Teachers' ICT Competences – a Way to Effective Learning for Children with Hearing Difficulties

Some Hints
Daži ieteikumi
Několik tipů
Βιβλίο Συμβουλών
Overvejelser ved anvendelse

Riga, Latvia
2009.

Some Hints for using ICT in the core subjects are based on the sources and ideas of the authors that prepared the learning material "The integration of ICT in the study process for children with hearing difficulties" It is designed to give a brief insight into the use of ICT in general and then how to work with children who have hearing problems.

Some hints for using ICT in the core subjects

Daži ieteikumi IKT izmantošanai pamata mācību priekšmetos

Overvejelser ved anvendelse af IT som undervisningsmiddel

Několik tipů pro využití ICT v práci učitelů

Συμβουλές για την χρήση των ΤΠΕ στα βασικά γνωστικά αντικείμενα

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Riga, Latvia
2009.

Dear teachers, future teachers and parents,

Nobody can deny that ICT has become an essential feature of our everyday work. The use of computers, video, TV, radio and CDs, as well as the internet, now plays a significant role in the study process. Where ICT is used skilfully and purposefully, study becomes more intensive and, in future, will also be more fruitful. Everyone realizes that the intellectual, creative and developed man can be characterized by a positive attitude towards both knowledge and the work of cognition, the wish to broaden and enrich knowledge permanently throughout life though entering into the process of lifelong learning. Schools, educational establishments, different learning centres become learning organisations. New technologies have stimulated changes not only in production, but also in economics, the social sphere, in politics and education. In the 21st century the most valued education is that which provides new knowledge and skills enabling the learner to compete in the labour market. The education and the information acquired as a result can be seen as a most important intellectual property ensuring the prosperity and welfare of society. In order to implement effective teaching and learning teachers have to be the main actors instigating changes in the study process. If the teachers are competent in their professional field having the necessary skills and competences then educational progress follows. ICT competence is of great importance for everybody, but especially for teachers working with the younger generation. It gives the teacher the ability to make the learning process more intensive, active, interesting and attractive thus promoting the motivation of the students to learn and to develop learning skills for life. Nowadays it is also very important to involve everybody in education regardless of gender, race or disability thus implementing the humanistic idea –education for all. The aim of the project "TICTC Teachers" ICT competences – a way to effective learning for children with hearing difficulties "in the frame of EU SOCRATES Programme Comenius 2.1. was to equip teachers with ICT competences and to improve and develop the teaching process leading students with hearing difficulties to increase their motivation to learn and develop the learning skills that are necessary for everybody for life in this information and knowledge based society. The target group consisted of practicing teachers and future teachers working with children who have hearing difficulties. The project ran from 1st October 2006 to 1st October 2009. The main outputs comprised the course description, study materials and an advice book for teachers on how to use ICT in core subjects. The teachers involved in testing the learning materials and the course book recognized it as a useful material for practical work in school, not only in core subjects and with children with hearing difficulties but as a resource for general use and specific purposes. So we, the participants of the project - University of Latvia, Faculty of Education and Psychology (coordinator) (Latvia), and partners University of Patras, Deaf Studies Unit, Department of Primary Education (Greece),University of Brno (Czech Republic), AR CTI (Academic Research Computer Technology Institute, University of Patras) (Greece), Munkholm Course and Project Centre (Denmark), Charles Resource Centre (U.K.), Riga boarding school for children with hearing difficulties(Latvia) - hope that you will also find these materials useful for your practical work. The advice book "Some hints for using ICT in the core subjects'' is designed to give you a brief insight into the use of ICT in general and then how to work with children who have hearing problems. Some practical examples are also included in the advice book. The team wishes you every success in your difficult but rewarding job with the younger generation.

Project coordinator prof.Ilze Ivanova

CONTENT

Dear teachers,

INTRODUCTION

New Technologies, and especially assistive technology, has broadened the educational opportunities and the independence of people with disabilities. Deaf and hard of hearing people, especially those with good written language skills, seem to take advantage from the opportunities computers technology and the internet offer to overcome their communication barriers that they face at school, work, and social life. New communication technology, such as mobile phones, faxes, electronic mail and instant messaging (IM), seem to offer more freedom to deaf and hard of hearing people to communicate directly with the broader society without delays or the "assistance" of a third party. Communication technology can also increase the educational and vocational opportunities of deaf and hard of hearing people, if schools prepare them to acquire the necessary skills to master and fully benefit from the new technologies.

Instructional technology has provided new opportunities to deaf students for accessing information. Teachers also use this technology as a tool to enhance and extend the learning of their deaf pupils. In the field of deaf education media has been always viewed as a critical component of teaching, because it is well recognized by the teachers the importance of supplementing the information provided to the deaf child through the visual channel. In general, we can divide the technology used in classes with deaf students into three basic categories:

- **Technology for the visualization of the environment**. This includes the different devices used to make the environmental sounds of the classrooms, like the lighted bells on the doors, the telephone, the bell for the breaks, the fire alarms etc. accessible by the deaf students.

- **The educational technology** that provides teachers and students with the visual accessibility of information and the opportunity for interaction. Computer technology gives able opportunities for classroom activities and learning. The *internet* ,the *instructional software* (drill and practice, tutorial, simulation, instructional games, problem solving), the *classroom technology tools* like the word processing, spread-sheet, database, *the support software* (gradebooks, wordsheets, desktop publishing, test generators, statistical packages, IEP generators , the *technology media* like interactive videodisc and CD-ROM, hyperlearning, distance learning ect, and the *emerging technologies* (personal digital assistants, virtual reality, multimedia-based simulation ect) are all valuable tools in the disposals of teachers.
- **Hearing and Speech rehabilitation technology**, like the digital hearing aids, the FM systems, the cochlear implants, the speech recognition tools ect.

The World Wide Web offers a gateway to many sources of information and is a valuable tool for teachers of deaf and hard of hearing learners. The electronic mail can be used by teachers and students to improve writing skills. The Web can be used to network with others. Students from one school can connect with students of another school and can collaborate in common projects. The gain of this kind of activities can be beneficial for the deaf and hard of hearing students in many aspects- linguistic, social, emotional, academic etc. Using the internet deaf students get stimulated to learn more and become active learners.

The internet also provides unique opportunities for teachers to collaborate and learn from each other. Teachers of the deaf can find many resources in the internet for specific teaching subjects like math, science, reading, social studies etc. Surfing for specific information on a topic like "Egyptian Pyramids" and "lesson" will find a number of ideas for preparing a lesson or activity for their class. Some sites include lesson plans teachers have found very

successful with their deaf students, and are willing to share with others. Some schools for the deaf also have Web sites where one can find a lot of information about their curriculum and math, language or science projects.

Deaf and hard of hearing students in mainstream programs can use the technology to acquire access to the classroom communication and information. Computer-assisted notetaking(CAN) or computer-assisted remote transcription (CART) are two technologies that provide easy accessibility to communication and sharing of information between deaf and hearing students and teachers in inclusive settings. CAN combines computer technology with notetaking. A notetaker types notes into a computer that displays the notes on a television monitor in the class. With CAN deaf and hard of hearing students see the notes as the class progresses, enabling them to participate fully in all ongoing activities of the class. CART is a procedure in which a stenographer transcribes the classroom communication which is projected in a classroom board, from a remote location.

Finally captioned films are films in the areas of education and entertainment that have subtitles specifically created for people with hearing loss. Closed captioned television is the captioning of TV shows. In closed captioned television, the subtitles appear only when the viewer has set the recorder. Film, television, and video captioning provide accessibility to information and entertainment for the deaf and hard of hearing students and at the same time encourage their reading development.

The technology as we can see is developing rapidly and can be a very helpful tool for teachers in order for them to help their students engage into learning activities that will lead them to become independent learners.

This advice book will begin with the general ICT competences that are necessary for every teacher and then highlight specific issues related to the use of ICT for teaching and working with children who have hearing difficulties.

Using educational technology and ICT effectively usually requires some planning.

- You do not need to know everything about computers in order to use them effectively, but it is important that you are competent and confident in the specific skills that you will need when you use the computers for a particular purpose.
- Plan to use the computers as an integral part of your work. Try to use computers in a meaningful way to enhance your subject, using your national or district curriculum guidelines.

COMPUTERS AND HOW THEY WORK

Here are some tips about computers and how they work

A computer (or computer system) is a combination of hardware that manipulates data according to a list of instructions (software). It receives data, stores data electronically, processes data, and then outputs data similar to the way our own brain functions:

- Using your mouse:
    - A good arrangement is a pad on an angled platform to the side of the keyboard;
    - The best arrangement for a mouse is a platform over the number keypad and just above the keyboard;
    - A poor arrangement is a flat surface on the side of the keyboard;
    - Worst arrangement is on the desk out to the side of the keyboard.
- Using shortcut keys you can quickly accomplish tasks you perform frequently by pressing one or more keys on the keyboard;
- Managing your files:
    - Take advantage of the **My Documents** feature (in Windows). To open Documents in Windows, click **Start**, and then click **My Documents**;
    - **Find files.** Through the **Start** menu, the task pane in **Windows Explorer**, common **File Open** and **File Save** dialog boxes, and other places;
    - **Keep files separate from programs.** By separating document files and program files you reduce the risk of accidentally deleting your documents;
    - **Separate ongoing and completed work.** Every month or so, move the files you're no longer working on to a different folder or location, such as a folder on a

special Archive folder, flash drive, external hard drive, or even on a CD;

- o **Keep names short.** Even though Windows allows you to use long file names, it does not necessarily mean you should;
- o **Avoid big folder structures.** If you need to put so many subfolders in a folder that you can't see all of them at a glance, consider creating an alphabetic menu.

Software Applications

The term *software* refers to the instructions, or programs, that tell the hardware what to do.

A word processing program that you can use to do a specific task, e.g. to write letters or to create documents your computer, is a type of software or *software application*.

