to achieve the goal. Students with different learning style prefer different media and different styles of practice. E.g. students with a more global approach to learning devote more time to the video information, work with video. Students with more analytic approach is often dealt searches relationships, work with links, etc. between the two groups, there were significant differences in the use of textual and graphical information. From the above it is clear that learning styles play an important role in teaching using the Internet. Students should be encouraged to do, to know what learning style works best for him, for that learning activity is appropriate and when it is necessary to try otherwise. At present, when considering the dynamic development of knowledge and technology from one based, the need for further education, especially remotely implemented with the support of electronic media, the skilled use of knowledge of learning styles and appropriate teaching learning process significantly easier. It is obvious that the technology itself is not able to replace the human dimension in education at any level.

Many of the results shows that the technology in terms of technical teaching aids, electronic devices which undoubtedly also are not usually quite so important as the formulation of learning tasks, characteristics of learners, ensuring motivation of students, teachers and tutors interested in the results of their students, etc. The educational system must also use the Internet to teach, among other things fulfill three important functions in the teaching process:

- To provide information,
- Give instructions, additional guidelines for information processing,
- Obtain feedback on the information processing.

It is important that the disclosure was made auxiliary instructions and then validated using feedback. In practice, the instructions for entering auxiliary information managed

discussed students' attention, there are presented the questions and get them to memory concepts and rules that are necessary for mastering the subject matter. The student must be familiar with the accuracy or inaccuracy of their efforts and get monitoring data of what already exist in relation to the anticipated requirements achieved. At the same time teachers need information about how to manage the influx of information students and how they are able to work. Based on this feedback process then determines the next instruction. Interactive multimedia computer applications are the future of the educational process. The lack of didactic computer software of all kinds makes the fact that our schools can't yet be implemented consistently prime need, i.e. computer classes practically operate in everyday educational practice. Instead, it often operates mostly just learning about computers. Foreign language applications can not cover our specific needs, so you must first create with the needs of our school.

Basic assumptions and Internet services allow the introduction and use of online study in this environment. Significantly, this study is usually finely detailed and if it uses the above possibilities of online communication are those observed basic didactic aspects of teaching. Advantages of e-learning consists in saving time, individualizing instruction, objective feedback and usability not only for teaching but also for the transmission of information, in which the emphasis is on their way transmission. Important for the use of e-learning is that there is no significant difference in relation readiness in the use of e-learning and the age of the students, as shown in a survey of high school students, described. This means that you can expect seamless use of e-learning students. Educators as the other side of didactic communication within teaching (e-learning), a central value of easy updating of training materials, the possibility of a permanent two-way contact with students. Surprisingly note that interest in contact with the teacher is the on-line system, is significantly larger than in classical studies. It's only an alternative in many areas suitable complement classical mode. Educators in the creation of e-learning realize the basic didactic aspects of teaching. A similar view and provides some reservations pedagogical-psychological nature that appear in e-learning. He mentions, for example, the promotion of technology in education at any cost, that affects the very understanding of e-learning. The original understanding of "e-learning is an educational process, coupled with a computer" to New "e-learning is the use of multimedia technologies and the Internet to promote the quality of the educational process." Newer understanding that defines the role of e-learning in teaching, i.e. its application wherever there is a shift in the quality of the educational process. Further developments shifted the understanding of the notion of e-learning in the current approach to the concept of teaching without full share of its forms. This is advantageous from the viewpoint of maintaining the "purity" of definitions of terms. This is based on the fact that full-time teaching only "live" teacher is different from full-time teaching, which forms an important part of teaching using electronic communication

options, and both are different from teaching only to the use of electronic communication capabilities. They differ in many respects, including:

- The preparation of teaching
- Used didactic means
- Teaching style of the teacher
- Learning style of the student

Based on the above was another concept of blended learning, which we in the narrower sense, understood as a combination of e-learning and other non-electronic (especially full-time) forms of learning at different rates, depending on the objectives and other didactic aspects of teaching. In a broader sense, the term can be understood as the combined instruction, the combination of full-and part-time forms. The issue of teaching in the context of dealing with a number of author.

About creating custom web applications to support teaching and use of the possibilities offered by different programs and databases, discusses a number of domestic and foreign authors. Some say a brief overview of options that allow modern web technologies and databases.

When learning from the Internet can lead to all kinds of communication noise. In electronic communication usually lack non-verbal communication, which would effectively support the encoding passed message. Even, if the video is only visible part of the second caller, usually also poorly. Text Communication provides for necessary brevity usually only clean content of the communication, and thus may lead to its connotation, and then the communication noise. E.g. even seemingly simple sentence "Today is warm." can be decoded in two ways, if we do not know the context. Forms of redundancy needed for better communication passed decoding is disappearing due to aforementioned brevity. To some extent this can be replaced by using emoticons, but this leads to the suppression of natural language, see above. Significant problems in the social sphere are also related to the digital divide and the resulting uneven current opportunities for all people in a globalized world.

