Determining Aspects of Electronic Systems for Teaching Support

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Abstract: This text examines the determining aspects of the electronic systems for teaching support. It also gives information about the survey carried out on this topic. The perception of the electronic systems by students and teachers is also a concern. The survey was made at selected Czech universities.

Key words: determining aspects, electronic systems, teaching support, survey, digital divide.

1 Introduction
The electronic environment is a universal mean of communication. Its biggest advantage is the interactivity which supports immediate feedback in the process of communication; we can use this environment for business, educational and other activities. The electronic environment is universal for people communicating but also from the point of view of media used [7].

There is an interesting paradox on the Internet. The individualized environment enables the recipient to decode a transferred message in his own working pace although he is moving in the mass environment. H. M. McLuhan published the term global village in the 1960s. That is a period of time when the Internet did not exist. He meant the speed of communication and the sense of proximity of participants in the electronic environment.

There are many disadvantages too. We classify them as sociological, economical, psychological, didactical problems, etc.

There are no regulatory measures on the Internet that are significant or successfully pushed through; as a result non-existence of regulatory measures leads to the contradictory content of the entire Internet. People can find there easily available valuable masterpieces side by side with a trash of the lowest quality that can have negative impacts on recipients, especially children and young people [2].

2 Problem Formulation
There are main problems in the development of electronic systems supporting teaching in several areas.

2.1 Digital Divide
In the world, there is an unequal development of population in terms of economic (income groups and their possibilities), social (literacy, leisure) and technical (development of new media and their technical tools). This issue is called digital divide.

Digital divide does not concern only the area of electronic media. It blends to all the areas of life and it can be understood from different views [8].

Digital divide will be discussed in terms of planning the teaching and using didactic tools. An overvalued example is the planning of using the e-learning teaching system on the population in Afghanistan. That is utopia today.

First of all, digital divide is a geographical problem. Huge educational potential can be noticed in developing countries in Africa, some parts of Asia, South America etc. There are some parts of the world where people have never been educated.

A time period that is characterized by the oral transfer of information is described as the world of ear – the period of oral fundamental culture.

In some particular parts of the world (for example some African countries) illiterate tribal period of time can be found and studied today as well.

Digital divide is also a social-economic problem. Differences between the groups of inhabitants exist in the economic and technically developed countries. Fast development of the information technologies and contemporary systems demands higher requirements imposed on service staff and on necessary equipment.

Low real income has a negative impact upon some specific groups of people. That affects their education.
Digital divide influences unemployment, especially people with low education. However, contemporary decrease in vacancies applies to all employees.

In the field of education certain problems can be emerge. Business entities must pay attention to efficient collaboration with human resources. A stable and highly-developed system has to be ensured. That requires higher expenses to be spent in education, retraining programmes and, last but not least, also an increase in salaries and other expenses in relation to highly qualified staff [1].

One should not rely on the fact that operating new information technologies and tools could be learnt during the process of education itself because most of the population does not continue studying after they reach the required level and degree.

The state leaves the expenses relating to learning how to use new technologies and tools to enterprises. These enterprises are dependent on using more perfect tools by their employees and customers.

2.2. Computers

A typical representative of the electronic systems for the teaching support is a computer that can be used for almost all the educational activities after installing the necessary software. Computer software can be programmed according to the different needs of the particular student. The software can be interactively adapted for a particular student, and re-adapted when used by another student. Through computers, the activity of connected didactic technical tools can be operated and, if needed, multimedia applications can be produced [3].

All possible and envisaged uses of computers in the course of education represent only some potential effects of rationalization of teaching. They can play an important role only when they are efficiently incorporated into the whole system of teaching so that the teacher can rely on them in his or her performance. Using computers may lead to the improvement of his or her teaching [4].

Another important aspect results from the fact that the teacher can, and has a possibility to, use these technical tools in such a way which develops his or her teaching. It should be noted, however that obligatory conditions should be ensured which are determined by other aspects of teaching. This set of conditions is then worked up in a theory marked as the planning of an optimal teaching environment.

When the connection with strong higher quality technical tools of electronic media is established it is possible to optimistically envisage the following. The role of the teacher changes from the source teacher to the role of a guide in the information environment from which the student will be able to gain the information under the direction of the teacher.

Connections and relations between ICT tools, multimedia and education are complicated. It is necessary to put emphasis on using these ICT tools primarily in the development of more individual and flexible processes. Reliable and more active teaching attitudes should be supported.

Students gain, with the aid of technical tools of electronic media, particular independence of the authority of their teacher; but they are not losing the teachers support. They are able to gain more knowledge. At the same time, students are moving in the virtual world where strict rules and a sense of belonging exist [5].

