Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management

Diploma Thesis

**Lifelong learning - Online learning
as a tool for adult education**

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DIPLOMA THESIS ASSIGNMENT

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Lifelong learning – Online learning as a tool for adult education

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Objectives of thesis

Objective of the diploma thesis is to introduce education of adults and online learning in general and to prove the importance of online learning as a tool for more accessible education for adults.

Methodology

The methodology will be provided by participating on a project focused on teaching lecturers how to teach online. The case study will be processed out of the project.

The structure is planned to be:

1. Introduction

2. Aims and Research Question/s

3. Literature overview

4. Practical part

5. Conclusion

6. Resources
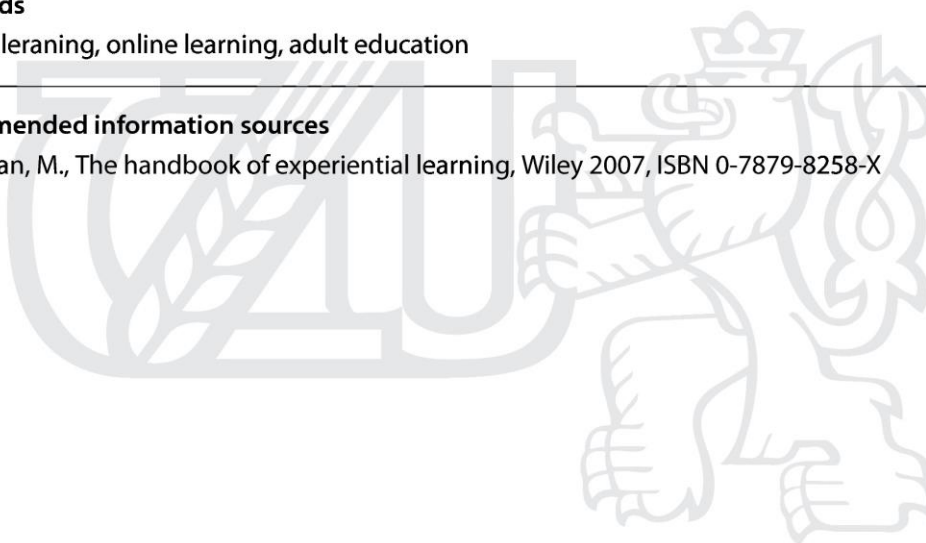
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Silberman, M., The handbook of experiential learning, Wiley 2007, ISBN 0-7879-8258-X

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Declaration

I herby declare that I have worked on my diploma thesis titled 'Lifelong learning – online learning as a tool for online education' solely and completely on my own and that I have marked all quotations in the text. The literature and other material I have used are mentioned in the References section of the Thesis.

In Prague on 10th March   _____

Acknowledgement

Lifelong Learning - Online learning
as a tool for adult education

Celoživotní vzdělávání - Online learning
Jako nástroj vzdělávání pro dospělé

Souhrn

Cílem této diplomové práce je představit termíny vzdělávání dospělých a on-line vzdělávání obecně a prokázat význam on-line vzdělávání jako nástroje pro přístupnější vzdělávání pro dospělé. Diplomová práce se skládá ze dvou částí. Teoretická část charakterizuje vzdělávání přes internet, vysvětluje všechny důležité pojmy spojené se synchronní a asynchronní on-line výukou a definuje je. Praktická část je zaměřena na synchronní vzdělávání v on-line kurzu Metodika on-line vzdělávání, v rámci projektu realizovaného společností iCORD International. Celý proces poskytování webového semináře-webináře je podrobně popsán a jsou vyhodnoceny hlavní výhody a nevýhody. Kromě toho je vypracován průzkum mezi vzdělavateli dospělých a výsledky jsou vyhodnoceny. Součástí diplomové práce je i SWOT analýza online synchronního vzdělávání.

Summary

The objective of this diploma thesis is to introduce the terms of education of adults and online learning in general and to prove the importance of online learning as a tool for more accessible education for adults. The diploma thesis consists of two parts. The theoretical part is characterizing education through the Internet, explains all important terms connected synchronous and asynchronous online learning and defines them. The practical part is focused on synchronous learning during the online course Methodology of online learning, in the frame of a project implemented by company iCORD International. The whole process of providing a web-based seminar, webinar, is described in detail and the advantages and disadvantages are evaluated. Furthermore, a

survey among educators is made and the results are evaluated. A part of the thesis is also represented by SWOT analysis of online synchronous learning.

Klíčová slova: celoživotní vzdělávání, online výuka, vzdelávání dospělých, webinar, synchronní vzdělávání, virtuální učebna

Keywords: lifelong leraning, online learning, adult education, web-based seminar, synchronous online learning, virtual classroom

Contents

1 Introduction

Internet remarked marvellous development in the last decade. Everyday lives of citizens of developed countries are more or less influenced by the Internet and modern technologies. If used wisely, it can save time, money and energy. This thesis is focused on Internet´s usage in education or more specifically on online education.

There are many terms used for online education. Some of them are for instance virtual education, Internet based education, web-based education, or education via computer-mediated communication. One of the most used definition of online education is based on Keegan's (1988) definition of distance education. That means that online education is characterized by the separation of teachers and learners, which distinguishes it from face-to-face education. There is also the influence of an educational organization, which distinguishes it from self-study and private tutoring. Online education is also defined by the use of a computer network, which presents or distributes some educational content. It also provides two-way communication via a computer network and therefore students may benefit from communication with each other,lectors, teachers, and staff.

This thesis is focused on online education and one of the key terms used in this thesis is virtual classroom. Virtual classroom, or Virtual Learning Environment (VLE) is crucial tool for providing online education. Virtual learning environment is a term that to some extent is used instead of Learning Management System (LMS). These two terms have more or less the same meaning, however one may argue that Virtual Learning Environment focuses less on the specific features related to the management of learning. Hall (2001) defines learning environment as a „software designed as an all-in-one solution that can facilitate online learning for an organization. It includes the functions of a learning management system for those courses within the learning environment, but it may not be able to track online courses that were not created within this particular learning environment". A learning environment in general is

characterized by an interface that allows students to register, enroll into and take courses, staying within that environment for the duration of the given course (in this thesis online course is rather called as web seminar, or webinar). The program usually includes some self-instructional portions. Most learning environments also include some authoring capability for creation of additional courses for the lector.

2 Aims and Methodology

2.1. Aims of the thesis

The main objective of the diploma thesis is to introduce the terms of education of adults and online learning in general and to prove the importance of online learning as a tool for more accessible education for adults. The aim of the thesis is to provide information about the possibilities offered by synchronous online learning, evaluate the methods used and to present the main advantages and disadvantages. Another goal is to design recommendations for making the course more effective and efficient. The practical part shows how synchronous online learning works in practice in detail. Strengths, weaknesses, opportunities and threats are compared in SWOT analysis.

2.2. Methodology

The first part of the diploma thesis is the theoretical part and the secondary data were gathered from books, literature and various online resources. This way, all important definitions and terms were clarified and explained.

The second part of the diploma thesis is the theoretical part. Methodology for the practical part consists of a case study processed in the frame of a European project about education of adults and teaching them how to teach online. Evaluation of the implemented case study and suggestions and recommendations are included. Survey among educators of adults will be undertaken and the results will be evaluated. Focus of the survey is usage of virtual rooms and webinars. The SWOT analysis will be

concluded based on the participation in the online course in the form of a web-based seminar (webinar), own observations and results of the survey.

2.3.   Hypotheses

The two main methodological instruments are used in the diploma thesis. The first one is participating in the online course and processing a case study with the use of own observations. The second one is a survey among educators of adults. Middle lengths questionairres with 11 questions will be given to the focus group. The main hypotheses are:

1) Online synchronous learning represents full-valued type of education of adults with the same efficiency as the traditional way of education of adults.
2) Preparation of the lecturer is very time consuming in order to provide a quality teaching.

3 Internet in the education

Internet has been gaining more importance across nations and across sectors and therefore it is no wonder that its usage in education has been growing too. Internet as a technology serves as a tremendous time saver when it comes to communication. Although education is based on face-to-face contact and traditional methods of education are all based on physical contact and mutual communication, Internet proved that it is capable of replacement of this physical contact. Its main advantages when speaking about online education are save of time, money and energy and also increased option of interactivity by employment of various multimedia tools.

The disadvantage of internet in the education is namely sceptical approach of both lectors and students. However, the most pessimistic are those who do not know how to work with computers properly. It is crucial to realize, that computers exist and they are broadly used. Nowadays it is a basic skill, expected even from young children and it is expected that people can use it. Modern systems are very simple, have user-friendly interface and are straight forward, therefore everybody can learn how to use it (Petty, 1996).

The importance of the Internet is in its availability, which is still growing. Nowadays it is quite normal that in developed countries ordinary people possess one or more smart phones, a tablet, a personal computer and eventually other devices. All these devices have one in common- they are easily connectable to the Internet. Also the option of work with various types of documents has been growing. Today it is common that people send their text documents or Excel documents from one device to another and they are editable in any single device. The fact, that everybody (in developed countries) is online is a sign that people like online communication and therefore they should be potentially interested in online education (Kubín, 2011).

Although people use Internet everyday and especially young people are becoming addicted to "staying online", online educations remains potential but not fully engaged field. People use Internet namely for work purposes or for entertainment but for some reasons they do not use it for online education even though they could significantly save their time and resources (Neumajer, 2011).

Online education in general is classified into several main categories. This chapter will introduce all of these categories and describe what the specific activities in these categories are.

3.1. Ways of Internet education

There are different ways how to provide education with the Internet. These ways vary according to used technology, scope of education and time (real time education, or education online without regard to specific time).

3.1.1. E-learning

The concept of e-learning is defined in the pedagogical dictionary as an electronic education. According to Průcha et al (2009b) "E-learning is the type of learning in which the acquisition and use of knowledge is distributed and facilitated by electronic devices. It can include comprehensive learning courses or smaller modular learning courses or relatively small teaching topics. It can rely on synchronous and asynchronous approaches and may be distributed from geographically and time independent sources. E-learning connects the internal management of and individual with the self-regulation. It is mainly used in distance and combined forms of higher education, corporate training and training courses. This type of learning gradually penetrates to the middle and elementary schools."

E-learning basically refers to some online platform where all materials are gathered and students can access them anytime. This platform usually comprises also interface for

communication among students and communication between student and lector. These platforms serve as libraries, for instance. They crate space where students meet (even virtually) and where all relevant materials are available. They also include forums for sharing of experience or obstacles during studies and different quizzes, practice quizzes, tests, links to useful websites, etc.

Tureckiová (2008) believes that technologies and processes like the Internet, or audiovisual and communication technologies bring new opportunities into education and provide completely new view on educational systems. However, positive impact of these technologies is rather discussed and being proved than really taken advantage of. Even though that studies offer results, which prove tremendous options of online education, reality is different. In practice people still prefer traditional educational practices with emphasis on face to face contact a physical teaching. Potential of online education has not been really used.

E-learning in general is used in different spheres, these are for example:
- Educational Institutions such as schools and universities
- Private educational organizations such as institutes for foreign languages or private schools for individual or group lessons
- Companies for employees´ training and development

E-learning has not been used only for traditional educational organizations but for all organizations, which somehow need to educate its stakeholders (does not matter if these are employees or suppliers). E-learning is a tool, which can significantly decrease costs for education and which can provide useful structure for all students. So called e-learning course includes a range of simulations, multimedia classes, animations and graphics and a student can choose whatever suits them (Educeo, 2012).

A traditional view on e-learning is often confused with the term "online learning". Despite its names, these two ways of Internet education are completely different and also their educational benefits are different. Online learning as such requires an online connection of both student and lector. Therefore student does not need to be physically next to the lector but they need Internet connection to be "together". They have to sit by their own computers and they need to be able to interact with each other in real time. The term e-learning includes much broader area, but in general to refers to offline sphere. It can be perceived as the offline version of learning. In this case, there is no direct connection between student and lector (Střítezská, 2003).

E-learning has become more pervasive, however, expressions of uncertainty and concern have emerged as well. The list of concerns uncludes lack of face-time between student and teacher, devaluation of oral discourse, problems with discussion practices and so on. Anderson (2008) believes that E-learning is not sufficient form of education. He believes that complex and deep learning can be achieved only together with real-time classroom experience. This would provide better technological and pedagogical uniformity.

3.1.2. Online learning

Online learning takes advantage of Internet options at most. It takes advantage of the opportunity to link people in different continents together by using Internet. It is a synchronous form of online e-learning and therefore it requires a constant (and stable) Internet connection. Students communicate with their lectors in real time (in the same time frame) and technology enables them to almost replace physical contact. Online learning is based on virtual space (classroom, lecture room, etc.), which students can enter as they would enter classical classroom in a school. Participants of the class are connected in the same moment (not at the same place) and lector can guide them all as he would if he stands in front of them in the classroom (Kopecký, 2006).