The importance of quality information in school, but also in everyday life, leads them to attempt to have as many available. Information is thus in many cases the shift of the auxiliary level for achieving the target level itself. In terms of psychology plays a role in human information overload different levels in terms of quality. Misunderstanding many acquired information leads to stress and anxiety certain information. There is a failure to capture the necessary information. Unfortunately, the electronic communication applies an inverse relationship. The more time a person spends electronic communications and other activities on the computer, the less time reasonably spent with family and true friends. This reduces the number of persons belonging to his social circle. This in turn can lead to feelings of loneliness and to depression. Modernization trends in education require new skills from all participants learning process. Their aim is to contribute to the individualization and optimization, facilitating and streamlining. Implementation of ICT in the

educational process, however, may not be subject to the sole, a technological point of view, but it must be based on serious grounds of the results of educational research.

#### IV. PROBLEM FORMULATION

Vastness of the Internet and a huge number of usable resources are prerequisites for its use in teaching. We note, however, that prolonged sitting at a computer can lead to the following: Meeting with pages of dubious levels in adolescents,- Some sites can like some computer games lead to loss of ability to distinguish between real world and reality, or extremely motivated, and thus provide the basis for addictive behavior- There are restrictions on movement and thereby adversely affecting the spine, circulation, sight, etc. Educators must be able to show how to work with information as to evaluate how to communicate with other people, how to create new digital documents. This is just part of the requirements that determine not only the use of the Internet, but the media and multimedia in teaching in general, see [5]. Interesting research on learning styles in relation to the files that contain hypermedia links describes [6]. Students with different learning styles prefer different media and different styles of practice. From the above it is clear that learning styles play an important role in teaching using the Internet. Students should be guided to know what learning style works best for him, for which learning activities are appropriate and when it is necessary to try otherwise. At present, in view of the dynamic development of knowledge and technology based on them, increasing the need for further education, especially distance implemented and supported by electronic media, the skilled use of knowledge of learning styles and appropriate teaching learning process significantly easier, I see Simon. It is clear that technology alone is not able to replace the human dimension in education at any level. Many of the results demonstrates that the technology for the purposes of teaching technical means by which electronic devices are also certainly is not usually so important as the formulation of learning tasks, characteristics of learners, providing the motivation of students, teachers and tutors interested in the results of their students [7].

#### V. PROBLEM SOLUTION

Research was conducted at three universities in the Czech Republic. Its aim was to map the potential conflict between the demands of students and teaching experience (opinions) teachers. The first hypothesis was that students will prefer learning with the use of certain Internet services that enable more "dynamic" and online communications, such as Facebook. The second hypothesis was that teachers will prefer more "static" form of communication that is based on pedagogical principles. It is also easier to create learning materials. [8]. For this occasion, we also conducted benchmarking exercise against the interest of students and teachers of learning using mobile devices (mobile phone, iPad). The third hypothesis was that students would prefer the monitors. Teachers will hesitate between iPad and non-use of mobile devices in teaching. The results of our research show various tables and graphs.

Table I: Preference forms of communication in the classroom - students (standard error of the estimate is 3.74)

E-book	11,6%
Mailing list	0,4%
Newsgroups	0,8%
Skype	2,9%
Facebook	83,2%
SecondLife	1,1%

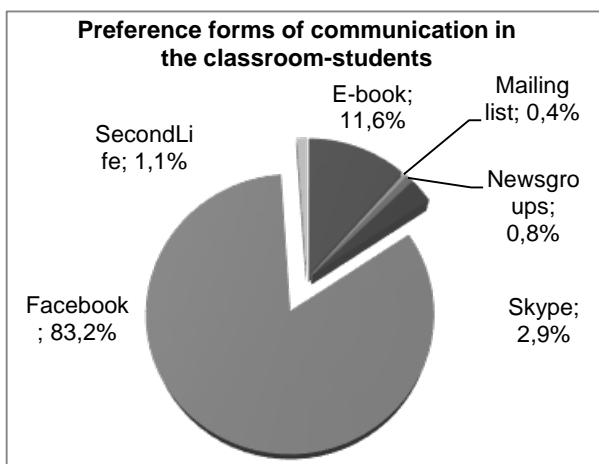


Fig. 1 Graphical presentation of results of own research

Tab. 2: Preference forms of communication in the classroom - teachers (standard error of the estimate is 3,59)

E-book	84,8%
Mailing list	4,5%
Newsgroups	5,8%
Skype	0,4%
Facebook	4,4%
SecondLife	0,1%

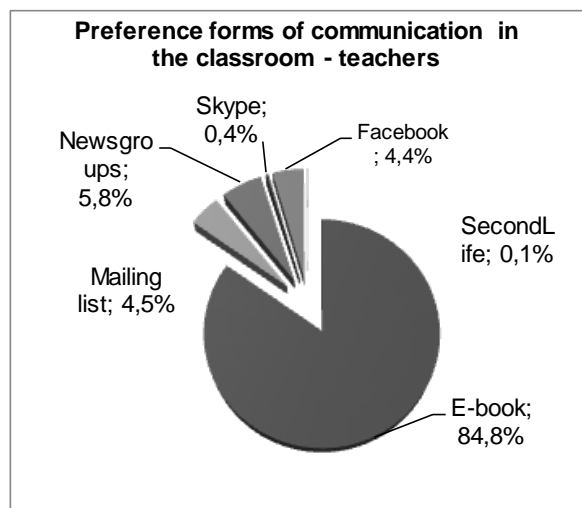


Fig.2 Graphical presentation of results of own research

Tab. 3: Preference of mobile devices in education - students (standard error of the estimate is 3.69)

not to use mobile devices	11,4%
Mobil phone	0,8%
SmartPhone	4,1%
iPad	83,7%

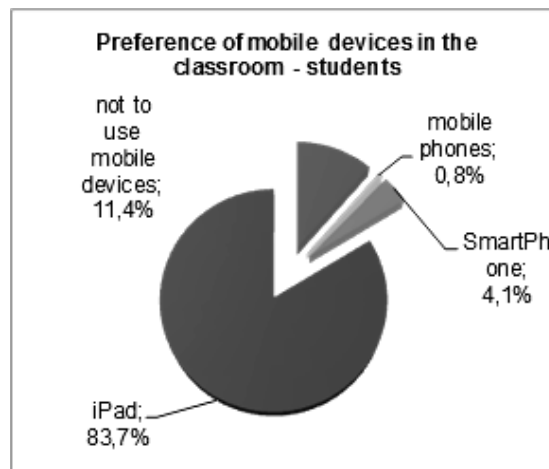


Fig.3 Graphical presentation of results of own research

Tab. 4: Preference of mobile devices in education - teachers (standard error of the estimate is 4,97)

not to use mobile devices	42,3%
Mobil phone	0,0%
SmartPhone	2,1%
iPad	55,6%

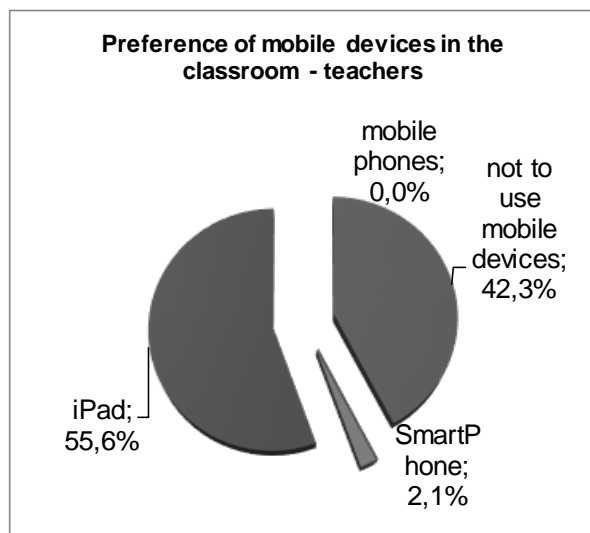


Fig.4 Graphical presentation of results of own research

Standard error is shown with 95% reliability. In addition, the table lists by percentage the average share of time spent by each teacher who performs this activity regularly. The total period of activity for each teacher for the activities mentioned above is 100%. Statistically, these calculations are verified using variable coefficients. Overview of the frequency of activities carried out by individual teachers in %, and an overview of the average % of the share in relation to other activities. All activities are always 100% of time spent by each teacher identified in the survey.

## VI. CONCLUSION

Based on our research, we can say that the first two confirmed our hypothesis and there is a discrepancy between the preferences of students and teachers. Students prefer communicating through Facebook. On the contrary, teachers preferred e-books. Our research showed that there was no interaction and communication is necessary to optimize the student – teacher [8]. Teachers should accept students' preferences, on the other hand, it is clear that no one t mindlessly. Above this contradiction it is necessary to consider in the future solve it on the basis of further research, particularly the influence of Facebook on students and their complementing styles of learning that the introduction of Facebook brought into teaching. A better situation is in the preferences of mobile devices in teaching. There was a consensus preference iPads only difference is the frequency. The difference is probably that the teachers see the current lack of software that has been specifically designed or optimized for the iPad. We realize such a relatively small monitor iPad. Another problem is that teachers of the social. Not all students own iPad and there is a digital divide.

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