Some of the things software applications can enable you to do include:

- creating documents;
- accounting and calculating;
- sending and receiving email messages;
- finding information;
- publishing information.

When **software problems** such as unexplained crashes and strange error messages begin to occur:

- Scan for viruses and malware;
- Free up RAM by closing other open programs;
- Restart the software;
- Use the internet to find help;
- Shut down and restart your computer;
- Undo any recent hardware or software changes;
- Uninstall the software, then reinstall it.

Web Applications

The internet has grown to the point where it is now possible to access information on almost every topic. However, finding relevant, high quality resources is becoming increasingly difficult and frustrating. Finding useful information on the web requires a combination of familiarity with the search tools and resources available, an understanding of search strategies and language, and persistence.

- Use the "find" (e.g. **Ctrl+F**) command When searching within a document or a web page
- When searching within with most search engines:
  - Put your most important keywords first in the string to search.

    e.g.: dog breed family pet choose
  - Type keywords and phrases in *lower case* to find both lower and upper case versions. Typing capital letters will usually return only an exact match.

    e.g: *tutorial* **retrieves both** *tutorial* **and** *Tutorial*
  - Use truncation (or stemming) and wildcards (e.g., *) to look for variations in spelling and word form.

    e.g: tutor* returns tutor, tutoring, turial, etc.

    e.g: recorgni*e returns both recognize (American) and recognise (British) spelling
  - Use double quotation marks (" ") around phrases to ensure they are searched exactly as is, with the words side by side in the same order.

    e.g.: "how to convert a doc to pdf" (Do NOT put quotation marks around a single word.)
  - Use the plus (+) and minus (-) signs in front of words to force their inclusion and/or exclusion in searches.

    e.g.: +Europe -UK (no space between the sign and the keyword)
  - Use CAPS when typing Boolean operators in your search statements. Most engines require that the operators (AND, OR, AND NOT/NOT) be capitalized. Other engines

will accept either CAPS or lower case, so you're on safe ground if you stick to CAPS.

e.g.: "printing photos" AND colour (printer OR inkjet)

Remember that it is important to carry out pedagogical evaluations of software and web pages!

The main goal of evaluating didactic software or web pages with the aim of using them in class is to provide teachers with fast insights into whether these web pages or applications can be used efficiently as an adequate teaching aid with respect to educational goals and objectives.

Recommendations:

- Use the internet or didactic software as teaching aids to meet educational objectives, i.e. set a didactic objective first (lesson objective, theme objective etc.) and then evaluate whether a particular web site or application is adequate to achieving this end. Do not look for an educational goal based on what is available on the internet!
- Do not rely on the internet in general or any didactic software for your key didactic tools. Be aware that web pages especially may lack evidence for many claims made, contain mistakes or simply be manipulative. Use the internet or didactic software as one of the aids, not a single one.
- Check whether the web pages selected by you can be accessed or whether particular didactic software is available and functional in the classroom before each lesson.
- Always use specific web pages or software whose quality you will have evaluated for that particular purpose in advance. Special attention should be given e.g. to hypertext links; check them – they may be useful but may be misleading too.

- Do not let pupils surf the net, use search engines or "kill time" in other ways. Pupils should always work in ways suggested by you which are consistent with the educational objectives.
- Do not underestimate pupils' internet skills. They are often more experienced in this respect than you are. Do not try to impress them just for the sake of it – strive to be better at using the internet in useful ways leading to the acquisition of meaningful knowledge and skills. Guide your pupils to aspire to the same thing.
- Use subject specific didactic web pages or software. Materials they include have usually been processed to suit didactic ends. It will make life easier for both you and your pupils.

A useful tip:

Build your own databases. Keep written or electronic records of which web sites you used, when and with which teaching objectives, of feedback in relation to the evaluation you made in advance, and whether the teaching objective was achieved, of your and your pupils' feelings about the lesson etc. One's own experience is most precious but easy to forget.

Disadvantages:

Time-costly, need to check all web page or software etc.

Advantages:

The time needed to evaluate a website or software gets shorter with growing experience; evaluation helps to find suitable materials; stimulates you to think about teaching and modern technologies; ICT use in class motivates pupils and raises the teacher's credit.

Be aware of different teaching strategies and learning theories

TEACHING STRATEGIES AND LEARNING THEORIES

ICT tools may expand some well known teaching strategies. So, computer technology *(web based technology)* can enhance student learning and help learners explore their world. Some basic issues about using ICT in classroom are:

- **why** to use computer technologies in classroom;
- **how** to prepare lesson plans to incorporate useful and appropriate computer activities;
- **when** to integrate computers into daily lessons.

Recommendations:

1. **Encourage Contact Between Students and Teacher**

    ICT worth nothing if there is no personal contact among students and teachers. As a teacher, I have to say that the contact **in and out** of classes is the most important factor in student motivation and involvement.

2. **Enhance the Cooperation among students**

    Learning is enhanced when it is more like a team effort and must be a collaborative and social work. Try to focus on using ICT tools that promote the collaborative work among your students *(ex. forums, blogs, wikis etc.)*

3. **Enhance the Self Regulating Learning**

    Students do not learn much while they are just memorizing pre-packaged assignments and read answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. A word processor, a blog, a wiki can help you in this field

4. **Explore the Learning Styles of your students**

    Each student may have it's own learning style. More over teacher's learning style may differ from student's learning style. Do not design activities having your's learning style in mind. Explore the learning styles of your students.

Thinking simple is difficult

Many times a simple lesson is better than a complex one. Think ICT as a tool that makes your's lesson simpler.

6. **Be careful with the project based learning (PBL)**
   - The teachers must have in mind some basic issues before designing a project for their students.
   - **when to use PBL**: Project based learning is designed to be used for complex issues that require students to investigate in order to understand. It is not useful to use PBL for easy to learn factual information;
   - **project title**: select as title for the project something that is real and relevant to the students lives;
   - **use of technology**: provide technologically oriented tools in order to enhance the ability of research *(e.x Web Quests);*
   - **collaboration**: base your project on student's collaboration;
   - **expand the time**: the time duration of the project must be long enough in order the students to be engaged *(at least 3 weeks);*
   - **request for outcomes**: the students must create an outcome as a result of their research *(presentation file, a text document, a summary etc.).*

7. **Be always prepared**

A good teacher needs to be well prepared to help his/her students accomplish their educational goals successfully. Thus, the key to student academic success is a good lesson plan. There are two different kinds of a lesson plan: **(a)** traditional and **(b)** online. **WebQuest** is a good example of an online lesson plan. You may find relative information in the http://Webquest.org

8. **Create your own educational material**

Nowadays there are a lot of specialized software that can be used by teachers helping them in creating their content. A very popular software in this category is the **eXe Project** (http://exeleanring.org) that is an **Open Source** authoring application to assist teachers and academics in the publishing of

web content without the need to become proficient in HTML or XML markup languages

9. Deliver your teaching using Learning Management Systems

An LMS is a kind of online application that automates the administration of training. A Learning Management System doesn't include its own authoring capabilities and is focusing on managing courses created by a variety of other sources *(documents, presentations, html pages, video etc).*

10. Using computers into classroom is not enough

Nowadays, we may claim that computers use appears to be most successful when involves **one** or **more** of the following factors **(a)** Critical thinking skill **(b)** Customization and student interests **(c)** Human interaction **(d)** Student collaboration **(e)**Accommodating disabilities **(f)** Using drill for memorization **(g)** Performing real-life tasks **(h)** Performing complex tasks

Keeping in mind the humanistic approach to education it is necessary to guarantee education for all

EDUCATION FOR ALL

The Education for All (EFA) movement is, as its name suggests, concerned with ensuring access to at least basic education for all.

"Every child has unique characteristics, interests, abilities and learning needs and therefore if the right to education is to mean anything, education systems should be designed and educational programmes implemented, to take into account the wide diversity of these characteristics and needs."

Like Education for All, inclusive education is about ensuring the rights to education of all learners, regardless of their individual characteristics or difficulties, in order to build a more just society. In the transition to inclusive education, managing of diversity is not simply a technical or organizational change. Managing diversity is about removing barriers and increasing educational opportunities. This does not happen through legislation or organisational change alone, but it is an on-going process.

Practice in each national system will be different depending on the background and traditions of the country. Countries have to be prepared to analyse their own situations, identify barriers and facilitators of inclusion and plan a process of development that is appropriate for them. Because of that, it is necessary:
- to initiate the change;
- to change administrative structures;
- to mobilise resources and to find new ones.

Grounds for inclusion

The move towards inclusive schools, where we need to manage the diversity can be justified on a number of grounds:
- educational justification - the requirement for inclusive schools to educate all children together means that they have to develop ways of teaching that respond to individual

differences and thus benefit and satisfy all children and their families;

- social justification - inclusive schools are able to change attitudes to difference by educating all children together and form the basis for a just and non-discriminatory society;
- economic justification - it is likely to be less costly to establish and maintain schools which educate all children together than to set up a complex system of different types of school specialising in different groups of children. If these inclusive schools offer an effective education to all their students, then they are also a more cost-effective means giving education for all.

Before starting your job with deaf students, keep in mind the characteristics of deaf people

ICT AND CHARACTERISTICS OF THE POPULATION WITH HEARING DIFFICULTIES

Description of the deaf population

Having a hearing loss does not mean the same thing for everyone. Depending on the type and degree of hearing loss students will have different needs and means of communication. This will affect their participation in the classroom in many ways.

For the purposes of this module the main focus is on the different degrees of hearing loss, as these may determine the different types of technology needed.

A **hard of hearing person** can depend partially on hearing for the comprehension of information. Again, this depends on the degree of hearing loss and the use of amplification devices. The various categories of hearing loss for children have been described as follows**:**

Mild - At 26-45 db, a little difficulty hearing speech. Even a mild hearing loss can be serious for children still learning to talk.

Moderate - At 46-65 db, more difficulty hearing speech.

Severe - At 66-85 db, a lot of difficulty hearing speech. It is at this level that we begin to use the term deaf.

Profound - Anything over 85 db. With this level of hearing loss, hearing aids may or may not help; cochlear implants are often an option.

A **deaf** person is someone who cannot rely on hearing (and thus on spoken forms of communication) at all and needs more visual ways and means to comprehend successfully what is being taught.

A second factor that should be taken into consideration is the communication mode used in the everyday life of the child, the one with which the child is more competent. For some children, sign

language is the main means of communication whereas for others the spoken form of language is what they have been trained to use. Research has indicated that only 10% of deaf children are born into deaf families (in which cases the use of sign language tends to be more straightforward). The remaining 90% of deaf children are born into hearing families and their communication preferences may vary in many ways.

Deaf population in mainstream classes

Regardless of their communication needs, all children at some point go to school. Although there are many different educational settings available in every country (schools for the deaf, deaf units in mainstream schools, parallel support teachers etc) the most recent trend in deaf education is the placement of deaf children in mainstream schools, where they attend classes together with their hearing peers. This has brought a number of challenges to classrooms most of which have occurred in order to meet the new needs arising from this combined population. Some of the most common problems that have been reported include:

1. *Communication between teacher and student*.
2. *Communication between peers.*
3. *Noisy classroom environments.*
4. *Participation in class discussions.*
5. *Access to the curriculum.*

Teachers in mainstream classes

Most mainstream teachers in all educational phases (pre-primary, primary, secondary, post- secondary) have very little – if any – experience and knowledge of deafness. At the same time they are faced with the challenge of meeting all the different educational needs of children in their classes. In addition to some additional training and/or teacher support in the class they may find technology a great help.

How inclusive settings work

For every school in every country there are certain of goals that need to be achieved by the end of each academic year, known to most educators as the curriculum. In inclusive settings this amount of information and knowledge needs to be passed on to all students. This may require alterations to the teaching methods or the teaching tools. A deaf or hard of hearing student for example may need the presence of a sign language interpreter, or some other student to take notes, or an FM system to supplement the lipreading of the teacher etc.

How has the use of technologies supported these settings?

Technological advances have been presented in inclusive educational settings for some years now in response to the difficulties arising therein. At the beginning these were focussed mostly on the teacher–student relationship and how what was being said could become more visual. Such systems were in the form of real-time speech-to–text transcription systems, where a stenographer was typing in code, converted afterwards by the computer into a real- time display of English text .Later, the development and introduction of laptop computers in schools brought note taking forward even further and also offered the opportunity for hard copies. Then, a more interactive form of technology appeared, giving the opportunity for interactive and not just passive learning. Some years later, cameras, software programs, the internet and all the latest technology has brought picture and sign language interpretation onto laptop screens.

"Technology for inclusive settings" is of great importance for every teacher.

Equal access to curriculum

The curriculum is the framework, within which every school designs and then delivers its educational program. The goals and

short–term targets that teachers set are usually based on their country's curriculum.

The main and most interesting question for inclusive settings for deaf/hard of hearing children is whether the school program and the everyday lessons are accessible to all students. Mainstream school teachers are used to working with hearing children and often do not realize the barriers that deaf pupils face. Additionally, modern curricula and educational programs, following the current pressures for more information in less possible time, try to include as much knowledge as possible even for younger children.

All this information going around in the class, especially at speed and without any modification on behalf of the educator, very often fails to reach the deaf student. This is the point at which technology can be of the greatest assistance.

Technological advances:

Voice to text technology

Text to sign technology

Interactive whiteboards

Digital video conferencing

Educational software

Criteria for choosing the right technology in classroom

As already explained in the previous session, the deaf population is heterogeneous. Depending on the needs of every student, the teacher will have to make a decision about the kind of technological support most useful for each group. Factors that should be taken under consideration include:

1. The educational phase (pre-primary, primary etc)

2. The communication mode of deaf / hard of hearing students

3. The presence of any additional educational needs

4. The number of students

What does technology do better?

Imagine you have a class of 20 hearing children and 3 deaf children. Also imagine that your task for the day is to teach the water cycle. Now, try to find a way to explain words such as vaporization, liquefaction, upwards movement of the water molecules etc to a child who:

1. Has very little hearing and uses sign language.
2. Has some hearing but a relatively small vocabulary.
3. Has very good hearing but is not at the level of fully understanding and/or decoding the meaning of words.

In all three cases some additional help is needed.

Visual help, so that all meanings can be explained.

Animated help, to keep levels of motivation high.

Immediate help, to ensure that all children are taught at the same rate.

Two of the main advantages of modern technology are speed and image. A teacher can use either a software program, or some images from the internet, or a video from a TV program, or some photos and at the same time can have simultaneous interpreting in sign language and/or anything said put on screen. The possibility that learning has been achieved is likely to be increased in such cases.

Extra help benefits everyone

Research has shown that the extra visual or other help addressed to deaf/hard of hearing children also benefits hearing children in all academic fields. It has been reported that hearing children get all the information from the spoken form of language

but at the same time enrich this knowledge with all the visual stimuli they get in the class.

What are the overall benefits?
- Better communication between teacher and student;
- Better communication between pupils;
- More fun learning;
- Faster results;
- Interactive learning;
- Improved self- esteem;
- Increased participation in the class.

Possible disadvantages:
- Insufficient training for teachers;
- Inconsistent use of technology;
- Inappropriate choice of the material.

THE USE OF DIFFERENT TECHNOLOGIES IN DEAF EDUCATION

It is necessary to remember that there are *different kinds of existing technologies for a deaf person and for Deaf Education. It may differ from country to country*, from teacher to teacher, but there are some general rules we have to remember.

The basic rules of work with **electronic teaching materials and e-learning** in the teaching of hearing disabled pupils are especially emphasized in the referred-to text. We must not leave out of consideration the fact that, despite the above mentioned specific kinds of teaching, the direct teacher-pupil communication is always important. Therefore we present the following rules of the teaching hearing disabled pupils:

- **The rule of keeping the eye contact** is the most important rule influencing the rate and efficiency of the communication between hearing disabled pupils and a teacher. This means that the teacher has to keep the face-to-face position, so that all the pupils could be actively involved in the communication.
- **The rule of communicative environment** emphasizes the positive motivation factor. This means the sufficient extent of questions and answers.
- **The feedback rule** is a very important factor influencing the output quality of activities, games, work and learning.
- **The rule of clear structure and rules of organizing activities.** In the case of hearing disabled pupils our acting should be highly structured with clear exposition of rules, especially at the very beginning, when implementing new methods and forms of organizing activities.

Some of the programmes and e-learning courses, designed for non-disabled pupils, can be used in the teaching of hearing disabled ones. However, a number of these programmes are based on work

with audio output, eventually on complicated sentences formulating instructions for the learner.

When preparing teaching programmes and e-learning courses for hearing disabled individuals we should necessarily take into account the level of their communication competence resulting from such kind of handicap. The mother tongue is a language with rich and irregular flexion, therefore deaf people may face serious difficulties when trying to identify the rules of separate grammatical categories, as well as understanding the syntactic rules.

When adapting the texts for hearing disabled pupils we should **take into account the written text reception skills** of individuals and follow the below listed **basic rules**:

- to differentiate between relevant (substantial) information which will be preserved, though slightly modified, and redundant (unnecessary) information, editing out of which will not affect the entire cohesion of the final text;
- to edit out unnecessary or redundant information which might confuse the deaf, but, at the same time, to emphasize the preservation of the text (event. the story) itself;
- to leave out complicated words or to replace them by the words known and understood by an individual
- to follow the chronology of events in the adapted text, despite this might not have been the basic feature of the original text;
- to integrate the explanatory notes that might be redundant for a common reader (e.g. glossaries, explanatory dictionary etc..

The trends of ICT implementation into education and the characteristics of particular components usable in the education of the hearing disabled pupils:

- **PC and projector with the help of which we can use electronic teaching materials.**

The comparison of traditional textbooks and electronic teaching materials:

The advantages of traditional textbooks	*The disadvantages of traditional textbooks*
- printed text is proper for reading and learning from the point of view of hygiene; - textbooks are portable and may be used for studying practically anywhere; - printed text is proper for taking notes, underlining etc.; - when using a textbook, no other equipment is needed.	- expensive distribution, new publishing; - the explanation is limited by the text, event. pictures and charts; - uneasy updating of information, event. links to internet sources etc.; - no interactive approach possible; - no feedback possible.

The advantages of electronic teaching materials	*The disadvantages of electronic teaching material*
- they can contain information not possible in printed materials (application, tutorials, learning software, interactive tests etc.); - easy and inexpensive	- a learner needs a proper equipment (at least a PC and a CD) - internet connection is needed for the live materials use - a learner must be technology literate

The advantages of electronic teaching materials	The disadvantages of electronic teaching material
distribution; • possible interaction and feedback; • easy updating; • sharing information possible; • multiple capacity use; • learner-teacher cooperation; • cooperation among learners.	• reading texts on the screen is unacceptable for many of the learners.

Remember that a printed textbook combined with electronic teaching materials is regarded as a very suitable form which enables to combine the advantages of both in the process of designing and distribution of teaching materials and eliminate their disadvantages.

- **Electronic learning course (E-learning)**

The strong points of e-learning	The weak points of e-learning
- more effective teaching – a possibility of dividing information into small units that may be easily assembled into different courses; - availability of learning materials (anywhere, anytime, from any place); - an individual approach to a learner – more versions of learning materials possible; - lower education cost; - an interactive form of teaching – multimedia components (e.g. flash animation, audio tracks, video); - the attractive content; - a wider range of knowledge testing possibilities.	- low motivation for self-education, commonly insufficient need of lifelong education; - lack of teachers able to create and manage e-learning courses - the potential e-learning clients are not computer literate enough and unable to work independently; - disproportionate duration of the courses; - the content – not matching student's requirements or not attractive enough; - insufficient participation of the learner (wrong motivation); - lack of contact with other learners.

The e-learning is explicitly a very suitable method of teaching hearing disabled pupils under condition that the specifics related to

a given sense handicap are taken into account. **The below mentioned recommendations are resulting from the e-learning course Eliška participants´ experience (http://www.eliska.cz/):**

- **E-learning plays a fundamental role in the field of motivation**. Anything related to computer work is catchy and impressive for the pupils. Respecting the natural competitiveness of the pupils, we recommend to implement an assessment system that might generate higher motivation.
- Success of the entire project is based on the respect for the pupils and positive approach to their age group and their way of communication. **The entire system should be visually catchy ; the pupils also should be offered suitable and interesting topics and a large scale of exercises.**
- **We can not expect the elementary school pupils to be systematic,** targeted at education and able to study independently, just like the adult students. We must frame a specification of the course, so that the participants were able to distinguish between compulsory and optional activities from the very beginning.
- We must **always keep in mind the language of the texts**. As mentioned above, we must take into account the fact that the major language of a certain country should not necessarily be understandable to a hearing disabled person. The problem may be solved properly by **adaptation of the texts** respecting above mentioned rules, event. **by translation of a written text into the sign language**.
- The pupils should be given an **opportunity to consult exercises and tasks with their parents**; so, it is also advisable to prepare activities suitable for participant's cooperation with other family members.
- **Organizing one-day, as well as multi-day, seminars and weekend events based on self-experience and thematically completing the e-learning courses seems to be very**

contributive. During their stay the pupils are not only given an opportunity to solve individual tasks, but also to get immediate feedback, and to work together with their tutors and schoolmates who they normally keep in touch with only electronically etc.

The authors of other e-learning courses for hearing disabled university students recommend to take into account following measures in the process of formulating single topics (http://www.teiresias.muni.cz/imosesp/download/pristupnost.pdf):

- The course texts, event. the course itself, **must be consistently structured** (e.g. to use lists and other organizational text components and to pick out, event. highlight, the main parts graphically).
- In case of unknown concepts or less frequented expressions, not explained in a certain course, appearing in the course texts, it is suitable to implement a certain form of dictionary into the course. The implementation of an **explanatory dictionary** appears to be optimal in relation with the problem of understanding the meaning of words by the hearing disabled . The fundamental parts of the text should include translations into the sign language (an interpretor performance video ; an interpretation of the given text into the national sign language}.
- **The course should also include visual and interactive components**. Charts, animations, pictures, interactive presentations etc., completing the main part of the course, play a fundamental role in the field of didactics and methodology of teaching the hearing disabled , they clarify the meaning of words and make the delivered information not only interesting, but also easier understandable and acceptable.
- The course should include an extended amount of parts used for **acquired knowledge practising**, follow-up **testing** and regular **revision**. Due to the effort made by the hearing

disabled person trying to understand a text, and due to the structural differentiation of the code he normally works with, the information acquired in the national (major) language never shows as permanent pedagogical impact as in the case of normal students.

- **All the audio tracks should be provided with typescripts included in the presented text** or, at least, with a short summary of the track content. If the audio track is essential for understanding of the presentation, it is highly advisable to be provided by subtitles or translation into the sign language.

Categorizing the other trends in information and communicative technologies that may be implemented into teaching pupils with a hearing handicap we can also list e.g.:

- **Digital camera and video camera;**
- **Interactive board (White Board);**
- **Computer labs;**
- **Digital libraries.**

USING ICT TO TEACH LANGUAGE TO STUDENTS WITH HEARING DIFFICULTIES

The main objectives of language teaching using ICT could be the following;
- To create an environment for learning language;
- To integrate ICT into the language programme;
- To develop spoken language skills;
- To develop sign language;
- To develop written language;
- To practise reading and language concepts;
- To enrich literacy skills;
- To enhance communication skills;
- To facilitate face to face conversation between children with hearing difficulties and hearing children;
- To motivate language learning;
- To provide a visual dimension to all language materials (to see what you hear);
- To introduce new units and themes;
- To research language topics on the internet;
- To use different materials or software in the language process;
- To improve confidence and self-esteem;
- To make learners as independent as possible.

ICT supports student language learning

Information Communication Technology (ICT) has had a major impact in the field of education, including the education of children with hearing difficulties, in the last 20 years. The majority of schools which educate children with hearing difficulties in the USA and in Europe use computer technology to support students learning language, at all levels of education. Instructional technologies that support learners with hearing difficulties are potential tools.

Teachers need to integrate ICT into their teaching and create an environment for learning in which the computer is used in ways that are not only directly related to their curriculum goals, but also incorporate a wide variety of uses that are relevant to knowledge building across

Children's behaviour has been changed in the following ways:
- The students do not learn or they do not want to learn from the books;
- They spend a lot of time to watching television, surfing the internet, playing electronic games and using mobile telephones;
- They learn about communicating.

The electronic technology engages their interest and through this they acquire knowledge and skills. One of the main characteristics of the modern period is the growth of communication which is interrelated with the production and the distribution of information. Our written and oral messages are transmitted instantly over large distances and speech is used more and more. Communication contributes to development and development creates more communication needs. Every culture produces knowledge and practices that are embedded in its language.

Language teaching using ICT has two aspects:
- To aid the effective teaching of the mother tongue;
- Learning language for communication and for professional reasons.

You can choose different hardware and software for your classroom.

Technology hardware and types of classroom tools:
- Electronic Whiteboards;
- Cameras;
- Videos;
- Scanners;
- Projectors;
- Computers;
- Laptops;
- Notepads.

Software for classroom integration:

Standard:
- Microsoft Office - MS Word, PowerPoint.
- Presentation Software - MS PowerPoint .
- Web-Based Programs - Maps, Digital Knowledge.

Favourites:
- Tools for the correction of orthographic errors in texts;
- Tools that point out of syntactic errors;
- Tools for the phonetic transcription of any word;
- Systems that transform text to voice and voice to text;
- Special electronic dictionaries for children at all levels of primary school, high school and lyceum;
- Key Skills for reading;
- Accelerated reader;
- Missing Links;
- Spell it;
- Stories;
- Written instructions;
- Written missing links;
- Pictures;
- Sign language-pictures or videos;
- Sign language video dictionary;

There are three basic criteria in the choice of educational software:

- The Usefulness;
- The Functionalism;
- The Aesthetics.

Collections of language resources are now available on the Web. Language resource collections also allow for data-driven learning. Many newspapers, search engines, and web-based directories offer access to countless sources of information that can be accessed via the Internet. In particular, newspapers and magazines provide reports on news information that students may have heard only a day before. Students are thus enabled to see the relevance of their world knowledge for language learning.

Remember that the use of ICT changes the learning process

Learners differ in their ability to import new elements – such as ICT – into their model of what constitutes an appropriate language learning environment. It is argued that accessibility, autonomy, reflectivity and interactivity are conditions which must be met if ICT is to become truly relevant to language learners.

When digital content is integrated into the language curriculum, a change in the learning process occurs. This is characterised as being:

- **Student-centred.** Students feel empowered in their work and participate in creating and developing their own investigations while their teacher's guide, facilitate and provide them with materials to support their learning. Teachers remain the cornerstone of the educational process in a learning partnership with their students, but adopt a role which is less authoritarian and more one of encouraging and guiding the learning of their students towards goals that have been defined by the teacher and the curriculum.
- **Collaborative.** Since learning with authentic tasks is an interactive experience between students and their teachers,

students acquire and use information, exchange ideas with each other and create relationships with professionals relevant to their work.

- **Relevant .** Learning with ICT has the potential to create educational opportunities that meet the needs of individuals and groups in diverse ways and allow them to work according to their needs and interests. In addition, teachers can use digital devices to record and report on their students' performance in enhanced ways, tracking achievement using databases or using video capture for the observation of skill development.
- **Productive.** As the use of ICT encourages both students and teachers to become 'content producers' this has the added benefit that the level and quality of the productions is usually high.
- **Lifelong.** Students develop skill in learning how to learn, which will benefit them in the long term and enable them to interact with people and ideas in a borderless manner. Skill in determining when and where to seek out information and people, and in how to use the information in context, becomes a fundamental part of the learning process.

Teachers must be involved in planning and overseeing such computer based experiences to ensure that students reflect on and understand the language concepts inherent to them.

Teachers might use the following approaches:
- Focus attention on particular aspects of the children with hearing difficulties' experiences;
- Suggest paths to work in that will develop the skills;
- Facilitate computer feedback as a catalyst;
- Help them to choose the most efficient route to find the answer;
- Support exploration with questions;

- Group sessions in which the children brainstorm ideas;
- Provide children with models as a base that they can build from.;
- Provide open-ended tasks that have initial structure then encourage the children to decide their own strategies for completion.

Oral language using ICT

Acquiring the ability to express oneself with confidence in a clear and effective manner remains a central aim of the education process. Language permeates all areas of the primary curriculum but is also addressed as one of the strands in the Curriculum. Teachers are required to continually plan and provide children with interesting and creative situations or scenarios in which to develop the strand units of receptiveness to language, competence and confidence in using language, developing cognitive abilities through language and finally emotional and imaginative development through language. ICT can provide many stimulating opportunities for language development. The activities can be undertaken with different age groups and different levels of ability. In addition, the activities offer immense opportunities for collaboration and teamwork among children leading to much conversation and discussion. "Storytime" provides an opportunity for children to publish their stories and everyday experiences to a very wide audience. It can help them to learn about storytelling, review their favourite books, interview authors and features a glossary, word bank and opinion poll. Children love to see their work being published and like to share their stories with other children, family and friends. The stories published vary from poems to reflections/observations of experiences.

Using the Digital Camera

The digital camera presents endless opportunities for language exploration and development across almost the entire subject of language. The digital camera is probably the most useful

piece of technology to have in a primary classroom and it acts as a fantastic tool in the development of children's language. Children are naturally curious about the world around them and the digital camera allows them to capture moments and events in time which can then be used for discussion in class, for example, a visit or a school outing.

Digital Storytelling

Digital Storytelling allows children to use multimedia tools to tell their stories reducing the emphasis on text and encouraging oral expression through the use of audio and video. A digital story is a series of images combined with a soundtrack with an emphasis on the personal voice. The children can do this in groups or individually but the focus is always on the message and meaning in their stories not the technology. It helps to use the storyboarding technique in developing their story. The stories can simply use text with a digital photo and audio or can be more sophisticated to include a sound track, moving images (captured via a DV camera), etc. The digital technologies being used connect the visual, oral and textual aspects but the storytelling remains the true art of communication. Children with special educational needs have much to gain from using the digital storytelling approach and it can lead to greater inclusion and participation in the learning process.

ICT and written language

Written language serves as an external memory. Children become much more amenable towards reflective or awareness-raising activities when they use ICT. Of even greater significance for literacy is the increased level of cognitive functioning which is encouraged by the more detached and critical attitude to experience that use of the written language promotes. Whereas in oral communication, meaning is defined by an interplay of speaker, recipient, and context, in writing, to a large extent, readers try to infer meaning from the text alone. To make the written text act as the autonomous and explicit representation of intended meaning

leads to the development of a greater awareness of the abstract relationship between language and experience and a greater willingness to exploit the symbolic possibilities inherent in language. The acquisition of literacy provides a tool for, and the spur to, higher levels of analytic thinking and formal reasoning – skills which are amongst the most influencial in the development of civilisation, both in whole cultures and in their individual members. It is in the actual creation of text, the writing process, that 'the individual is made most aware of the symbolising function of language, and of the power that it has to capture experience so that it may be considered, questioned and modified in the interests of increased understanding and future applications. Through the process of writing, learners are required to develop those literacy skills that we most associate with higher cognitive skills. This involves a greater awareness of their learning processes, and in the case of language learners, a greater metalinguistic awareness . Collaborative writing can add a social and pragmatic dimension to this process contrary to early predictions that the shift away from orality in new media necessarily brings with it social alienation and a lack of interpersonal involvement in the dissemination of information and participation in entertainment and teaching activities. Learner and teacher autonomy are inextricably linked. When they apply these concepts to internet technology for language teaching, there are some technologies and ways of using them that are more appropriate than others. If they use only authentic non-participatory information resources in the target language, they neglect the wide variety of communication resources that are available to them. Teachers who are willing to exchange ideas and help can support projects. In this way, they can not only develop a community of learners, but also a community of educators on the internet, and both are far from being virtual.

Expectations using ICT in language learning

- The progress of the children;
- The children's growth in confidence and the assistance they give each other, fun and laughter;
- The language the children are using especially when they explain what they have done or when they are helping others;
- The children's navigation of the computer. Going through processes to find different files – stories.

ICT USING IN TEACHING MATHEMATICS TO CHILDREN WITH HEARIMG DIFFICULTIES

ICT Resources Available

Several Considerations are of importance before applying Information and Communication Technology to the teaching of Mathematics to deaf children. Information Technology should be used to enhance the National Curriculum in Mathematics in the European Union by employing the Technology in an integrated way so that it is meaningful with directions. Decision as to where the ICT is to be applied in Mathematics should be preceded by your goals; and to make sure that your solution to problem solving relates to this goal. A discussion with other ICT users for deaf children in Mathematics and other subjects will help the teacher to learn unique, practical and personal solutions. It is important to talk to software manufacturers the subject and ask them to provide software free, on trial basis before a decision is reached as to its purchase. Also ample research should be carried out in relation to the software before a final decision is made to apply it to the teaching of Mathematics.

A deaf student in Mathematics has no first language because of his/her disability. For this reason, when teaching deaf children in Mathematics, the approach should be that of a new language. Furthermore, deaf children differ in their degree of deafness; therefore response to teaching methods will differ significantly. Consequently many different ICT methods and resources should be applied to cope with all possible problems in Mathematics that may be experienced by any particular student. In this section, the different software and hardware available will be described:

- **Communication.** As deaf students have problems with communication within themselves and normal students, collaborating on an ICT activity in mathematics may encourage a group of students extend the use of a

developed mathematical sign language and the corresponding mathematical concepts; and to plan and complete their work. Furthermore, communication is integral to the student's social, emotional and cognitive development. ICT software such as the web Browser to navigate the internet, E-mail Software to communicate with Friends, instant messaging software, software pertaining to mobile phones which can be used for texting, videophones and video conferencing, chat rooms and discussion Forums for Mathematics will improve communication options for deaf students.

- **Early Mathematical software** can be employed to develop numerical skills to reinforce difficult concepts. This is because students who are hard of hearing have difficulty acquiring language skills. Since mathematics is taught in particular languages, the concept should be introduced at an early age. Software should be chosen so that it is not heavily dependent on sound.
- **Subject oriented software** such as mathematics are available for problem solving, tutorials and practice as well as simulations.
- **Using Sign Language Software** designed specifically for Mathematics.
- **Word Processing Software** will enable a deaf student to complete a mathematics assignment or coursework
- **Multimedia presentations combining text, pictures, video and animation can enable students to experiment on numbers and other arithmetic operations**. The two most commonly used authoring software tools are Presentation Software such as Power Point and Hyper studio. Software has been designed in the United States that incorporates the American Sign Language as seen by the diagram below.

Figure 1: **A typical Animation sign language signal developed by Purdue University. Matching time with Mathsign (1).**
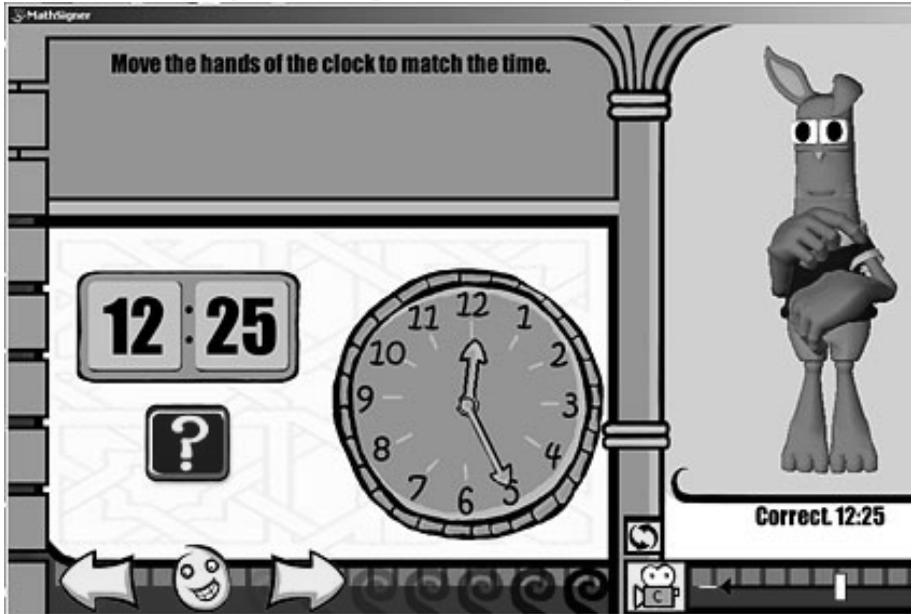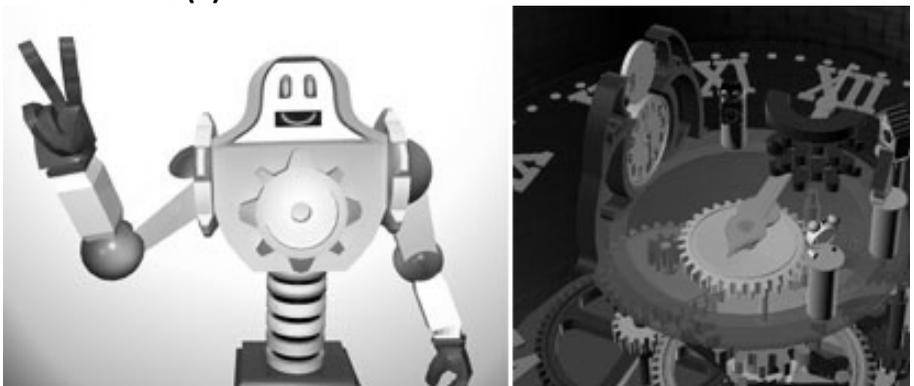

Figure 2: **A computer game animation to show signs in Mathematics (1).**

Hardware

The following hardware goes with the computer in enhancing the teaching of Math to deaf or hard of hearing students:

1. *Scanner*: utilized to input images, numbers, text graphics and drawings into the computer;
2. *Digital Camera*: This enhances project work, numerical skills as well as literacy skills for the student;
3. *Digital Video camera*: For use in Math Lessons, Math Sign Language, speech lessons etc.;
4. *Printer*: To produce high quality work;
5. *Mobile Phones*: For Text Messaging. This is important in that hard of hearing students will have the same facilities to discuss or exchange ideas with their peers;
6. *Videophones and Video conferencing*: This permits two-way, real-time visual and audio communication at a distance. Mathematics can therefore be taught with deaf or hearing people in sign language directly or through an interpreter at a particular location, nationally or internationally;
7. *Hearing Aids* such as loop systems;
8. *Personal listening devices* such as television or video amplifiers.

Teaching Methodology

There are several theories pertaining to methods of teaching Mathematics to deaf children. Garnet (4) emphasized on what he called distributed practice whereby teaching and practicing are carried out for short periods of time rather than one long period daily. This reduces the possibility of students loosing concentration in difficult topics. The paper also emphasized on reverses in teaching, for example, when teaching 7 + 8, you also teach 8 + 7. Large group of facts are broken down in small chunks to teach mastery.

Another method that has been postulated includes designing systems and activities that relate mathematics to students' own experiences by selecting tasks that interest them and challenge their

intellect. An example would be to teach percentages in relation to Value Added Tax (VAT) or interest rate for example 25 % x £20000.

Use ICT tools such as built-in computer calculator to investigate problems. Employ mathematical instruments such as rulers, set square, protractors when teaching problems connected to geometry. You could also relate other subjects to mathematics. The strengths and interests of the child should be identified so as to motivate him/her. Concepts should be taught in line with known information and knowledge base. Include the teaching of grammatical vocabulary including spelling, finger spelling, sign and pronunciation while re-enforcing meanings. Write symbolic representations of each solution on the board. Give one-to-one to augment differentiation in learning; and then encourage students to ask for help. Independent learning should be encouraged. In all cases, provide feed back to the student after assessment.

LEARNING COMMUNITIES

Learning community consists in a group of people who take an active, reflective, collaborative, learning oriented and growth – promoting approach toward the mysteries, problems, and perplexities of teaching and learning.

Learning Communities bring people together for shared learning, discovery, and the generation of knowledge. Within a learning community (LC), all participants take responsibility for achieving the learning goals. Learning communities are the process by which individuals come together to achieve learning goals. These learning goals can be specific to individual courses and activities, or can be those that guide an entire teaching and learning institute.

The following four core ideas are central to the learning community process:

- **Shared discovery and learning.** Collaborative learning activities where participants share responsibility for the learning that takes place help the development of a learning community. Rather than relying on traditional "expert centered" lecture formats, practitioners should include collaborative learning techniques so every learner can see his/her contribution to the learning goals.
- **Functional connections among learners.** Learning communities develop when the interactions among learners are meaningful, functional and necessary for the accomplishment of the "work" within the courses or learning activities. Meaningful connections extend throughout the entire learning community, e.g. among students, teachers and different staff members rather than simply among cohort or role-related peers.

- **Connections to other related learning and life experiences.** Learning communities flourish when implicit and explicit connections are made to experiences and activities beyond the course or program in which one participates. These connections help situate one's learning in a larger context by solidifying one's place in the broader campus community of learners and life experiences. These connections decrease the personal isolation.
- **Inclusive learning environment.** Learning communities succeed when the diverse backgrounds and experiences of learners are welcomed in such a way that they help inform the group's collective learning. Whenever possible, activities should be sought that help participants reach out and connect with others from backgrounds different from their own.

There are different types of LC such as:
- professional;
- living;
- active;
- expended;
- dynamic;
- IT;
- Internet;
- On – line;
- Electronic.

A successful professional learning community could be described as follows:
- the collegial and facilitative participation of the principal, who shares leadership - and thus, power and authority - through inviting staff input in decision making;

- a shared vision that is developed from staff's unswerving commitment to students' learning and that is consistently articulated and referenced for the staff's work;
- collective learning among staff and the application of that learning to solutions that address students' needs;
- the visitation and review of each teacher's classroom behaviour by peers as a feedback and assistance activity to support individual and community improvement and
- physical conditions and human capacities that support such an operation.

Outcomes of Professional Learning Communities for Staff and Students

For staff, the following results have been observed:
- reduction of isolation of teachers;
- increased commitment to the mission and goals of the school and increased vigour in working to strengthen the mission;
- shared responsibility for the total development of students and collective responsibility for students' success;
- powerful learning that defines good teaching and classroom practice and that creates new knowledge and beliefs about teaching and learners;
- increased meaning and understanding of the content that teachers teach and the roles they play in helping all students achieve expectations;
- higher likelihood that teachers will be well informed, professionally renewed, and inspired to inspire students;
- more satisfaction, higher morale, and lower rates of absenteeism;
- significant advances in adapting teaching to the students, accomplished more quickly than in traditional schools;
- commitment to making significant and lasting changes and

- higher likelihood of undertaking fundamental systemic change

For <u>students</u>, the results include:
- decreased dropout rate and fewer classes "skipped";
- lower rates of absenteeism;
- increased learning that is distributed more equitably in the smaller high schools;
- greater academic gains in math, science, history, and reading than in traditional schools and
- smaller achievement gaps between students from different backgrounds (p. 28).

If you would like to learn more about professional learning community outcomes, please refer to the literature review (Hord, 1997).

When speaking about an ICT learning community different (terminology) phenomenon are used to describe similar learning communities:
- on-line;
- networking;
- internet;
- distance;
- virtual.

An online learning community is a common place on the internet addressing the learning needs of its members through proactive and collaborative partnerships.

Through social networking and computer – mediated communication, people work as a community to achieve a shared learning objective.

In an online learning community, people communicate via textual discussion (synchronous or asynchronous), audio, video, or other Internet-supported devices. Learning objectives may be proposed by an instructor or may arise out of discussions between

participants that reflect personal interests. Intentional online learning communities may be categorized as knowledge-based, practice-based and task-based.

The characteristic features of an ICT learning community:
- common goal, mission;
- the use of technologies;
- language knowledge;
- skills in the use of technologies;
- supportive system;
- tutors;
- well designed learning material;
- learning environment.

There are certain benefits to an ICT learning community and they are as follows:
- quick communication, cooperation;
- cheap communication;
- economy of time;
- develops independent and autonomous learners;
- learning by sharing;
- new friends, colleagues.

There are also some problems and risks, not all teaching staff and students have good computing skills. There is also the necessity to have technical platforms that support learning communities in different ways: 'active', 'constructive', 'collaborative', 'intentional', 'conversational', 'reflective' and 'contextualized'. Therefore, technical platforms for CSCL have to support different types of synchronous and asynchronous communication between members of a learning group. They should provide the learning community with platform functions like email, newsgroups, chat, shared data bases, concepts of group awareness, scheduling and mind mapping tools, shared whiteboards, document processing software and multi-user simulation and exploration environments.

If we consider the school as a learning organization – learning community, then we can say that everybody in this organization is interested in developing teaching and learning processes by integrating ICT into school in order to prepare students for future life.

Gooperation leads to better results

COOPERATION AND THE ASSESSMENT OF STUDENTS

There are many institutions, centres, associations, social partners and families taking part in the management process of this diversity in education. Families provide the major contribution to children's education. Partnerships can only be built if both professionals and families themselves respect this contribution and understand the part they can play in making it a reality. A starting point is the recognition of children's rights as set out in the UN Convention on the Rights of the Child.

It is also important for education that the child is really and fully included in the family. Only then it is possible to include the child in education and society. Families sometimes experience great distress and pain when they realise that their child has some difficulties in learning, behaviour or some other particular problems. It may lead to problems in the relationship with the child in the family. In these cases the school, different centres and class teachers can encourage contact between the family and child, school and family. It may help to relieve the stress, rebuild hope and enable the child to experience the family and school as well.

It is also important that the child is supported in learning and development at home. Children will learn more successfully if there is a harmony between expectations and opportunities to learn at home and at school. Cooperation with the school in sharing knowledge about the child is an essential factor relating to the inclusion of the child in education and society in general. Families know their children best. They have seen the development of their child since birth. Their knowledge includes information about abilities, activities, relationships, attitudes at home, his or her wishes and views on different problems. Class teachers working in the school cannot acquire this knowledge without the support of families.

The assessment of the students

In order to learn more about the children it is possible to use different tools to assess the child's learning. These tools may consist of a simple checklist which describes the child's achievements and difficulties in a range of areas:

- gross motor development
- fine motor development
- communication and language development
- cognitive development (thinking)
- self-help skills (daily living skills, life skills)
- school-related learning (e.g. behaviour, language, reading, writing, numeracy)
- social development
- emotional development
- sensory problems

Such checklists can be completed on the basis of the teacher's daily contact with the child, and achievements can be recorded as they arise.
The class teachers may use:

- questionnaires;
- interviews;
- records of discussions;
- observation of the children.

Of course the work is easier if the teacher uses ICT to record the results and to prepare observations about students. ICT is also of great help in communicating with parents and other specialists in school.

Class teachers working in close contact with the school psychologists, medical doctors, subject teachers, school administrators or support centres can learn a lot about the child during the lessons, in the breaks and out-of-class activities. The aim of research and assessment of the students and their families is to

ensure an individual approach for every child. The information received helps in making decisions, coordinating the actions of the students and families and giving support to the student. If students are assessed continuously in terms of their progress through the curriculum, then emerging difficulties will become apparent long before they become serious. Assessment also helps to discover different talents and gifted students.

Early assessment

The early assessment of a child's difficulties is very important so that early intervention can be made. 'Early' in this sense does not simply mean in the child's first years. It also means that difficulties have to be identified before they have turned into serious problems. This can only be done in collaboration with families. Early assessment and intervention in this sense:

- minimises the impact of any difficulties;
- reduces the need for costly programmes of rehabilitation and remediation;
- makes it more likely that the student's needs can be met in the mainstream class.

Early assessment and intervention is particularly important in the early years of life, the school years and the transition phase. A common problem is that many teachers in schools wait until there is some clear evidence of educational failure and then try to act. In order to avoid this, it is necessary that:

- Teachers are familiar with usual patterns of child development and should be able to identify any significant deviations from these patterns;
- Teachers co-operate with parents to get information from them about their child's development, skills, interests and difficulties;
- Teachers are able to use simple research instruments;

- Teachers work closely in teams with health and social work personnel so that they can seek advice from them or refer children to them when necessary.

It is also very important that teachers realise that students have different abilities and talents that may not be related to the school curriculum. Class teachers in partnership with families, subject teachers, and psychologists should organise support system for students.

Support for students

Support includes everything that enables learners to learn. In particular it includes those resources which supplement what the ordinary class teacher can provide. The most important form of support is that which is provided from the resources which are at the disposal of every school:
- children supporting children;
- teachers supporting teachers;
- parents as partners in the education of their children;
- communities as supporters of schools;
- the use of modern forms, methods, ICT to raise motivation for learning.

In many situations there will also be support from teachers with specialist knowledge, resource centres and professionals from other sectors. Support has to be delivered holistically. Services and agencies have to work together rather than in isolation from each other. In school the class teacher will become the coordinator of this support.

One of the first tasks in building effective support is to mobilise those resources which already exist in and around schools. The strategies that are commonly used to increase this effectiveness include:

- child-to-child support in which students work collaboratively within the classroom and are able to help each other with their work;
- teacher-to-teacher support in which the staff of a school work collaboratively to decide how best to meet the diverse needs of their students;
- differentiation in the classroom and school.

Developing school-based teams is of great importance in managing diversity and building partnerships in school.

In many cases parents function as activists in some kind of national parents' association. Such associations work in every region. They help school boards and schools to find better contacts within communities, other educational establishments, support centres and marginalised families. School boards act as a part of the support system to implement the aims of education and personal development.

The education system recognises that families have a right to be involved in the decisions that are made about their children, whether or not this is protected in legislation. For instance, parents can be invited to meetings at school where the situation regarding their own child is to be discussed. This ensures that decisions are taken on the basis of all available information. It also enables the family to act as advocates for the rights of the child in the decision-making process. Parents' meetings are organised on two levels – school and class. A parents' group can provide support for the class teacher in solving different problems related to learning, teaching and the relationship between school and community.

Levels of cooperation

Class teacher's cooperation with the families may be on:
- individual level:
  - communication using phone, internet, letters;
  - answers to the questions;
  - invitation to school;

- o individual consultations;
- o home visits.
- class level:
  - o meetings;
  - o consultations;
  - o discussions;
  - o lectures.
- school level:
  - o family evenings (parties);
  - o festivities;
  - o excursions, hiking;
  - o sporting activities.

Class teachers use both verbal approaches (discussions, instructions, situation analysis, explanations, telling) and practical methods (excursions, sport activities, birthday parties and role plays) in their work with students and their families.

Partnership

The class teacher co-ordinates the cooperation of different partners as depicted in Figure 3.

The class teacher has to fulfil different pedagogical functions such as: diagnosing, planning, organising, managing, educating, controlling, correcting, assessing and evaluating. The class teacher's working cycle can be depicted in Figure 4.

If the class teacher is good at using ICT, then it can be of great use for communication, in research and in keeping records about every child.

All the activities of the class teacher are directed towards the improvement of students' support systems, to give them opportunities for more effective learning.
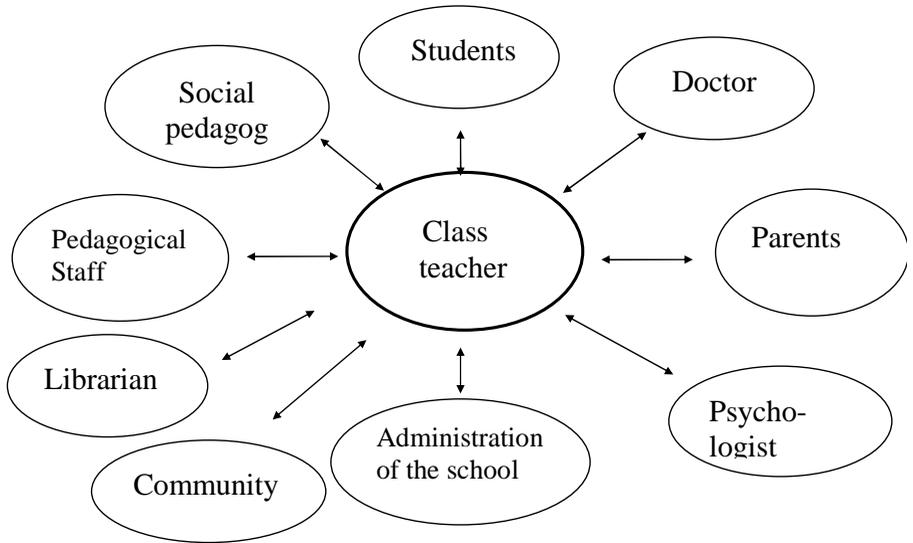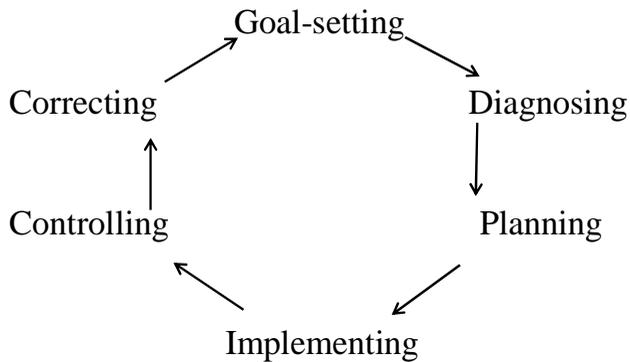
Figure 3**: Class teacher's partnership**

Figure 4: **Class teacher's working cycle**

Every school tries to create support for the child. It may differ in countries, even in municipalities and cities.

The aim of such systems is to support the child and the family. In the support system the use of ICT could be of great help with communicating, finding information, educating families and in contacting students.

It is very important to keep in mind the ethics of the use of modern technologies in teaching and learning

ETHICAL ISSUES AND MODERN TECHNOLOGIES

Ethics (via Latin ethica from the Ancient Greek θική [φιλοσοφία] "moral philosophy", from the adjective of θος ēthos "custom, habit"), a major branch of philosophy, is the study of the values and customs of a person or group. It covers the analysis and employment of concepts such as right and wrong, good and evil, and responsibility. It is divided into three primary areas: meta-ethics (the study of the concept of ethics), normative ethics (the study of how to determine ethical values), and applied ethics (the study of the use of ethical values).

When communicating using computers

Each kind of communication has specific rules for users; we will view electronic mail in more detail.

Electronic mail (often shortened to email or e-mail):
- enables you to send and receive written communications to/from other computer users conveniently and quickly;
- combines the speed, convenience and informality of a telephone call with the assurance of delivery and the permanence of a letter;
- can deliver messages within minutes - even to computers on the other side of the world;
- often works out cheaper than using traditional mail methods to send messages, which usually have to be typed and/or printed, then put in an envelope, stamped and posted.

Handling messages using email also has advantages over traditional methods. For example:
- incoming messages can be stored until you are ready to deal with them
- it is easy to reply to messages or forward them to others

- messages can be saved and grouped in folders for ease of reference
- unwanted messages can be deleted at the push of a button, and without wasting paper

Email features and facilities

Mail server and mail client software have different capabilities and user interfaces, but most offer the following features:

- Messages received are displayed as a list showing the sender's name and the subject of the message: this makes it easy to find important messages and delete unwanted ones.
- Selecting a message from the list loads it automatically into a viewer so that it can be read.
- Messages can be saved to named folders from either the list or the viewer, for future reference and processing. Folders can be created as required.
- You can easily reply to a message, attaching the original message (as a whole or quoting selected parts) if necessary: this makes it easy to answer queries point by point. Original messages included in a reply are usually indicated by a > at the start of each line, to differentiate them from your response.
- The subject header of a reply message is normally the same as the original but with Re: before it. For example, the reply to a message with the subject header 'Database Advice 'would be 'Re:Database Advice'.
- You can easily forward messages to other people, adding your own comments if you wish.
- You can assign a nickname, or alias, to someone you often send messages to, making the email address shorter and easier to type - for instance, anna rather than an.other@soton.ac.uk . Aliases can also be created for groups of people, making it simple to send the same message to everyone in the group.

- Many systems allow you to close down your mailbox temporarily - for example, while you are on holiday. Any messages sent to you during this time will return to the originator with a message explaining that you are away.

Many systems enable you to create a signature file: this is attached to the end of all your outgoing messages and should include details such as your name, address and telephone number. Some people also include a disclaimer or a quotation.

In the light of the above, we can identify rules of behaviour for the sender and for the receiver and we can point out several stages and items we have to pay attention to. These stages include the following;
- obtaining the e-mail address,
- preparing the e mail,
- sending the e mail, attachments,
- reading the e mail,
- responding, forwarding.

Email addresses

Most email addresses on the internet take the general structure person@site.domain.
For example:
janis.plume@lu.lv

Note that not all these forms are supported by all sites.
The site name may simply be the 'name' of the organization (such as lu.lv University of Latvia) or it may include the names of individual departments. The sender of the email has to provide the correct addresses precisely to avoid undelivered messages.

The use of CC: and BCC: has to be appropriate.

Email messages

Email messages consist of two basic parts, the header and the body:

- the header contains control information- namely From, To, Date and Subject;
- the body contains the text of the message.

It is a task of the teacher to learn himself/herself and to teach pupils how to prepare good emails.

Here are some tips on how to compose a good e-mail before sending it:

- **Think** about what you want to say!
- **Remember** that the purpose of an e-mail is to send messages quickly so that the recipients can read and respond quickly too. Get straight to the point without missing important ones and without over elaborating. **Be concrete!**
- **Use lowercase or sentence case**. **One of the common mistakes that emailers make is to use uppercase letters thinking that the message will grab immediate attention**. Well, in a way, it will but the attention you'll get is not going to be good. Try typing a paragraph in uppercase letters and let your friend read it. What do you think he would say? Is he able to read it without any difficulty? In fact, if you do that, the recipient might just ignore your e-mail as words in uppercase are far more difficult to read than using lower case. Another reason is that using only uppercase may infer that you are threatening or are angry with the recipient. It's like telling that person, "Read this, or else!"
- **Use correct and appropriate subject headings.** The subject heading should be brief so that the recipient knows at one glance its content. Never leave the subject heading empty. Check it before sending the e mail!
- **Don't forget to be polite**. Always begin with a salutation "Dear Mr. /Ms or Mrs" and sign off with "Regards", "Sincerely yours" or something similar if the e-mail is for

your colleagues. If you're writing to your best friend, you might say "Hi John".

- If you wish **you can add emphasis** to your messages by using some widely understood conventions:
- underscores_ are used for emphasis (as bold text is in letters)
- *asterisks* are used to highlight (like italics)
- CAPITALS are for strong emphasis only (email messages typed entirely or mainly in capitals are widely regarded as shouting!)
- 'smileys' are facial expressions created from keyboard characters which are used to indicate the mood or intention of the writer (happy, sad).
- **Take reasonable care with grammar, spelling and punctuation**. In some languages the grammar and punctuation may cause great errors. Always correct your mistakes before sending a message - a poorly typed message with spelling and grammatical errors will reflect badly on the sender, especially if you are writing to an official person.
- **Be attentive when quoting from other people's messages**, particularly if you are replying to a message from a Usenet group or mailing list - others on the list will have seen the original and are unlikely to want to read it all again or you could have understood the information differently.
- **Don't forget to sign the e mail.**
- If you write in English make your writing simple for your recipients. Not all of them will have English as their mother tongue, so write in 'global English'.

Try to avoid:
- slang, clichés, and humour;
- phrasal verbs;
- negatives.

They can confuse your readers.

Avoid negatives. Positive questions and statements are easier to understand than negative ones.

Forwarding and attachments:
- Some people love **forwarding emails**;
- **If an email is important and should be forwarded to another party that didn't receive it, then by all means, forward it**;
- **Don't mix attachments.**

Searching for information on the web.

There are 3 basic ways to search the internet for information: browsing, internet directories and internet search tools.

Searching for information requires patience, a logical approach, note taking and being very specific. That is what you have to learn.

- Don't forget to cite the sources especially if you prepare the handout, paper, report or project.
- Creating a bibliography takes time, and you have to be attentive.
- If you would like to create a bibliography on-line use the tool called Noodlebib.
- It is important to know how to write references.

The three main types of electronic sources are:
- websites or web pages
- complete works (reports, research papers, online books)
- articles from periodicals such as journals or newspapers.

Making References
- **Beas specificas possible**
- **Be consistent**
- You need to include the same key elements and to order them in the same way that you do for print sources. The

details of how you do this will depend on the referencing style you use.

- **Remember** Internet sources differ from print sources in two main ways.
- Internet sources should include two dates — the date on which a web page was last updated (if possible) and the date on which it was accessed.
- Internet sources should have a Uniform Resource Locator (URL) that shows where you sourced the document.

Include the following elements
- Author;
- Date of publication or revision;
- Title of document;
- Title of complete work;
- Issue information.

For periodicals, this will be volume, issue, and (perhaps) page numbers.

Date of access

The way in which you format this element will depend on your referencing style, but it is important to include the date on which you accessed the document on the internet.

Uniform Resource Locator

The best way to make sure you record the URL accurately is to copy and paste it into your word processing document directly from the address window in your browser. If you must break a long URL over a line, break it after a slash or before a period. Don't add any punctuation at the end of the URL.

Material in the "public domain" is intellectual property that does not come under copyright laws.

Avoid Plagiarism!

Plagiarism is the act of stealing and passing off the ideas, words, or other intellectual property produced by another as one's own. For example, using someone else's words in a research paper without citing the source is an act of plagiarism.

What can be done legitimately?

Legitimate copying may take place in two ways:
- under licence from the copyright owner;
- under Fair Dealing provisions which allow for certain permitted acts.

The Internet and Copyright

What is concretely protected on the WWW? The unique underlying design of a web page and its contents, including:
- links;
- original text;
- graphics;
- audio;
- video;
- html, vrml, other unique markup language sequences;
- a list of web sites compiled by an individual or organization;
- all other unique elements that make up the original nature of the material.

You can make your own web page or a web page for your class

If you have decided to make your own web page then you have to plan it very carefully. You have to pay attention to the design as well as to the content. Material for pupils should be written in a way that they can understand and suitable for their age group. The layout should be very structured. The web page may include announcements, additional material for the lessons, differentiated homework tasks etc. But remember that the web is a dynamic publishing medium.

When creating a web page, you CAN:
- Link to other web sites. [However, some individuals and organizations have specific requirements when you link to their web material. Check a site carefully to find such restrictions. It is wise to ask permission. You need to cite source, as you are required to do in a research paper, when quoting or paraphrasing material from other sources. How much you quote is limited.]
- Use free graphics on your web page, if the graphics are advertised as "free".

When creating a web page, you CANNOT:
- Put the contents of another person's or organization's web site on your web page.
- Copy and paste information together from various internet sources to create "your own" document. (You CAN quote or paraphrase limited amounts, if you give credit to the original source and the location of the source. This same principle applies to print sources, of course.).
- Incorporate other people's electronic material, such as email, in your own document, without permission.
- Change the context of or edit someone else's digital correspondence in a way which changes the meaning.
- Copy and paste others' lists of resources on your own web page.
- Copy and paste logos, icons, and other graphics from other web sites to your web page (unless it is clearly advertised as "freeware." Shareware is not free). Some organizations are happy to let you use their logos, with permission - it is free advertising. But they want to know who is using it. They might not approve of all sites who want to use their logo.

Remember Gaming has its positive and negative sides:
- Games can be integrated into almost any area of the school curriculum, from mathematics to languages and social sciences.
- Games promote creativity, interaction, self discipline, obeying rules, autonomy, following directions, being patient and precise. Games foster interest in ICT and its possibilities.
- The content and form of games varies according to the age group it is designed for.
- In teaching and learning processes the games have to either reflect subject content, or may be used for relaxing after a serious and difficult task. Every game has its beginning and. It is important for the teacher to set certain rules for playing games.

Minuses of the playing of games:
- Teachers and parents cannot always be with the child and see what games she/he is playing, but it is necessary to exercise parental control and not allow the child to play everything.
- It is advisable to have a talk with a child after the game to get feedback about what he/she has played and discover what did he/she gained from it. Gaming is a specific issue for parents because games are very often played at home; the teacher, in cooperation with parents, can work out rules for playing games. It is also important to involve the medical doctor in working out these rules if the children in question have with special needs. The children with hearing difficulties receive a great amount of information by sight (seeing), their eyes sometimes get very tired, they may get headaches or become nervous.
- When we talk about playing games then we usually talk about so called unwritten rules that go hand in hand with the ethics of the work of the teacher.

The teacher's responsibility is to cooperate with parents:
- Ethical talks with parents may help to promote a safe game playing culture at home;
- Together with parents you may create Internet Safety Tips for Parents - how to ensure internet safety for children;
- At first it is useful to equip parents with statistics.

Internet Safety Tips for Parents. General rules for ensuring internet safety:
- Learn about the internet;
- It is good to know things about the internet because even if you don't have a computer your child can access it in other places;
- Make a rule for the internet and allow certain sites and a limited time;
- Set up your computer in an open area so you can see it;
- Check sites your child likes to visit;
- Block sites your child should not be visiting;
- Install a search site for your child;
- Make a folder so your child can bookmark sites;
- Don't put your child's picture on any sites;
- Tell your children to not give out any information about themselves or any family member;
- Teach your children to tell you when someone is asking for personal information;
- Tell your children that talking to a stranger online is no different than outside.

Here are some tips to help protect the child in social networking areas:
- Encourage them only to upload pictures that you as their parents/carer would be happy to see – anything too sexy to be passed round the dinner table should NOT make it on to the web. It's also not a good idea to post pictures which can

identify the school which your child attends since this could help someone locate them.
- Tell your children not to post their phone number or email address on their homepage.
- Help your child to adjust their account settings so that only approved friends can instant message them. This won't ruin their social life – new people can still send them friend requests and message them, they just won't be able to pester them via Instant Messenger (IM).
- Check if your child has ticked the "no picture forwarding" option on their social networking site settings page – this will stop people sending pictures from their page around the world without their consent
- Encourage them not to give too much away in a blog. Friends can call them for the address of the latest party rather than read about it on their site.
- Ask them to show you how to use a social networking site - getting involved will empower them to share the experience with you.

There are certain ethics for networking and for web chat as well. The site http://www.rediff.com/money/2003/aug/07betterlife1.htm will lead you to the ethics of web chat.

For children and adults
- Never give out your last name;
- Never put your age as part of your nickname e.g. Sameer 14;
- Never give away your address, not even the town where you live;
- Never give anyone your phone number or agree to phone them;
- Be very careful of people who ask you your age just after you've met them;
- Don't accept files from people who you don't know;
- Don't give your picture to people who you don't know;

- Never agree to meet anyone you've met on chat unless you go with an adult you trust like your mom or dad;
- If anyone makes you feel scared tell one of the ops -- the guys with the @ in front of their nicks.

Don't believe anyone who says, "The only ethics out there are what you can get away with." But if you encounter an ethical dilemma in cyberspace, consult the code you follow in real life. **Chances are good you'll find the answer.**

Follow the rules of common courtesy just like you would in real life.

Privacy and Safety
Privacy and safety are of great importance for teachers, pupils and parents. Here are some tips:
- Remember that nothing is ever really private on the internet. Because of that don't include your home address and phone number in your signature file. Don't give out personal information about someone else;
- Be careful what you say about yourself in blogs and social networking sites– even in the comments sections. Your words could come back to haunt you;
- **Always log off** when you leave your computer;
- Never give your password to somebody. Do not use anyone else's password. Change your password if you think it has been compromised. When creating passwords mix cases, numbers, letters, and symbols. Learn to prepare a password;
- Never write in an email message anything that could be used against you;
- Treat other peoples' communications with respect;
- Don't respond to spam;
- Don't think that you know someone after having "met" him or her online. Virtual meeting may be misleading;
- Don't respond to threatening messages.

It is important for the teacher and administration of a school to create a proper working environment for students when working with modern technologies.

It is important to think about the chairs, the location of the computer, about the lights, especially if we work with pupils with hearing difficulties etc. so as not to harm the health of the children.

Ethics – written rules and unwritten rules when using ICT will become a norm only when all involved in educational process cooperate and obey these rules themselves. In this material we have viewed some aspects of ethics of the use of ICT, let us hope that it will stimulate the desire to study more about this important problem.