Synchronous learning is often called "live education" or "live learning online" due to the fact that actual class is being made in a real time. This term is often used with regard to education, videoconferencing and communication via the Internet. The concept of "synchronous" education refers to a type of education where a group of people is learning the same topics, at the same time. This means that the communication (lecture or seminar) happens at the same time and the information is transferred immediately from lector to student. All participants of that particular class can communicate in real time or send text messages (sometimes even multimedia). The interface where the learning is actually undertaken is called "virtual classroom" and the presentations can be shown on an electronically blackboard. When speaking about the lecture taken online, term "webinar" is used for it connects words Web and Seminar (Barešová, 2003).

Shepherd (2011) describes the most used tools for synchronous online communication. These are:

- Instant Messaging
    - Windows Live Messenger
    - Yahoo messenger
    - Google Talk
- Web conferencing
    - Cisco WebEx
    - Microsoft LiveMeeting
    - Saba
    - DimDim

The most common form online communication is IM (Instant Messaging). By IM typically two participants communicate but new technological development enables connection of much higher number of participants. Originally IM was based on simple text communication, but today it includes both audio and video communication. The examples are Windows Live Messenger, Yahoo messenger or Google Talk. These tools

are now broadly available on mobile devices and computers and therefore affordable and available for public. However, their usage is limited and especially for educational purposes Instant Messaging is obsolete and not efficient enough (Shepherd, 2011).

Other category of online communication is Web conferencing. It is used for managing live meetings, training sessions, forums, briefings or Internet presentations. Web conference includes audio/video communication, application sharing, electronical whiteboards and shared media (e.g. PowePoint presentation). Technology for web conferencing also offers text messages and opportunity for quiestionnaires filling and submitting. Web conferencing systems are represented by various systems such as Cisco WebEx, Microsoft, LiveMeeting, Saba and DimDim. Nevertheless number of technologies for web conferencing is growing (Shepherd, 2011).

Ally (2004) defines components of effective online learning. He put them into four categories- learner preparation, activities, interaction and transfer.

Figure 1 - Components of effective online learning
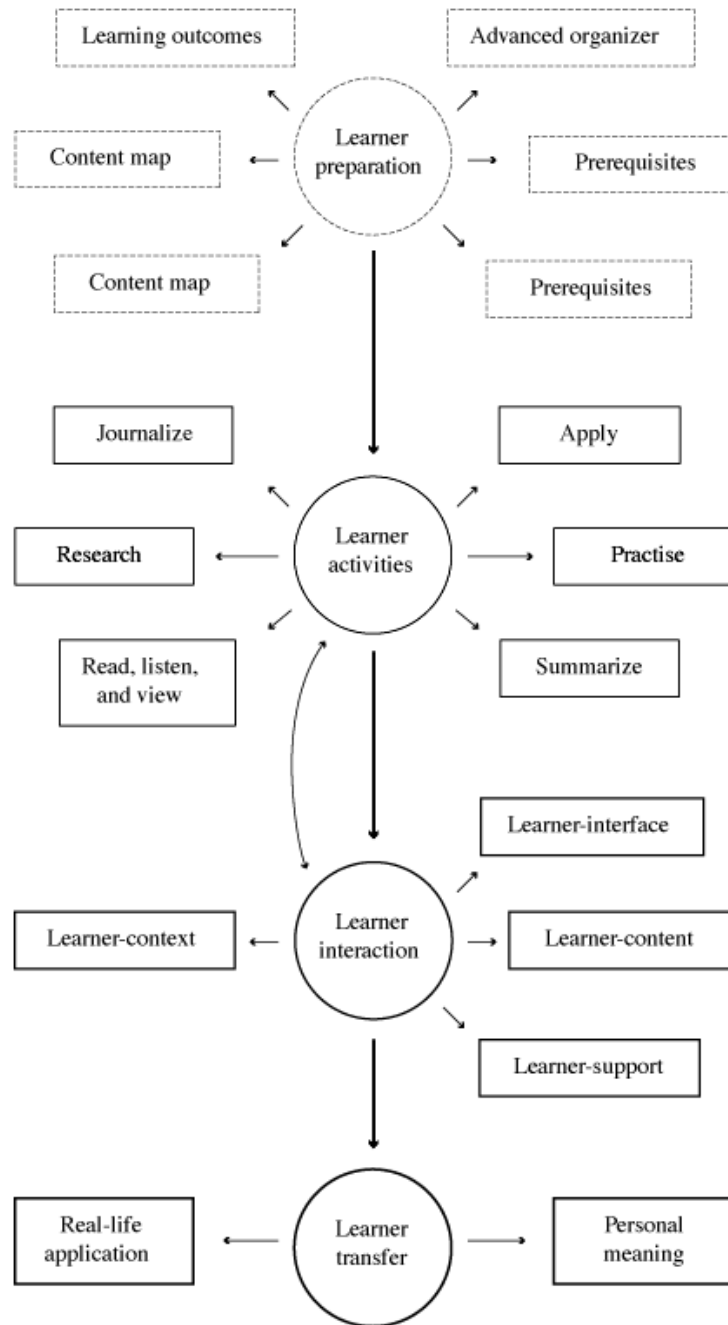
Source: Ally, 2004

3.1.3. Forms of synchronous online education

There are different forms of online education and these are:

- Individual where there is one lector and one student in the virtual classroom.
- Group where lector provides education to more than one student.
- Collective where there are up to one hundred of participants of online session. Usually it is not classical webinar but rather forum or lecture. Participants can ask for permission to speak and lector or host is moderating them.

Broadcast (broadcasting) in computer science is the message that the network accepts all connected network interface. This is a model of digital communication, where one transmits and everyone hears. Broadcast is conceptually predecessor of webcasts and podcasts. Webcast (webcasting) is a term that is used differently (sometimes incorrectly) by different users. Webcast refers to one-way audio or video streaming. Nowadays there are a huge number of tools that provide much more sophisticated communications capabilities synchronized with the audio or video transmission - mostly slideshows and documents in real-time headlines, text chat, polls and questionnaires and downloading files. E.g. by WebEx it is appropriate to use the term webcast as one-way synchronous communication from one point to many places (one-way point-to-multipoint). Webcast is a typical tool for providing a large number of subscribers an option to connect simultaneously through a microphone.

3.1.4. Blended learning

Blended learning is the third way hot to provide education via Internet. It combines both E-learning and Online learning in order to maximize efficiency of both and maximize attractivity of online courses- It is a approach where both online learning (webinars) and educational courses are employes. It is the most valuated approach, because it is complex and it enables student an opportunity to study at home with usage

of available materials but also take advantage of real-time webinars. It provides a structure to the lector where both offline and online methods are used. Student can maximize the efficiency of the course by using as many educational sources as possible. If online classes- webinars are properly complemented by platform supplied with materials, readings and quizzes, students can only benefit (Barešová, 2003).

Proper combination of E-learning and Online learning can provide wide flexibility to students together with significant save of time and money.

3.2. Videoconferencing

A word Videconference comprises two words: video as a medium providing audio and video, and conference, which refer to meeting "face to face". Videoconference therefore refers to a technology, which enables people to meet "face to face" without regard to distance, which physically divides participants of the conference.

Videoconference connects people without regard to timezone and place but it requires stable Internet connection. Technology developed for videoconferencing does not only connect audio and video of participants, it offers additional options too. These are for instance sharing of documents, multimedia or desktop sharing. Videoconfernce can therefore increase productivity; decrease costs for traveling and even save natural resources and the environment. Videoconference is often called synchronous online communication and in education it refers to virtual seminars, virtual classrooms and virtual (online) education.

3.2.1. History of videoconferencing

No new technology develops easily and so videoconferencing had to overcome many obstacles before it began to be widely used. History of videoconferencing started in the late 60s, when AT & T launched its "Picturephone" in New York. Even though it

was a great curiosity, it remarked tremendous success because of affordable price. Its price was $60 per month (Studenčík, 2010).

Commercial use of videoconferencing for the first time was launched by Ericsson company. Other companies have begun to enrich the videoconferencing by technologies such as Network Video Protocol (NVP) in 1976 or Packet Video Protocol in 1981. However, none of these technologies was used in a commercial environment. In 1976, the Japanese telecommunications (Nippon Telegraph and Telephone) established a videoconference connection between Tokyo and Osaka for business use. The Japanese subsidiary of IBM followed and in 1982 it built a videoconferencing link with the parent IBM in the United States running speed of 48000 bps. This allowed the company to hold regular weekly meetings (Nefsis, 2012).

IBM introduced the first video conferencing system based on the use of PC under the name "PicTel" in 1991. At that time it was incredibly expensive, it required $20,000 cost of acquisition and operation of one line required operational costs of $ 30 per every hour (Nefsis, 2012).

In June 1991 the DARTnet Company successfully linked more than a dozen research facilities in the United States and Great Britain. Currently it is known as DARTnet CAIRN system and it connects dozens of institutions. One of the most famous videoconferencing systems was CU-SeeM, which caused a revolution in videoconferencing. It was developed for the Macintosh in 1992. Although the first version did not have any audio, it was the best system in those times. In 1994 CU-SeeMe videoconferencing system was already equipped by full audio support. Because developers were aware of the limits of compatibility with Windows OS, they worked hard and finally, in April 1994, CU-SeeMe for Windows was released. The first version, in those times without audio, was later replaced by version 0.66b1 released in September 1995 (Roberts, 2004).

Company AT & T launched in 1992 its own videophone for home use (for price of $1,500) and sold it with relative success. That same year, the company made its first MBone audio video transmission and introduced videoconferencing system from INRIA. In 1992 the world witnessed the first real boom in videoconferencing for businesses. Everything eventually led to the standards developed by the International Telecommunication Union - ITU, International Telecommunication Union (Roberts, 2004).

ITU began to develop standards for videoconferencing in 1996, when it established a standard H.263 to reduce bandwidth for the communication of small data stream. Others followed this standard such as e.g. H.323 for multimedia communication based on packets (Roberts, 2004).

In September 1996 Microsoft joined the world of videoconferencing. Finally it introduced Microsoft NetMeeting (it was offspring of program Liveshare Plus of PictureTel company), although without support of video. However, in December 1996 version 2.02b NetMeeting was released and it was already equipped by video (Roberts, 2004).

In June 1997, the research center CERN-Caltech launched the project VRVS (Virtual Room Videoconferencing System). It was designed exclusively for communication of researchers in the project LHC (Large Hadron Collider) and for scientists dealing with elementary particles and nuclear physics in Europe and the United States. Virtual Room Videoconferencing System was so successful that the initial capital for the project was immediately increased and project could enter the second phase. CalREN-2 was an expanded version of VRVS and its purpose was to link genetics experts, doctors and other scientists and experts using videoconferencing technology (Roberts, 2004).

Videoconferencing on PC leaped also forward and one of the biggest steps forward was introduction of CU-SeeMe program version 1.0 in 1998. This version provided a color video and was compatible with Mac and Windows platforms.

The year 1999 was a very busy with regard to the development of videoconferencing and related technologies. Many new programs and new versions of older programs were introduced and launched. The most important were for instance NetMeeting version 3.0b (followed by several patching) or iVisit for Mac and Windows. Standards, which were introduced and which were important for the development of videoconferencing were efor instance SIP (Session Initiation Protocol with many advantages compared to H.323) or MGCP (Media Gateway Control Protocol). In 1999 standard MPEG-4 (created by Moving Pictures Experts Group) came into force as a part of ISO family of standards for multimedia content (Roberts, 2004).

In 2000, Samsung introduced the first mobile phone capable of transmitting MPEG-4. It was a huge hit, especially in Japan (Roberts, 2004).

The year 2001 was a milestone because video conferencing technology enabled the United States to control the robot surgeon overseas during gallbladder surgery. It was one of the most compelling non-business use of videoconferencing in history and it brought this technology to both experts and the public. In October 2001, television reporters started to use a portable satellite and video for live broadcasting from the war in Afghanistan. It was the first use of videoconferencing technology by someone directly in the war zone, which again brought the videoconferencing to public attention (Roberts, 2004).

In December 2002 the Protocol ITU-T H.264 video compression technology was presented. It standardizes wide range of applications, which made it more versatile and flexible than its predecessors (Roberts, 2004).

In 2003 virtual classrooms were firstly widely used across universities. These interactive "classes" consisted offered increased quality of the transmitted video and audio, and decreased response time (Roberts, 2004).

Nowadays, videoconferencing popularity is growing. It is because of the fact that majority of people in developed countries possess PC, laptop, smartphone and other devices, which can easily provide video conference. Also quality and availability of the Internet connection has been continuously growing and price decreasing. Both corporate and private sectors pay closer attention to videoconferencing technologis. Companies save so important time and money and ordinary people enjoy comfort of home when communicating with anyone in the world in real time. What was quite costly or impossible few years ago is ordinary and common today.

3.2.2. Advantages and disadvantages of videoconferencing

As every technology, videoconferencing has its positive and negative aspects too.

Benefits of Videoconferencing

- Saves money

If an employer sends an employee on a business trip, employer is obliged to pay for instance for transportation, food and accommodation. All this, of course, increases costs, which is nowadays, when companies try to save as much as possible, undesirable. However, if the employer purchases some of the videoconferencing solutions, such costs are eliminated.

- Saves time

Hand in hand with the above-mentioned financial savings there goes timesavings. Traveling requires time and sometimes it is simply more advantageous to execute desired meeting online than face-to-face. The introduction of video

conferencing logically eliminates the time and therefore working time can be used more effectively.

- Saves environment

Videoconferencing enable people to "meet" without traveling and therefore it saves environment. Reduction of fuels and pollution caused by transportation is caused when introducing videoconferencing.

- Provides better and more effective communication

Videoconferencing offers both audio and video. Therefore it gives space also to nonverbal communication, which is very important too. It was found that "verbal components represent only 7% of the messages vocals (tone of voice modulation and other sounds), constitute 38% of messages and the remaining 55% of the non-verbal communication are mediated signals" (Pease, 2001).

Of course one can argue that the cheaper option of remote communication without physical presence may be a mobile phone, but it is necessary to say that "the phone lags well as the human voice disproportionately distorted by the fact that it cuts off only a small portion of the acoustic band from 300 to 3400 Hz. Videoconferencing facilities work with band audio 7 kHz wide and sometimes more "(Zikmund, 2012).

- Faster and more effective management

Very good use of videoconferencing systems is in business management or business, especially if branches are in different locations. If the company therefore provides videoconferencing solution it can better supervise the workers or delegate various tasks faster. Staff in remote sections can quickly communicate and share files and do not need to do so via email.

- Increases competitiveness

Of all the above-mentioned aspects contribute to higher competitiveness of the company as a result of cost savings (savings finance can be used elsewhere and efficiently), labour savings (time saved can devote more important activities) and better governance (better distance communication between superiors and subordinates).

At the same time, we must also mention that nowadays just society must "move with the times" and not to resist further development. The introduction of videoconferencing systém indicates that company does not prevent progress, which obviously contributes to improved company image. In addition, young people tend to use the Internet and online technologies on a daily basis, and therefore i tis assumed that many businesses will slowly shift to online sales.

Disadvantages of videoconferencing

- Requires high initial investment

Videoconferencing solutions are relatively costly, does not matted if they are based on software (only program, using PC) or hardware (eg. Room equipment). Depending on the size of the company or the number of future users, the price ranges from thousands to hundreds of thousands of Czech Crowns. Of course, there are some cheaper solutions, however, it is important to mention that the invested cost of acquisition systems always returns.

- Requires high quality of Internet connection

For the realization of video conferencing it is necessary to ensure quality and stable internet connection to make the transfer smooth, without the "lag" (jams). Users can connect to a videoconference from anywhere, as long as it is a reliable wireless connection with a strong signal.

- Requires high transmission quality

If, for example, laptop or PC are equipped with a low-quality camera or microphone, connection is poor quality (blurry image, husky voice, noise, etc.) and thus mutual communication suffers. Nevertheless, todays devices are usually high quality and affordable price.

- Requires technical training

When implementing new technology, i tis necessary to provide proper training. Videoconferencing systems usually are usually used also by beginners, so developers of these systems think about that. Systems are therefore mostly intuitive and there is also instruction guide in the proper language. If the user is not equipped with either technical or language skills, this situation can be resolved by purchasing systém in mother language and from domestic company, which ensures that only the system itself, but also technical support will be in the mother language.

- Requires electricity and technology

Videoconferencing solutions are dependent on electricity and in case of failure transmission can be broken. The technique itsel in addition may malfunction. Blackouts can certainly to some extent be prevented or at least some risk can be eliminated by thorough preparation, training, testing, etc.

- Requires overcoming of initial shyness

Conservative people, and especially elderly can have little confidence in the new technology. These people usually try to avoid videoconferences. Employers have to think about that before acquisiton of ideoconferencing solution. Due to the development of society and the development of these technologies number of shy people is decreasing and people feel more confident when using modern technologies.

3.2.3. Architecture of communication

All videoconferencing systems, which are used fot linking together more participants are usually connected to a central server. The server then "decides" who will communicate with whom and at the same time it keeps users connected to the information that it transimttef further. Another case are those programs, which are based on IP multicast addresses (multicast IP addresses are public, other type are reserved IP addresses and IP addresses with a limited range). These programs do not require a central server, but have specific requirements for network infrastructure (Marik, 2010).

Main types of architecture are two, peer to peer and client – server:

Peer to Peer (P2P)

In case of this architecture, Peer to Peer (Person to person) communicate, so each participant of the videoconference is connected with everyone. In practice this means that the main advantage is in lower demands on network connectivity and central server. Server in this case conveys information about other clients and does not carry the greatest burden, which is an image or video and audio transmission, or sound (Marik, 2010).

Client - Server

In this architecture a major factor is server, since it communicates with all connected users. Server provides necessary data. This architecture is advantageous at the moment there is a larger number of participants and it would be difficult to ensure quality connections for all participants. However, the server is in this case greatly burdened and it the key factor in reliability of the entire session. In this case, it is necessary to provide really high quality and reliable hardware and avoid overloading a server (Marik, 2010).

Simple scheme below demonstrates main differences between these two architectures.

Figure 2 - Architecture of communication

Server-based   P2P-network
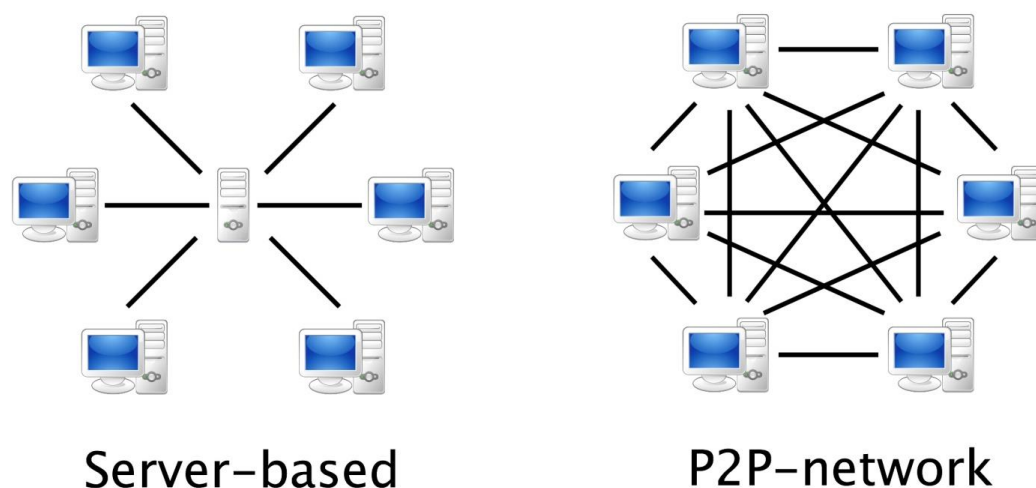
Source: Marik, 2010

3.3. Virtual classroom

Virtual classroom is a virtual space, which is necessary for linking student and lector and for existence of the webinar. Usually it is a space, which belongs to a lector (lector pays either monthly fee or purchase the virtual classroom from a provider) and lector can give access (link) to his or her students. Students use a specific link and together with login and password enter the classroom.

A virtual classroom is either online or an application, which must be downloaded in advance. If it is online, it is available via web browser and lector can access his or her classroom from any computer. If it is an application, it requires an installation of the program. As mentioned before, lectors are usually the owners of the virtual classroom. They can set up the classroom, prepare it before the webinar (f.e. uploading the files such as pdfs, pictures, ppt presentations, etc.) and during the webinar they manage tools and communication of the participants. The virtual classrooms are offered by many companies, the most used, are:

- Cisco Webex
- Microsoft Office Communicator
- Adobe Connect
- Citrix GoToMeeting
- HP Virtual Rooms
- GoMeetNow
- WiZiQ
- Wimba Classroom

Other systems, which can be used as basic virtual rooms, are:
- Skype
- Google Talk

But it is important to realize that these programs cannot be used as virtual classrooms. These programs were designed for the personal usage and they are available for free download. However, their usage for business purposes is not legal, which is written in their Legal Terms of Use that must be signed by user before downloading.

3.3.1. Technical requirements of the virtual classroom

For successful organization of online events, online consultations or online meetings the proper set up of the hardware is crucial. The requirements can be divided into two main categories; technical requirements before the online session and technical requirements during the online session (without regard to the character of online session). The requirements are diverse for the owner of the classroom and for the participants (visitors of the classroom). Before the online session is launched it is necessary to set up and control the hardware. Every online session requires participants (namely lector, owner of the classroom) to possess microphone, web camera and

Internet connection. The connection of devices such as microphone, web camera, or data projector must be executed and controlled. The proper Internet connection has to be provided in order to ensure fluentness of an online session. These steps have to be undertaken by the owner (lector) of the classroom. Participants of the online sessions have to control their Internet connection, its availabilitx and stability and their microphone. Web camera is not necessary for the participants, but it is useful and strongly recommended to have it. During the online session the owner (lector) of the virtual classroom has to control participants of the session and ensure that all participants of the course can hear him or her properly. Audio is crucial, but video too, therefore the lector has to also ensure that he or she can be seen. It is recommended for both participants of the course and the lector to install Adobe Flash Player. Adobe Flash Player is a program, which can be downloaded for free and installation takes only few minutes. This program offers better possibilities of viewing the content of the online session. Stable Internet connection is crucial for both participants and lector since it is the tool of connection. Participants should possess computer´s proccessor of the computing power at least 2GHz. In the professional virtual rooms the provider offers the option of testing both software and hardware at their website (iCORD, 2012).

The main purpose of the virtual classrooms is to simulate the environment of the usual classroom. The common environment enables participants to use various interactive and presenting tools. The lector is leading the session and has to support the concentration of the participants. The lecturer also decides, which materials can be seen by participants (iCORD, 2012).

3.4. ONIF virtual classroom

Since practical part of this thesis is focused on case study of online webinars and these took place in ONIF virtual classroom, this virtual environment must be introduced. Application ONIF 4.0 is a program developed by Czech company iCORD

International s.r.o. and it serves as a virtual space for unlimited number of participants. It enables people from different continets to participate at same online session without regard to physical distance. It transmits video through web cameras but also audio thanks to microphones and headphones. It also includes chat, which enables participants to send and receive text messages. Virtual classroom ONIF enables lectors to organize webinars and provide education to people without regard their area of presence. ONIF virtual classroom offers similar features as other videoconferencing systems, which are mentioned in previous chapters. ICORD (2014) defines the functionalities as follows:

- Audivisual communication, chat during session and internal communication for virtual classrooms'owners
- Whiteboard
- Sharing of documents, web pages, desktop, kurzors
- History of calls, recording of calls, monitoring of connection quality
- PayPal, surveys, questionnaires

Before any online session it is necessary to control and test softare and hardware. Both lector and participants have to ensure that their cameras are working as well as their headphones. Virtual classroom ONIF 4.0 offers option of this control and users are step by step navigated how to control and properly setup their software and hardware. Control panels enable user to control volume, decrease buzzing and eliminate or reduce echoes (iCORD, 2014).

3.4.1. Useful tools for lectors

Lector has many options how to control what is going on during an online session.

Accepting participants into virtual classroom

Lector as an owner of a virtual classroom (in most cases) can choose one of two ways of accepting participants into virtual classroom. The first way is automatic access into virtual classroom when participants access the classroom after filling out welcome screen (usually email address and name). Second way is access after approval. After

filling out the welcome screen participants are moved into "qeue", which lector can see. Then it is up to lector if participants are enabled to access the virtual classroom and in what order. Lector has basically three options when he or she sees participants waiting for access into virtual classroom. Green icon enables participant to enter the classroom, red one means refusing and green icon of fast chat let participant in and even more, gives him or her option of chatting (iCORD, 2014).

Hosted chat

Another way of controlling students' activities in the virtual classroom is hosted (moderated) chat. Everyone can contribute to common chat, which is situated in bottom left corner. In case this chat is hosted, owner of the virtual classroom must approve all posts before they are published to common chat. By this option lector can control participants' posts not only for eliminating undesired posts but also for higher interactivity. For instance lector can ask a question and all participants can write their answers. However, these answers would be visible after lector collects them all and publishes them (iCORD, 2014).

Visibility of the classroom

Lector can control visibility of ONIF virtual classroom. Classroom can be either visible or hidden. Visible classroom means that all participants see each other and they can see list of their names too. Hidden classroom means that list of names of participants is hidden, however participants can see each other. Visibility can be setup in left top corner and this functionality is available for owner of the classroom.

Other tools

There are various tools that can be used in the virtual room during a webinar. All of these tools can be used separately and a lector can use the maximum advantage of the concrete tool, or a chosen combination of the tools might be used. By choosing the suitable mixture of tools according to the target audience and their needs, the

effectiveness of the course will be maximized. These tools according to iCORD (2014) comprise:

- Audio/video conference – the lector can communicate with several participants in the active call. The number of participants in the active call depends on possibilities of the concrete virtual room.

- Auditorium – this feature contains the list of participants in the virtual room who can express their reactions on the ongoing presentation or they can signalize that they want to be called in the active communication. Participants can be divided into working groups.

- Chat and moderated chat – communicating by text messages that can be either public or private. The lector can coordinate text communication.

- Presentations sharing – materials like text documents and files can be modified in the whiteboard that allows to highlight certain parts of a document (without changing the original version). It is also possible to prepare an interactive acitivity for participants like text filling or shapes connecting.

- Desktop and application sharing – sharing of webpages. Sharing is directly in the virtual room in real time with minimal delay. This depends on used technology, on the transfer quality and Internet connection.

- Audio and video streaming – by using youtube.com directly in the virtual room.

- Questionnaires, polling and voting – the lector can prepare a set of polls or questionnaires to be shared directly in the virtual room. Evaluation of the questionnaires is anonymous and is presented automatically. The most common

form of the evaluation is a graph. This is also one of the tools that provide feedback after the webinar.

3.4.2. Modes of entrance into virtual classroom

There are several possibilities how a student can enter lector's virtual classroom. It is up to lector which mode of entrance he or she uses. It is possible o send an email to student where is all information about access with specific link into the classroom.

Entrance based on original invitation

This is suitable mode of entrance when lector wants to ensure that webinar will be accessed only by those students who are justified to do so. Student receives an email with specific link into the virtual classroom. This link is original for every student and the lector fills out all information about student in advance. This way ensures that only owner of the email address can access the webinar. If more people use this original link they access the webinar under the original name of the student and lector can easily see that link was used more than once. This is useful tool also in case when original student cannot participate in webinar because of for instance illness. Prepaid webinar is not therefore lost and someone else can participate in it instead of ill student (Novotný et al., 2012).

Free access via webpage of lector or course

Another way of accesing virtual classroom is via webpage. Lector places link for virtual classroom on the webpage or icon of the classroom. Student just has to find proper webpage and use some of the links into virtual classroom. By clicking on the link student is redirected into startup screen. Icons and their colour (red-not available, orange-busy or green-available) indicate status of the lector. After filling out information student can either access virtual classroom, or open dialog window with "quick chat" and communicate with the lector. Quick chat means that student enters

virtuall classroom but is able only to chat. Student and lector do not see each other but are able to chat (Novotný et al., 2012).

3.5. Organization of webinar

Every organization of webinar starts with the decision of the lector what should be taught and to whom. Some subjects are more suitable for online education than others so it is very important to think about the content of the webinar. Since lector makes the decision about the content next step is choosing of proper virtual room. Every videoconference system has its own specifics therefore lector should consider these aspects and choose proper virtual space. Basically any system offers trial version, which can be used for free. The trial version is usually for week or two and this is period long enough for lector to consider all specifics of the virtual room (Novotný et al., 2012).

3.5.1. Preparation of webinar

The lector must prepare content of the webinar well in advance. It is important to prepare the basic outline of the webinar presentation, at which participants will look throughout the webinar, including beginning when lector welcomes participants. The lector should prepare a presentation, which will contain main ideas that he wants to communicate and/or further elaborate on. It is good to make a brief list (scenario) of what the lecturer will say to every slide of the presentation and try to estimate the response of students. To be well prepared, lecturer must count with different reactions, for example, that student can ask for very basic thing, or demand something to be repeated. The lector must also assess how different parts of the webinar will be attractive and understandable for the students. As soon as the lector defines some part of the webinar potentially less attractive and useful, then it is good to include some interactivity into webinar, such as questionnaire, voting, comments, or a short video (Novotný et al., 2012).

The lector also needs to plan in advance when to apply moderated chat, or options of auditorium visibility. The more details the lecturer considers in advance, better prepared and more professional the webinar will look.

In general webinar's aspects, which must be taken into consideration, Novotný (2012) summarizes as follows:

- Timeframe
- Amount of participants
- Activity of the lecturer
- Activity of the participants
- Feedback (mostly during webinar and at the end)

It's not just about the webinar content, but also good environment in which the lector operates, must be provided. Environment should be quiet, so that students can hear lector properly and clearly. Lector should ensure that noone would pass behind him, even pets. If lector does webinar at home, it is important to sit down in front of the webcam and arrange background in a way, which should look professional. Lector sits down with his back to the wall, or put behind him a monochrome canvas or banner. It is also necessary to sit so that the lector is optimally enlightened and students can see him. Of course there appropriate clothing is a must. Although lecturer is not physically in the same room with students, they still can see him, so it is good to choose a decent formal outfit.

Below there is example how the lector should not look like in front of students.

Figure 3 - Wrong arrangement of a lector

This is how lector should arrange himself in the virtual classroom. Decent background (banner in this case), proper distance from webcamera, good lightning, decent clothes.

3.5.2. Principles of successful webinar

There are some common recommendations for lectors when preparing webinars. According to Novotný (2012) these are some useful advices:

- Avoid technical problems and inform about them also participants of online training (webinars), give space for the trial participants before the webinar;
- Be prepared for frequent and technical difficulties of participants (echo, headset, turn off programs using the camera and microphone); for a webinar always prepare script or schedule of activities;
- Prepare all files and multimedia sharing and playback at webinar (and try to display them in a virtual classroom);
- Ensure that the planned amount of participants will really participate (changes in the amount of participants can cause problems in compliance scenarios webinar, Time-Lapse ad.);
- Have the "Plan B" in case of technical problems or outages Internet connection.

3.6. Case study

Common definition of case study says that it is an intensive study of a single case (single situation, person, or problem). It is a qualitative method, which does not bring quantitative and easily interpreted results, but brings complex outcomes, which require proper interpretation. Case study is focused on a phenomenon and its context and serves as a base for understanding that particular phenomenon and its occurrence. It is especially valuable, namely in situations where common observation does not reveal clearly phenomenon and its context (Yin, 2009).

Detailed observation and study of a case enables researcher to understand whole situation. Case study has one bonus, which is lacked by other qualitative research methods- it does not only clarify why is given phenomenon occurring but it also has practical educational usage for both students and experts. It is usually focused on either

common phenomenon (e.g. case study of a patient with pneumonia symptoms and his reactions on ATB medicine), or phenomenon, which is really rare, special, or deviated from normal (e.g. case study of a patient with inadequate reaction on common cure). Case study of the first type of phenomenon (common one) is used mainly for education of students, who can learn common practices and procedures. The second one is used for education about non-standard situations and minimizes possible mistakes coming from lack of knowledge of these situations. These case studies are used in different disciplines, such as psychology, sociology, etc. Possibilities of usage of case studies´ are almost unlimited. However, it is necessary to follow proper instructions when doing case study. Procedure of concluding case study is a linear and repetitive process. It includes phases such as planning, projecting, data gathering, analysing and interpretation of results (Yin, 2009).

So when should a case study approach should be used? According to Yin (2009) a case study design should be considered when:

- the study is attempting to answer "how" and "why" questions;
- the behaviour of those involved in the study cannot be manipulated;
- contextual conditions require to be covered because there is a belief that they are relevant to the phenomenon under study;
- the boundaries between the phenomenon and context are not clear.

For instance, Baxter (2006) conducted a study of the decision making of nursing students. Purpose was to show the types of decisions made by nursing students and the factors that influenced the decision-making process and particular decisions. In order to answer questions posed a case study was chosen because the case itself was the decision-making process of nursing students. However, case could not be considered without its context, or more specifically the School of Nursing (the clinical and classroom settings). It was in these settings and details that the decision-making skills

were firstly developed and then utilized. Author of the case simply had to study the case within its context in order to truly understand the situation.

3.6.1. Phases of case study

Every case study has three stages. This chapter will introduce them all and briefly describe steps of these phases.

Research phase

In the process of writing a case study it is necessary to start with a research. This research comprises study of proper literature and Internet sources. All relevant data should be gathered and taken into consideration. Purpose of a case study in general is to solve some problem and answer questions posed. But at first problem must be identified and right question should be asked. Once author decides on the situation or issue he or she would like to cover in the case study (and there might be several issues, not just one), then it is necessary to go to the site and talk to experts. Research phase also includes interviewing of people who are familiar with that particular case. Any personal experience can help (GTTP, 2015).

Analysis phase

Since all relevant data is collected it is necessary to analyse them properly. All data should be placed into one place and categorized into different categories based on character and content. It is crucial to go through all materials and data and figure out what is important and what is not. Problem (or questions, which need to be answered) should be clearly formulated. In this phase author should clearly state what is the case study focused on and what it wants to solve. It comprises analysis of all data, evaluation of the facts and connecting data to particular issues (GTTP, 2015).

Conclusion phase

Final stage of a case study is formulation of a conclusion. It means that all outcomes of the analysis should form a solution to the problem or answers for questions posed. This part should comprise conclusions, which are supported by facts and arguments. These facts should be described in detail in analysis phase (GTTP, 2015).

The whole purpose of writing case studies and sharing them with other people is to share experience without readers' need of being in the same place.

3.6.2. Generalization

Generalization is one the most important issues in case studies, the one most questioned.

Procedures is different according to principle the generalization is based on. If it is based on deductive principle, procedure is similar to an experiment. At first, hypothesis is formulated and by deduction the testable consequences are derived. Comparison of the expected findings must be deduced from a theory (or a case) and then empirical findings either verify or falsify the whole theory. As a result author is finally able to define the domain within which the theory can be perceived as more exactly valid. Then, theory must be tested and this process is made by emulation of experimental method in a naturalistic setting. Finally, generalizations can be drawn based on theory and case's facts. Robert Yin developed this model of the way in which generalisations are drawn from a particular case (Johannson, 2003).

A second type of generalisation can be achieved through induction. If speaking about case studies, induction is done through inductive theory-generation, or conceptualization. Conceptualization is usually based on data from given case. The result is a theory, which usually consists of a set of interrelated concepts. Theory, which implies this procedure, is called the Grounded Theory, and was defined by Glaser & Strauss in 1967 (Johannson, 2003).

The third and last type of generalisation is based on the principle of abduction. Deduction and induction are usually terms, which are familiar to almost everyone, however, abduction is term not commonly known. Principle of deduction implies that conclusion should necessarily true. If implied premises are true, the conclusion must be also true. Deduction says and proves that something must be true. Induction enables author to conclude from facts in a case a rule that probably is operative in similar cases and actually is operative in given case. Abduction is the process where author of a case study faces unexpected facts, applies some rule (already known or created for this very occasion), and, as a result, defines what a case that may be. A philosopher Charles Sanders Peirce firstly defined the concept of abduction. He stated "The surprising fact, C, is observed; But if A were true, C would be a matter of course, Hence, there is reason to suspect that A is true" (Johannson, 2003).

Following scheme describes modes of generalisation and reasoning within case study methodology.

Figure 4 - Modes of generalization and reasoning within case study methodology

Procedure	Mode of reasoning	Result	Generalisation
HYPOTHESIS TESTING A theory (hypothesis) is tested in a case, and validated or falsified	Deductive	The establishment of the domain of the theory	From a hypothesis and facts to the validation of a *theory*
THEORY GENERATING A principle (theory) is generated from facts in the case	Inductive	A theory (Conceptualisation)	From facts in a case to *theory*
NATURALISTIC GENERALISATION An actual problem situation is compared with known cases	Abductive	Ability to act based on the conception of a case	From cases to a *case*
SYNTHESISING A CASE A case is synthesised from facts in the case and a principle (theory)	Abductive	The (re)construction of a case	From facts and a theory to a *case*

Source: Johannson, 2003

4. Practical part

4.1. Increasing the availability and attractiveness of further education of teachers Project

Description of the project:

The project aims to provide participating educational institutions with a completely new way of learning so that teachers can learn from the place of work or from the comfort of their homes and save their time, which has now become very scarce. The main activities of the project are:

- accredited introductory half-day seminars entitled "Options of online education";
- creating a product with an ICT component „Methodology of online teaching I.";
- accredited course for teachers and lecturers "Methodology of online teaching I. ";
- involvement of expert lecturers in further education into the project, their training and preparation for the implementation of online webinars;
- creation of further learning offers online;
- designing of courses according to head of participating educational institutions.

The project aims to train school staff and teachers in the online environment and create conditions for education in the 21st century. The output of the project is an investment in the future education of teachers, educated lecturer in the field of IT and creating offer of webinars on further education of teachers. The project has addressed more than 300 teachers and lecturers mostly from secondary schools in the Liberec Region, the project was officially involved 12 secondary schools in this area. Total of 110 teachers and lecturers took part in the online synchronous accredited course Methodology of online teaching. Every registered teacher who attended the online course within the project was provided with a free access into the virtual room for the duration of the project so they could fully test the features and settings of the online classrooms and solve their problems at webinars or during online consultations with lecturers from the project team.

The project team used as a basis an international project How to Webcast (HOW TO, 2009) for methodological preparations and the main part was taken and adapted based on experience from completing the online course of the Oxford University Effective online tutoring (EFFECTIVE,2012).

Under this project was subsequently accredited approximately 30 online courses designed as a place for further education of teachers offers (Further learning online). Offer of courses was placed on a website that was also developed under the project - www.schoolnet.cz (hereinafter "schoolnet").

Website Schoolnet provides continuous access to information about courses and applications to online courses and are an example of a websites offering administration, organization and promotion of online courses. Schoolnet provides facilities for students to sign up and search in offerings of webinars or long-term online courses.

For participants of the project, schoolnet environment is an ideal example of asynchronous LMS system that provides information on courses offered with possibility of browsing and searching, logging into online courses and managing of online courses applications. The participants are informed during the course through email sent automatically through schoolnet environment before the webinar start as a reminder. Participating lecturers have other possibilities to:

- use discussion - start a new topic or contribute to an existing one;
- connect with an expert tutor from the project team (if online and available)
- check the website calendar of events that is updated and synchronized through Google Calendar.

The course Methodology of online teaching included a practical workshop of online administration and preparing own webinars on the schoolnet website. Educators were informed how to enter details of planned courses and the administration of students applying for an online course and webinars. The methodology also includes hints and tips on how to promote your online courses and webinars in the Internet environment (social networks, e-mail correspondence, information on the web, etc.).

The main objective of the project and another part of the online course was to prepare teachers to work in a virtual online classroom, which had been provided for free as part of the project. For this purposes a very own virtual classroom of project implementer ONIF 4.0 was used.

Project description and further information about it can be found on the project website. Preparation and implementation of a webinar as part of the online course, Methodology of online teaching I. is described in detail as a case study in chapter 4.3. and the subsequent evaluation of outputs of educational event, together with suggestions for innovation.

4.2. Case study – webinar

Preparation and implementation of the webinar designed for educators and trainers was carried out within project described in section 4.2. The online course Methodology of online teaching was composed of 32 lessons of 45 minutes, which were conducted online in a virtual classroom ONIF 4.0. Another 8 hours were devoted to individual online consultations, preparation of webinars of participating lecturers for accreditation. Schedule of online courses in the project is available to all registered participants for the orientation within course topics.

4.2.1. Annotation of the course

Online teaching methodology course is aimed at educators who are interested in acquiring or improving their knowledge and skills in the area of synchronous online teaching. Course participants should try to respond primarily to the questions: What is synchronous online teaching and how it evolved? How to work with elements of virtual environment? How to behave when we are online? How to prepare for teaching online? How to assess your students? How to evaluate yourself?

Hour duration of the course is 40 hours. The course lasts for 8 weeks. Participants and course takes up about 5 hours a week. By number of hours are counted online lessons – webinars and preparation and studying of teaching materials.

4.2.2. Addressing and informing the webinar participants

Information about the project and online courses were provided to participants during the preliminary seminars and subsequently sent by information emails to email addresses provided. Total of 15 registered participants were addressed and the first webinar was attended by 9 of them. Space for discussion and possible questions before the course was available through email. For the purpose of the case study the first webinar of the project was selected due to the first contact with the virtual classroom and also due to scheduling all the webinars and informing the participants. These webinars have repeated several times throughout the course.\

4.2.3. Preparation of a lecturer for webinar

The author of the thesis was a lecturer in the webinars and the online course. Virtual classroom ONIF is based on the technology of Flash Player, so that participants can join the webinar through a web browser without having to install the program directly on their computers.

Preparing for a webinar inside the virtual room includes:
- checking the Internet connection speed and disabling any unnecessary programs (especially other programs using a microphone or web camera);
- preparing documents and presentations relevant to the webinar directly into the virtual classroom (checking the functionality of links to videos and web pages, the files are uploaded to the server for instant display during the webinar);
- trying out different tasks in the virtual classroom in rough – nothing can surprise us during the webinar.

4.2.4. Webinar planning

In the preparation phase of the webinar it was necessary to ensure the availability of information on the website schoolnet.cz. The term webinar was determined after consultation with the participants. These data were entered into a shared calendar (Google), which is immediately reflected on the webpage schoolnet.cz. Furthermore it was necessary to address the registered participants at least 2 weeks prior to the webinar via email with login information to the virtual classroom and this had to be repeated again the day before the meeting. Portal schoolnet allowed to plan the course in detail with the possibility of registering to the course and registered participants automatically received a notification email with a link to connect to the webinar.
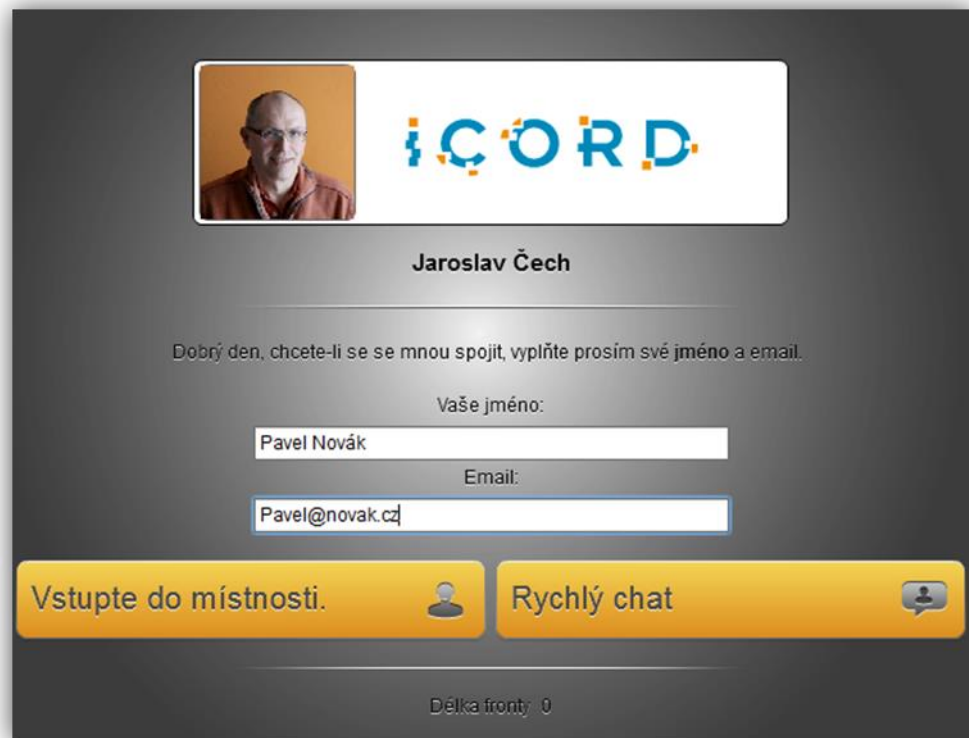
Before starting the actual webinar it is useful to provide some time for participants to test the environment, in the best case to provide them a testing connection directly into the virtual classroom where the webinars will take place. Approximately half of registered participants use this possibility and most of them had to solve minor technical issues, e.g. setting up a headset or a webcam.

The lecturer connected into the virtual classroom about half an hour before the announced starting time of the webinar and the initial presentation in PowerPoint and PDF was uploaded. The first webinar was focused on basic familiarization with the virtual classroom and setting of software or headset and web camera and participants are forwarded organizational information about the online course. Due to space before the webinar for testing, this activity should not take more than 5 minutes of introductory webinar.

The last 15 minutes before the start of the webinar, the lecturer was ready to receive the first connected students and try the connection with them (audio / video). Those students could stay in the room until the beginning of the webinar. Connecting to the webinar takes place via the login form of the virtual classroom (which is accessible through most web browsers, and requires only Flash Player).

URL of the webinar login page was sent to registered students via email or can be accessed via a link on the website schoolnet.cz. The participant fills in their name or email and clicks on "enter". The lecturer can see students who log into the virtual classroom and confirms their entry into the virtual classroom. The login form is shown on the following picture:

Figure 5 - Login form into the virtual classroom ONIF 4.0

Source: ICORD, 2014

There are other variants of accessing the virtual classroom:

- **access for invited guests**, who will receive the original URL for the connection (no one else is then able to connect to the webinar)
- **open access directly into the classroom** (lecturer sets open access into the classroom, after clicking on enter the student joins the classroom without permission needed)

- **managed entry into the virtual classroom** (lecturer receives or disconnects participants of the webinar - This option allows control over the process of logging in and records).

A good experience is to prepare an expanded working space, if the lecturer has a secondary monitor. By connecting a second monitor to the computer, the lecturer gains space for own notes or text for copying and the virtual room with the webinar runs on the primary screen.

4.2.5. Connection of participants and introduction

All the participants, nine of them, connected to the virtual classroom approximately 5 minutes before the starting time. The lecturer has an option to send a message to all the participants during logging in. It can be an information about the starting time of the webinar or anything else. During logging in of participants, no technical difficulties occurred, and when asked about audibility and visibility, all participants responded positively using text chat or emoticons in the auditorium – list of participants.

4.2.6. Webinar introduction

In the introductory phase of the webinar, all the opportunities of active involvement were explained using the lecturer manual and description on features of the virtual classroom. Participants were explained they can raise their hand if they want to say or ask something using emoticons, they can express their emotions – feeling confused, not understanding something, technical difficulties. The appearance of the virtual classroom is shown in following illustrative figure (iCORD, 2014):

Figure 6 - Illustration of the virtual classroom environment
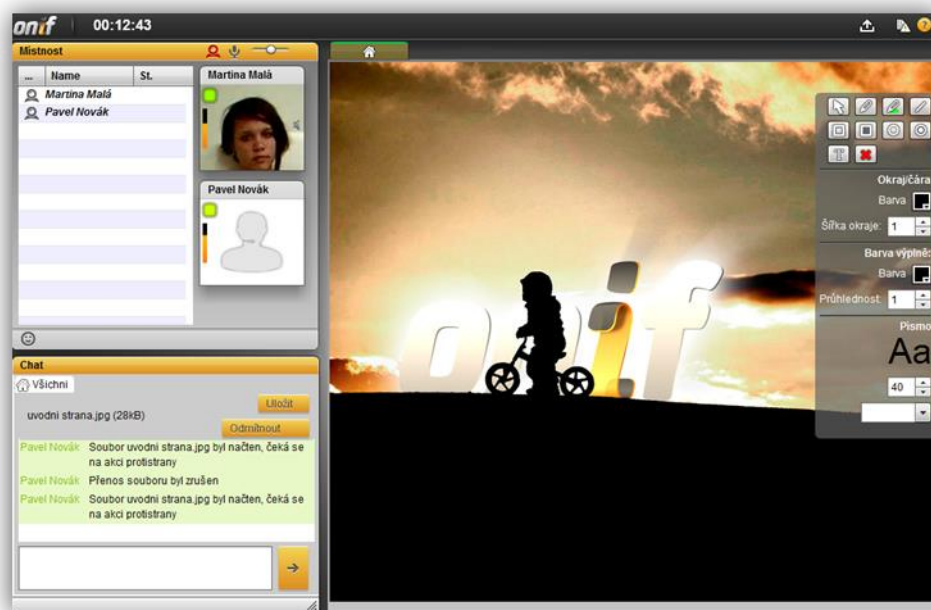
Source: ICORD, 2014

4.2.7. Communication and interaction with participants

During the webinar communication took place through the text chat and participants responded to lecturer questions using emoticons (symbols shown next to their names in the auditorium). Participants are called to speak through the audio / video, they ask questions, answer questions or discuss with the lecturer on the subject. Chat history of webinars in text format ensures to the lecturer record materials while allowing other uses (such as documentation feedback for lecturers, etc.). Participants in an active call may highlight a certain part of the document, as shown in Fig. No. 10th

4.2.8. Sharing and multimedia presentation

During the webinar the following media were used:

- first webinar presentation of the project in PPT and PDF;
- pictures - examples of virtual classrooms;
- screen sharing - schoolnet.cz;
- sending of the presentation;

- creating a screen-shot (image recording current computer desktop).

During the presentation whiteboard was used as a tool for highlighting text in presentations, and also so called pointer (highlighted cursor of the lecturer) for better illustration and overview of the presentation. Other accompanying activities were anonymous voting on the question "Is the weather nice for you?" as an example of additional features of virtual classrooms for participants. All participants are displayed a voting window where they can choose from answer Yes, No, or I do not know. The survey results are automatically displayed in a pie chart with percentage (number of responses). Voting tool is a useful attractive tool which for example strengthens awareness of the opinion structure of the group. The trainer can easily create a list of questions and perform the questionnaire in the virtual classroom among students.

4.2.9. Webinar scenario

Webinar scenario brings benefits as a management tool during the webinars is also serves as a plan of webinar for the lecturer. Several forms can exist, most often as a planned sequence of activities for the lecturer and participants. For the webinar, the presentation was chosen as a basic outline, which was alternated with other media presentations. Scenario corresponded to the sequence of slides presented in the main presentation.

4.2.10. End of the webinar

The end of the webinar was devoted to summarize the main points of the webinar. After answering and saying goodbye, the participants disconnect by closing the webinar tab of their browser. One of the participants remained in the classroom at his own request and we focused on individual setting of the microphone and web camera. After solving the issues, the participant disconnected from the virtual classroom and the lecturer copied the text chat.

4.2.11. Activities after the webinar

Awareness in the online course was provided mainly by email. Also social networks can be used for continual informing the participants. Short videos of webinars or other tutorial videos can be placed there along with discussion among the participants. History of calls within the online rooms allows to track a monitor logging of individual participants. In case of the project, the webinars were implemented within a comprehensive online course. There for they had certain continuity and most of the registered participants finished the whole course.

4.3. Survey among educators of adults

The aim of the survey is to determine the extent and level of awareness of an entirely new field of online education for educators of adults. The focus of the survey was chosen due to the lack of information and data on the use of tools for synchronous online education in the Czech Republic like for example a virtual classroom or web-based environment for hosting webinars - online seminars.

Advantages and tools (software) of existing networks and computers allow to save costs while keeping the qualities of personal contact among experts, students and lecturers. E-learning crosses all areas of lifelong learning - is present in formal, non-formal and informal learning.

The specialized literature and research in the Czech environment do not pay sufficient attention on the area of synchronous online learning and its application in our country. In research studies appear only fragments of information about this very progressive development of eLearning. Therefore, the survey is addressed to educators, without which even the best technology would be useless.

The target group were elected by teachers and lecturers in Liberec region who are engaged in adult education and are an important group that deserves special attention in the news in e-learning and online education.

4.3.1. Distribution of questionnaires

The questionnaire was distributed via the email with the possibility to fill it in online – Google documents.

Total of 250 educators was addressed in the frame of education institutions. Overall return was 73.6%. That means that total number of 184 filled questionnaires returned.

The survey and its results serve only as an illustration of the researched area, and given the magnitude of the theme of ICT in education has minimal meaningful value. The survey results illustrate well and complement existing research in the field of e-learning. Research in the field requires a long-term approach to broader impacts that could accommodate synchronous online learning topic comprehensively and ensure the necessary data, which so far in this area in the Czech Republic is missing.

4.3.2. Analysis and description of the survey results

1) **What is your attitude to education over the Internet in general?**
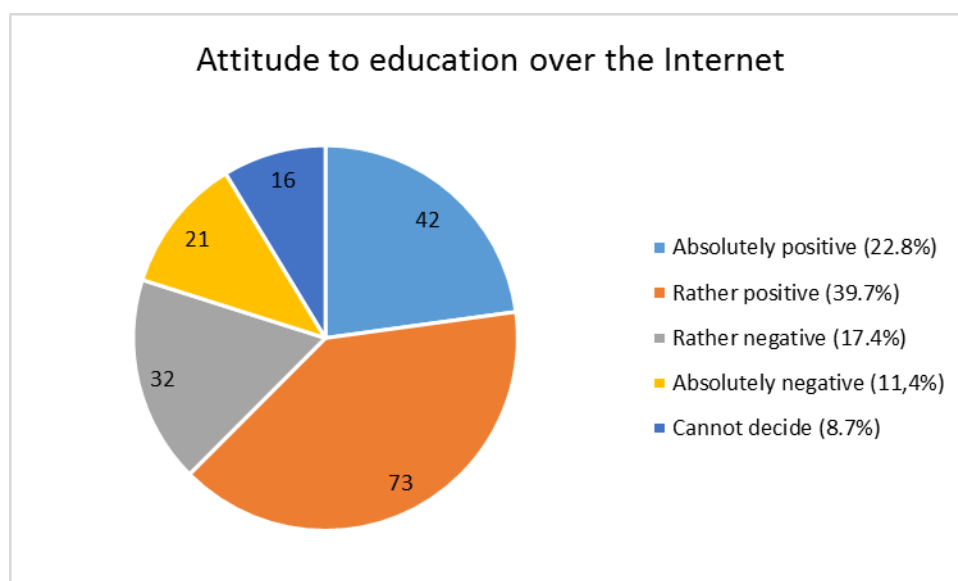
The introductory question shows more positive attitude towards learning on the Internet. Total of 62.5% of respondents is on the positive level (Absolutely positive and rather positive). Attitude of educators to education on the Internet is an important initial information.
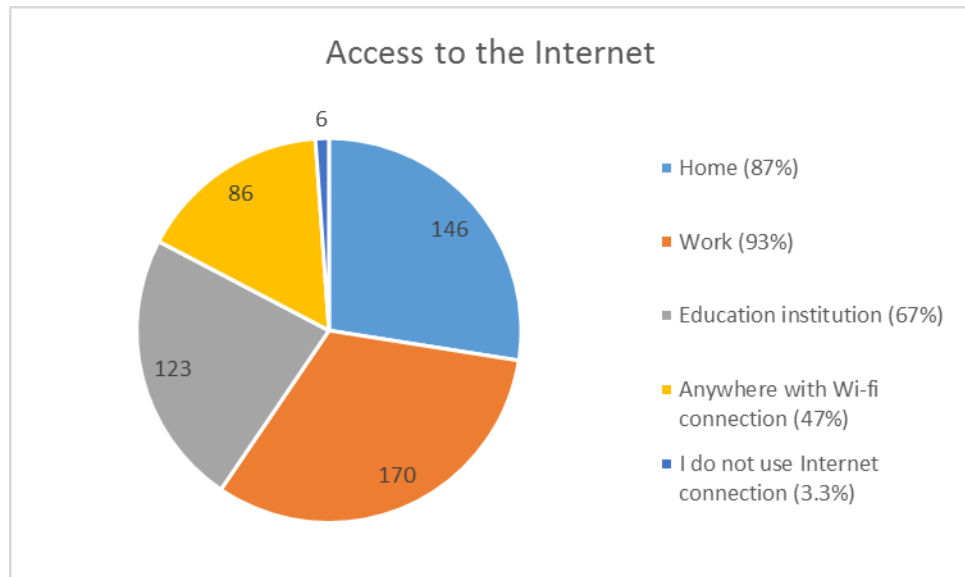
2) Do you have a PC with Internet connection at home?
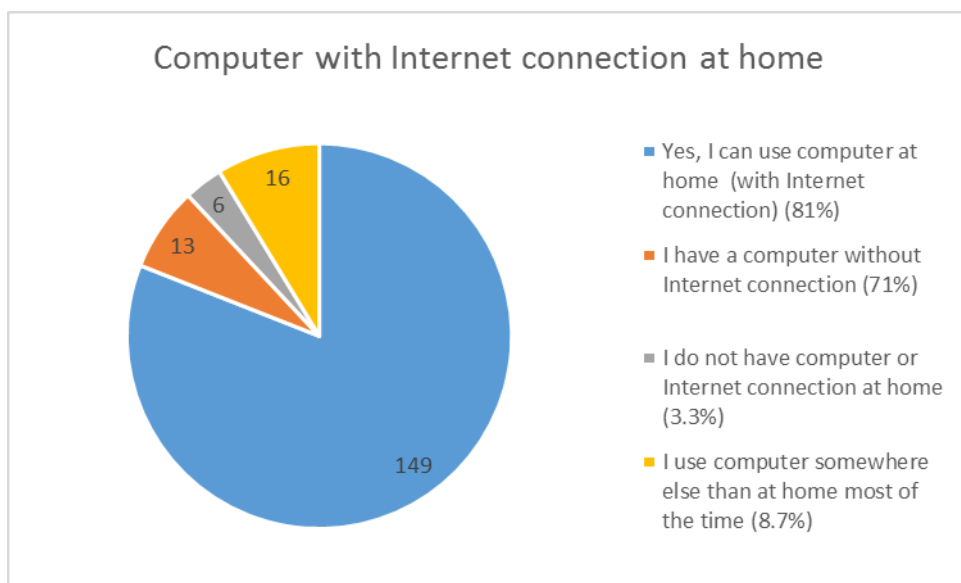
Question no. 2 was directed to availability and accessibility of technologies, which are necessary for online education. 81% of respondents can use a computer at home with the Internet access, while important is the fact that 8.7% of respondents use Internet more frequently elsewhere than at home. Only 3.3% of respondents do not have access to a computer or Internet connection.
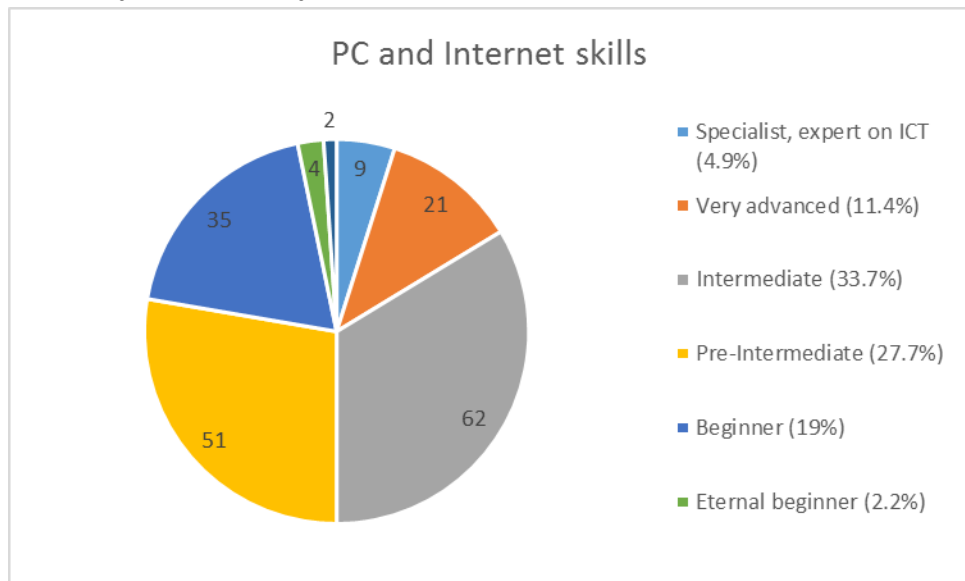
3)   From where do you connect to the Internet most often?

Access to the Internet

6

86

146

123

170

- Home (87%)
- Work (93%)
- Education institution (67%)
- Anywhere with Wi-fi connection (47%)
- I do not use Internet connection (3.3%)

Question number 3 had the possibility of multiple answers, respondents could choose more options. The most frequent place of connection to the Internet, according to the results, were at work with the percentage 93%, followed by 87% at home. From a mobile phone or Wi-Fi network can connect 55% of respondents. The results show a good availability of the Internet among the respondents. This way educators confirm good availability of the Internet in schools and educational institutions.

4) How do you evaluate your user skills on PC and Internet?

PC and Internet skills

Value	Category
9	Specialist, expert on ICT (4.9%)
21	Very advanced (11.4%)
62	Intermediate (33.7%)
51	Pre-Intermediate (27.7%)
35	Beginner (19%)
4	
2	Eternal beginner (2.2%)

Self-assessment of user skills on PC and the Internet is dominated by intermediate and pre-intermediate, which shows rather basic user skills. It is an important assumption for the ability to learn new things on the Internet alone, often as quickly as news come on the market. Self-esteem in discovering and learning about new technologies certainly plays an important role. On the basis of these capabilities, educators can create added value to their education – enriching their teaching with quality online contact and facilities for learning activities of their students. In doing so, they are not necessarily replacing existing contact, rather it is its extension and other options.

5) What tools (programmes, softwares) do you use for audio/video/text communication over the Internet?
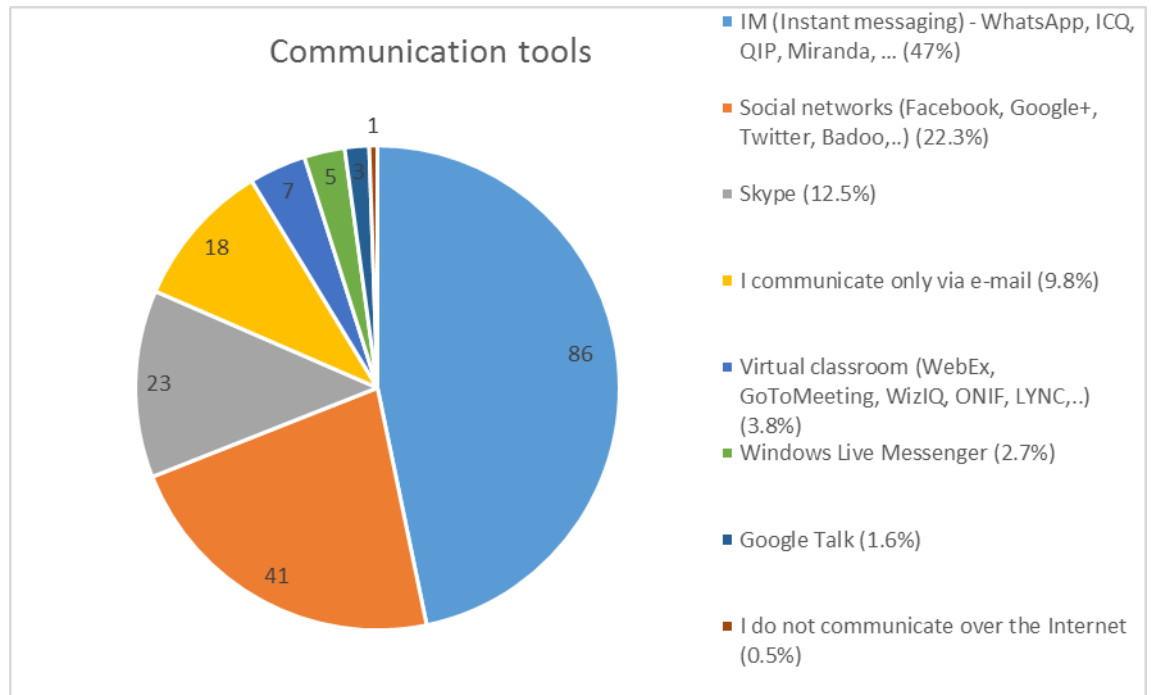
Tools for communication over the Internet is a key question in the poll where respondents chose items that are used for communication. For answers were chosen categories (groups) of tools, which are used for synchronous online communication, mostly for text, voice or audio / video communication over the Internet. The largest response rate was observed in Instant Messaging programs for messaging in real time, this answer was chosen by 47% of respondents.

The following answer was social networks with the percentage 22.3%, which enable synchronous and asynchronous communication. Another group used by respondents (9.8%) are email clients, who also allow text communication in real time and even some audio / video transmission (Video Chat) between connected parties.

**6) Have you ever participated in a webinar?**
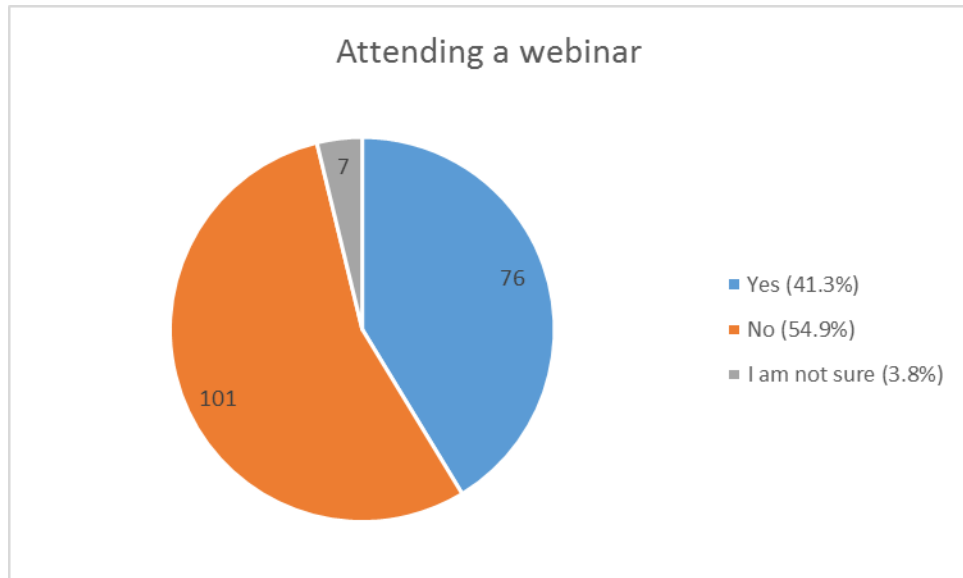
More than a third of surveyed people with the percentage of 41.3% have participated in a webinar - seminar on the Internet. The results illustrate the gradually increasing awareness of webinars and also fairly high level of participation in this type of Internet education. 54.9% of respondents have never participated in webinars, which can have several causes (lack of interest in this type of education, lack of information, availability and quality of ICT equipment, insufficient supply of specific courses ...).

7) Would you like to teach through a virtual classroom?

Teaching in a virtual room

- Yes (24.5%)
- No (51.6%)
- I am not sure (23.9%)
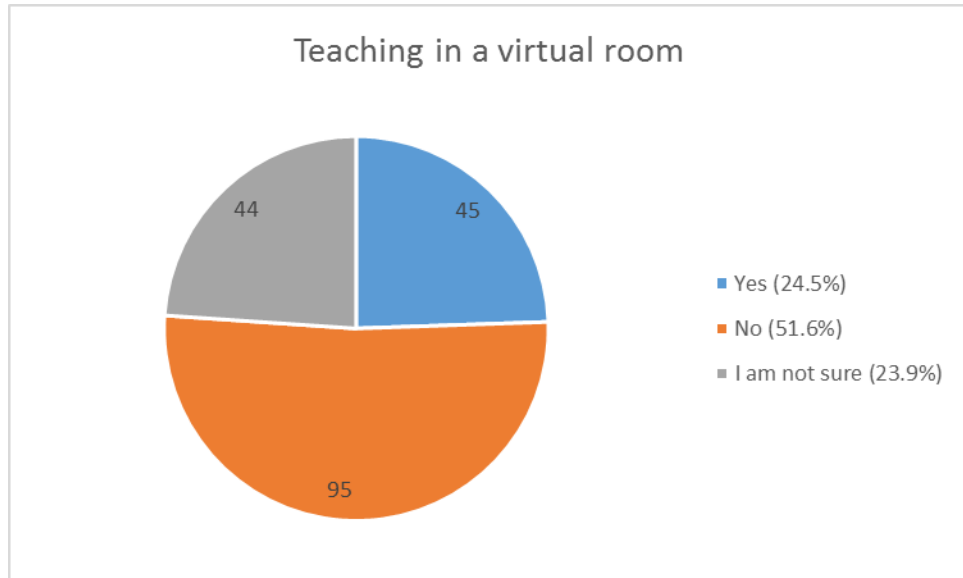
Question number 7 examined how many of the respondents would like to educate through virtual classrooms (online virtual classroom). 51.6% would not want to use the virtual classroom and a high percentage of respondents also were unsure (23.9%). Group of 45 respondents from research sample (24.5%) answered yes to the question.

8) **Do you want to attend a webinar (online education session) in the frame of your own education?**

Learning through a webinar

- Yes (65.8%)
- No (19.6%)
- I am not sure (14.7%)
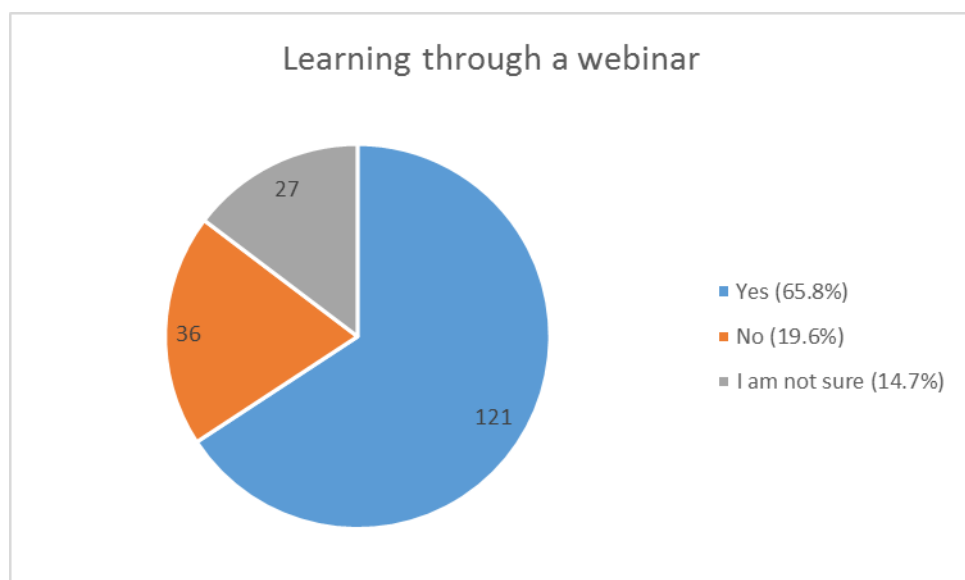
65.8% of respondents plans to participate in online education in the future. This question tried to uncover how many educators would exploit the possibilities of online education on the Internet and corresponds to the first question, which has a positive view of education on the Internet. 19.6% of respondents who answered no, they did not want to attend an online learning session can mean, that those people are in need for real personal contact.

9) What are the main obstacles for implementation of live online education according to you?
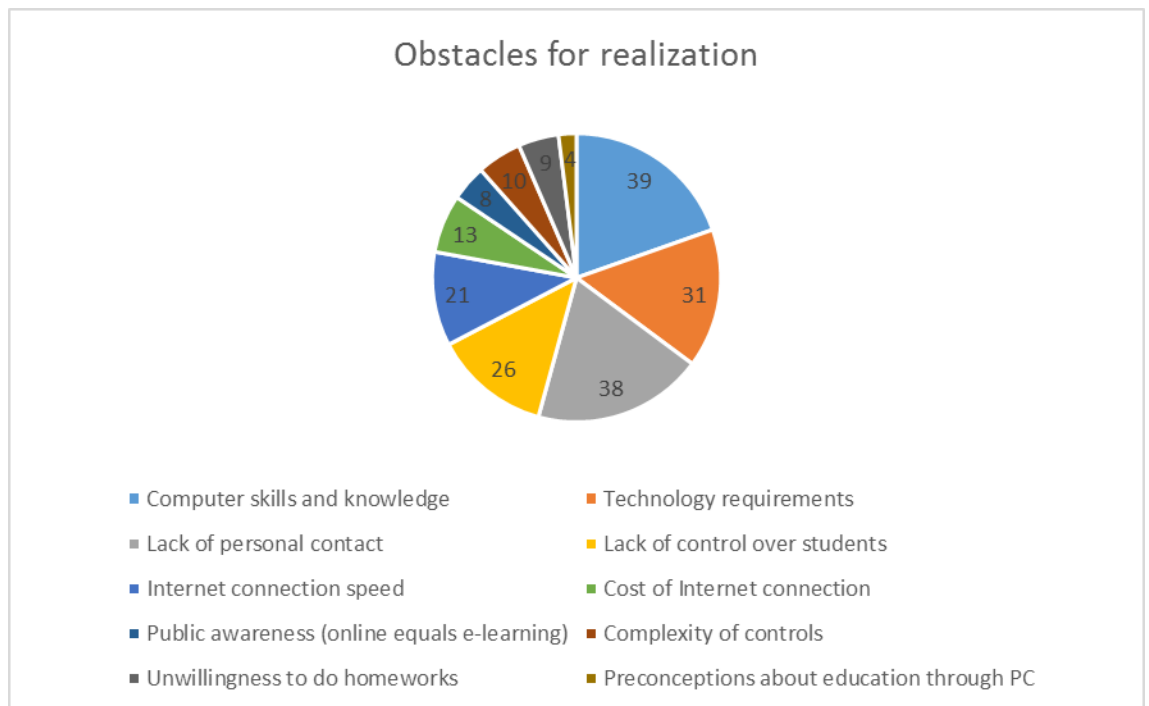
The respondents see the main obstacles for implementation of live online education in need for computer skills and knowledge on both sides of the lecturer and students, also in lack of personal contact and technology requirements in general. Other factor important to mention is, that a certain group of people thinks that online education means e-learning, which means downloading a programme to computer, not synchronous learning with a lecturer.

10) Where do you see possible use of virtual classroom in your teaching practice?
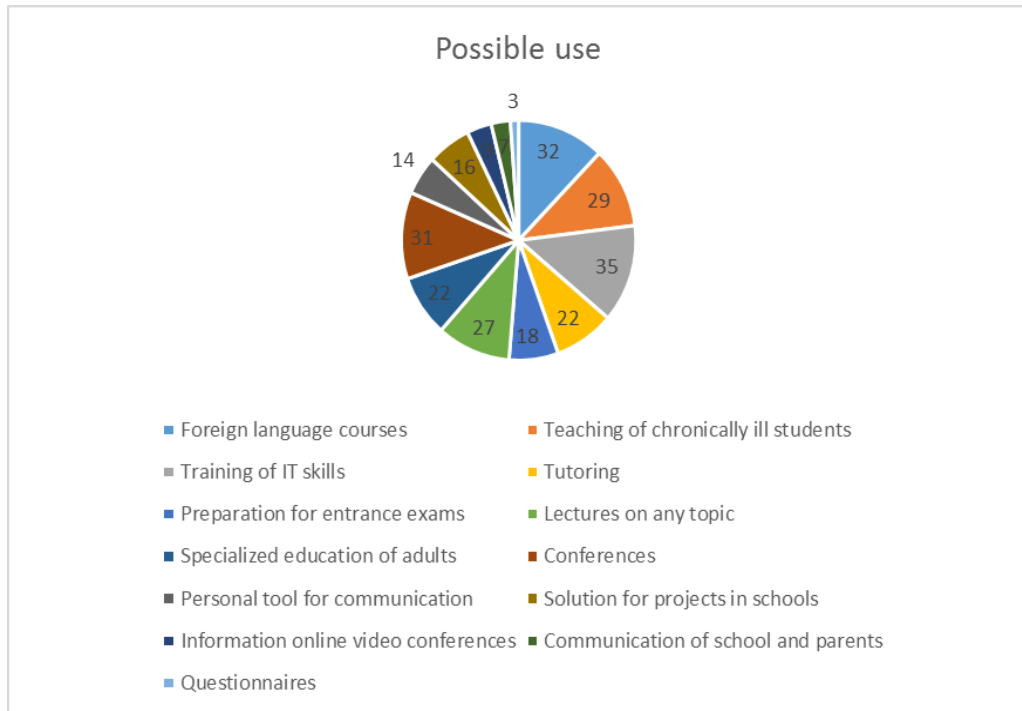
The respondents see the possible use mainly in foreign language courses, teaching of chronically ill students, training of IT skills and tutoring. Furthermore in conferences regarding any possible topic and bigger actions.

11) Additional comments on online education, virtual classrooms and webinars.

Followed by answers of respondents:

- "Very enjoyable way of education with a big future, I cannot imagine a better form of mass education and so called education of the public and economically modest at the same time."

- "I am not confident about the technical side (using softwares, slow and confused about work with computer, I have to practice a lot first)."

- "It will take time until it is mass. The future is in mobile technologies."

- "I do not enjoy choosing from online programmes and applications offered and I am afraid about security of my computer."

- "Too expensive, but it might be useful."

- "It is necessary to go with the flow, if this is the way the flow is taking me, I accept the challenge."

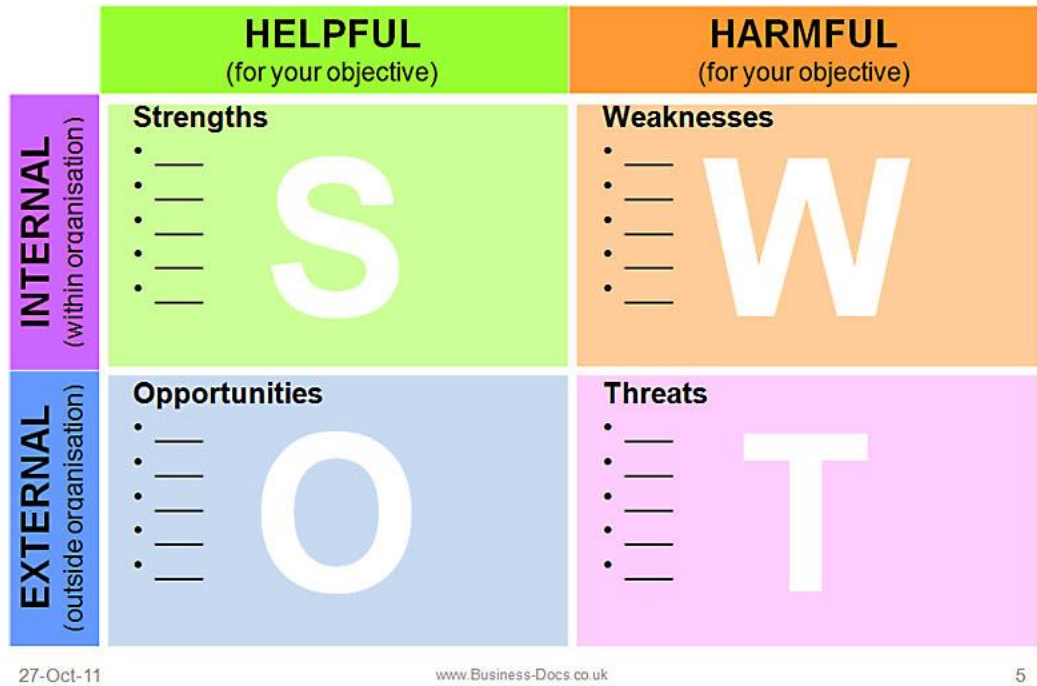## 4.4. SWOT Analysis of Online learning

4.4.1 SWOT analysis

SWOT analysis is a method by which it is possible to identify strengths, weaknesses, opportunities and threats associated with a project, type of business etc. This method makes possible to comprehensively evaluate functioning, find problems and new opportunities for growth. Basics of the method consists of the classification and evaluation of individual factors, which are divided into four basic categories mentioned above. Output of SWOT analysis is it maximize strengths and opportunities and minimizing weaknesses and threats.

For the purposes if this diploma thesis, the SWOT analysis is used to examine strengths, weaknesses, opportunities and threats of online learning.

Figure 7 - SWOT analysis

SWOT Matrix

	HELPFUL (for your objective)	HARMFUL (for your objective)
INTERNAL (within organisation)	**Strengths** S	**Weaknesses** W
EXTERNAL (outside organisation)	**Opportunities** O	**Threats** T

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This theory can be used in number of different situations, for example evaluation of projects, businesses, decision making, solving of various problems and much more.

- **Strengths**

    Strengths can be described as internal factors or characteristics adding the organization's value, such as competitive advantages over others, skills, knowledge, resources or potential. Also reached rewards are included in this category as well as know-how, product or service.

- **Weaknesses**

    Weaknesses are the reverse of the strengths. This category includes characteristics when is the organization worse than competition. Those characteristics can be for example high costs, worse taste of a product, insufficient transportation, not enough skills, etc.

60

- **Opportunities**

  Opportunities can be described as external factors which can bring success if correctly identified and used. This category includes for example technology development, fashion trends, etc.

- **Threats**

  Threats cover external factors which can lower the demand, cause unsatisfaction or even endanger economic stability. Typical threats can be activities of competitors, change in customers preferences, etc.

4.4.2. Application of SWOT: Analysis of Online learning

The SWOT Analysis was compiled on the basis of the observation and participation during the online seminars – webinars. The behaviour of the participating lecturers was observed, their issues, questions and remarks were reported. Further information used for processing of the SWOT analysis was gathered during participation on the whole project mentioned in the section 4.2.

Strengths:
- Attractive way of delivering knowledge to participants
- Education in an innovative way
- Many interactive tools, such as chat, screen sharing, shared drawing, media,..
- Saving of time – participants do not have to commute
- Saving of costs
- Saving of environment
- Efficient way of teaching management

Weaknesses:

- Insufficient technical knowledge of participants

- Lack of physical contact

- Requirements on Software and Hardware

- Participants hesitate to be active during the teaching

- Low level of control over concentration of participants

- Internet often leads to loss of concentration

- Not all subject can be taught this way

- Insufficient skills and knowledge of lecturers

- High initial investment

Opportunities:

- Subsidies from the European Union

- Better accessibility of education for disadvantaged people - disabled, women with children

- New technologies development

Threats:

- Insufficient and unreliable Internet connection

- Easier to skip a lesson

- Limited financial means of participants

5. Results

5.1. Evaluation of results and recommendations

Evaluation of the educational event - webinar can be viewed from several basic views. Webinar as a first lesson of the online course passed well, given the continuing high attendance. Separately and in the detailed view space for improvement in realized webinar can be found.

Evaluation from the virtual environment and its possibilities point of view:

- positive uniformity of the environment - keeping the attention of all participants "in one window"; connection of all participants in the webinar happened without any problems;
- interaction - chat, emoticons and the ability to call someone to an active call are the most common communication channels;
- not technical problems occurred, one participant had a problem with setting up, which was resolved after the webinar;
- in the virtual classroom an opportunity to share more than one presentation at a time was greatly missed; sometimes the Internet connection was slow;

Evaluation from the skills of the lecturer and preparations point of view:

- preparation was successful, as well as providing information and communication with participants before the actual webinar;
- Loading of the files caused an "empty" space within the webinar couple of times, better preparation of files would be recommended;
- better managing of discussion in chat or to disable chat, in certain parts the participants were distracted, or it would be useful to use moderated chat;
- prepare documents and MP3 with the maximum size up to 5 MB for quick and easy sharing and work with files; verify the functionality of the video in youtube.com directly within the virtual room;

- work more with the possibilities of voice and microphone volume settings, to explain the sound settings and options to all participants.

The project is evaluated as successful mainly due to the positive feedback from participants and due to the fact that many began to actively use synchronous online learning tools in their practice, which was the main objective of the project.

Webinar fulfilled its purpose in this case. However, it is always necessary to consider the use of virtual classrooms in relation to the lecturer, objectives, resources and audience of the education. For some of the lecturers and future participants online education will continue to be too modern term but for some it will become a full part of their educational environment. The rapid development of technology always brings new features and tools that significantly contribute to the realization of new possibilities and accessibility of education. Thanks to this the requirement for teachers and educators arises to learn to work with those technologies and also through learning. The development of online communication and possibilities of virtual classrooms complement each other and create a very effective and now easily accessible space for education. However, it will depend only on teachers and lecturers, how they will approach those new possibilities.

6. Conclusion

Synchronous online education is currently full of possibilities for the realization of online education while such contact resembles the traditional classed thanks to its capabilities. In the Czech Republic, synchronous e-learning is in the beginnings, but in the field of non-formal education we can talk about relatively broad opportunities to participate in various even international webinars.

To make the training using virtual classrooms effective, it is necessary to ensure good preparation of the lecturer, to respect the principles of work in the chosen online

environment and to achieve maximum certainty in controlling all the features that are provided. At the same time it is very crucial to be prepared to solve any possible problems. It depends on the transformation of education offerings, which can be implemented just online in many cases. Virtual classrooms can be considered as computer software that enables complex synchronous communication, but their use still does not meet the high expectations that are attributed to synchronous e-learning. This is primarily because of the shortage of supply of such a type of education on the Internet and the gradual computerization of society with an uneven impact on different socio-economic impact on the population. Another important outcome is the fact that it always depends on the attitudes of lecturers and their access to modern information and communication technologies that are offered to them. It will thus depend not only on the activities of the state and project activities, but also on lecturers and students themselves, how they will approach the issue of online education via the Internet.

In the future, it is necessary to monitor new trends and linking of functional e-learning systems with other means of the Internet communication. Education in 21st century is facing many challenges and difficult tasks and those tools can significantly contribute or help with the solution. It is important to require high quality of this kind of contact and at the same time not to expect that online learning will replace the classical encounters of people. In this sense is synchronous online learning a very effective supplement to existing forms of education being one of the possible bases for work of educators and their students.

Online synchronous learning model is for adults and their learning needs an opportunity for both the online communication and collaboration implemented in the social context of real-time, which is certainly desirable in lifelong learning. This way computers do not fulfil only the role of a "learning machine", but they play the role of a mean to full interpersonal communication and education.

This diploma thesis responds to innovation in the field ICT and contributes to the current understanding of the development and use of webinars in lifelong learning.

Finally, the first hypothesis that online synchronous learning represents full-valued type of adult education with the same efficiency as the traditional way of adult education was confirmed. But with the note, that only in certain branches and with certain subjects and issues. The second hypothesis that the preparation of the lecturer is very time consuming in order to provide a quality teaching was also confirmed. And not only that, thoroughly preparation is also crucial for successful teaching. The lecturer has to be prepared for a range of different situations and in the virtual environment is no time for improvisation.

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