It is essential to avoid certain extremes in relation of electronic didactic tools. Computers are now used at all schools in the U.S.A. including primary schools. They tend to replace the job of a real teacher who then becomes an assistant to the electronic “teacher” and reduces his or her role to helping the students in how to use particular programs, etc. Students’ profiles have been changing. Especially the importance of reading and writing skills will be decreased [6].

An article about similar developments was published by the Czech portal idnes.cz. An education board in Indiana, U.S.A. decided (on 25th April 2011) that teaching children hand writing is becoming useless. Today’s children belong to the generation of new technologies so it is sufficient for them to be able to use the keyboard and the printer. Such skills will be required: each school in the Midwestern Indiana will examine how children can write on the computer. Handwriting will not be tested anymore and the exam in block letters writing will be optional. It only depends on a particular school whether its administration incorporates the decision into its school plan.

Indiana’s approach is not unique in the U.S.A. There are also some schools in New York that teach how to write on the computer while hand-writing has become an optional subject [12].

Undoubtedly, there are more convenient and realistic movements. It is vital to check whether new technologies could have any impact upon, for example, the development and improvement of the students’ identification skills. Entertainment and ease of the gaining the information may lead to the reduction of students’ cognitive skills. Application of these new technologies in teaching cannot be
generally effective for all areas of education and for all age categories of students [13].

The opinion that a real teacher can be replaced by an electronic one has been refused. There were similar positions in the 1960s and 1970s in relation to programmed teaching. On the contrary, the teacher is even a more important factor that may reduce technocratic impact of the contemporary civilization.

According to some experts, the promoting of new technologies in teaching is apparently commercially based. Enterprises are trying hard to promote their products without paying any attention to the real effects in the pedagogical sense.

Many psychological studies about the cultivation styles of learning with the help of computers and other didactic techniques have been growing recently. However, there are not so many analyses on how huge the field of technical devices is and how many companies operate here.

Despite differences in teaching methods (using didactic and technical tools) the following factors should be considered when using computers in the course of teaching:

- All aspects have to be carefully considered;
- Computers become an irreplaceable part of the multimedia classes;
- It helps communication between different media in different places;
- It can be used for big groups (in a lecture hall);
- It can be used individually during e-learning.

CMI - Computer Managed Instruction is another example of using the computers when educating. It means that the computer only helps to organize the study and is not a teaching device. Information is saved in the computer and the user can later retrieve it. Information need not be a text but also drawings, sounds, videos, etc. The computer can analyze results and give the recommendations for the next study.

2.3 Computer Networks - Internet

The primary goal of the computer networks is to share their data and to transfer them in a short time in a large distance. Generally, other devices of ICT can be the part of these networks. These devices can be for example mobile phones, iPod or iPhones that form a different group. To make it easier, this group of devices will be called as computers in this part.

Elementary types of network can be unified into larger units with the same or different arrangement, i.e. to homogeneous or heterogeneous networks. There are not so many purely homogeneous large units but there are many heterogeneous ones. The example of the most important heterogeneous one is the Internet.

From the didactic point of view, the overview of the basic functions will be more interesting for us and the possibility of using the Internet during the class.

Functions of the Internet:
- Informational – plentiful amount of information available;
- Presentation – anything can be presented – people, companies, university, studying materials, results, etc.;
- Communication – all the users are able to communicate with each other in a real time. They can see and hear themselves. They are able to write, draw on the same board, help each other. If it is needed they can control one another.

2.4 The possible Communication Problems of the Internet

Some problems may occur when studying and using the Internet.

Non-verbal communication is sometimes missing during the electronic communication. Non-verbal communication can help decoding the transferred message. In case of video calls, only a part of a person can be seen and transmission usually does not reach a good quality.

Text messages contain only the minimum necessary signs; as a result, they just denote and may lead to communication problems. For example, a seemingly easy sentence: “It is warm today” can be decoded in two ways without a sufficient knowledge of context. It could be the expression of satisfaction or dissatisfaction with the temperature. Emoticons can help to understand but the natural language is disused [9].

Significant problems in a social field are connected with a digital divide.

The importance of quality information in school leads to the need of having the maximum of information available. It may happen that information moves from the level of a helpful source to the goal itself.

Considering psychological aspects, people are overloaded with data. This is caused by an influx of data coming from various means of communication, especially from electronic and mass media [10].

Continuing absence of understanding information received may lead to stressful situations; permanent information discomfort may
result in a person’s inability to understand information he or she really needs.

