



Innovative Teacher

Leonardo da Vinci

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Methodology Handbook on ICT-enhanced skills

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This handbook is intended for teachers and teacher trainers who would like to implement practical methods, methodological tools, and software instruments to support their students in building ICT-enhanced skills and competences. The materials included in it were developed in collaboration with all project partners. Special thanks are due to the teachers, and especially to Nikolina Nikolova, having contributed with valuable ideas and feedback during the project, and to Ron Siemelink who provided some materials.

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PART 2

How to build ICT-enhanced skills

PART 2: How to build ICT-enhanced skills

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PART
2

How to build ICT enhanced skills

In this chapter:

- *Information skills*
- *Presentation skills*
- *Working- on- a-project skills*
- *Working-in-a-team skill*

INFORMATION SKILLS

INTRODUCTION

Finding appropriate information has always been a necessary skill, not only for pupils and students but for everybody, both in his professional and in his personal life. Using a phone book and a dictionary are the first steps. Encyclopaedias and railway timetables require a little more skills. And finding information in a library with proper use of catalogues and secondary sources, or in archives call on even more sophisticated skills.

In this era of information and communication technology finding information has dramatically changed.

In the first place almost all traditional information providers have made their resources digitally accessible. Libraries, archives, newspapers, and magazines all over the world can be visited electronically twenty four hours a day.

To search through digital information resources search engines have been developed. Where the traditional ways of information search used secondary and tertiary resources, based on human made annotations, the search engines nowadays can address the contents of a resource directly.

Traditional information search was text based, even if the required information was, for instance, an audio fragment from a broadcasting museum. Digital information can contain a variety of media, and search engines can address those media directly.

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And, last but not least, through internet the amount of information is overwhelming. Information from all over the world is available nowadays, which increases the pile a lot. But where traditionally professional organisations collected and disseminated information, internet is totally open and everybody can publish. This has caused an enormous information haystack, where finding the needle is a non-trivial skill.

PREPARATION

Thinking of the ability to collect and process information you must, on beforehand, be aware of three aspects.

In the first place, the more specific the requested information is, the more straight forward the information search can be. And, on the other hand, the more general the information you are looking for, the more general the information search must be. When you are looking for the phone number of a plumber in a given city you can use the (digital) yellow pages. (And to find the yellow pages you can use a search engine, of course.) But if you want to write a paper on ‘The use of football terms in daily language’ your information search will be quite different. So the first aspect to realize is the characteristic of the needed information.

The second important aspect is to know which information search tools are available, what their characteristics are, and how they can be used properly. Can you get on-line access to the library catalogue? And if so, how do you use it? Can you consult the archives of the newspapers? How do search engines like Google get their results? And what about search engines on sites from institutions like the Ministry of Education? So the variety of tools is the second aspect to be aware of.

The reliability of the found information is the third aspect you must be prepared to. Especially when using search engines you must be very critical on the found information. Always question yourself after picking a piece of information: Who is the author and what is his affiliation? Who is the owner of the site? Why has the author made the information available? Has he personal interests? And if you are convinced that the information is correct, you must find out that the information is complete. Product information on the website of a producer is probably correct, but will it be complete? So the third aspect you must be prepared for is the correctness and reliability of found information.

As a side step, there is another important aspect, related to internet use in general and not particularly related to information search. It is a duty for adults, for schools, teachers, and parents, to provide the pupils with a safe environment. And internet is part of that environment. So taking care of prudent and correct behavior, with attention to protection of privacy and ‘safe surfing’, is an educational duty. It may be advisable to install protection filters, to prevent pupils from abuse.

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ELABORATION

Sample activities:

When **researching a specific problem** learners will develop their **information skills**, i.e. their ability to collect and process the appropriate information properly in order to reach a preset goal. This embraces the following subskills:

1. To determine the information problem;
2. To determine the relevance of the various information sources;
3. To search systematically by application of relevant searching techniques;
4. To localize and acquire the found information;
5. To evaluate the found information and readjust the search;
6. To process the found information effectively

1. To determine the information problem

For the right *determination of the information problem* it is important to formulate this information problem as precise as possible to prevent you from collecting too much non-relevant information or too few (relevant) information. Formulating the information problem consists of three activities.

- Determining the subject (the topic where it is about)
- Distinguishing various aspects within this subject
- Deciding on the limiting conditions of the information.

Determining the subject starts with a first, widely formulated problem, that covers the information need of the task as well as possible. With this problem you can orientate yourself in general resources. With the found (general) information you can sharpen the information question. During the search the problem will probably evaluate from rather general to more specific. A lot of subjects consist of relations between phenomena. Take for instance cryptographic methods for security of web-based applications. You can distinguish three aspects: cryptography, security, and web-based applications. All three aspects can be used as an entry in an information searching process. Depending on your task it may be appropriate to search the various aspects separately or in their very relationship and cohesion.

When searching information you must decide on limiting conditions you want to imply on the found information. Possible criteria for this are:

- Kind of information. Do you want facts or opinions, theoretical information or practical (like data)?
- Actuality. You can for instance decide to leave out all information older than six years.
- Kind of resources. Do you want (scientific) articles, statistics, internet sites (from recognized institutions, only?), policy documents, advise documents, ...?
- Language. Local language or just English, or both, or all possible languages?

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- Geography. Information on the national situation, or regional, continental, or worldwide?

2. To determine the relevance of the various information sources

Judging the *relevance of information resources* is a laborious task. More or less 'official' resources are rather easy to judge. Referential resources like catalogues, bibliographies and databases, usually connected to libraries, are trustworthy, but they don't provide information, just references. Informative resources, often found through referential resources, must be considered with more care, especially when found on the internet. Judgement of the relevance of those documents must be twofold. In the first place you must check if the information contributes to the solving of your information problem. End then you must judge the trustworthiness of the information. Scientific articles, conference papers, European Union documents are all examples of trustworthy resources, even when found on the internet. The documents have been accomplished by experts and are published after thorough peer review. Most publications on internet lack that quality guarantee. So before using an internet resource of unofficial origin you must evaluate it. You can use as a checklist:

- is the author's name mentioned
- is the date of publication mentioned
- is the author's affiliation mentioned
- is the owner of the site mentioned
- is it obvious why the author made the site available
- does the author (or his company) have interest in the publication
- does the publication show some bias or prejudice
- is the publication complete
- is clear who is the intended reader/user
- did the author make references to the used resources
- do other resources provide comparable results/facts/opinions

3. To search systematically by application of relevant searching techniques

To perform the information search successfully it is important to have some notice of *searching techniques*. The starting point of a information search is the well formulated information problem. The subject, and the distinguished aspects, must be translated into a searching phrase. In general that phrase consists of searching terms and Boolean operators.

First you need to build up a vocabulary in the area of the subject. Talking and listening to experts, a first search in encyclopaedia and dictionaries, this can extend your vocabulary and give you a good sense for the relevant terminology. Libraries often have keyword catalogues which can be very inspiring.

Then you must find as much terms as possible for every aspect of the information problem. You must think of singular/plural, different languages, spelling varieties, etc. For the aspect cryptography from the before mentioned example you can think of search terms like cryptography, cryptographic, cryptographic methods, cryptology, and terms in the local language.

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Most searching tools provide means for enlarging or reducing the set of found resources.

- AND. Providing a search engine with two or more search term with the Boolean operator AND results in a set of resources containing all search terms. This may be default for the used tool. Most search engines have a help function to find out the possibilities.
- OR. This enlarges the set of found resources by offering results that contain one of the provided search terms.
- NOT. This excludes results. This option is not recommended because often too much results are rejected.
- Truncation. Only the stem of a word is given; the last letter(s) are replaced by a special tool-dependent symbol. Thoughtless use of the trunk option can lead to very time consuming searches with a lot of irrelevant results
- Stemming. Some search engines automatically include variants: manager, management, managers, managerial, etc.
- Phrase search. Used search terms must occur in exactly the given order. This is a much stronger demand than AND.
- Indexing, also called scanning or browsing. Some search engines contain a list of available search terms. This kind of engines often appear on the home page of a company site, a university, or a ministry and is meant to search that particular site, and not for searching the web.

4. To localize and acquire the found information

While performing an information search you must *localize and acquire* the found resources. It is important to keep track of the search in a log. Write down the used search terms, and combinations thereof, and the number of hits. By explore the results roughly you must select the promising resources. Write down the location and, if possible download the document to your machine. If the found information contains a reference to a resource that is not direct available (because it is a book in a library or so), write down all the relevant details and decide if at this stage of the search it is appropriate to get that information at hand.

Most documents, at least most reliable and trustworthy documents, contain references to used resources. These have proven to be very valuable. Localize the ones that are relevant at first glance and try to acquire them. Of course you have to be very prudent and selective, otherwise this snow ball effect will cause an avalanche.

When you often have to perform an information search it can be worthwhile to assemble an individual search machine by collecting sites that are important for your own personal information need. You can store the data of companies, research institutes, ministerial departments, or people that are involved in the area of your interest. Those sites may improve and accelerate your future searches.

5. To evaluate the found information and readjust the search

An information problem is posed with a preset goal: you want to perform a task or make a product that is dependent of the found information. It is important to *evaluate* that information, to determine if you are able to perform the task. A possible outcome of the evaluation can be a *readjustment* of the search.

Evaluation criteria allow for selecting the appropriate information, with respect to the usability. These criteria are both specific, related to the task to perform, and general, regarding the quality of the content.

General quality criteria with respect to the found information are:

- is the information precise and reliable
- is the information objective
- is the text understandable and clear
- is the argumentation sound
- is there a clear distinction between facts and opinions
- has the information clear references
- does the information contain illustrations, graphs, tables, etc.
- is the information based upon a sound empirical research and/or a study of literature
- is the author well-known and renowned
- is the publisher/magazine/company well-known and renowned
- can the information be used legally / is the use protected or prohibited or limited by law (copyright?)

Specific criteria with respect to the subject of the information search are:

- is the information relevant for the subject
- is the information relevant for further search
- is the information easily available and accessible
- is the information available in a suitable language
- has the information also been found via other resources
- is the information still valid and up-to-date

Of course it is possible that, after having selected the appropriate information, it is still impossible to perform the requested task. The results of the information search are insufficient. Then you must readjust the search. The process starts at the very beginning. Try to find new aspects in the subject. Search for synonyms, keywords, terms in the vocabulary of experts. Explore the possibilities of the search engines. Dive into the references of suitable resources. And in the references of those. And of those. And of those. Beware of the avalanche.

6. To process the found information effectively

Processing the found information is the last step. In the final product, let's say the report the search was meant for, all used resources must be mentioned in an appropriate way. This serves three goals. First it convinces the reader of the quality of the report and the expertise of the writer. Than it gives the reader

the possibility to check the report and to find related information. And last but not least, it gives credit to the referenced author. It is simply unethical to use someone's work without recognition.

Correct references consist of a small entry in the written text, usually the beginning of the author's name and the year between square brackets, like [Wil06]. In a literature annex all references are listed in such a way that the resource is bibliographically traceable. This traceability has been standardised by the American Psychological Association (see [Apa06]), but different institutions use different standards. Especially the way websites are referred to is still a point of concern.

For writers who must cite frequently and who want to organise their citations the use of an ICT-tool may be appropriate. You can organise the references to books, articles, texts and websites in a tool. When you write a report, you can simply insert the reference and in the final version the reference list is generated. Examples of those tools are BibTeX (for LaTeX-users) and WibTeX, with an interface to Microsoft Word and BibTeX [see Wib06].

Relation with other 'soft skills'

Searching information is always done in a context. You need information to perform a given task, like building a website, designing a product, or writing a report. In general information searching is done as described above. But when the final task is to make a written or oral presentation you can sharpen the method. Especially task one (determination of the information problem) and task six (processing of the found information) can benefit from 'fixed structures' for written and oral presentations.

Examples of those 'fixed structures' [Ste99] with information processing questions are:

- (a) the problem structure
 - What is the problem exactly?
 - Why is it a problem?
 - What are the causes?
 - Is there any solutions?
- (b) the measure structure
 - What is the measure exactly?
 - Why is the measure necessary?
 - How is the measure executed?
 - Which are the effects?
- (c) the research structure
 - What exactly is investigated?
 - Why is the research done?
 - Which method is used?
 - Which results are found?
 - Which are the conclusions?

These examples illustrate that such ‘fixed structures’ and their leading questions, in the first place meant for structuring a presentation, can very well be applied for improving the information search process as well.

And moreover, it shows that information skills are ‘supporting skills’. They always occur in combination with other skills, not seldom other soft skills like project working skills, and/or team working skills and/or presentation skills.

Parts of this chapter are based upon the manual “Systematisch informatie zoeken” by P. de Willigen [Wil06].

Sample scenarios

Scenario 1:

Title: A log-on mechanism for a website		No 1
Author: N.M. van Diepen, C. Terlouw	Country: Netherlands	Language: English
Description (300-400 symbols)*: A project team is building a website, for instance for the football club. Part of this site is for members only. This part must be protected by a log-on system. Two team members are to find information on log-on mechanisms. They have to write an internal report on their findings for their fellow team mates. In this report they present the results of their information search and they recommend a specific solution for the members-only part of the site.		
Age: 16-18	Duration: 12 hours	Subject(s): ICT, security, web applications
ICT enhanced skill(s): see table below		
Active learning method(s): Two-person task within project work		
Learning objectives: Knowledge of and insight in various log-on systems Knowledge on how to insert a log-on system in a web site Ability to write a recommendation, based on research Ability to explain and defend a report		
Prior knowledge and skills: Operational knowledge of HTML and PHP Basic knowledge on databases and SQL		
Results/Products: Internal report to peers		
Process:		
Task 1 Orientation on the information problem	Milestone 1	
Task 2 Collecting information	Milestone 2	
Task 3 Internal report to peers	Milestone 3	
Task 4 Peer-evaluation of recommendation	Milestone 4	
Tools: Web-based search engine Word processor		
Resources: Evaluation forms Checklists		
Student Assessment: - assessment by peers (checklist), both on process and product - assessment by tutor (checklist) , both on process and product		

ICT Enhanced skills

Information skills

- X ability to determine an information problem
- X ability to determine the relevance of an information source
- X ability to search systematically by applying relevant searching techniques
- X ability to locate and retrieve information
- X ability to evaluate information
- X ability to process information effectively, in order to reach a preset goal
- X ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- X ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- X ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- X ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- X ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Outline of the tasks and milestones:

Task 1: Orientation on the information problem

This task consists of a brief orientation on information search in general. Then the two pupils carry out the orientation. They distinguish as much as possible aspects of log-on systems in web applications. They decide on limiting conditions for the search.

Milestone 1:

List of aspects

List of limiting conditions for the search

Task 2: Collecting information

The pupils perform the search. They collect the information systematically. They make a log of their search. They judge the found information, both the resource and the content.

Milestone 2:

List of relevant documents, including evaluation of the resources and the content

Log book of the search process

Task 3: Internal report to peers

The pupils write an overview of the various log-on mechanisms, with the pro's and cons.

They recommend a specific system.

They account for the overview and the choice.

Milestone 3:

Report with a) overview b) recommendation c) references

Task 4: Peer-evaluation of recommendation

The project group as a whole discusses the report. The writers clarify, if necessary, and justify their recommendation. The project group decides on the log-on system they will implement in their application.

Milestone 4:

Summary of the discussion

Reflection on the discussion results

Note to the project leader with the description of the log-on system, they are going to implement.

Tasks for Scenario 1

Title: Orientation on the information problem		No 1
Author: N.M. van Diepen, C. Terlouw	Country: Netherlands	Language: English
Used in scenario: A log-on mechanism for a website		
Description: This task consists of a brief orientation on information search in general. Then the two pupils carry out the orientation. They distinguish as much as possible aspects of log-on systems in web applications. They decide on limiting conditions for the search.		
Age: 16-18	Duration: 2 hours	Subjects: ICT, security, web application
ICT enhanced skill(s): see below		
Active learning method: Two-person task within project work		
Learning objective: Knowledge of various aspects of log-on systems		
Prior knowledge and skills: Basic knowledge of web-based applications		
Type of work: group of two		
Result / Product: List of aspects List of limiting conditions for the search results		
Process: <ul style="list-style-type: none"> - the pupils generate aspects, by brainstorming, reading, talking to experts, searching - they list the aspects - they limit the conditions for the search 		
Tools (Hardware & Software): Word processor		
Resources: None		
Student Assessment: Self assessment		

ICT Enhanced skills

Information skills

- Ability to determine an information problem

Title: Collecting information		No 2
Author: N.M. van Diepen, C. Terlouw	Country: Netherlands	Language: English
Used in scenario: A log-on mechanism for a website		
Description (100-300 symbols)*: The pupils perform the search. They collect the information systematically. They make a log of their search. They judge the found information, both the resources and the content.		
Age: 16-18	Duration: 4 hours	Subjects: ICT, security, web application
ICT enhanced skill(s): see below		
Active learning method: Two-person task within project work		
Learning objective: Knowledge on log-on systems in web-based applications Knowledge on how to insert a log-on system in a web site		
Prior knowledge and skills: Basic knowledge of web-based applications		
Type of work: group of two		
Result / Product: List of annotated information resources Log book		
Process: Pupils search systematically for information They determine the relevance of the sources They evaluate the found information They keep track in a log		
Tools: Word processor Search engines		
Resources: None		
Student Assessment: Self assessment		

ICT Enhanced skills

Information skills

- Ability to determine the relevance of an information source
- Ability to search systematically by applying relevant searching techniques
- Ability to locate and retrieve information
- Ability to evaluate information

Title: Internal report to peers		No 3
Author: N.M. van Diepen, C. Terlouw	Country: Netherlands	Language: English
Used in scenario: A log-on mechanism for a website		
Description: The pupils write an overview of the various log-on mechanisms, with the pro's and cons. They recommend a specific system. They account for the overview and the choice.		
Age: 16-18	Duration: 4 hours	Subjects : ICT, security, web application
ICT enhanced skills: see below		
Active learning method: Two-person task within project work		
Learning objectives: Knowledge of and insight in various log-on systems Knowledge on how to insert a log-on system in a web site Ability to write a recommendation, based on research		
Prior knowledge and skills: Basic knowledge of web-based applications		
Type of work: group of two		
Result / Product: Report to project group, consisting of a) overview of log-on systems b) recommendation for the system to implement c) references		
Process: Pupils make a list of systems with pro's and cons They weigh the arguments and make their choice They write a report		
Tools Word processor		
Resources: None		
Student Assessment: Self assessment		

ICT Enhanced skills

Information skills

- Ability to process information effectively, in order to reach a preset goal
- Ability to use the information ethically and legally

Presentation skills, written presentation

- Ability to select and order information
- Ability to make correct references and citations

Title: Peer-evaluation of recommendation		No 4
Author: N.M. van Diepen, C. Terlouw	Country: Netherlands	Language: English
Used in scenario: A log-on mechanism for a website		
Description (100-300 symbols)*: The project group as a whole discusses the report. The writers clarify, if necessary, and justify their recommendation. The project group decides on the log-on system they will implement in their application.		
Age: 16-18	Duration: 2 hours	Subjects: ICT, security, web application
ICT enhanced skills: see table below		
Active learning method: Project work		
Learning objectives: Ability to explain and defend a report		
Prior knowledge and skill None		
Type of work: Group		
Result / Product: Meeting minutes Reflection note Working document, on which the group agreed		
Process: The two pupils explain their report and their recommendation. The project group discusses the report and the recommendation The two pupils reflect on the discussion results and their own report The project group decides which log-on system they are going to implement in their web application The project group secretary writes minutes		
Tools (Hardware & Software): Word processor		
Resources: None		
Student Assessment: Peer assessment by fellow group members		

ICT Enhanced skills

Project working skills

- Ability to communicate internally
- Ability to report results

ASSESSMENT

Assessment of student's work in an educational setting of active learning activities for acquisition of skills is a laborious task for the tutor. It requires the analysis of the overall learning process. The assessment consists of three types:

- (a) self-assessment,
- (b) peer assessment, and
- (c) tutor assessment

The self assessment is an important part of the active learning process. Therefore pupils are stimulated to reflect on the learning process and the (intermediate) learning results.

The peer assessment is deliberately used in order to stimulate an independent learning process. Moreover, by assessing learning products and processes pupils get insight in the educational goals. Peer assessment is also used to give feedback to their peers. For the tutor this is also a measure of efficiency.

Tutor assessment is also used to give feedback to the pupils. Of course tutor assessment is finally needed in order to grade or the make up an fail / pass decision.

Below an assessment form for the tutor assessment and the peer assessment. By using the same evaluation criteria the judgements can be compared giving feedback. Such a comparison also can give a reason to discuss the learning process and the products, and with that stimulate an active learning process.

Sample evaluation criteria:

ASSESSMENT SCENARIO 1					
Peer. Name:.....					
Tutor: Name:.....					
Date:.....					
Task 1. Orientation on the information problem					
Criteria	Evaluation 1 = excellent; 2 = good; 3 = sufficient; 4 = poor 5 = bad				
1. Aspects relevant?	1	2	3	4	5
2. Sufficient range of aspects	1	2	3	4	5
3. Limited conditions clear?	1	2	3	4	5
Etc.	1	2	3	4	5
Task 2 Collecting information					
1. Appropriate searching technique?	1	2	3	4	5
2. Appropriate evaluation of information	1	2	3	4	5
3. Correct use of logbook?	1	2	3	4	5
Etc.	1	2	3	4	5
Task 3 Internal report to peers					
1. Balanced overview of pro's and con's?	1	2	3	4	5
2. Argumentation of recommendation?	1	2	3	4	5
3. Reporting style?	1	2	3	4	5
Etc.	1	2	3	4	5
Task 4 Peer evaluation of recommendation					
1. Quality of reflection?	1	2	3	4	5
2. Clarification and defence of the report	1	2	3	4	5
3. Group decision making	1	2	3	4	5
Etc.	1	2	3	4	5

CONCLUSION

Our conclusion is that the information skill is a very complex soft skill, because it consists of different related components. Therefore it is quite difficult to master the skill. It is necessary that teachers pay a lot of attention to the acquisition process by giving a clear orientation on the skill using demonstration, by giving opportunity to practice the different components of the skills in authentic situations, and by giving

focussed feedback on the (intermediate) products based on a checklist with clear criteria.

TIPS & HINTS

We have the following tips and hints:

1. Use the criteria mentioned as a checklist (e.g. see section 1, 2, and 5);
2. Let the pupil construct a personal webpage or list of bookmarks with useful links, hints, etc. for information search (see section 4);
3. Practice in three ways: (a) the sub skills separately, (b) several sub skills connected up to the complete skill, and (c) sub skills / complete skill connected to other soft skills;
4. Apply 'fixed structures' in the determination of the information problem;

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PART
2.2

PRESENTATION SKILLS

INTRODUCTION

Judge an artist not by the quality of what is framed and hanging on the walls, but by the quality of what is in the waste basket.

Anonymous

An essential part of our life is to present something we have in mind to an audience – face-to face, or indirectly. What your students should know is that good presenting could convey even more than they originally might have hoped for. For this, the **first condition is to have something to say**. No matter how trivial this might sound, it is the most important thing about presenting (both in written or in oral form). The **second thing is to know consciously who that audience is** [1]. The next two conditions are **to have the appropriate tools** and to **know how to make the best use of them**. In a nut shell, to present well your students will need the confidence that they:

- have something worth saying;
- know their audience well;
- have the appropriate tools;
- know how to use them.

How could we, as teachers, help our students develop these types of confidence? With the first part (*having something worth saying*) young people don't seem to have problems – they are not afraid of arguing with authorities and of smiling with condescension at the works of classical writers. The teacher's task is to convince them that just expressing an opinion without arguments doesn't count much. And the arguments should be tuned to the audience. Here comes the second important condition – *knowing your audience and conveying your message to it*. If a student has written a love letter (a poem) to his beloved he/she shouldn't worry about the opinion of his teacher in English, or his parents. His audience is a single and very special person. He should know the things he wants to say and he should do this with a conviction.

Even if you are lucky to have students who are young researchers, having something important to report and knowing well their audience, there is still something left for you – to help them with a proper presentation.

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In the traditional IT classes the emphasis has often been on the technical skills, e.g. how to learn the full potential of Power Point (since this was the novelty to be learned). We reached the time when “knowing what to throw in the wastebasket”, “how to get rid of the redundant” becomes not less important in an ICT enhanced education.

In order to reach the essence of the content of what is being presented everything non-essential should be eliminated since it might only distract the attention of the audience.

PREPARATION

“Begin at the beginning,” the King said, very gravely, “and go on till you come to the end: then stop.”

Lewis Carroll

You could start by showing your students examples of a presentation (could be *good* or *bad*) and *throw the gauntlet down* to them to formulate what important principles behind its preparation have been observed or neglected. Some important questions to consider when looking critically at a presentation include:

- *What is the essence of the point being made?*
- *Are any elements non-essential?*
- *At its core, what is the real point?*

These are always good questions to ask ourselves, too, when critiquing our own presentations.

You could show what some authors consider “really bad presentations” (and how to avoid them) and discuss with your students why they have been considered by their creators as good. Such an example could be found at [2].

It should be clear that since the tastes differ, there is nothing like *the best presentation*, even less so – a recipe for a *best presentation*.

As the good artists have demonstrated one should start with learning the rules in order to feel free to break them.

On issues related to professional presentation design you could find a very insightful comparison by Reynolds between presentations styles at the two extremes (Steve Jobs and Bill Gates) [3]

In our view, the whole process behind a presentation could be considered as follows (Figure 1.):

- *planning* (keeping in mind the initial conditions - i.e. the type of the presentation, the audience, the tools available, the limitations in terms of time, pages, etc.)
- *preparation* (to use the proper tools properly depending on the information/data to be presented; to determine the lay-out accordingly; to include rehearsals in the case of an oral presentation)
- *delivery* (taking into consideration the specific rules for oral, written and web presentations)
- *feedback*
 - oral (the presenters react to questions and comments from the audience **immediately**)
 - written (the authors react to the suggestions of the reviewers, editors /the teacher with consecutive versions of their works **after some fixed period of time**)

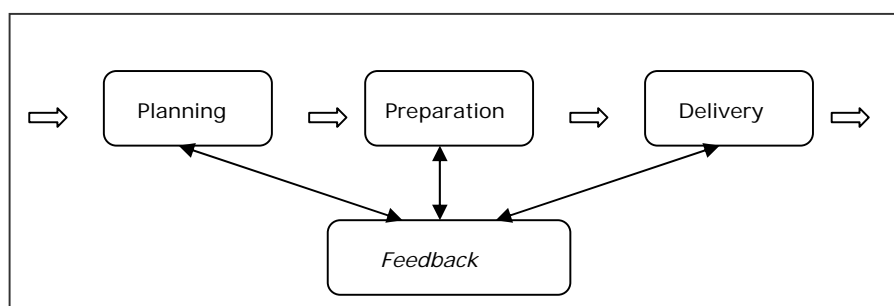


Figure 1. Presentation phases

All the important issues with regard to a presentation (oral, written, and web alike) could be addressed by means of special activities, e.g. – the so called “mini-presentations”.

For instance, in order to cultivate in your students a good sense of time when delivering an oral presentation you could start with asking them to tell a story (a joke) in a short and fixed period of time (1-3 min). As a further exercise they could present the introduction of their work in 5 min. Thus they should become aware of the fact that reading aloud takes much less time than speaking in front of an audience.

A *mini written presentation* in turn could follow the general structure of which students should be given a sample, the length

should be much shorter (up to 2 pages) and the content could be on a topic chosen by them.

You will find in the Appendix selected and tested guidance materials on how to deliver oral and written presentations. But it would be a bad idea just to give a list of rules to your students. The students would capture them much better if you act as a “midwife” of their own ideas and opinions on concrete examples of presentations. If you start with a bad example in the style of “How-not-to-give-a-talk”, your students would be proud if they manage to formulate what makes a presentation “really bad” [4] and then to see that this is what the experts also think (probably slightly better verbalized).

Finally you could show your students examples of evaluation forms (also given in the Appendix) – thus you would hopefully convince them that although the tastes differ there are some standards to be taken into account.

ELABORATION

In order to get an idea how to help your students to develop their presentation skills, we are suggesting some concrete relevant activities to be carried out by them during each presentation phase. In addition, we propose approaches you could use to support them in your role of a facilitator and a partner (rather than a preacher on *what is right to do*).

In the process of the elaboration you have the freedom of choosing the concrete activities and approaches but you are still expected to:

- organize the learning process so that your students work successfully on the tasks designed for the different phases and become aware of their importance;
- support them in reflecting on what they have achieved during the practice.

Table 1 below shows examples of appropriate activities during each presentation phase and the supporting role you should play.

	Students' activity	Teacher role
Planning	<ul style="list-style-type: none"> To analyse the audience To analyse the limitations 	<ul style="list-style-type: none"> To suggest topics to work on based on the learners' interests To engage the students in a discussion To select proposals according to students previous knowledge and background To monitor the activity To provide help on demand To stimulate learners to organise the work on their presentation
Preparation	<ul style="list-style-type: none"> To choose the structure To choose the tools 	<ul style="list-style-type: none"> To guide the learners' work by means of explanations, providing further material, etc.. To monitor the learners' work To produce FAQ or personal support To provide explanations on the ICT tools to be used To verify students' ability to use the ICT tools To ask learners to choose the most appropriate program from those available To prepare preliminary and gradual tasks for the students To set up and maintain the ICT tools To provide operative examples of the use of tools in a number of situation
Delivery	<ul style="list-style-type: none"> To deliver presentations 	<ul style="list-style-type: none"> To suggest possible tools To give guidelines if needed
Feedback	<ul style="list-style-type: none"> To take part in discussions – answering and posing questions To react on the feedback 	<ul style="list-style-type: none"> To produce guidelines for evaluation To provide tools and suggest activities for self-evaluation (questionnaire, portfolio indications, ...)

Table 1. Examples of activities aimed at acquiring concrete presentation skills together with the corresponding role of teachers

All these activities should not be considered as an end in themselves but rather as a natural part of real-life problems. Table 2 shows examples of tasks in support of developing and enhancing concrete skills by means of ICT tools. You should pay special attention to the importance of an appropriate choice of tools - the ICT tools should be used only when needed and in such a way that they really enhance and enrich a concrete presentation.

	Skills	Example tasks	Tools
Planning	<ul style="list-style-type: none"> • To identify the needs of the audience • To identify the limitations • To make a plan of the presentation 	<ul style="list-style-type: none"> • To plan the preparation of a poster taking into account: <ul style="list-style-type: none"> ◦ the specifics of a web poster and a paper based one ◦ the difference in presenting for kids and adults 	<ul style="list-style-type: none"> • Power point • Text processor
Preparation	<ul style="list-style-type: none"> • To structure the presentation • To use the proper tool properly 	<ul style="list-style-type: none"> • To prepare a presentation of a book for different audience (a marketing oriented one and one for pupils) • To prepare (within a group) an advertisement, as a result of the joint efforts of the individuals (content, description, illustration, format, ..) 	<ul style="list-style-type: none"> • Power point • Text processor • Photo Editors • Spreadsheets • Web pages development tools • Digital camera
Delivery	<ul style="list-style-type: none"> • To present a product within concrete limitations (time/ pages) • To establish a real contact with the audience 	<ul style="list-style-type: none"> • To deliver an oral poster presentation for a fixed time (1, 5 or 10 min.) • To deliver a Power point presentation in front of the whole class 	<ul style="list-style-type: none"> • Power point • Word processing • Photo Editors • Spreadsheets
Feedback	<ul style="list-style-type: none"> • To answer questions with self-confidence • To provide arguments when defending one's position 	<ul style="list-style-type: none"> • To answer questions after/during an oral presentation • To answer <i>reviewers'</i> remarks 	<ul style="list-style-type: none"> • Word processor • Communication tools

Table 2. Examples of abilities involved in presentation phases, corresponding students activities and possible uses of ICT

Let us put in a nut shell what you should have done so far:

- shown your students concrete examples of bad and good presentations
- discussed and jointly *discovered* some presentation rules
- trained concrete skills by means of several activities directed towards the solving of a certain challenge (let us remind here that *challenge* is defined as a **demanding or stimulating situation** [5] and we would like your students to care about *lifting the gauntlet thrown*)

At this point you and your students are hopefully ready to start with a more ambitious scenario. What follows is just an example (which could be modified or completely replaced by something generated by you or suggested by your students). The important thing is that the scenario should be motivating enough for your students and the outputs should correspond to acquiring some skills as defined in the aims. The set of skills to be cultivated and elaborated could vary depending on the situation.

Example of a scenario for a written presentation

Aim¹:

To help students acquire skills of:

- designing the presentation according to the media specifics
- selecting appropriate tools
- orienting the presentation towards a specific audience
- accepting the constructive feedback with gratitude and reflecting the comments and suggestions appropriately

Scenario:

To create, publish and advertise a written presentation (newspaper, poster, magazine, or booklet).

Task 1

Teams consisting of writers, proofreaders, technical and language editors, and graphical designers are formed. Each team chooses a concrete type of a written presentation (paper- or web based) and plans accordingly.

Task 2

The teams develop their presentations in several stages. The feedback and comments of all the players should be considered until reaching a consensus (within the time planned).

Task 3

Each team publishes its presentation.

Task 4

Each team produces an advertisement of its presentation for a different audience (parents, teachers, peers)

Activities:

- The writers present a document on a given topic to the team.
- The proof-readers suggest corrections (by means of the spell checker, track changes, comments and other sources such as encyclopedias and dictionaries, etc.).
- The language editors suggest changes in the style and the language (by means of thesaurus, track changes, comments, and other sources).
- Graphical designers prepare the illustrations and the layout of the presentation.
- The technical editors take care of the formatting.

Tools:

- Text processors (spell checker, comments, thesaurus, track changes)
- Encyclopedias and dictionaries
- e-mail, on-line communication tools
- Graphical editors
- Publishing tool
- Newspaper wizards
- Clipart/Internet sources
- Digital camera (Audio/video – in case of web presentations)

¹ Here we limit ourselves to the aims related to presentations skills although in any scenario there could be added aims related all other domains of the ICT-enhanced skills.

Web resources:

- **Design of scientific posters**
<http://www.writing.eng.vt.edu/posters.html>
- **Poster template**
http://www.writing.eng.vt.edu/presentations/poster_template.ppt
- **Mathematical modeling in the environment**
Math awareness month poster, April 2001
<http://www.math.uconn.edu/~glaz/math108/poster/index.html>

A modification of the scenario of a poster presentation is offered in Part 3. In this modification some useful techniques are considered in support of the presentations skills together with skills for working in a team and working on a project. This illustrates our basic idea that even when the product looks the same the paths leading to it could be traced by different milestones (i.e. acquiring different skills as a result of carrying out concrete tasks).

A step-by-step advice on creating an effective poster presentation could be found at [6].

ASSESSMENT

As it has been said on numerous occasions (not only in the Handbook) that the evaluation of *products* containing creative elements is a very difficult matter since there are subjective factors involved. If we paraphrase Brandon [7] when evaluating a presentation we should *try to cultivate the perspective of an “impartial spectator” in addition to our own perspective. That is, we need to do the hard work of trying to recognize what in our response to the “product” is a matter of personal quirk and temperament, and what is something shared in common with people who are not exact clones of ourselves.*

We have to try to clarify for ourselves why and what we don't like about a given presentation might be liked by our students, or why they might dislike our ideas for its improvement. Although this is extremely difficult to do, difficulty is not an excuse for not trying. Furthermore, a genuine evaluation involves the analysis of the whole learning *path* which means that the assessment should include two components:

- a qualitative approach and self- and a peer evaluation
- a quantitative approach with respect to given criteria.

Sample evaluation criteria:

Further on we will outline some evaluation criteria, referring to the *Poster Scenario*. They are based on two main approaches:

- a **qualitative approach**, according to which you will evaluate to what extent
 - the design corresponds to the media specifics

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- the tools are appropriate
- the specifics of the audience has been taken into account
- the author has accepted the constructive feedback and has reflected the comments and suggestions
- a **quantitative approach**, according to which you will evaluate the appearance, content and the presentation of
 - the poster
 - the advertisement

Some sample criteria (suggested by G. Hess [8]) concerning the quantitative evaluation of a poster are given in the Appendix 3.4.4. Evaluation of written presentation - poster evaluation.

WRITTEN PRESENTATION

INTRODUCTION

It is difficult to categorize the presentations in terms of *written*, *oral* and *web-based* since there is a great deal of overlapping. As we shall discuss below part of preparing a written presentation would normally involve reading to ourselves out loud. In turn, when preparing an oral presentation we have to write down the content we will be talking about. Still, we are making a conventional classification so as to separate certain techniques, methods and guidelines for you to focus better when working with your students.

You have already taught your students to be sure that before starting to write they should know what they want to say and to whom they wish to say it. It is even more difficult to teach them when to stop writing. Here is the advice given in [9]:

Stop when you have said what you have to say. Say it clearly, say it completely, say it forcefully, say it without leap but then shut up. To prattle on and on is not to convince further.

A more detailed guidance on writing in specific genres (a research paper, a business paper, application forms, CV) is given in Appendix 4. The guidance relates presentation strategies in several areas: formatting, writing, incorporating graphics, and documenting sources, acknowledgements.

ELABORATION

Following the *I*Teach* Methodology we will give you some examples of tasks the fulfillment of which would contribute to the acquirement of concrete written presentation skills. Depending on the interests and the background of your students you could split the tasks into even smaller exercises or combine them in real-life scenarios.

Filling an application form is a suitable task for your students to demonstrate their writing abilities. You are free to choose different applications forms but as a start you could use the sample application in Appendix 5.1 Sample for application form. This example is based on the application form for participation in the *Research Science Institute (RSI)* [11] - an international six-week summer program (sponsored jointly by the *Center of Excellence in Education* and the *Massachusetts Institute of Technology*) for high school students from the US and around the world who are working on research projects in science and mathematics. Encourage your students to use **the guidance for writing a personal presentation** which could be very useful for a variety of application forms.

Since to complete the personal essay section of the application form is a relatively complicated task you could start with a simpler one, viz. writing a short personal presentation for a specific case (e.g. participation in competitions, festivals, etc.).

Example of a task for short personal presentation

Aim:

To help students acquire skills of:

- designing the presentation according to the media specifics
- selecting appropriate tools
- orienting the presentation towards a specific audience

Task

To prepare personal presentation for a participation in a competition or festival, emphasizing on the experience related to the specific event (e.g. music experience and achievements if applying for a music festival, research experience and achievements in contests if applying for mathematical research camp, etc.)

Tools:

- Text processors (spell checker, comments, thesaurus, track changes)
- e-mail, on-line communication tools
- Graphical editors
- Digital camera (Audio/video – in case of web presentations)

Writing a CV is another task the students should learn how to perform depending on the situation. Here follow some **preliminary exercises**:

Exercise 1. Direct the students to a site with various templates, e.g. [12]. Let them select one for a particular situation and fill it for you to evaluate. They could use also the sample given in the Appendix 5.2 Samples for CVs as found in [13].

Exercise 2. Ask your students to study the examples given below of resumes before and after editing. Let them discuss what they have noticed and encourage them to generalise their findings. At the end compare the findings of the students with the critiques as formulated by the professional editors.

- Resume for **Business School Admissions**:

Before

[http://www.resumeedge.com/promo/resumeviewer.php?
filename=admissions-mba_before](http://www.resumeedge.com/promo/resumeviewer.php?filename=admissions-mba_before)

After

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http://www.resumeedge.com/promo/resumeviewer.php?filename=admissions-mba_after

Critique

http://www.resumeedge.com/promo/admissions-mba_critique.php

- Resume for **Graduate School Admissions:**

Before

http://www.resumeedge.com/promo/resumeviewer.php?filename=admissions-msfinance_before

After

http://www.resumeedge.com/promo/resumeviewer.php?filename=admissions-msfinance_after

Critique

http://www.resumeedge.com/promo/admissions-msfinance_critique.php

These exercises could be extended (replaced according the interests of your students) with other examples of resumes before and after editing together with professional critiques could be found at:

<http://www.resumeedge.com/whyus/samplework.php?nav=wu.sw>

Exercise 3. Invite your students to discuss the examples of short and long CVs (Appendix 5.2 Samples for CVs) and edit their own resume appropriately. A detailed guidance on writing CVs extracted from [14] could be found in Appendix 4.2. Guidance on writing CVs.

Exercise 4. Ask the students to provide the examples of the short CVs with a better structure.

Exercise 5. Challenge your students to write a document in which using bullets is justified (e.g. you could make slightly modification of the previous exercise, explicitly defining that students should keep in mind the *Guidance for writing in bullets* from Appendix 4.12. Guidance for using bullets and numbers – providing them with it as supplementary material).

Bring their attention to the fact that to write a well-turned bulleted list is somewhere *between rule-governed craft and instinct-guided art* [15]. Furthermore, choosing the most appropriate tool and way of presenting the information (in this case about yourself) is very essential for the effect.

If your students are in 11 or 12 class, then to prepare their CVs and motivation letters when applying for a concrete job will be a real-life situation. That is why an **Applying-for-a-job scenario** would be an appropriate challenge contributing to the development of both presentation- and information skills. Similarly, you could make the students work on Applying for colleges, universities and other graduate schools by modifying the scenario below appropriately.

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Example of an Applying-for-a-job scenario

Aim:

To help students acquire skills of:

- designing the written presentation according to the specific requirements²
- selecting appropriate tools
- orienting the presentation towards a specific audience

Scenario

To find an appropriate job.

Task 1

To find offers for a job (according to one's interests and qualification).

Task 2

To prepare a CV and a motivation letter for a job application.

Tools:

- Text processors (spell checker, thesaurus)
- e-mail, on-line communication tools
- Digital camera

Once your students *have been accepted for their favorite job* they should expect the next challenge – **to prepare business reports** on their work.

As a **preliminary exercise** you could ask them to prepare a written presentation on comparative analysis of *Office automation technologies* with regard to their suitability for a concrete situation. You could discuss with your students the tools they have used and challenge them to justify their choice (part of them could propose just a list; other could find the table, or different types of charts as more suitable).

This activity could be extended with the following scenario:

Example for a Business-report scenario

Aim:

To help students acquire skills of:

- finding and selecting information
- preparing a written report
- selecting appropriate tools
- putting correct citations

Scenario

In the role of a member of an IT department team the student is expected to find and propose an appropriate solution for solving a problem in the *Office work automation*.

Task 1

To analyze the problem and to find information for possible solutions.

Task 2

To prepare a written report to be presented to the managers

Tools:

- Text processors
- Spreadsheets (charts)

² Task 1 is oriented to finding all the information the students should take into account – not only the types of jobs interesting for the student but also all the requirements concerning the application (e.g. the form, the length, the structure).

As supplementary resources for the above scenario you could provide students with the business report guidelines available in Appendix 4.5. Business report guidance.

The Business-report scenario could be naturally extended with correspondence elements during Task 2. Thus the set of presentation skills (as enlisted in the *Aim section*) will be enriched with the working-on-a-project and working-in-a-team skills. Since business correspondence consists mainly of memos, letters, and electronic mail some templates and guidance for writing a letter are given in the Appendix 4.1. Guidance for a written personal presentation. In addition, exercise for improving the writing style could be found in the web resource below.

Web resources:

- **Correspondence templates, samples, guidance, exercises**
<http://www.writing.eng.vt.edu/workbooks/correspondence.html>

We hope that your students will find such assignments motivating enough since the skills and knowledge they could gain while carrying it out would be used on many occasions in their life.

ASSESSMENT

Sample evaluation criteria

A sample of evaluation criteria and templates of evaluation form of written presentation (a research paper and a business report) are provided in Appendix 3. Examples for evaluation forms.

In the case of writing a CV the students could start with using a template. Thus the only thing you should check in terms of formatting is if they have kept the original format. You should require that they use a spell- and grammar checker so that you would have to worry mainly about improving their style. Before delivering their work let them check once again their use of verb tense, the capitalization, the syntax (word order), if there are unnecessary words (phrases), the punctuation.

In the case of the scenarios dealing with the job application and the business report you should play the role of the manager who comments on the whole impression of the application/report.

ORAL PRESENTATION

INTRODUCTION

Giving a talk is different from a written presentation (although usually it involves writing). Your students should already know that it is normal to do some writing to prepare a talk and this writing will strongly influence the talk. Involve them in a discussion on the topic *Which is more flexible – the talk or the paper?* Here are some thoughts supporting different views:

A talk is more flexible than a paper. As they say: “A small imprecision can save a ton of explanations”. Explain to your students that they could talk not only about things they have succeeded with but also about things that failed. Sometimes even trivial examples could be used as a foundation on which to build ideas.

A talk is also less flexible than a paper. Because the audience received the talk in linear order it is at the mercy of the presenter (it cannot check things and cannot rewind what he is presenting).

PREPARATION

The most important thing to remember is that the oral presentations reveals your personality – not only how creative or knowledgeable you are but also how well you know your audience and how much you care about it. Oral presentations are considered so crucial in the research community that some authors [16] provide recommendations even for tongue twisters so that busy scientists could improve their articulation. Many authors refer to the recent research on the psychology of the audience, specifics of the memory and the non-verbal communication. To give more freedom of the future presenters, it is useful to give presentations in the style of “how not to give a talk”.

ELABORATION

Typical exercises could include the following:

- preparing (possibly with the help of your students) a Power Point presentations in which all the above rules are broken and ask the class to point what is wrong and to edit it according to their vision.
- Make a sample structure and ask the students to fill it with their own talk
- To develop concrete elements of the above rules, prepare special exercises to practice them, e.g. ask the students to tell a joke for up to 3 min.
- In Appendix 4. Templates and guidance you will find guidance for preparing a good talk (in a specific field) and two sets of tips

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for public speaking [17, 18]. Ask your students to compare the two sets of tips on public speaking and discuss the overlapping and the differences.

We will offer two concrete tasks as an extension of the scenarios proposed to the students in the written presentation section.

If your students have prepared and *sent* their CVs and motivation letters to their potential employers (you), then you could ask them **to make a personal oral presentation in front of you** (and the class).

As it is often the case in real-life situations the written report is not sufficient for the *Big boss*. If the expert or a team of experts proposes something requiring investments the proposed solution should be *defended*. Thus the next challenge for your students could be **to prepare oral presentation, based on written report and to present it**.

Some helpful guidance for the oral presentations of your students are given in the Appendix 4. Templates and guidance. Furthermore, examples of good models and templates for slides could be found in the following sites.

Web resources

- **Model Slides from Various Research Presentations**
<http://www.writing.eng.vt.edu/samples/aspmo.pdf>
<http://www.writing.eng.vt.edu/samples/bekins.pdf>
<http://www.writing.eng.vt.edu/samples/dibbern.pdf>
<http://www.writing.eng.vt.edu/samples/lynch.pdf>
<http://www.writing.eng.vt.edu/samples/simmers.pdf>
<http://www.writing.eng.vt.edu/samples/stelzer.pdf>
<http://www.writing.eng.vt.edu/samples/various.pdf>
- **Slide templates for scientific presentations (white and dark background)**
http://www.writing.eng.vt.edu/speaking/slide_template_dark.ppt
http://www.writing.eng.vt.edu/speaking/slide_template_light.ppt
- **Guidance on visuals in the form of an exemplary presentation**
<http://www.writing.eng.vt.edu/handbook/visuals/08b.ppt>

In conclusion, you could share with your students that there is not a single recipe for making “the best presentation” and the guidance in the Appendix are based on the most often found in the literature (Internet including). There is a variety of styles ranging from very few to very many [19] but designed for a very specific situation. The important thing is that in order to break the standard rules your student should learn them and justify their own choice. If you are interested to see more comments on using Power Point, you should visit the site published by Miller [20].

ASSESSMENT

A sample of evaluation criteria and template for evaluation form of oral presentation is provided in Appendix 3.4. Evaluation of presentation skills. Many more sites could be found in the Internet. But a very concise set of criteria for a good talk could be described as verifying if the presenter has followed the following rules:

1. Design the talk for the audience
2. Prepare thoroughly and rehear the talk
3. Produce clear, legible slides
4. Arrive early and check the room
5. Speak slowly and loudly
6. Be enthusiastic about what you say
7. Look at the audience as you speak
8. Don't fidget with the slides or with the pointer
9. Finish on time (or early)
10. Answer questions clearly, courteously and concisely. Admit if you don't know.

When assessing the proposed tasks for **oral presentation** you again are expected to play the role of the manager who will give the corresponding feedback concerning its meeting the goals.

SUGGESTED FURTHER READING

"The Elements of Style", William Strunk Jr. and E. B. White

A classic. Very helpful tips for improving your writing. Not aimed at technical writing, but certainly the tips suggested are universal. There is a companion book "The Elements of Grammar" by Margaret Shertzer, but at 168 pages it's maybe a little too dense to be all that useful except as a reference book.

***"Writing Mathematics Well", Leonard Gillman
(Mathematical Association of America (c) 1987, 64 pages)***

An excellent guide for writing mathematics. Plus, the author has a good sense of humor, so it's fun to read, and at only 64 pages, not very time-consuming.

***"Mathematical Writing", Donald Knuth, Tracy Larrabee,
Paul Roberts, The Mathematical Association of America,
1989***

Gallion, Joe, "How to Give a Good Talk", Math Horizons, April 1998, pp 29-30

George D. Gopen, Judith A. Swan, The Science of Scientific Writing

<http://www.americanscientist.org/template/AssetDetail/assetid/23947?fulltext=true&print=yes>

Advice for writing a paper (for the Research Science Institute)-
Compiled by Debbie Yeh and modified by the RSI2002 staff,
<http://web.mit.edu/jrickert/www/paperadvice.html>

Williams, Joseph M. 1988. *Style: Ten Lessons in Clarity and Grace*. Scott, Foresman, & Co.

Colomb, Gregory G., and Joseph M. Williams. 1985. Perceiving structure in professional prose: a multiply determined experience. In *Writing in Non-Academic Settings*, eds. Lee Odell and Dixie Goswami. Guilford Press, pp. 87-128.



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TIP

There is encountered an accent shift from a teacher-centered education to a student-centered one.

TIP

The Web's impact make students, teachers and parents to rediscover writing and publishing fascination.

TIP

The Web presentation must be developed permanently having in mind the target group.

WEB PRESENTATION SKILL

INTRODUCTION

The students, teachers, and instructors are more and more concerned with learning how to use at full potential the ICT in order to adapt themselves to the new education forms and to the new labour market needs. An essential part concerns the competence of interact and collaborate inside an Internet based learning environment. For this purpose, the development of Web materials, the information presentation on the Web is an important task.

The ICT usage in education could conduct to the accent shifting from a teacher-centered learning environment to a student-centered one, in which the teachers do not represent any more the key information and knowledge transmission source, but the students' collaborators; also, the students are not any more passive information receivers, but they are actively involved in their own education.

The Internet provides an incredible number of opportunities for organizing modern classes. The students could communicate through the Internet with other students from different countries, and the teachers could follow and discuss the socio-cultural differences. It could be exchanged experience and materials.

The simplicity of developing a personal Web page encouraged alike students, teachers and parents to rediscover writing and publishing fascination. With a half billion peoples global audience, there increases students' confidence and attention for what they are doing and for the materials they prepare to be published on their own Web site, implicitly they obtaining better results to school.

Because the rules of Web publishing and communication have some specific features, it is necessary for students to acquire knowledge about how to build a Web page, as well as about how to organize the presented information.

PREPARATION

The development of a Web page is a long and meticulous process, which involves many stages:

- a. Identification and understanding of final users' needs;
- b. The analysis of the activities and of the human-computer interactions context;
- c. Building of the interface prototype;
- d. Interface evaluation;
- e. Programming the interface;
- f. Reiteration of the prior stages.

When a teacher or a student has to make a Web presentation, it must be integrated in a certain site (e.g. his/her personal site, or course's site, or institution's site). If he contributes to this site, then he must know in

Innovative Teacher



which consist the developing process, and which are the Web design principles. If he only place his Web presentation on a site, then he must build it according to the general site design.

Identification and understanding of final users' needs implies identification of the target audience (beginners and occasional users, frequent and experienced users, international users), establish the site goal, know the main objectives, build a concise plan about the available information on the site.

The Web users do not only search information, but interact with information in a specific manner, not possible in the case of written documents. The graphical user interface includes interaction metaphors, images and concepts used for transmitting functionality and understanding in a visual manner. The Web pages *look and feel* make part of the visitor's experience.

A great part of the knowledge about the design, generation, assembling, editing, and organizing of the *Web information* is similar with that corresponding to the printed mediums. The conventions used in the *printed materials* make-up are still available for the Web pages editorial style and text organization.

Among the particularities for organizing the Web presentations, comparing printed presentations, there could be mentioned:

- Direct access to related information, through the **hyperlinks**. Internal site hyperlinks provide a better scour of the Web site, and external hyperlinks provide an opening to a lot of supplementary materials
- **All pages** of a Web site must include (inside the header or the footer) some important information, that appears only once in a printed book: the name of the site, the banner, the hyperlinks menu, the copyright notice, the name of the author, the material creation date. The visitors must know in any moment inside which site they are, taking into account that simultaneously they have multiple Web browser windows or tabs opened with various Web addresses. There exist a similarity between the requirements for a Web page and a printed journal page: each of them must provide the answer at the following questions:
 - *Who?* (Who speaks through that Web page?): the author/authors of the page content must be emphasized, because the visitor have to rate the its credibility, and it is possible to be necessary to make references to the page. Also, it is indicated to be mentioned the page webmaster, for technical issues.
 - *What?* (What about is this page?) The page title is extremely important (those which appear in the browser title bar, and also those which is displayed I the top of page). It's also recommended to exist subtitles for the

TIP

Simply transforming a printed material into a Web presentation shall be a failure.

- different sections of the Web page. In this way, the visitor shall understand by the fly the page topic.
- *When?* (When was edited the information in this page?) In the page footer it must be displayed the content last update date. It's recommended to be done periodically some updates, in order to attract visitors to come back on the site.
 - *Where?* (Where is located the author or the institution to whom belongs the site? Also, from which URL I saved or printed this Web page?) So, it must be mentioned the coordinates of the author/institution, and also it's recommended that the Web address of the start page to be included in the site banner, or site logo, or site logo.

ELABORATION

After the analysis of the future Web site necessities, there must be realized the site interface prototype. For that, in order to design the navigation menu and instruments, first it must be gather all the material (text, images, audio and video files) that shall be published, and then this material have to be structured. In order to organize the information inside the future site, there are necessary the following steps:

1. Division of the information into logical units;
2. Establishing a hierarchy for the data modules in function of importance and generality;

The correspondents of the chapters from the printed materials consist in main menu items. There must established this items, and the material corresponding to each of them. Because a Web page content must not to exceed 2 screens long, may be necessary that the material for a menu item to be split in some parts (to be paged), or even in a submenu. A common site structured is depicted in the picture below:

TIP
The navigation mechanism it's the most important thing for the site usability.

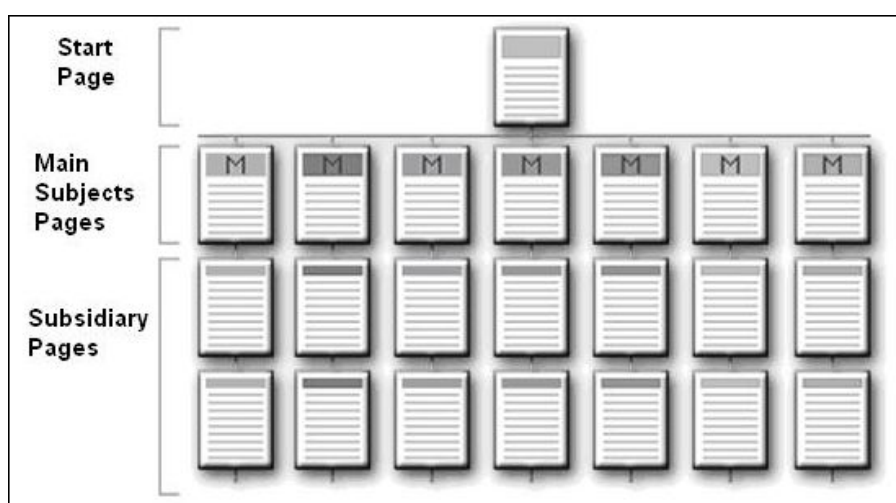


Figure 1: A Web site structure

Also, inside each page content, it's better to establish some sections, marked with eloquent section title, in order the information to be easy readable.

3. Using this hierarchy for creating relations between logical units; The main menu shall be displayed on all Web site pages, so shall be easy for the user to have an general idea about the available information, and also to navigate inside the site. In addition, inside the content itself that is necessary to exist internal hyperlinks, in all places that is possible, to the corresponding information inside the site. The hypertext character of the content is the most important for a Web presentation.

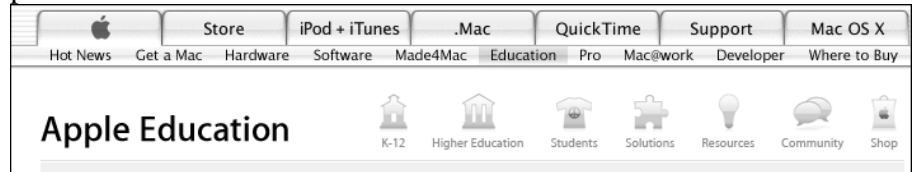


Figure 2: The Navigation Menu of different Web sites

TIP

A Web site is well-designed if the users don't need help, and they behave in the manner expected by the author. Also, if the users shall find on the site what they expect to find.

4. Analyzing the result aesthetically and functionally. The menu and pages hierarchy must seem natural to the user, easy to navigate, without confusions.

The general design of the site must be applied to all pages, in order to obtain a visual uniformity which confer personality to the site. Only the *start page* must have a particular design, in order to be emphasized. Inside it, there must be specified:

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- The site logo, eventually larger than inside the rest of the site pages (for example, 200x50, or 250x100, comparing with 70x70 inside the ordinary pages);
- The site goal;
- The type of the provided content;
- The main menu, eventually with explications about the corresponding content.

Some supplementary **principles for the design** of all the site pages:

- The visual organization of the information must be constant inside the site, in order the user to quickly acquire the ability to navigate and to locate the information wherever in the site.
- The importance order for arranging the information inside a page must be according to the visual going over the page: from the upper left corner to the bottom right one.
- The horizontal scroll bar must be absent, and the vertical one must cover maximum two screens, in each page.
- A good navigation menu assure a good orientation through the site, the information context, and also the information accessibility.
- It must be assured the simplicity and the consistence: the dimension and the colour of the similar importance text, buttons or hyperlinks must be the same, and also the navigation hyperlinks must be similar located.
- The not visited hyperlinks must be different, brilliantly coloured, but with same colour luminosity variants
- The upper case letters must be used with economy
- Between the various page sections it is necessary a certain space, for the seeing intermission
- It is necessary a luminosity contrast: the text must have a luminous colour, and the background – a dark one, or other way round;
- The images published on the site must be of high quality, but in the same time not very big. The site must load instantaneously; otherwise the visitors renounce and change the site.

TIP

A bad design shall send away the users, despite of the valuable and very good content.

We provide below some frequently **Web design mistakes**:

- Difficult pursuing text: a compact text is worse for an interactive experience: intimidate, bore, is unpleasant.

Some aeration methods: establishing subtitles, bullet lists, and emphasized phrases, writing short paragraphs, using a concise and clear style.

- Page title (from the title bar) very long or without relevance.

The title must be describe exactly and concisely the content of the current page. A subsidiary page title includes the main page title and a particular phrase. The title is taken over by the search engines, and is included in the description of the saved bookmarks.

- Blinking text: it reduces with approximately 87% visitors' concentration power, according to <http://www.userfriendly.org/>. The same situation for the text inserted within <marquee> element.

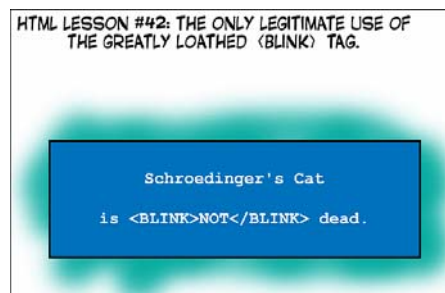
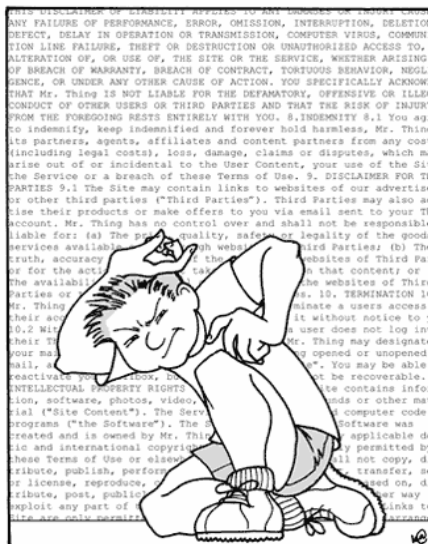


Figure 3: It's strongly recommended to avoid the compact text and the blinking text

TIP
The hypertext character and the interactivity of a Web significantly contribute to the user experience success.

- Unfounded animation: as the blinking, it reduces the concentration power, and moreover, it increase the page loading time;
- A strong background, or a hard loading one (designed in Flash or Shockwave);
- The so-called “clown trousers” effect: a lot of discordant combinations;
- Counting visitors: it depicts to congratulate himself, and it charge the loading time;
- To exist hyperlinks that point out to “Page not found”, or to “Page under construction”, or to a deprecate information source;
- Inside the textual content, it's unpleasant to be written some sentence without relevance, or in an affected manner, or to be used the loquacity;
- The lack of instruments for feed-back: e-mail, guestbook form, phone, forum, Weblog, etc.

The **content** is the most important for a Web site: it is necessary to have something to tell in order to publish it. There exist, unfortunately, many pages full of “noise” and without signifying something. The design must be correlated with its message.

Alongside with the general Web design principles, in the educational context must be taken into account the **rules for designing an on-line**

course. It's very important to accord a special attention to the manner of developing an on-line course, in order to be efficient for students, not to imply supplementary, useless efforts from the teachers, and also, to be easy extended in the future. A course development stages are:

- Analysis
- Modularization
- Teaching
- Learner support
- Evaluation
- Continuous improvement



Analysis is the stage when there are established concrete requirements: the course type (old/new, the necessary students knowledge, the modalities for materials delivering), the course goal, the target audience, the team working methods, the course duration, the schedule, etc. The fundamental principle for the course development should be *the students necessities respect*.

Modularization means the instruction planning in the form of modules. It must be established first the entire knowledge package to be transmitted to students, and its division into fragments (modules) should be realized according to the course's general objectives (which shall give names to the modules and chapters).

Teaching should be according a teaching strategy, which to take into account the concrete activities that shall be done in order to be achieved each objective, the activities for each student or team, the necessary resources. Among the teaching strategies could be mentioned the references to various Web sites, the usage of video/audio sequences, and images for illustrating the introduced concepts, the usage of comparisons and metaphors, etc.

Learner support is essential inside a virtual medium. It must be provided various modalities for interacting with the teacher: real-time dialogues through phone, chat, videoconferences, conversations on the discussion forum, e-mail, feed-back. The interaction could be synchronous or asynchronous, individual or inside teams.

Evaluation inside a virtual medium could be realized through on-line tests, projects, and practical works. Some possible homework which could be taken into account:

- To design Web pages with certain themes;
- To create a guided tour of the Web resources on a certain subject;
- Establishing some discussion groups for debating certain topics;
- Research issues;
- Preparation of some case studies;
- To provide a certain bibliography to a group of students in order to be prepared and presented each source by one of them;
- To find different examples for a certain course/concept.

TIP

The courses design must be done according the general teaching strategy.

Continuous improvement starts in the moment of publishing the course on the Web. In function of the concrete problems encountered during the course (special learner typologies, requests for developing a certain topic, etc), the teacher should refine the existing materials, to adapt them according to the various students necessities.

A rigorous planning of the course development is extremely important for obtaining a quality course.

Example

Aim: To help students to discriminate and to apply the Web design principles

Activity: It shall be taken into discussion a Web site much like those from the site <http://www.webpagesthatsuck.com/>, and the students shall be asked to localize Web design deficiencies

Individual work: each student shall pass over the examples from <http://www.webpagesthatsuck.com/>

Team work: For a given educational Web site that is familiar to students, it shall be discussed the Web design negative aspects and proposals for enhancement

Example

Aim: Development of the ability to implement a Web interface

Activity: The teacher show to students images representing a certain Web sites interfaces (such those exposed in Figure 2), and ask them to propose implementation solutions (for example, the page organization into tables, establishing the CSS properties, etc)

Example

Aim: Establishing the audience of an educational Web site

Activity: It shall be taken into discussion a certain educational Web site (such as: <http://school.discovery.com/>, <http://www.w3schools.com/>, <http://www.toutapprendre.com/>, <http://www.vts.intute.ac.uk/>, etc.), and the students shall be asked to establish the profile of the best user (as teacher, and as student). Then, shall be discussed the modalities of transforming this site so that to be dedicated to themselves, or to the pupils from primary education, or to the pupils from secondary education, or to the students from other specializations.

TIP

A novice designer starts with the existing good and bad sites analysis.

Sample activities:

1. Building a personal Web site by customizing a (free) Web site template

Framework

A class of students is highly interested in knowing to develop a Web site, but is feeling frustrated because of doesn't have programming abilities. The teacher shall show them that it is easy to use some applications, without needing programming competences, in order to build an wonderful personal Web site.

Student's role

Web designers / Web design application users

Prerequisites

- WEB (Basic knowledge)
- knowledge on the personal Web site structure
- Office suite applications usage

Student level

From upper secondary school to university level

Length of the activity

Two hours

Abilities to be developed

- To use the proper tools properly
- To structure the information
- To know the steps for developing a personal Web site
- To identify and formulate tasks
- To make plan

Content related aims

Beginner level knowledge about the Web design technology

Kind of activity

Collaborative and individual

Material supplied

- The software (*Macromedia Dreamweaver* or Microsoft FrontPage, eventually Adobe Photoshop or other graphical editor)
- Guide to use software
- Web space

Product

- The personal web site developed

Outline of the activity

- Download the Web template from the Web (www.templatesbox.com)
 - Unzip the archive
 - Install the fonts (Control Panel, Fonts)
 - Eventually (if the student level is not beginner): open **index.psd** file in Adobe Photoshop, and modify some layers, which in the **index.html** appears as images. In final: save the index.psd file as HTML file (obtaining another **index.html** file)
 - or (for beginner students level): Browse the images directory, and change some images with some customized ones
- open index.html file with Macromedia Dreamweaver or Microsoft

TIP

In order to attract visitors, it's very important to provide them with valuable content, and with reasons for coming back.

FrontPage, and make changes on the menu hyperlinks (associate menu items with **index.html**, **about.html**, **http://studentname.blogspot.com** (for News hyperlink), **photos.html**, **contact.html**).

- change the textual content inside the **index.html** file with a personalized one, by keeping the format

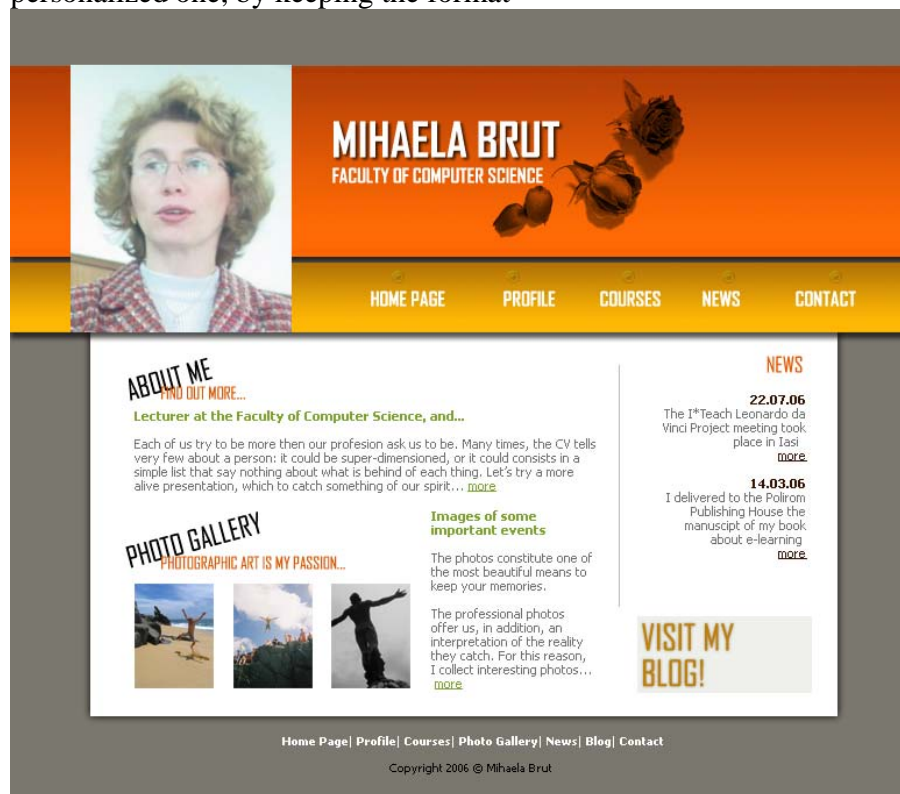


Figure 4: A modified free web template

- save the changes made on **index.html**, and then make some multiple copies of this file, named: **about.html**, **photos.html**, and **contact.html**
- Open each of the files **about.html**, **photos.html**, and **contact.html**, and make changes accordingly their destination.
- Create a personal blog on the <http://www.blogger.com>, with each **studentname** user name and blog name.

TIP

For structuring a Web presentation, usually this is organized into one or more tables (by using <table> or <div> HTML elements).

2. Building a simple HTML/CSS presentation Framework

Because the HTML and CSS languages are better learned by examples, the teacher shall construct a first HTML page together with the pupils/students, in order to develop a Web presentation similar with the following:

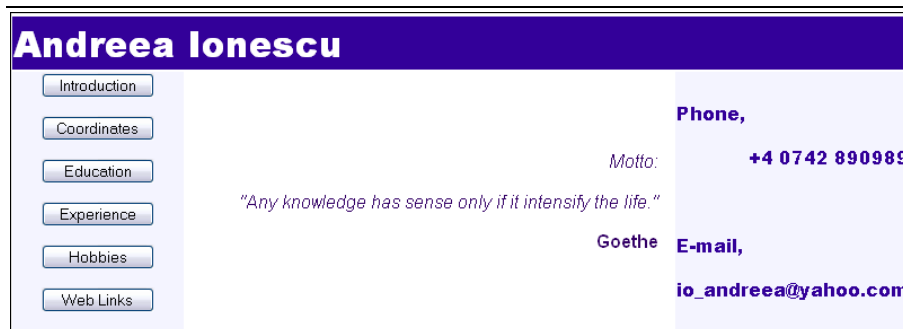


Figure 5: The skeleton of a Web presentation

Students' role

Web designers

Prerequisites

- WEB (Basic knowledge)
- Knowledge on the presentations Web site structure
- HTML and CSS fundamentals

Student level

- From upper secondary school to university level, HTML and CSS beginners

Length of the activity

Two hours

Abilities to be developed

- To use the proper tools properly
- To structure the information
- To structure a Web site content by using HTML **table** or **div** element
- To know the steps for developing a personal Web site
- To identify and formulate tasks
- To make plan

Content related aims

Beginner level knowledge about using HTML (*HyperText Markup Language*) and CSS (*Cascading Style Sheet*) in the Web design technology

Kind of activity

Collaborative and individual

Material supplied

- The software (Macromedia Dreamweaver or HTML Kit)
- Guide to use software
- Web space

TIP

Many practical things about CSS styles could be learned from the site www.csszengarden.com



Product

- A Web site for presenting a chosen theme

Outline of the activity

- The teacher outline the fundamentals of HTML and CSS languages
- The teacher discuss together with the students about the organization of the Web page that shall be developed: a table (800 pixels width), with 2 rows and 3 columns, first row occupying all the 3 cells, and the second row having 3 cells: 175 pixels, 450 pixels, 175 pixels. The table is centred on the screen, have no borders, etc.
- It follows the page development: the HTML document structure (with title, link to the CSS file, meta-information, and the structure of the table - created with `<table>` or `<div>` HTML element, so that to remain only the content of each cell to be filled).
- In the upper cell (on the first row): it shall be included the title of the site, inside an `<h1>` element, and in the CSS file it shall be defined the CSS properties for this
- In the left cell (on the second row): it shall be defined the menu of the site, with hyperlinks to all the site files, which name are provided here. In the CSS file - that are defined properties for hyperlinks (`<a>` element)
- In the right cell: it shall be included some information about the site's content and author, information that shall remain on each site page (if the information is included, for example, inside an `<h6>` element, in the CSS file there shall be included properties for this element).
- In the centre cell: it shall be included the information that corresponds to each page of the site. For each HTML used element, there shall be defined CSS properties inside the CSS file.
- After finalizing the first page of the site: it shall be saved as **index.html**, and then there shall be made copies under all the named mentioned inside the menu items.
- It shall be opened each of these pages, and it shall be replaced only the center cell content.

3. Building a simple Web form, processed in PHP Framework

On each student/pupil personal Web site, that is interesting to exist a Web form in order to collect visitors' impressions about the site or about a certain topic. Teacher shall develop such site together with his pupils; in order to collect impression about a certain book was recommended in the bibliography. Teacher shall use such Web site as example:

TIP

The Web forms increase the site interactivity. Users are very comfortable if they could send their feed-back to the author.

Invitation to reading

Name and surname:

Occupation:

Age: under 18 | 18-25 | 25-35 | 35-60 | over 60

E-mail:

Photo:

Your Impressions:

Instrumente pentru E-LEARNING
MIHAELA BRUT
GHIDUL INFORMATIC AL PROFESORULUI MODERN
POLIROM

Figure 6: A Web form example

Students' role

Web designers

Prerequisites

- WEB (Basic knowledge)
- Knowledge on the feed-back Web pages structure
- HTML, CSS, and PHP fundamentals

Student level

- From high school to university level

Length of the activity

Two hours

Abilities to be developed

- To use the proper tools properly
- To structure the information
- To structure a Web site content by using HTML **table** or **div** element
- To know the steps for developing a feed-back Web page
- To process the information collected through a Web form, by using PHP language
- To make plan

TIP

Collecting feed-back through a Web form is a good exercise for the beginners in learning PHP language.

Content related aims

Intermediate level knowledge about using HTML (*HyperText Markup Language*) and CSS (*Cascading Style Sheet*) in the Web design technology, and beginner level for using PHP (PHP: Hypertext Processor) for processing a Web form information

Kind of activity

Collaborative and individual

Material supplied

- The software (Macromedia Dreamweaver or HTML Kit)
- Guide to use software
- Web space

Product

A Web page for collecting feed-back from the visitors

Outline of the activity

- Teacher outline the HTML `<form>`, `<input>`, `<textarea>`, `<select>` elements usage, taking as example the Web form depicted in Figure 6
- Also, teacher explains the mechanism of running PHP scripts on the server, with the result published on the client browser.
- There are discussed the structure of the Web page, by using a `<table>` or `<div>` HTML element, the dimensions of the support table
- The teacher coordinates students for creating the HTML structure of the document, which shall be filled with the corresponding information
- The teacher explain the significance of the `<form action="processing.php" method="post">` element and attributes
- When complete each table cell with form elements, the teacher emphasize the role of the "name" attribute for generating PHP variables inside the **processing.php** file
- After the Web form is finalized, the teacher build together with the pupils the processing.php file, in which the content filled by a user in the form is used for building a string variable, which shall be written inside a file (stored on the server), and also it shall be sent by e-mail to the Web site owner.

Sample tasks:

1. Building a personal Web site by customizing a (free) Web site template

Task 1. Developing the personal blog, created on the <http://www.blogger.com>, by inserting, each week: personal news for friends and colleagues, useful Web addresses for attended disciplines, or for interest domains, news from the education world, from the faculty secretariat or professors, etc.

Objectives:

- To be able to communicate interest news about himself/herself to the colleagues and friends
- To be able to select interest news from education world for himself/herself, and also for the colleagues and friends
- To be able to insert images and to format the textual content inside his/her personal blog

TIP

In order to learn Web design, it's crucial to develop yourself some Web sites.



Task 2. Developing the personal Web site, by customizing a Web template. Illustrating, through this site, a certain part of his/her personality: place of provenience, knowledge background (very important for the students and pupils at the beginning of a learning stage, when they have new colleagues and teachers), interests, hobbies, photos, and CV.

Objectives:

- To underline a himself/herself interpretation, a personal personality profile (the simple enumerations are forbidden, all the information must be provided in a captivating manner)
- To pay attention to the details (how could be interpreted this assertion about me?)
- To find the proper Web design techniques for expressing a certain message (proper photos, proper formatting, proper page organization)

2. Building a simple HTML/CSS presentation

Task 1. Developing a presentation Web site for a certain scientific theme, on which the students have to made a paper at a certain discipline (for example, Sorting Algorithms, or IPoetry, or Ancient Egypt Pyramids, or Astronomic Phenomena, etc).

Objectives:

- To structure the information for being presented on the Web
- To search for some interesting pictures that could enrich the site
- To develop a **HTML/CSS** presentation, on a certain topic
- To improve the usage of **HTML/CSS** elements, and of some Web authoring tools (Macromedia Dreamweaver or HTML Kit)

3. Building a simple Web form, processed in PHP

Task 1. Inside his/her personal, each student shall include a Web form, by asking from the visitors impressions about his/her site, or about a certain interest topic.

Objectives:

- To compose questions about a certain interest topic
- To include them inside a Web form
- To collect the responses

ASSESSMENT

Sample evaluation criteria:

1. Building a personal Web site by customizing a (free) Web site template

Sample evaluation criteria:

- Well-distributed information inside the Web site section
- A clear message transmitted by the site about himself/herself
- The same design for all site pages, with the hyperlinks functioning properly
- The customizations made on the Web template
- Defining all the formatting properties inside a CSS file

2. Building a simple HTML/CSS presentation

Sample evaluation criteria:

- Well-structured information on the site topic
- Keeping the same design for the entire site, with the hyperlinks functioning properly
- The presentation of the information properly
- Defining all the formatting properties inside a CSS file

3. Building a simple Web form, processed in PHP

Sample evaluation criteria:

- Formulating questions in a properly manner for be exposed inside a Web form
- The design of the Web form
- Collecting and accessing the results

TIP

The assessments are modalities to evaluate your knowledge, and also to learn how to improve your competences.

CONCLUSION

Developing a Web presentation is a quite complex task, involving some important milestones: well understanding the target group needs, well selecting and organizing the material, designing the Web presentation according to the general site style and to the target group profile, respecting the Web design principles, and also continuous improving and updating the presentation. The users must find something interesting at each visit, for having reasons to coming back.

TIPS & HINTS

It must be remembered that the *content* of a Web page is the most important thing: it must to have something to say in order to publish it! There are many noise full Web pages that say nothing... Also, as in oral or written presentation, it must be considered that the same thing could be “said” in many ways: as Web design style, and as ideas formulation. For testing the appropriateness of the Web presentation, is strongly recommended to ask the opinion of some other Web designers, and also, of some persons compatible with the target group.



TIP

Each book constitutes a practical experience. A genius shall keep his fame only if continuous improve his experience.

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PART
2.3

WORKING-ON-A-PROJECT SKILLS

INTRODUCTION

We all know what a project is – do we? Turner defines a project as [Turner 1993] ‘an endeavour in which human, material and financial resources are organized in a novel way, to undertake a unique scope of work, of given specifications, within constraints of cost and time, so as to achieve beneficial changes defined by quantitative and qualitative objectives’. In other words,

- it aims to create a unique product or service,
- it develops in a limited period of time,
- it has well-defined objectives,
- it has a precise starting and end dates;
- it has to be carried out according to predefined conditions of quality and cost [Chambers & Forth 1995].

Other aspects usually qualify a project:

- it is characterised by temporariness with respect to the ordinary work and aims of the organisations taking part in the project;
- it is innovative in organisation practice;
- it requires the integration, harmonisation and re-orientation of pre-existing resources and knowledge;
- it is independent, at least to some extent, from ordinary practice.
- finally, it generally constitutes a group activity.

Taking into account this fact, in the following, we will use the expressions *project* and *team project* indifferently.

A project can involve many sites (that is physical locations where people work for the project) in parallel, and it can be carried out at international level: research and development projects are usually transnational. In production projects, an example is the design and development of an information system developed in India and having customers in US [Evaristo & Fenema 1999].

A growing number of organisations choose project activity as a flexible structure to develop products and services [Schindler & Eppler 2003]. This happens in many sectors: medicine, engineering, ICT, science, education, and so on, and by a variety of types of organisations: business, education and training, research, services, ... [Chambers & Forth 1995]. Also the wide use of ICT facilitates project structure and its evolution according to different types (from local to distributed, from single to multiple ones).

This trend has an important consequence, that is, there is an increasing need for students to develop project working skills, with different roles and responsibilities [Yuan, Benson and Glick 1994], [Denton 1996], [Tan & Phillips 2003]. These abilities must be a part of the knowledge

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formation process in any topic of interest. Thus, teaching and learning process must be organised aiming to develop project working skills, together with learning specific contents and methods.

Skills for working in a team project

Working in a project, and being able to take different roles and responsibilities, requires to be an effective team player, so, skills needed for working in a team are also needed for working in a project (see Figure 1). In addition, project leading skills are needed to play the role of manager.

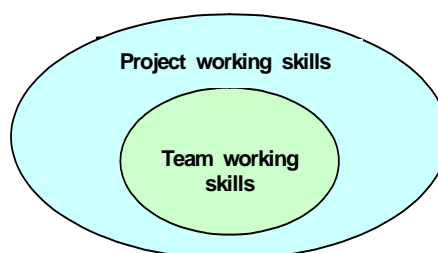


Figure 1. Skills requirements for managing and working in a team project

Abilities involved in managing a project are of different nature [El-Sabaa 2001]:

- social and personal,
- conceptual and organisational,
- technical;

and they refer to [Brill, Bishop & Walker 2006].

- expertise in different fields,
- personal characteristics.

Figure 2 shows an integration of the two visions.

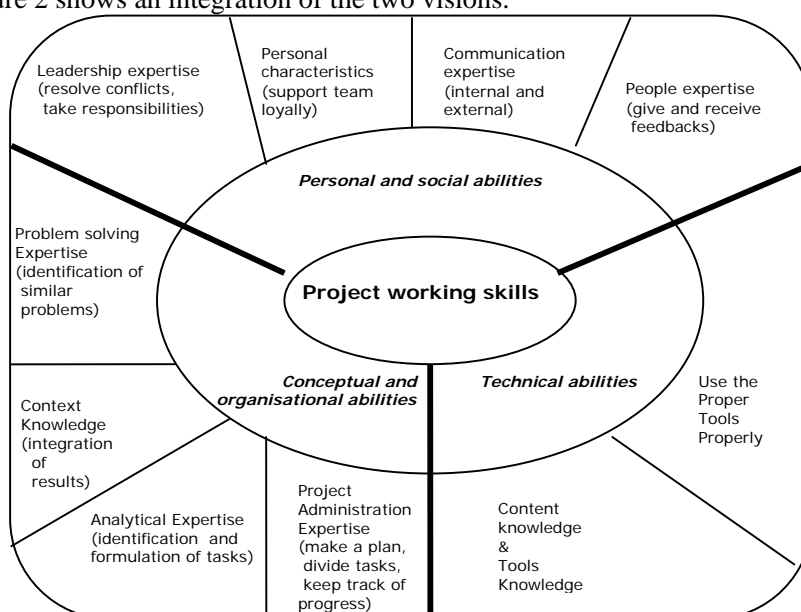


Figure 2. Skills requirements for project managing

Social and personal abilities allow individuals to work more effectively in groups. They include team-working skills, such as capability of communicating internally, and externally, to give and receive feedback, to resolve conflicts, to support the team loyally, to take responsibility.

Conceptual and organisational abilities refer to “planning, assessing, and making choices and decisions concerning how to proceed with people or things, and judging or evaluating the result produced by self or others” [Ray 1989]. They include identification and formulation of tasks, making a plan, division of tasks, keeping track of progress, integration of results, and so on. Moreover conceptual abilities often involve the identification of similarities and differences of situations, that is discovering, learning and using methodologies apt for solving a set of similar problems [Heckman 1998].

Technical abilities include knowledge on the specific content, general knowledge about the tools to be used and knowledge about the context. The outcome of such technical abilities is to be able to use the proper tools properly. Examples of technical abilities are: programming in a specific language, using a particular application (i.e. a given knowledge management system) or platform.

PREPARATION

In Part 1 of this guide we already observed that an active approach to learning [Keyser 2000] improves the learning achievements, because it reinforces motivations, and permits to control the input of information. This facilitates reinterpretation in term of pre-existing knowledge, and emphasizes a dialog between learner and teacher, driven by the needs of the learner [Norman 2004].

An active approach implies, in our case, to devise stimulating activities, so the learner is obliged to extend his-her project working abilities. It also requires working methods, contexts and tools suitable to develop activities at various levels of complexity: this should help in taking into account the different students’ backgrounds and interests, and in orienting them towards concrete results.

To be effective, the project proposal should [Barak 2006]:

- be related to the context in which learning takes place,
- provide opportunities for social knowledge construction,
- promote reflective practice.

ELABORATION

In our view, a project is organized in four phases (see Figure 7):

- *planning* the project (i.e. setting the problem: clearly define the objectives, the resources needed to reach them, cost and time, identify and formulate tasks, their priorities, time for development, integration),
- *executing* it (i.e. solving the problem: divide the tasks, monitor the execution, communicate internally and externally, integrate the various results and activities, keep track of the progress by

- adjusting time, resources etc.. depending on the needs, use the proper tools properly);
- *reporting* the results (i.e. explaining the solution relating it to the initial objectives: write a report and organize a presentation).
 - *Evaluation* must be done in parallel, in order to adjust choices if needed, and to check the adherence of the work to the requirements.

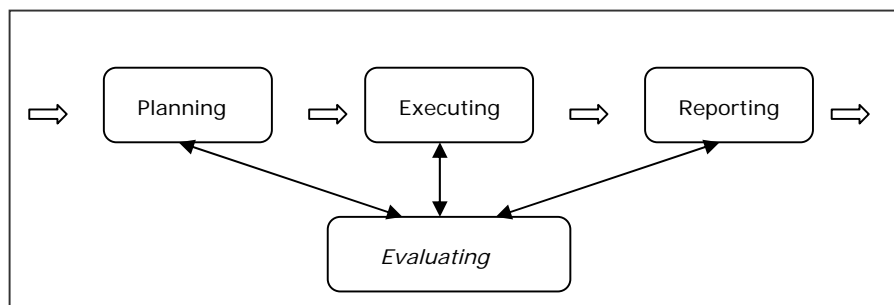


Figure 7. Project phases

To help students learn project working skills, activities should be prepared to:

- make them practice with tasks involved in all these phases;
- help them to become aware of the meaning, within a reference context, of the tasks proposed;
- support them in reflecting on the practice.

Table 1. Types of scaffolding, related examples and tools

Scaffolding type	Examples	Tools
<i>Motivational Scaffolding</i> Supports motivation, self-confidence, ...	-Presentation of the activity and of its objectives -Examples already developed	Personal feedback Careful classification of the activity with respect to the abilities involved <i>Opportunity to access repositories of examples and problems already solved</i> <i>Electronic mail</i>
<i>Procedural scaffolding</i> Support to the proper use of resources and tools	-Introductory explanation of tools to be used, meaning and opportunities of their use -Activities dedicated to practice with tools	Guides/help to the use of the electronic tools provided <i>FAQ service</i> <i>Electronic mail</i>
<i>Cognitive Scaffolding</i> Support to reasoning and to the construction of perspectives on a project/problem, identification, formulation, organisation of tasks	Manipulation and analysis of a problem from different points of view: - Guidelines to the organisation of a problem in subtasks - Exercises aimed to evaluate the effect of a choice on other choices - Exercise aimed to help to find out resources Questions aimed to orient a group activity regarding the structuring of a project	<i>Simulation tools</i> <i>Calculation instruments</i> <i>Electronic communication tools</i> <i>Discussion lists</i> <i>Search tools</i>
<i>Metacognitive Scaffolding</i> Supports self-regulation, control, monitoring and evaluation	In-progress exam of the work carried out Guide work to: -Analysis of the material at disposal -Integration of different solutions to similar problems -Integration among different parts of the same problem -Self-evaluation and peer review -Comparison between different solution proposals	<i>Simulation tools</i> <i>Presentation tools</i> <i>Calculation instruments</i> <i>Systems for document management</i> <i>Electronic communication tools</i> <i>Discussion lists</i> <i>Portfolio</i> <i>Cahier de board</i>
<i>Strategic Scaffolding</i> Supports planning, organisation and work control and integration of results	Planning complex activities/projects	<i>Knowledge management tools (including documents, agenda, news service, group management))</i> <i>Group management software</i>

Table 2 shows, for each phase of a project, examples of students' possible activities and the supporting role that should be played by teachers.

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ICT can greatly help to enhance the learning of project working skills, for the following reasons:

- *Effective working tool.* ICT links the school to the outside world, thus constituting a motivating tool [Rekkedal 1998].
- *Communication opportunities.* Technology makes it possible to maintain contact between teacher and students. At the same time, the physical distance naturally gives students more independence from the teacher. Technology helps in leading students to acquire autonomous working capabilities. Synchronous and asynchronous communication tools, possibly paired with knowledge management tools, help in accessing the experience of others, and in collaborating to the creation of a shared product.
- *Knowledge access and sharing.* The fundamental skills in setting a problem are those already seen in the previous chapter on Information skills, such as: to search for, to find, and to recognise useful sources of information, critically analyse and compare them, and choose those that are relevant to the objectives. This kind of activity is encouraged by the availability of the Web for seeking material that can be re-used by the students.
- *Knowledge management.* Knowledge management tools allow people to create, access, discuss knowledge produced by peers, with a limited technological effort. Thus, they facilitate active involvement, shared production and reflection on artefacts. The opportunity given by these kinds of systems to keep track of the history of an artefact (i.e. its versions, the discussions on it, the information about people involved, etc.), represents a further learning occasion, allowing to operatively reflect on the evolution of a product.
- *Team work organisation.* Planning and organisational activities are considerably simplified and improved by tools such as electronic calendar, automatic notifications of news, etc ... These tools act as scaffolding for group activities, as they help in monitoring work development, and allow all group participants to control the situation, thus preventing misunderstandings and encouraging active involvement.
- *Problem solving.* Computer based support systems (such as simulation system, diagnostic tools, ...) allow to devise and compare different scenarios without wasting time, and without putting cognitive effort on repetitive activities (such as carry out computations, manually look for similarities in different situations). This allows to focus attention on the educational activity at hand (for example, evaluating the effect of a decision on a project parameter on another one, without wasting time in calculations and drawings).

Examples of the scaffolding role that can be played by ICT in the learning of project working abilities are shown in Table 1 (Column 3, in italics). Table 3 relates ICT tools to abilities that can be enhanced through their use, and provide examples of problems focusing on such abilities.

In order to fruitfully exploit ICT opportunities, the teacher should provide suitable support, for the following reasons [Reiser 2004]:

- The use of ICT tools, (i.e. the web) helps in forming self-regulated learning and metacognitive abilities. However, some kind of self-

regulation in learning and metacognition is needed in order to fruitfully use the tools themselves.

- Students are not always used to electronic communication tools for learning and working. Moreover, personal characteristics can prevent from an active involvement in tasks that requires distant discussions. Finally, it is difficult to evaluate the effective participation of students to this kind of activity.
- ICT tools create, at least at some extent, cognitive overload with respect to a given task, as students have to learn to use such tools effectively.



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Table 2. Examples of activities aimed at the learning of project working abilities and supporting role of teachers

	Students' activity	Teacher role
Planning	<ul style="list-style-type: none"> - Brainstorming - Role-Play - Analysis of various material - Articulated projects 	<ul style="list-style-type: none"> - To suggest theme to work out, based on the learners' interests - To engage a discussion - To monitor the activity - To give help on demand - To operatively encourage and monitor the use of electronic communication - To ask learners to organise the work and take over the management of the whole activity - To take part in the project (without management responsibility) - To give help on-demand - To prepare preliminary and gradual tasks for the students - To devise scenarios for the work to be carried out - To select proposals according to students previous knowledge and background
Executing	<ul style="list-style-type: none"> - Problem Solving - Management 	<ul style="list-style-type: none"> - To guide the learners' work by means of explanations, further material, etc.. - To monitor the learners' work - To solicit any work involved - To produce FAQ or personal support - To provide explanations on the ICT tools to be used - To verify students' ability to use the ICT tools - To ask learners to choose the program to use, from those available - To prepare preliminary and gradual tasks for the students - To set up and maintain the ICT tools - To provide operative examples of the use of tools in a number of situation
Reporting	Organising presentations and discussions	<ul style="list-style-type: none"> - To suggest possible tools - To produce guidelines, if needed
Evaluating	Self-evaluation Evaluation of others work	<ul style="list-style-type: none"> - To produce guidelines for peer evaluation - To provide tools and suggest activities for self-evaluation (questionnaire, portfolio indications, ...)

Table 3. Examples of abilities involved in project working, corresponding students activities and possible uses of ICT

	Abilities	Example problem	Computer tools
Planning	<ul style="list-style-type: none"> - To make a plan - To identify and formulate tasks - To divide tasks in subtasks 	<ul style="list-style-type: none"> - To preliminary discuss about the opportunity of organizing a web site to advertise an activity - To identify the decision process involved in the choice for or against a diesel car - To identify the tasks included in the planning and development of an advertisement 	Communication tools (email, chat, instant messaging) Web searching
Executing	<ul style="list-style-type: none"> - To use the proper tool properly - To keep track of the progress - To integrate results 	<ul style="list-style-type: none"> - To prepare a presentation of your activity at different technological levels - To plan (in group) the organisation of a meeting given the overall budget - To produce and publish the minutes of the meeting you have with your peers during the development of the project assigned to your group - To prepare (in group) an advertisement, as a result of the contribution of the individuals on the specific parts (content, description, illustration, format, ..) 	<ul style="list-style-type: none"> - Simulation environments - Graphic manipulation tools - Word processing - Web searching - Web pages development tools - KMS
Reporting	<ul style="list-style-type: none"> - To integrate results - To present results 	<ul style="list-style-type: none"> - To prepare a report on the work carried out by your group, using as a basis the individual reports of the specific parts - To prepare a presentation 	Electronic presentation tools
Evaluating	<ul style="list-style-type: none"> - To analyse a work with respect to fixed objectives - To adjust a work according to the changes of the context 	<ul style="list-style-type: none"> - To prepare a presentation of the activity you carried out in the course highlighting difficulties, problems, methods adopted to overcome them - To prepare a reasoned sitography on a topic of your choice - To analyse the project realised by a group of your peers and comment the work 	<ul style="list-style-type: none"> - KMS - Application software

Sample scenarios

Scenario 1: Exploring and evaluating web based educational software

Title: Exploring and evaluating web based educational software		No 1
Author: P.Forcheri, G.Dodero	Country: Italy	Language: English
Description (300-400 symbols)*: A software company produces a web application, oriented to secondary schools. The application consists in a collaborative environment, built around a repository of learning objects. In order to evaluate validity of the application, a prototype has been constructed and filled with contents taken from modern Italian history (1860-1914), and a group of students has to carry out the evaluation of the interface for the functionalities offered.		
Age: 18	Duration: 12 hours (4 hours online)	Subject(s): ICT and modern Italian history
ICT enhanced skill(s): see table below		
Active learning method(s): project working		
Learning objectives: Improved knowledge of events in modern Italian History Operative knowledge about ICT collaborative environments		
<ul style="list-style-type: none"> - Prior knowledge and skills: - WEB (Basic knowledge). - Modern Italian history (1860-1914) 		
<ul style="list-style-type: none"> - Results/Products: - Report on the evaluation by each team - History group homeworks - Synthesis of the discussion among all teams 		
Process:		
Task 1 Introduction to software for history	Milestone 1	
Task 2 Exploration of the Environment	Milestone 2	
Task 3 Preparation of homeworks	Milestone 3	
Task 4 Collective discussion and evaluation	Milestone 4	
Tools: Web Laboratory with access to the software		
Resources: List of history topics The software Guide to the use of the software Guidelines for carrying out the evaluation Evaluation form List of questions for history homeworks		
Student Assessment: separate group assessment for ICT and for history		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- X ability to determine the relevance of an information source
- X ability to search systematically by applying relevant searching techniques
- X ability to locate and retrieve information
- X ability to evaluate information
- X ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- X ability to make a planning
- X ability to identify tasks and divide tasks into subtasks
- X ability to communicate internally
- X ability to communicate externally
- X ability to keep track of the progress
- X ability to integrate results
- X ability to report results
- X ability to use the proper tools properly

Team working skills:

- X ability to communicate internally
- X ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- X ability to resolve conflicts
- X ability to support the team loyally, as a good colleague
- X ability to bear responsibility

Outline of the tasks and milestones:

Task 1:

Brief introduction of the application, carried out by the teacher of ICT. The resources are given to the students and the students divide in groups of 3. The teacher of history gives a list of possible topics to be explored (e.g. Giolitti's government; role of the Popes; effects of the death of King Umberto I)

Milestone 1: each group selects a topic and makes own schedule of work to be done

Presentation skills

Written presentation

- X ability to select and order information
- X good command of the language
- X ability to structure and build up a report
- X ability to lay-out a report
- X ability to make correct references and citations
- X ability to use a word-processor properly

Oral presentation

- X ability to select and order information
- X fluency in the language
- X ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- X ability of public speaking

Task 2:

Free exploration of the application, under the teacher supervision, for each group. Different level of guidance can be provided. Students can exploit the opportunity for communication offered by the system to discuss and ask for help from peer and from the teacher/supervisor.

Milestone 2: each group has collected materials on the selected history topic and has experienced the system.

Task 3:

Each group completes the evaluation form for the application. The history teacher adds specific questions to be answered, as homework.

Milestone 3: Delivery of the evaluation form and the history homework.

Task 4:

Discussion, guided by the ICT teacher, aiming to compare the results and point out drawbacks and advantages of the application. The history teacher leads a separate discussion for history.

Milestone 4: Summary of the evaluation agreed upon by all groups; group assessment for history.

Scenario 2. Projecting and building a household budget

Title: <i>Projecting and building a household budget</i>		No 2
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Description (300-400 symbols): An activity focused on spreadsheet, supervised by the teacher, aimed at being used in the introduction of spreadsheets concepts and tools. The activity is centered on the following problem: "A young family needs to keep expenses under control, as it intends to buy a house, thus would need to know the flow of expenses in order to see if it is possible to limit them. Thus, it decides to build a household budget". Build such a budget and comment it.		
Age: 15	Duration: About 10 hours, plus the time needed to report on the artefact produced	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method(s): problem based learning		
Learning objectives: Improve basic knowledge about worksheets and about (basic) functionalities of a specific spreadsheet program Introduce and analyse the budget concept		
Prior knowledge and skills: Worksheets and functionalities of a specific spreadsheet program (basic knowledge) Budget concept (basic knowledge)		
Results/Products: The household budget Report on the work done		
Process:		
Task 1 Introduction of the budget problem as a decision problem	Milestone 1	
Task 2 First planning of the budget	Milestone 2	
Task 3 Analysis of some functionalities of a spreadsheet program and development of the budget	Milestone 3	
Task 4 To develop the report on the work done	Milestone 4	
Task 5 Comparison of the result with the expected outcomes	Milestone 5	
Tools: Personal Computer, spreadsheet program, word processor		

Resources: A spreadsheet application Guide to the use of the software Template to build the report
Student Assessment: Students' observation Reports (including the budget) Oral presentation of the work

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

Outline of the tasks and milestones:

Task 1:

Introduction to the overall work, carried out by the teacher: what is a budget, a budget w.r.t. its use, etc. Some examples (from different realities and with different aims) worked out.

Milestone 1: to focus the work requested.

Task 2:

Brief introduction of the specific problem. Overall discussion (brainstorming) aimed to support students in indicating items and approaches to the budget definition.

Milestone 2: to develop the plan of the budget.

Task 3:

Exam of the sheet and detailed analysis of the calculation. Selection of the appropriate functionalities of the application software (spreadsheet) and development of the budget.

Milestone 3: Each group develops (by successive refinements) the budget with the spreadsheet program, under the teacher guide or supervision.

Task 4:

Development of the description of the work done, of the choices made and of the difficulties faced executing the previous tasks

Milestone 4: Each group summarizes the steps of the work.

Task 5:

Oral presentation of the budget. Analysis of the correspondence of the budget scheme proposed to the problem requisites.

Milestone 5: The class compares the artefacts produced by the various groups with the requirements of the reference situation. Possible changes of the different solutions are devised.

Sample tasks:

Tasks for Scenario 1

Title: Introduction to software for history		No 1
Author: P.Forcheri, G.Dodero	Country: Italy	Language: English
Used in scenario: <i>Exploring and evaluating web based educational software</i>		
Description: Brief introduction of the application, carried out by the teacher of ICT. The students divide in groups of 3. The teacher of history gives a list of possible topics to be explored		
Age: 18	Duration: 1 hour	Subjects: ICT and history
ICT enhanced skill(s): see below		
Active learning method: Project based learning		
Learning objective: To select the working method according to context		
Prior knowledge and skills: Modern Italian History (1860-1914)		
Type of work*:	X group	
Result / Product: A plan for future work is agreed upon		
Process: <ul style="list-style-type: none"> ➤ The group selects a topic from the list provided by the history teacher ➤ The group makes a plan for future work and divides roles and responsibilities (when to use the software, who will fill in the evaluation form, who will collect the history material,...) 		
Tools (Hardware & Software): None		
Resources: List of history topics		
Student Assessment: Self-assessment by the students, who evaluate own possible behaviour in a context, analysis of advantages and drawbacks of each choice, interest in specific history topics.		

ICT Enhanced skills

Project working skills

- X ability to make a planning
- X ability to identify tasks and divide tasks into subtasks

Team working skills:

- X ability to communicate internally
- X ability to bear responsibility

Title: Exploration of the environment		No 2
Author: P.Forcheri, G.Dodero	Country: Italy	Language: English
Used in scenario: <i>Exploring and evaluating web based educational software</i>		
Description (100-300 symbols)*: Free exploration of the application, under the teacher supervision, for each group.		
Age: 18	Duration: 4 hours	Subjects: ICT and history
ICT enhanced skill(s): see below		
Active learning method: project based learning		
Learning objective: Improved knowledge of events in modern Italian History Operative knowledge about ICT collaborative environments		
Prior knowledge and skills: WEB (Basic knowledge).		
Type of work*:		X group
Result / Product: each group has collected materials on the selected history topic and has experienced the system (collecting printed pages and own notes)		
Process: Students schedule 4 hours in the lab and freely explore the system. They can select and print material. The ICT teacher or a supervisor is available to provide information upon request. Students may cooperate and communicate with peers and teachers within the environment itself.		
Tools (Hardware & Software): Lab with web access and the software already installed		
Resources: The software Guide to the use of the software Guidelines for carrying out the evaluation Evaluation form		
Student Assessment: self assessment about effectiveness of the tool to solve the history homework		

ICT Enhanced skills

Information skills

- X ability to evaluate information
- X ability to determine the relevance of an information source
- X ability to search systematically by applying relevant searching techniques
- X ability to locate and retrieve information

Project working skills

- X ability to communicate internally
- X ability to communicate externally
- X ability to keep track of the progress

X ability to use the proper tools properly

Team working skills:

- X ability to resolve conflicts
- X ability to support the team loyally, as a good colleague
- X ability to bear responsibility

Title: Preparation of homeworks		No 3
Author: P.Forcheri, G.Dodero	Country: Italy	Language: English
Used in scenario: <i>Exploring and evaluating web based educational software</i>		
Description: Each group meets to complete the evaluation form for the software and to make a history homework on the selected topic		
Age: 18	Duration: 8 hours	Subjects : ICT and History
ICT enhanced skills: see below		
Active learning method: project based working		
Learning objectives: Improved knowledge of events in modern Italian History Operative knowledge about ICT collaborative environments		
Prior knowledge and skills: having explored web based resources about history and collected materials from them		
Type of work:	X group	
Result / Product: Evaluation form History homework.		
Process: The group meets and reviews what was done in the lab The evaluation form for the software is discussed, and is filled with agreed upon statements The history questions are examined, and the printed material is used to answer them.		
Tools (Hardware & Software): A PC with word processing features to prepare the two documents, one per teacher/subject.		
Resources: The history teacher gives specific questions to be answered, as homework.		
Student Assessment: self asesment at group level, controversial points have to be mediated, and agreed upon answer have to be provided to the teachers		

ICT Enhanced skills

Information skills

- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Project working skills

- ability to integrate results
- ability to report results

Team working skills:

- ability to communicate internally
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague

Title: Collective discussion and evaluation		No 4
Author: P.Forcheri, G.Dodero	Country: Italy	Language: English
Used in scenario: <i>Exploring and evaluating web based educational software</i>		
Description (100-300 symbols)*: The ICT teacher and the history teacher summarize the results of group activities and give assessment to the students		
Age: 18	Duration: 1 hour	Subjects: ICT and history
ICT enhanced skills: see table below		
Active learning method: project based learning		
Learning objectives: Improved knowledge of events in modern Italian History Operative knowledge about ICT collaborative environments		
Prior knowledge and skills: WEB (Basic knowledge). Modern Italian history (1860-1914) having explored web based resources about history, collected materials from them, and having done ICT and history homeworks		
Type of work: <input type="checkbox"/> group		
Result / Product: Summary of the ICT evaluation agreed upon by all groups; history group assessment for homeworks		
Process: -- The ICT teacher guides a discussion, aiming to compare the results and point out drawbacks and advantages of the software. A student collects all relevant forms to prepare a collective summary. -- The history teacher leads a separate discussion for assessing the homeworks about history.		
Tools (Hardware & Software): spreadsheet/ graphics tools (to prepare the summary)		
Resources: Template for evaluation summary;		
Student Assessment: ICT group assessment for the evaluation activity group assessments for history homeworks		

ICT Enhanced skills

Presentation skills

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability of public speaking

Tasks for Scenario 2

Title: <i>Introduction of the budget problem as a decision problem</i>		No 1
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Used in scenario(s): Projecting and building a household budget		
Description (100-300 symbols): Introduction to the overall work, carried out by the teacher: what is a budget, a budget w.r.t. its use, etc Some examples (from different realities and with different aims) worked out		
Age: 15	Duration: 2 hours	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method: Problem based learning		
Learning objective: To present a reference situation To focus the problem		
Prior knowledge and skills: Budget concept (basic knowledge)		
Type of work: <input type="checkbox"/> individual <input checked="" type="checkbox"/> group		
Result / Product: to focus the work requested		
Process: Students have to understand the overall working context, intervening with questions Discussion on the examples with respect to the problem they focus on		
Tools (Hardware & Software): none		
Resources: Examples of real budgets		
Student Assessment: none		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

Title: <i>First planning of the budget</i>		No 2
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Used in scenario(s): Projecting and building a household budget		
Description (100-300 symbols): Brief introduction of the specific problem. Overall discussion (brainstorming) aimed to support students in indicating items and approaches to the budget definition.		
Age: 15	Duration: 2 hours	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method: Problem based learning		
Learning objective: To order and select information To select the meaningful variables To define the structure of budget		
Prior knowledge and skills: Budget concept		
Type of work: <input type="checkbox"/> individual <input checked="" type="checkbox"/> group		
Result / Product: the plan of the budget to develop		
Process: Students have to take part into the discussion, take notes about possible alternatives and summarize alternatives. The class divides in groups of 3-4 persons. Each group has to select the meaningful variables according to a number of different views. The group has to write an outline of the structure of the budget and of the steps that have to be followed to prepare a spreadsheet accordingly.		
Tools (Hardware & Software): Personal Computer, word-processor		
Resources: none		
Student Assessment: Students' observation		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

Title: Analysis of some functionalities of a spreadsheet program and development of the budget		No 3
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Used in scenario(s): Projecting and building a household budget		
Description (100-300 symbols): Exam of the sheet and detailed analysis of the calculation. Selection of the appropriate functionalities of the application software (spreadsheet) and development of the budget		
Age: 15	Duration: 4 hours	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method: Problem based learning		
Learning objective: To develop the budget by using the appropriate functionalities of the spreadsheet		
Prior knowledge and skills: Spreadsheets and functionalities of a spreadsheet program (basic knowledge)		
Type of work: <input type="checkbox"/> individual <input checked="" type="checkbox"/> group		
Result / Product: the budget		
Process: Students have to learn/revise about calculations involving variables and translate the problem in data of the worksheet in 'readable' and usable form Each group develops (by successive refinements) the budget with the spreadsheet program, under the teacher guide or supervision.		
Tools (Hardware & Software): Personal Computer, spreadsheet program		
Resources: A spreadsheet program Guide to the use of the software		
Student Assessment: Students' observation and evaluation of the budget		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

information

- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

Title: <i>To develop the report on the work done</i>		No 4
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Used in scenario(s): Projecting and building a household budget		
Description (100-300 symbols): Development of the description of the work done, of the choices made and of the difficulties faced executing the previous tasks		
Age: 15	Duration: 2 hours (homework)	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method: problem working		
Learning objective: to report the process followed		
Prior knowledge and skills:		
Type of work: <input type="checkbox"/> individual <input checked="" type="checkbox"/> group		
Result / Product: the report		
Process: Each group summarizes the steps of the work		
Tools (Hardware & Software): Personal Computer, word-processor		
Resources: Template to build the report		
Student Assessment: Reports (including the budget)		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

Title: <i>To compare the result with the expected outcomes</i>		No 5
Author(s): P. Forcheri, M. T. Molfino, E. Busetti	Country(ies): Italy	Language: English
Used in scenario(s): Projecting and building a household budget		
Description (100-300 symbols): Oral presentation of the budget. Analysis of the correspondence of the budget scheme proposed to the problem requisites.		
Age: 15	Duration: 2 hours	Subject(s): ICT and Mathematics
ICT enhanced skill(s): see table below		
Active learning method: Problem based learning		
Learning objective: To check the correspondence of the product to the reference situation. To verify the appropriateness of the use of the spreadsheet program.		
Prior knowledge and skills: Spreadsheets and functionalities of spreadsheet program (basic knowledge) Budget concept (basic knowledge)		
Type of work: <input type="checkbox"/> individual <input checked="" type="checkbox"/> group		
Result / Product: Modifications to the budget proposed, if needed		
Process: Each group presents its work to peers and discuss with them the results. The class compare the artefacts produced by the various groups whit the requirements of the reference situation. Possible changes of the different solutions are devised.		
Tools (Hardware & Software): Personal Computer, spreadsheet program		
Resources: The budgets carried out A spreadsheet program Guide to the use of the software		
Student Assessment: Reports (including the budget) Oral presentation of the work		

ICT Enhanced skills

Information skills

- ability to determine an information problem
- ability to determine the relevance of an information source
- ability to search systematically by applying relevant searching techniques
- ability to locate and retrieve information
- ability to evaluate information
- ability to process information effectively, in order to reach a preset goal
- ability to use the information ethically and legally

Project working skills

- ability to make a planning
- ability to identify tasks and divide tasks into subtasks
- ability to communicate internally
- ability to communicate externally
- ability to keep track of the progress
- ability to integrate results
- ability to report results
- ability to use the proper tools properly

Team working skills:

- ability to communicate internally
- ability to communicate externally
- ability to give feedback
- ability to receive and utilize feedback
- ability to resolve conflicts
- ability to support the team loyally, as a good colleague
- ability to bear responsibility

Presentation skills

Written presentation

- ability to select and order information
- good command of the language
- ability to structure and build up a report
- ability to lay-out a report
- ability to make correct references and citations
- ability to use a word-processor properly

Oral presentation

- ability to select and order information
- fluency in the language
- ability to structure and build up an oral presentation
- ability to design an oral presentation
- ability to make correct references and citations
- ability to use a presentation tool properly
- ability of public speaking

Web presentation

- ability to select and order information
- good command of the language
- ability to build up a web presentation
- ability to design a hyper structure
- ability to make correct references, citations, and links
- ability to use a web publishing tool properly
- ability to select and use multimedia

ASSESSMENT

Evaluation, in constructivist approach to education, is a quite delicate problem, as it requires the analysis of the overall learning process, not only of its result. In our case, evaluation is carried out during the overall activity, constitutes an integral part of it, and aims to produce learning.

From the above considerations, and for the need of a formal evaluation usually required by the education environment, assessment can be carried out integrating two approaches:

- the first one, mainly based on qualitative methods and self-evaluation, aimed to support students to reflect on their learning process and to produce new learning (Authentic evaluation);
- the second one, based on qualitative/quantitative methods, aimed to evaluate the product with respect to given standards.

Sample evaluation criteria:

In the following some evaluation criteria will be outlined, referring to the kind of activity indicated

Scenario 1. Exploring and evaluating web based educational software

Sample evaluation criteria (for ICT based evaluation):

- Quality of the report:
 - o Adherence of the work reported to the work requested
- Quality of the presentation of the work done
 - o Brief description of the system
 - o Comments on the evaluation of system
- Critical analysis of the system
 - o Possible advantages
 - o Possible drawbacks
 - o Comparison with other (non –ICT based) methods
- Note that the history homework may be evaluated using the first two of the above criteria, not the third.

Case 2. Projecting and building a household budget

Sample evaluation criteria:

- Overall organisation of the budget
 - o Quality of the choice
 - o Quality of the explanation
- Discussion and motivation of the choices for the items
 - o Quality of the choice
 - o Quality of the explanation
- Use of spreadsheet
 - o Complexity of the structure of the artefact with respect to the task
 - o Adequacy of the functionalities chosen
 - o Quality of the functionalities used
 - o Efficiency of the choices

CONCLUSION (SUMMARY)

Teaching and learning ICT enhanced project working skills is a complex task, as it asks both teacher and student to acquire a new habit; moreover, it takes time and effort, thus requiring, at least at some extent, a different organisation of the educational context. Starting from an analysis of project working skills, we suggested tasks aimed to support their development. Then, we described some possible use of ICT as a means to enhance their development. We also detailed some activities, based on the use of ICT, analysing tasks involved, objectives, products and evaluation.

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PART
2.4

WORKING-IN-A-TEAM SKILLS

INTRODUCTION

Informal interactions within small groups of students are popular and natural. Students have always gathered to practice and study. Nowadays it is commonly believed that combining interaction within groups with individual work through cooperation should be an integral part of any educational process.

Learning may be structured within the spirit of **competitiveness**, but also within the system of **individual work** and **cooperation**. While all of the three structures are required for an effective educational process, the structure of cooperation should definitely dominate in the classroom.

The most important advantages of teaching via cooperation is the fact that³ it develops critical and creative thinking, shapes a positive attitude towards the school subject as well as the school as a whole, it boosts up group interaction and social skills. Last, but not least, it allows students to build up their own assertiveness.

In addition to this, teamwork develops personal abilities. Group tasks help students develop responsibility and facilitate practicing specific skills, which are very useful in students' professional carriers.

PREPARATION

Moreover, such abilities as: team working, leadership, the ability to think analytically and to employ this type of thinking in problem solving, formulating questions, critical interpretation of the material and evaluation of the others' work, cooperation in handling conflict situations, solving such situation, accepting intellectual criticism, flexibility, the ability to negotiate and compromise, and finally organizational and time management skills are developed by team work.

It is amazing what can be accomplished when nobody cares about who gets the credit.

Robert Yates

Two elements must be stressed as most vital for learning through team work: **group aims orientation** and **individual responsibility**.

The following factors constitute key organizational elements:

- The size and composition of the group.
- The choice of team members.
- The function of the group.

³ Thousan, J., Villa A., Nevis (Eds), Creativity and Collaborative Learning, Brookes Press, Baltimore, 1994

- Working out appropriate standards of teamwork.
- Group skills.
- Aims and tasks of the group as well as roles assigned to its particular members.

SOCIAL SKILLS

Aside from technical proficiency, a variety of social skills are required for successful teamwork⁴. Social skills are skills used in interaction and communication with others to assist status in the social structure and other motivations⁵. Social skills include communicating, listening, questioning, self-assertion, participating, negotiation, persuading, respecting, helping, counseling and sharing⁶.

THE FOUR ASPECT OF TEAM DEVELOPMENT

Team formation is a process. A useful identification of four stages of team development may be quite applicable⁷:

- **Forming** — at this stage the team is formed and each team member's main strength, assignment of roles and responsibilities are determined.
- **Storming** — at which stage members become aware of their differences and try to determine the way of cooperation.
- **Norming** — when the group comes to agreement on its function.
- **Performing** — where the structure of the group, its norms, and behaviors are finally accepted.

ELABORATION

Group exercises are usually time-consuming. If we are to use scenarios of exemplary tasks in order to create and develop basic group work skills, it is advisable to preserve thematic continuity of subsequent tasks. Therefore, in order to do the first task, the group of participants must be divided into four teams, which subsequently consolidate their efforts: in the second task the teams blend, in the third - they form two teams and in the fourth one all the teams work on one issue.

A well designed problem should be presented in the task and it should allow the students to work out independent and opposing versions which may be combined into one final and commonly reached solution. This ambivalence leads to creating natural situations in which students are able to practice all of the basic skills of group work: problem solving, team working, leadership, conflict resolution, change, personal impact.

⁴ <http://en.wikipedia.org/wiki/Teamwork>

⁵ http://en.wikipedia.org/wiki/Social_skills

⁶ <http://www.oup.com/uk/booksites/content/0199253978/student/glossary/glossary.htm#S>

⁷ Tuckman, B. W., Developmental sequence in small groups, *Psychological Bulletin*, 63, 348-399, 1965

ESSENTIAL QUESTION

The concept of essential questions creates an appropriate basis for formulating a useful problem task. Of the two operational goals of essential questions, to **make a decision** or **plan a course of action**, we will be most interested in the latter one.

Essential questions are questions that probe for deeper meaning and set the stage for further questioning, foster the development of critical thinking skills and higher order capabilities such as problem-solving and understanding complex systems. A good essential question is the principle component of designing inquiry-based learning.⁸ After you get experience writing essential questions, you will become a more competent researcher.⁹

The essential question directs the course of student research. As such, essential questions are powerful, directive and commit students to the process of critical thinking through inquiry. Ultimately, the answer to the essential question will require that students craft a response that involves knowledge construction. This new knowledge building occurs through the integration of discrete pieces of information obtained during the research process. Answers to essential questions are a direct measure of student understanding.¹⁰

None of us is as smart as all of us.
Ken Blanchard

The essential question put forward in the first task should have two options, two characteristic view points, apparently opposite, but in reality complementary. These viewpoints will be combined in the fourth task.

The questions may be as follows:

- ***How is conflict an inevitable part of relationships?***¹¹
- ***Do personal qualities help or hinder the formation of relationships?***
- ***How do I find traditional and electronic sources that can help me solve problems?***¹²

Many other interesting options of questions may be found on the following websites:

- <http://www.greece.k12.ny.us/instruction/ela/6-12/Essential%20Questions/culture.htm>
- <http://www.biopoint.com/eq/page1.html>
- <http://www.fno.org/nov97/toolkit.html#anchor173647>
- <http://www.gen.bham.wednet.edu/essenque.htm>

⁸ http://mathstar.nmsu.edu/exploration1/unit/content_questions.html

⁹ <http://www.biopoint.com/ibr/askquestion.html>

¹⁰ http://www.myprojectpages.com/support/ess_questpopup.htm

¹¹ <http://www.greece.k12.ny.us/instruction/ela/6-12/Essential%20Questions/culture.htm>

¹² <http://www.ncpublicschools.org/nccep/lp/lp2.html>

Sample Task:

Teamwork role assignment — Problem solving task based on essential question

(Software used: Skype)

Introduction: The first group exercise should identify the key roles, which the participants are to assume. In addition to this, as a result of the exercise the students are to identify the most important problems with implementation of group work they may encounter especially in the IT environment.

Implementation: The group of participants must be divided into four teams (if the number of team members is smaller than three or four students, there may be fewer teams). Each team is to work on one of the initially selected problems. Two teams are to justify the positive aspects of the problem task and the two remaining teams must work on its negative aspects. Each of the members must fulfill his own role in the team. A team leader must also be appointed. The leader must create a discussion group in **Skype** and invite his team members to discuss in order to work out a common stance.

The attempt to solve a problem using a communicator, which may be **Skype**, puts the participants in a situation in which communication skills are hindered by synchronic communication carried out by means of IT tools. The task must be formulated in a manner, which creates a problem situation resulting from different outlooks of the team members.

Results: The materials prepared in the course of this exercise may be presented in the form of a **PowerPoint** presentation.

Examples of problems:

- *What „should” inspire artists?*
- *How can we use the power of language to change the world?*
- *Why the term „literacy” should not only pertain to the ability to read and write?*
- *If contemporary science was to focus on merely four areas/ directions/ tasks, what would they be?*
- *Which rights and obligations are common for all of the countries in the world and which are country-specific.*
- *Must we have wars?*
- *What is the road to success?*
- *To be famous*
- *To be wise*
- *To have good connections*
- *To be rich*
- *To steal*
- *To study*
- *To do nothing*

- *To be lucky*
- *Can you achieve success on your own?*
- *A group success or an individual one?*
- *What is success?*
- *What are the types of success?*
- *Why do we need success?*
- *Planned success or accidental success?*
- *Can anybody be successful?*
- *When is it impossible to become successful?*

TASKS, FUNCTIONAL ROLES AND INTERACTION CHANNELS IN THE TEAMWORK

Integration of soft skills during teamwork constitute channels of interaction, which can be:

- **Communication** — communicating, listening, questioning;
- **Negotiation** — self-assertion, persuading, respecting, counseling;
- **Participation** — commitment, capability, helping, sharing;
- **Organization** — procedure, preparation, progress, leadership.

To achieve teamwork goals, specific tasks needed for problem solution need to be shared by team members. Those tasks are as such¹³: initiation, setting a goal, coordination, monitor of progress, seeking for information or opinions, clarification, summarization, decision planning and pushing, troubleshooting, diagnosing, evaluation.

Following those tasks and channels in terms of teamwork – Each task need to be controlled by separate team member thus constituting teamwork roles. These functional roles help the group to function as a team and to achieve its goals. In fact, depending on the size of a team and specifics of the task, each team member can adopt one or more functional roles, which can be:

- Facilitator
- Analyst
- Task Tracker
- Writer
- Recorder
- Graphics
- Vizualizer
- Archivist

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<http://www.dlsweb.rmit.edu.au/eng/beng0001/learning/teamwork/extdoc/team4b.html>

COMMUNICATION

Communication is the transmission of messages between a sender and a receiver using any of the senses, usually via a common system of symbols. There are many means of communicating and many different language systems. Communication is a fundamental component of social behavior.^{14,15}

Communication occurs in synchronic and non-synchronic mode. Not only teachers communicate with their students. Students must also be able to communicate with one another. In addition to this, we witness traditional forms of direct communication as well as the new type of communication taking place by means of electronic tools used in e-learning. Therefore, skilful use of communication shall vastly contribute to successful training.

Good communication constitutes the basis for good education. Communication is in fact the exchange of information between the person supervising the process of education (the instructor) and his students. In addition to this, information is also exchanged among students themselves.

Communication tools focus on spoken or written content and they cover receiving, storing and presenting messages usually in a written form but also in the form of audio and video messages.

COMMUNICATORS (INSTANT MESSAGING)

In recent years Internet chats have been making use of such „instant messaging” tools as ICQ, AIM, MSN, Jabber, Skype etc. These communicators are based on a different approach than the classical chat also called IRC (Internet Relay Chat) as the participants of conversations communicate with each other directly and not, as it used to be, via chat rooms.¹⁶

Instant Messaging is a tool of direct communication among the Internet users. This is a kind of Internet mail where communication takes place in real time and as such it resembles chat software. Instant Messaging require software, which can manage the communication service. The Internet service presents information about people from contacts list, called “Buddy list“, of a given software who are currently connected to the service, active or available.

Instant Messaging enable very efficient communication and co-operation. Although communication is instant, the participants are not obliged to reply instantly and thus the pace of conversation is not enforced as it is in the event of regular telephone conversation (which explains its popularity).

¹⁴ http://www.csa.com/discoveryguides/ebonics/gloss_f.php

¹⁵ <http://courses.bio.psu.edu/GenEd-Manual/GenEd-glossary.html>

¹⁶ Instant messaging, *Wikipedia, The Free Encyclopedia*, 2006, http://en.wikipedia.org/wiki/Instant_messaging

The user may add new people to his contact list by adding their e-mail address or their communication ID. If the participants are Online, their name will be listed as available for discussion. Clicking on the name of the user activates the chat window and texts of conversation are sent to the recipient.

The most popular Internet programs are: Qnext, MSN Messenger, AOL Instant Messenger, Yahoo Messenger, Skype, Google Talk, .NET Messenger Service, Jabber, QQ, iChat, ICQ. They are free of charge, however some offer additional opportunities at an additional fee.

SKYPE

Skype is a Instant Messaging Application, which has gained a lot of popularity in recent years as it gives access not only to written chats but also voice ones. It is a free tool of peer-to-peer audio-conferences. It belongs to VoIP (Voice Over IP) tools, which enable telephone conversations over the Internet. It also covers written communication similar to the one offered by Chat programs and communicators.¹⁷

Skype is based on p2p, which means that sound and text packages are not sent by the net and the central server, which distributes them further, but they are sent directly between users. Thus, it is a very simple and user-friendly communicator featuring a very well integrated VoIP functionality.

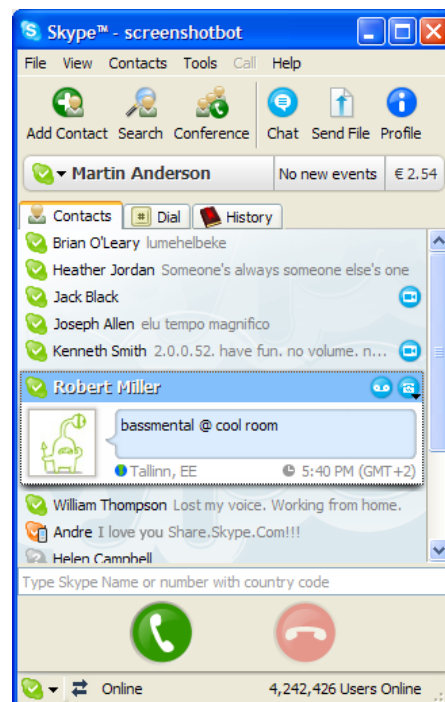
Moreover, Skype offers a service of combining Internet telephony with the fixed one. This, however, requires paying an additional fee, but as a result the users are able to enter into international and intercontinental conversations for the price of a local call.

Go to <http://www.skype.com/>, download the updated version of the program and install it according to the instructions presented on the screen. Once the program is started, do the task „log on to Skype” by setting up a new Skype account (if you choose the hyperlink „No Skype account?”)

Sample answers given by students in analysis of question

Sample Task:

Team working with concept mapping
(software used: Freemind)



¹⁷ Skype, <http://www.skype.com/intl/pl/>

Introduction: The second task allows for identification of a graphic evaluation of concepts and group work carried out by means of graphic representation in the form of a conceptual map. The topic of the exercise should constitute the continuity of the first task topic so that it would develop the acquired skills and outlooks.

Implementation: The same teams which worked on the first task are expected to prepare a graphic representation of the reached concept. **Freemind** is a free software which supports conceptual map making. Although it is not a software designed for cooperation on the net, it should serve the implementation of this task.

Results: The map of concept may be added to a **PowerPoint** presentation.

CONCEPT MAP

Concept map are analogous to idea map. They graphically illustrate relationships between concepts. Two or more concepts are connected by words, which describe their relations.

Concept map support understanding issues by helping pupils organize and expand their knowledge of the subject. They help to find out new information by building each new concept into the structure of knowledge they already have.

Concept map constitute an effective tool of evaluation the increase of knowledge. When students make maps of concepts, they transform the concepts they already have by means of their own words. If the connections the pupils make are incorrect, the teacher knows what the pupil have not understood and thus concept map constitute an objective and effective means of evaluation of concepts which pupils were not able to understand.

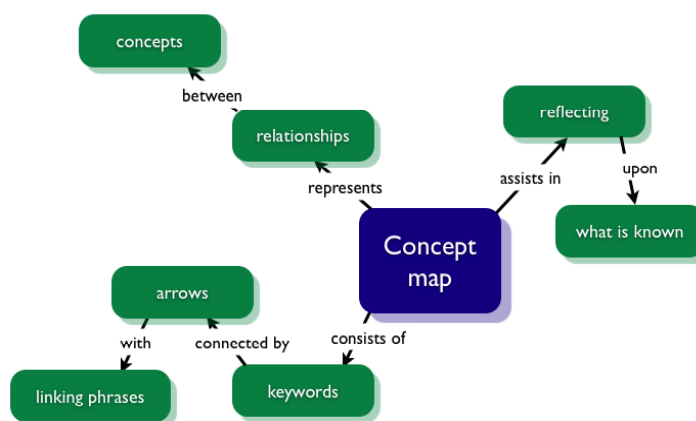


Figure 2. Example of concept map

Visit the FreeMind site: <http://freemind.sourceforge.net/Freemind-development.html> and download the file http://prdownloads.sourceforge.net/freemind/FreeMind-Windows-Installer-0_8_0-max.exe?download. Start the program and create a map.

Sample Task:
Innovative Teacher

Leadership and conflict resolution — Electronic Meeting System

(software used: LiveMeeting)

Introduction: Another task creates opportunities to enforce changes in the formerly prepared materials as in this task, different team members must cooperate. In each of the teams which worked on the materials in previous exercises, a team representative should be chosen. This person shall then discuss the solutions of his team with the other teams' members who, at this stage, join his team. Teams must be blended for this task (but only on the plane of "positive" and "negative" outlooks). In each of the original groups there must be only one member who will present the remaining materials.

Implementation: The application of an electronic meetings system, e.g. **Microsoft Office Live Meeting** or **Adobe/Macromedia Breeze**, makes it possible to present all of the prepared texts and graphic materials. The discussion with the new group should lead to presenting the reached conclusions in the form of texts, graphic conceptual maps as well as by supporting and justifying Internet materials. **PowerPoint** presentations prepared in previous tasks may be used during an electronic meeting. Sharing the application desktop will help the participants present conceptual maps prepared in the previous exercises. In the text window, texts may be introduced and shared whereas the electronic board will be used to visualize outlooks and plans. The system of voting may prove to be of great use as it allows deciding by way voting which of the conclusions should be final.

In this task, the four teams are combined into two: one consisting of the „positive" and one of the „negative" group members.

Results: All of the elements of the discussion must be prepared as a **PowerPoint** presentation.

GROUPWARE

In use there is classification of groupware consisting of four categories, according to when each is used, and where ¹⁸:

- **Same Time/Same Place.** (One of the most interesting Same Time/Same Place applications is electronic voting systems, such as OptionFinder. OptionFinder is a handheld remote hooked up via wires or wireless to a PC.)
- **Same Time/Different Place.** (This is technology that allows people to communicate simultaneously across distance.)
- **Different Time/Same Place.** (A Post-It note tabbed to the chair of the worker sitting at your desk during the shift after yours) single-site networking
- **Different Time/Different Place.** (Lotus Notes, a powerful messaging, planning and organizing tool)

¹⁸ <http://mfinley.com/bizbooks/teams/chapter30.htm>

COOPERATION

Social (Community) Software enables setting up meetings, communication and cooperation via the computer as well as creating an online community. It is believed that the above term does not refer to single type of software but to the application of numerous types of computer communications resulting in creating an online society¹⁹. In this context, Internet societies may combine the modes of one-to-one communication (e-mail or communicators), one-to-many (net sites, blogs) as well as many-to-many (wiki).²⁰

The communities are created according to a bottom-up mode which defines an open type participation. Joining the group is voluntary and the reputation is built up by gaining trust of the other members of the group of the community. The mission of the community as well as its implementation is defined by its members²¹. The above is the opposite of a top-down approach in which the roles are defined by external authorities who assign and define the accessibility to the community.²²

Tools used in the applications of community software are communication and cooperation tools. They usually include receiving, storing and presenting messages in written form; however currently more and more messages take the form of audio and video messages. Interaction tools facilitate interaction between pairs and groups of users. Communication tools focus on spoken or written content, whereas interaction tools focus on manners of expressing activities and presence. Such tools include the following applications of communicators: IRC, the Internet forums, Blogs, Wikis, community networks services, etc.²³

¹⁹ Social software , *Wikipedia, The Free Encyclopedia*, 2006,
http://en.wikipedia.org/wiki/Social_software

²⁰ Products & services, Collaboration tools,
<http://www.e-learningcentre.co.uk/eclipse/vendors/collaboration.htm>

²¹ Cultivating Communities of Practice: A Guide to Managing Knowledge
Wenger E.,
McDermott R., Snyder W., 2002

²² Collaborative Learning Activities Using Social Software Tools,
<http://www.writely.com/View.aspx?docid=ahh5gqp63qx4>

²³ Distance learning – Social software's killer, Terry Anderson, Athabasca University

WEB CONFERENCES

There are many other web-conferencing tools available which base on the VoIP idea. So far such conferences have been carried out as audio-conferences via telephone lines, which used to ensure a very good quality of transmission, yet was quite expensive and in some areas such services are still forbidden. Currently the following Internet solutions are available Voxwre, Orbitalk, Roomtalk.net, VCOM Central, WebConference.com, VoiceCafe. In addition to these, such companies as Lotus IBM SameTime and Microsoft Live Meeting²⁴ are available.

VIDEO CONFERENCES

Video conference, also known as video teleconference, constitutes a set of interactive telecommunication technologies facilitating interaction between two or more locations which is carried out on the principle of a two-directional simultaneous video and audio transmission. This is also called a Visual Collaboration.²⁵

Video conferences were also known at the times of radio telecommunication as well as the telephone transmissions such as ISDN. When the Internet became popular, a multitude of software for video conferences appeared. These include: NetMeeting, MSM Messenger, Yahoo Messenger, AOL Instant Messenger, Apple iChat AV, Skype, Webex and others.²⁶

This type of conference makes it possible for the students to participate in a two-way communication. Classes and lesson groups can be created and they consist of students from all over the world. Thus, students from various environments and of various social backgrounds can participate in the educational process. They can cooperate, research, communicate, analyze and exchange their outlooks and information. They can also take part in virtual excursions and do many other activities.²⁷

GROUP WORK

Cooperation software, also known as groupware is a computer application which integrates the work on one projects implemented simultaneously by many users working on separate computers. The

²⁴ Spielman S., Winfeld L.,
The Web Conferencing Book: Understand the Technology, Choose the Right Vendors,
Software, and Equipment 2003

²⁵ Rhodes J., Videoconferencing for the Real World: Implementing Effective Visual Communications Systems, 2001, Focal Press

²⁶ Wetteroth D., Instant Messaging Demystified 2002

²⁷ Peter P., Barlow L., Smart Videoconferencing: New Habits for Virtual Meetings
by Janelle Barlow, 2002

very first application of this type was the popular LotusNotes by Lotus Software working in combination with LotusDominoServer.²⁸

The **group** work and cooperation software may be included in one of the three groups²⁹:

- Tools for electronic communication facilitate the exchange of information by enabling users sending messages, files, data and documents. These tools include email, electronic mail, communicators, faxes, voice mail and WWW publications.
- Tools for electronic conferences allow for a more interactive manner of exchanging information. The most popular forms are teleconferences and video conferences but recently new technologies have emerged.
- Data conferences, which allow for the connected computers to share the board on which each of the users may write and add their information to the shared image.
- Systems of electronic meetings give access to conference rooms equipped with big screen projectors connected to many computers, discussion forums and chat rooms where users may exchange text messages.
- Tools for managing cooperation are simple tools of group activity.
- Electronic group calendars allow for planning meetings and events for many users and their alarm systems automatically remind the group members of the events.
- Data Flow and Work Flow Systems are used to manage tasks and documents.
- Project Management Systems are used to create the schedule of the project and trace the implementation of its stages.
- Content and Knowledge Management Systems help collect, organize, manage and exchange information in numerous formats.

²⁸ Groupware, *Wikipedia, The Free Encyclopedia*, 2006,
<http://en.wikipedia.org/wiki/Groupware>

²⁹ Lipnack J., Stamps J., *Virtual Teams: Reaching Across Space, Time, and Organizations With Technology*, 1997

MICROSOFT OFFICE LIVE MEETING

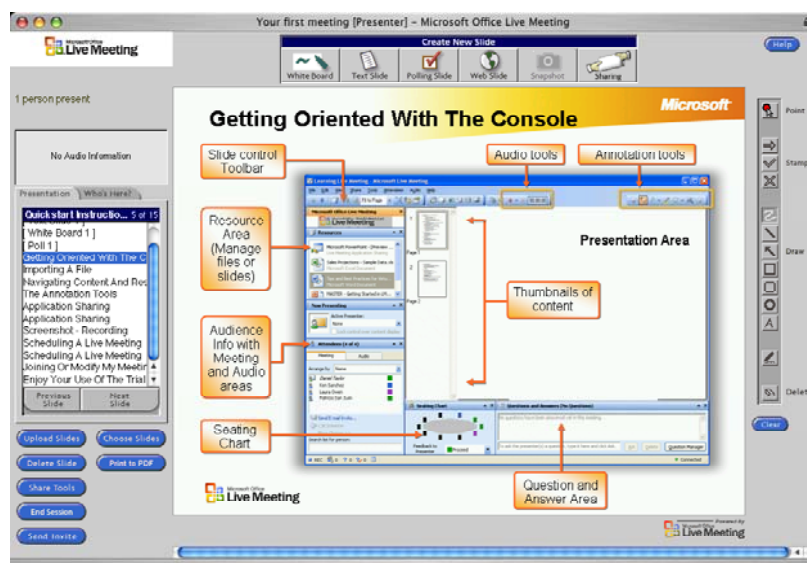


Figure 3. Microsoft Office Live Meeting window

Microsoft Office Live Meeting System offers six typical elements of conference systems.

- **Sharing the application desktop** allows to remotely present the content of the desktop and thus to present the application and the operation of computer applications.
- **Electronic board** – allows for sharing the board on which each of the participants of an Internet meeting may write, draw and exchange information;
- **„Web touring”** – or touring the net allows to share the window of the browser and share the information found on the Internet;
- **Sharing the text window** enables writing and co-writing texts. This opportunity is also created by text chat,
- **Questionnaire and voting** allows to send and share screens.
- In addition to the above, the software also contains a very useful function of importing **PowerPoint** presentations.³⁰

Visit the product site <http://www.microsoft.com/uc/livemeeting/default.aspx>, using the bookmark try Live Meeting software, which is free of charge for 14 days.

ADOBE/MACROMEDIA BREEZE

Breeze has been designed for online presentations, it gives access to PowerPoint slides, it allows for playing and presenting audio and

³⁰ Winters F.J., Manchester J. T., Web Collaboration Using Office XP and NetMeeting, 2002

video live as well as viewing Flash presentations and sharing the screen in real time.³¹

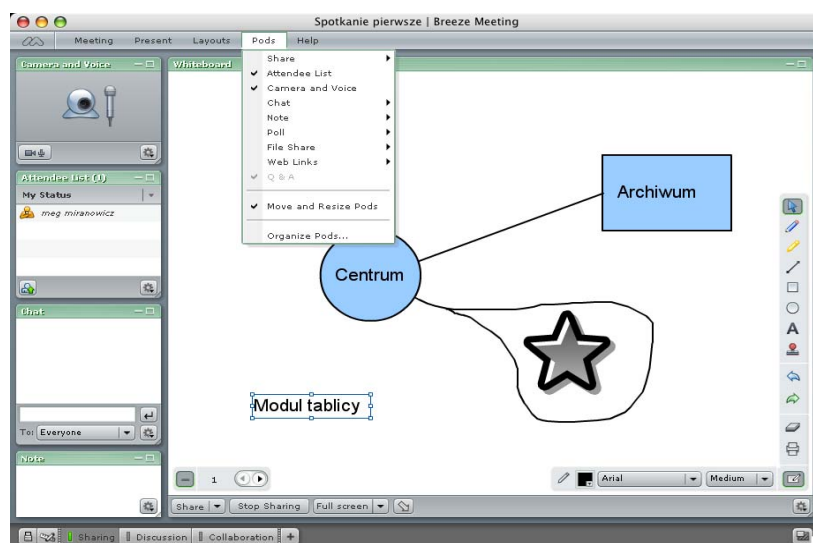


Figure 4. Adobe/Macromedia Breeze window

Visit the product site <http://www.adobe.com/products/breeze/>, using the bookmark try the software free of charge for 15 days.

Sample Task:

Teamwork and change

(software used: Wiki)

Introduction: The task dealing with problem solving must be based on these products and materials worked out by the students to which the students are most emotionally attached. Thus, the participant's decision will be one of "loss and gain" nature. Here we are aiming at creating a quite realistic, yet fairly safe conflict situation which will have to be solved by the participants using their team work skills.

Implementation: In this task all of the teams should combine their efforts and cooperate on one final material which will have to reflect the opinion of the team on the task under discussion. If **Wiki** is used at this stage, the students are required to decide on the most effective work division.

Results: All of the elements of the discussion must be put together in a form of a **PowerPoint** presentation in order to represent the agreed approach towards the whole of the subject.

WIKI

Wiki is a simplified process of creating HTML websites as it registers each change introduced. Therefore the work may be undone at any time and the original site may be restored. Wiki may also contain

³¹ Macromedia Breeze, <http://www.adobe.com/products/breeze/>

many other tools designed for the users for trouble free monitoring the current design of Wiki. Moreover, it features sites for discussion and solving problems such as various outlooks of authors on the content presented there.³²

Wiki is an Internet site, which may be relatively easily edited. This means that anybody may edit, change and delete texts. The examples of the above are Wikipedia, Wikitionary and Wikisource.

WIKI SOFTWARE

A type of collaborative software that runs a Wiki system is called „**Wiki software**“. Wiki software is usually implemented as a server-side script, which typically allows creation and editing of web pages with the use a web browser. Content is generally stored in a relational database management system³³.

Most popular Wiki engines are: UseMod, TWiki, MoinMoin, PmWiki and MediaWiki (a list of wiki engines is available at <http://c2.com/cgi/wiki?WikiEngines>).

Sample Task:

Defining personal impact of teamwork - ePortfolio

(software used: ePortfolio)

Introduction: The final task is of a reflexive nature allowing to use the concept of **ePortfolio**, which allows each of the participants to independently identify his/her role played in the team, their personal input and the result of their work.

Implementation: Each of the participants of the previous tasks may present their own conclusions on concrete examples of the discussed methods and roles they identified in the form of texts or electronically.

Results: The materials and conclusions may be issued in the form of **ePortfolio**, a **PowerPoint** presentation or in an web presentation form.

E-PORTFOLIO

„Portfolios, in education and personal or professional development, are collections of documents and other objects that can be shown as evidence to support claims a person makes about what they know, what they have achieved, and what they can do.

³²Ebersbach A., Glaser M., Heigl R., Dueck G., Wiki : Web Collaboration, 2005

³³ http://en.wikipedia.org/wiki/Wiki_software

As for e-portfolios, a common starting point is that they are simply electronic versions of physical portfolios that contain digital objects instead of physical objects. „³⁴

ePortfolio (electronic portfolio, e-portfolio, digital portfolio) is collection of electronic documents that demonstrate skills, education, professional development of the person that owns/prepared it as well as the benefits he/she offers to a target reader³⁵.

e-Portfolios are understood as personalized, web-based collections that include: **selected evidence** from coursework, **artifacts** from extra-curricular activities, and **reflective annotations** and commentary related to these experiences³⁶.

The process of development of e-Portfolio activates students and encourages them to be involved in planning and responsible for achieving their own educational goals. It is done by sharing examples of their work, mastering information technology skills, and demonstrating knowledge, skills and attributes gained³⁷.

Three main goals of ePortfolio are represented in three types of ePortfolio ³⁸:

- A **developmental** ePortfolio — is meant to be a record of personal development process.
- A **reflective** ePortfolio — presents personal reflection on the content and it's meaning.
- A **representational** ePortfolio — shows the personal achievements in context of particular work.

³⁴ <http://www.jisc.ac.uk/index.cfm?name=myworld>

³⁵ <http://en.wikipedia.org/wiki/EPortfolio>

³⁶ <http://css.its.psu.edu/news/nlfa02/Featurepages/Evidence.html>

³⁷ <http://eportfolio.psu.edu/about/index.html>

³⁸ http://www.bde.enseiht.fr/~hansn/portfolio_en.php

CONCLUSION

Teaching ICT-enhanced presentation skills is a complex task and learning to be a better presenter than you have been takes the joint efforts of teachers and learners.

The difficulty is due to the fact that there are no strictly defined criteria for something that involves creativity and novelty. Your role as teachers is to contribute to creating an environment rich with ICT and traditional presentation tools and an audience which is critical with the noble intention to make the presenter much better and self-confident than he has been.

The tasks, the activities and the scenario offered in this section will support the development of presentation skills in all aspects (written, oral and web-based and their combinations). Guidance materials for making good presentations and avoiding bad ones are given in the Appendix on CD together with samples of evaluation forms.