Unfortunately, an inverse proportion works in electronic communication. The more time people spend with the electronic communication (and other computer activities) the less time they spend with members of their family and real friends. The number of people belonging to their social sphere is reducing. This may lead to the feelings of loneliness and to depression.

The emphasis is laid on the elementary aspects of teaching.

The trends of modernization of education are calling for new competences required from all participants in the learning process. Their goal is to contribute to individualization and optimalization of the learning process, to its facilitation and increase in its efficiency. The application of ICT tools to educational process cannot be subordinate to their technical aspects. It has to be based on serious pedagogical research and its results [11].

The quality software is very important, as well as its simple operation by both the sender and the recipient of information.

Another important requirement is availability of relevant documents. Activities of departmental councils or commissions are very important as are those of the guarantors of different subjects. Their systematic work can lead to the simplification of preparation or provision of teaching tools so that the quality of teaching itself may increase. For example, some tools prepared for the class of Accountancy can be used when teaching the subject Applied Software for Accountancy. The advantage is that students have been already informed about these tools in another class so they can find out the connections.

The advantage can be a quality Business Intelligence concerning the list of tools, short description and specific place of its position. This can be found on a webpage with a good and tested content which may become a good source of information to be used in teaching.

3 Problem Solution

Most of the problems mentioned can be solved if students and teachers are interested in their solution. The main requirement is that both sides would like to use one specific system of teaching support. That is why teachers as well as students are asked in the survey about their opinion on different modes of the electronic teaching support system.

The first hypothesis has been that students would like to use most of the offered possibilities.

The second hypothesis has been that teachers would choose a specific system very carefully and they would not prefer a particular one. They would choose the system with the taught subject in mind. They would choose according to these aspects of teaching:
- objectives,
- character of the presented data and information,
- mental level of the students,
- social level of the students,
- selected methods,
- selected resources.

Table 1: Preference forms of communication in the classroom - students (standard error of the estimate is 3.74, 95% confidence interval is 75,8 – 90,5 %)

<table>
<thead>
<tr>
<th>Forms of communications</th>
<th>% preference</th>
</tr>
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<tbody>
<tr>
<td>E-book</td>
<td>11,6</td>
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<tr>
<td>Mailing list</td>
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<tr>
<td>Newsgroups</td>
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<tr>
<td>Skype</td>
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<tr>
<td>Facebook</td>
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</tr>
<tr>
<td>Second Life</td>
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</tbody>
</table>

Fig. 1 Graphical presentation of the survey results

Table 2: Preference forms of communication in the classroom - teachers (standard error of the estimate is 3.59, 95% confidence interval 77,8 – 91,8 %)

<table>
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<tr>
<td>Mailing list</td>
<td>4,5</td>
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<tr>
<td>Newsgroups</td>
<td>5,8</td>
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<tr>
<td>Skype</td>
<td>0,4</td>
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<tr>
<td>Facebook</td>
<td>4,4</td>
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<tr>
<td>Second Life</td>
<td>0,1</td>
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</tbody>
</table>
Table 3: Preference of mobile devices in education - students (standard error of the estimate is 3.69, 95% confidence interval 76.4 – 90.9 %)

<table>
<thead>
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<tbody>
<tr>
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<tr>
<td>Mobil Phone</td>
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<tr>
<td>Smartphone</td>
<td>4.1</td>
</tr>
<tr>
<td>iPad</td>
<td>83.7</td>
</tr>
</tbody>
</table>

Table 4: Preference of mobile devices in education - teachers (standard error of the estimate is 4.97, 95% confidence interval 45.9 – 65.3 %)

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<tr>
<td>Smartphone</td>
<td>2.1</td>
</tr>
<tr>
<td>iPad</td>
<td>55.6</td>
</tr>
</tbody>
</table>

4 Conclusion

As can be seen the above the survey shows different opinions of the groups.

The students obviously do not realize that they cannot choose tools first and then adjust the way of teaching.

On the contrary, teachers are used to choose the tools and methods according to the above mentioned requirements of teaching.

Teachers have to take account of goals, characters of data and information shown above, the mental level of students, their social level and only then they can choose relevant electronic systems supporting their teaching.

Important aspects have to be realized. The teacher cannot be commanded to use concrete electronic systems to support teaching if s/he is not convinced about their suitability or if s/he cannot work with them. Each teacher has his or her own style of teaching and always prepares his or her own schedule of teaching.

The same principle applies to students. Each student has his own style of studying. Teachers can help him or her to change the style of studying but cannot force him or her to do so. In many cases, fast and obligatory made change may lead to deterioration of studying.

These different findings need to be brought closer one by one. For the quality of teaching it is important to overlap the style of teacher’s teaching and the style of student’s studying.

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References:


