



Innovative Teacher

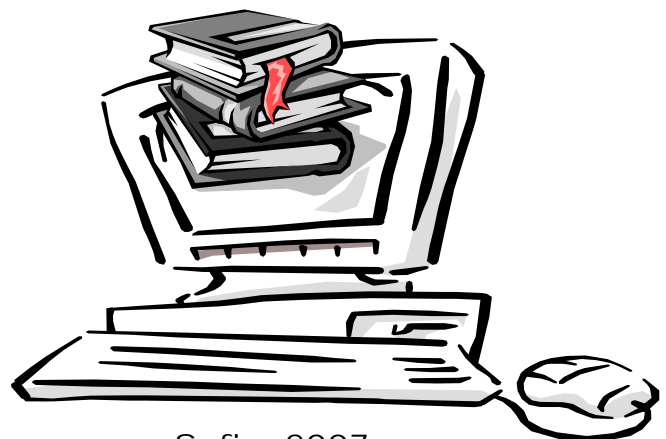
Leonardo da Vinci

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Methodology Handbook on ICT-enhanced skills

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Leonardo da Vinci
Pilot projects



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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 1

Innovative Teacher Style of Teaching

PART 1: Innovative Teacher Style of Teaching

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Innovative Teacher style of teaching

In this chapter:

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- *Active learning*
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- *I*Teach Methodology*

INTRODUCTION

Why is such a handbook needed

The aims and goals in secondary education stipulate that our pupils must acquire a variety of skills related to ICT. Since the eighties ICT has emerged in the classroom and in the personal lives of the pupils. That asks for general ICT skills, the first group of required ICT-skills. Pupils must have basic proficiency in file systems and file management, operating systems, office applications, and the web. In some European countries these skills are officially taught up to the level of the European Computer Driving License (see also <http://www.ecdl.com>).

The second group of the required ICT-skills is course-related and is embedded in the subject matter. You can think of solving quadratic equations in math, applying a mathematical ICT-program like Matlab or Mathematica. In geography pupils can use Geographical Information Systems, or demographic databases, or even Google Earth.

Modern education is increasingly based upon active and pupil centered learning. As a consequence of that active, independent learning style a special group of skills is becoming more and more important. These so called 'soft skills' are the abilities of pupils connected to the proper fulfillment of their active, independently executed learning tasks. We mention the four skills that we regard as most important 'soft skills': information searching skills, presentation skills, team working skills, and project working skills. It is an



interesting development that nowadays these ‘soft skills’ are also related with ICT, the third group of required ICT-skills. In the following we will focus on this third group of ICT-skills.

In the last decade the personal use of ICT by pupils has grown exponentially, at home, at school, at the library, at the internet café. And with that growth the need for the acquisition of the abovementioned three groups of ICT-related skills increased accordingly. The extent of ICT use may vary in the different European countries, the growth is enormous all over the continent. The acquisition of ‘soft skills’ in relation with ICT is the newest development in this respect.

In acquiring their ‘soft skills’, and in performing their tasks related to those soft skills, pupils are using ICT. So, the acquisition of soft skills, and the soft skills themselves, are influenced by the mere existence of ICT. The way ICT acts upon the soft skills is too important to neglect or to be left to self exploration by pupils. Educational professionals must now seize the opportunity to incorporate the proper use of ICT in the (acquisition of) soft skills. Thus the soft skills themselves will benefit from the ICT. Therefore, we will refer to those skills as *ICT-enhanced skills*.

The enhancement of the soft skill by the use of ICT can be threefold. In the first place the acquisition of the skill can be facilitated. The task is done simpler, easier, quicker. As an example you can think of the ability to write a report as a team. Without the proper use of a suitable ICT tool this is a tedious task. Assembling parts, annotations, peer remarks, different versions, lay out, all these very important aspects of collaborative writing are very difficult in a pen-and-paper world. The second possible enhancement is the possibility of deepening the performance of the skill. For instance, making a professional multimedia presentation with text, sound, images, movies, animations (collected from all over the world) is unthinkable without ICT. The presentation skill therefore can be deepened in performance by using ICT. And finally, the third enhancement is the chance (and challenge) to broaden the skill. With respect to the collaboration skill ICT offers the possibility to collaborate on an international and intercultural level which extends the possibilities of a classroom.

Profitable and proper use of ICT in ‘soft skills’, both in acquiring the skill and in fulfilling tasks related to the skill, doesn’t come easy. It requires a sound methodological approach. This handbook aims at offering that approach.



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The I*Teach project

In response to the identified needs for skills and competences relevant to the knowledge-based economy and the independent life-long learning the **I*Teach** (*Innovative Teacher*) project has been launched in the autumn of 2005 with the goal of developing a set of practical methodologies, approaches and tools targeted at day-to-day use by teacher trainers and teachers.

The project addresses the fourth call priority “*Continuous training of teachers and trainers*” in the Leonardo da Vinci programme Call 2005-2006.

It is expected that the results of the project will contribute to the practical acquisition of the *ICT-enhanced skills* as identified above by means of the most appropriate active learning methods. The idea behind writing this handbook was to offer practical methods and methodological tools for design, development, and use of:

- learning activities;
- learning assignment;
- assessment & evaluation methods.

for supporting students in building *ICT-enhanced skills* and competences.

Future work will be to relate the findings of the I*Teach project, and more specifically the developed scenarios, with the European Qualifications Framework (see for instance http://ec.europa.eu/education/policies/educ/eqf/index_en.html).

Which is the target audience

The book is addressed to:

- teacher trainers in ICT from universities and teacher training institutions (pre-service and in-service)
- teachers (both pre-service and in-service) in ICT-related subjects within vocational school settings, in specialised secondary schools (e.g. mathematical gymnasia), vocational training centres/ organisations, or HRD-departments in the business enterprises

Potential users are also teacher trainers and teachers in other subjects who are willing to apply ICT in their subject domains.

What is its goal

The goal of the handbook is to provide teacher trainers and teachers with a methodology about teaching and acquisition of the identified *ICT-enhanced skills* through offering them practices in designing and developing meaningful and motivational authentic learning scenarios (*projects, challenges, activities, assignments, and assessments*).

Teachers can use these scenarios in all different settings. In mandatory classes, where all pupils have to perform the tasks to acquire the desired skills, the methodology is very well applicable. But for optional classes, with possibly more interested pupils, the teacher can easily pick suitable scenarios and, if necessary, modify and adapt them to the specific needs of the pupils. As for other classes, like voluntary or remedial classes, the methodology offers appropriate clues, too.

The Methodological Handbook and the associated teacher training curriculum, software instruments, and online content repository of learning tasks and materials will hopefully promote innovative training opportunities to teachers and trainers both as new methods of teaching and learning facilitation of *ICT-enhanced skills*, and as training/learning delivery opportunities for their continuous professional development.

ICT-ENHANCED SKILLS

What were they and how were they identified

A wide audience of teacher trainers, pre-service and in-service teachers has been interviewed by a specially developed questionnaire, disseminated through an educational web-site (<http://www.informaticavo.nl>), via e-mail and by direct contact. The results have been analysed and summarised. The findings have been discussed with colleagues from Netherlands, Germany, Italy, Poland, Romania, Lithuania and Bulgaria and a conclusion has been reached for the existence of common needs throughout Europe, with regard to teaching and learning *soft skills* related to:

- information;
- presentation;
- working on a project;
- working in a team.

At the same time the acquisition of ICT skills could be interweaved in a natural way with the four mentioned above skills thus giving the notion of *ICT-enhanced skills* as it will be used throughout this handbook.

INFORMATION SKILLS

We call **Information skills**:

“The ability to collect and process the appropriate information properly, in order to reach a preset goal”.

The following *sub-skills* have been identified as necessary *for building Information skills*:

1. Ability to determine the information problem;
2. Ability to determine the relevance of the various information sources;
3. Ability to search systematically by application of relevant searching techniques;
4. Ability to localize and acquire the found information;
5. Ability to evaluate the found information and (if necessary) to readjust the search;
6. Ability to process the found information effectively, in order to reach the preset goal;
7. Ability to use the found information ethically and legally.

BY
“INFORMATION
SKILLS”
WE MEAN

The ability to collect and process the appropriate information properly, in order to reach a preset goal.



BY
"PRESENTATION
SKILL"
WE MEAN
Ability to present
information

PRESENTATION SKILLS

Under **Presentation skills** we understand:

"The ability to present information."

The following *sub-skills* have been identified as necessary *for building Presentation skill*:

1. Ability to order and select information;
2. Language proficiency;
3. Ability to build up a presentation;
4. Ability to design a presentation;
5. Ability to account for information;
6. Ability to use the proper tool properly.

Three **sub-domains** have been identified with specifics of the presentation skills.

- a. Written presentation;
- b. Oral presentation;
- c. Web presentation.

Here follows a specification of the presentation skills per domain:

Written presentation

1. Ability to order and select information;
2. Command of the language;
3. Ability to build up a report;
4. Ability to lay-out a report;
5. Ability to make correct references and citations;
6. Ability to use a word-processor properly.

Oral presentation

1. Ability to order and select information;
2. Fluency in the language;
3. Ability to build up an oral presentation;
4. Ability to design an oral presentation;
5. Ability to make correct references and citations;
6. Ability to use a presentation tool properly.

Web presentation

1. Ability to order and select information;
2. Command of the language;
3. Ability to build up an web presentation;
4. Ability to design a hyper structure;
5. Ability to make correct references, citations, and links;
6. Ability to use a web publishing tool properly;
7. Ability to select and use multi media.



WORKING-ON-A-PROJECT SKILLS

The following *sub-skills* have been identified as necessary *for building skills for working on a project*:

1. Ability to identify tasks and subtasks;
2. Ability to make a planning;
3. Ability to divide tasks;
4. Ability to communicate internally;
5. Ability to communicate externally;
6. Ability to keep track of the progress;
7. Ability to integrate results;
8. Ability to use the proper tools properly.

WORKING-IN-A-TEAM SKILLS

The following *sub-skills* have been identified as necessary *for building skills for working in a team*:

1. Ability to communicate internally;
2. Ability to communicate externally;
3. Ability to give feedback;
4. Ability to receive feedback;
5. Ability to resolve conflicts
6. Ability to support the team loyally, as a good colleague;
7. Ability to take responsibility.

The communication in 1 & 2: includes written and oral communication, face-to-face and virtual communication, intercultural communication, reports and short notes.

ACTIVE LEARNING

A selection of pedagogical theories, methodologies and practices for teaching Enhanced ICT-skills has been discussed both electronically and face-to-face by the *I*Teach* project partners. On that base **the active learning methods** have been identified as the most appropriate instructional approaches related to the effective teaching of the selected *ICT-enhanced skills*.

The definitions on the web include the following key-words related to active learning:

- Carefully constructed activities which range from groups of students discussing material during a calculated pause in a lecture, to **role-playing, case studies, group projects, and seminars**.
- It is about **learning by doing, performing, and taking action**. The action can be either mental (e.g. reflection) or physical (e.g. case study). It uses such devices as **games, simulations, introspection, role playing**.
- In active learning, students are much more actively **engaged in their own learning** while educators take a more guiding role. Related terms/concepts include: **experiential learning, hands on learning**.



- Systematic process of **reflection on action**, for the purpose of developing skills and competencies
- Active learning involves reading, writing, discussion, and **engagement in solving problems**, analysis, synthesis, and evaluation. Active learning is also known as **cooperative learning**

Why is active learning important

"I hear and I forget. I see and I remember. I do and I understand."
Confucius

IMPORTANT

In order to be actively involved *students should* not only listen but also *read, write, discuss, or be engaged in solving problems.*

Some cognitive research has shown that a significant number of individuals have learning styles best served by pedagogical techniques other than lecturing. As Chickering and Gamson (1987) suggests, in order to be actively involved students should not only listen but also **read, write, discuss, or be engaged in solving problems**. Most important, they should be **engaged in such higher-order thinking tasks as analysis, synthesis, and evaluation**. Using active learning techniques in the classroom is found vital because of their powerful impact upon students' learning. Several studies have shown that **strategies promoting active learning are superior to lectures in promoting the development of students' skills in thinking and writing**.

Developing skills, identified by the *I*Teach* project as Enhancing the ICT skills, is in harmony with objectives of active learning.

Methods of active learning promoting ICT-enhanced skills

PROJECT-BASED LEARNING

Project-based Learning (PBL) is a model of carefully designed learning activities that are long-term, interdisciplinary, student-centred, and integrated with real-world issues and practices.

The goal of a *project* (defined as an in-depth investigation of a topic worth learning) is to learn more about a topic rather than to seek the right answers to questions posed by the teacher. In PBL classrooms, students work cooperatively with their classmates over a sustained period of time to solve problems and ultimately present their work to an outside audience. This final project might be a multimedia presentation, a play, a written report, a web page or a constructed product.

Some powerful components of PBL include:

Relevance PBL provides learning experiences that involve students in complex, real world projects with which they develop and apply skills and knowledge. Course content is more meaningful because it is based on real world learning and students can look at their work in a way that is interesting to them.

Challenge PBL encourages students to solve complex, authentic problems. They explore, make judgments, interpret, and synthesize information in meaningful ways. Examples of such projects are: creating plans for an "ideal school," complete with curriculum, job descriptions, floor plans, criteria for hiring and rationales for each.



Motivation PBL recognizes that significant learning enhances students' innate desire to learn, their capability to do important work, and their need to be valued. When students have the opportunity to be in control of their learning, its value to them is increased. The opportunity for choice and control, as well as the chance to collaborate with their peers, also increases their motivation.

Interdisciplinarity PBL requires students to use information from several disciplines to solve problems. In almost every PBL enterprise, students work on assignments that link disciplines.

Authenticity PBL engages students in learning information in ways that are more like the ways adults are asked to learn and demonstrate knowledge. For example, real-world, authentic implications are clear when students complete an English assignment such as creating brochures that publicize their school.

Collaborativeness PBL promotes collaboration between students and between students and teachers; in many cases collaboration extends to the community. All disciplines recognize the importance of students working collaboratively as a means of enriching and expanding students' understanding of what they are learning.

Fun Students enjoy Project-based Learning! Teachers who use PBL talk about students who are eager to come to school.

Savoie and Hughes describe the PBL process in the following steps:

1. Identify a problem suitable for students.
2. Connect the problem with the students' world.
3. Organize the subject around the problem/project, not the discipline.
4. Give students the opportunity to define their learning experience and planning to solve the problem.
5. Encourage collaboration by creating learning teams.
6. Expect all students to present the results of their learning with a project or performance.

IMPORTANT

The importance of a project is the *experience* of doing it.

PBL is not an add-on, but an integral component of learning. As teachers increasingly instruct groups of children with different learning styles, diverse backgrounds, and varying ability levels, PBL offers a direct approach to learning that can help all students achieve. With roots in constructivism, PBL is grounded in the work of psychologists and educators such as Lev Vygotsky, Jerome Bruner, Jean Piaget and John Dewey. Constructivist learning is based on students' active participation in problem-solving and critical thinking regarding a learning activity that they find relevant and engaging. The groundwork is set for students to be in control of their own learning and to construct their own meaning from a wealth of sources. The pupil learns by thinking about problems and trying to solve them. The importance of a project is the *experience* of doing it, not the end result. As they say: *Teacher is guide on the side rather than sage on the stage*. The teacher and students provide formative evaluation and possibly with the help of others - the summative (final) evaluation.

You can find information on evaluating projects in the appendix and at the following site:

<http://tutor.petech.ac.za/EducSupport/examples1.htm>



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PROBLEM-BASED LEARNING

The *Problem Based Learning* is an individual or group activity that goes on over a period of time, resulting in a product, presentation, or performance. It typically has a timeline, milestones, and other aspects of formative evaluation as the project proceeds. The essence of problem-based learning is that it is a group approach encouraging a self-directed and independent learning. The approach is based on providing a problem or issue usually encountered in everyday organizational life. Students have a significant voice in selecting the content areas and nature of the projects that they do. They are expected to explore the nature of the problem, analyze the issues, and use relevant theoretical frameworks to research possible solutions, dilemmas and confusions. There is considerable focus on students understanding what it is they are doing, why it is important, and how they will be assessed. Indeed, students may help to set some of the goals over which they will be assessed and how they will be assessed over these goals. All of these learner-centered characteristics the *Problem Based Learning* contribute to learner motivation and active engagement. A high level of motivation and active engagement are essential to the success of this approach. You might ask: *What evidence do we have that increasing the emphasis on a lesson being student centered leads to better quality education?*

From the student point of view the *Problem Based Learning*:

- Is learner centered and intrinsically motivating.
- Encourages collaboration and cooperative learning.
- Requires students to produce a product, presentation, or performance.
- Allows students to make incremental and continual improvement in their product, presentation, or performance.
- Is designed so that students are actively engaged in "doing" things rather than in "learning about" something.
- Is challenging, focusing on higher-order knowledge and skills.



From the teacher point of view the *Problem Based Learning*:

- Has authentic content and purpose.
- Uses authentic assessment.
- Is teacher facilitated—but the teacher is much more a "guide on the side" rather than a "sage on the stage."
- Has explicit educational goals.
- Is rooted in constructivism (a social learning theory) and gives careful consideration to situated learning theory.
- Is designed so that the teacher will be a learner, learning from and with the students.

Schultz and Christensen (2004) state that this method involves seven major steps

1. Understanding the situation/clarifying the terminology/clarifying the concepts

The teacher and the group read the scenario/problem; the teacher then asks if any of the group do not understand any of the vocabulary in the scenario/problem.

2. Identifying/formulating the problem

The teacher asks the group to identify what they think the scenario/problem statement is about. At this stage, students may be clueless about the depth of the knowledge inherent in the statement but this will become clearer as the process continues. Some of the answers therefore may be naïve or ignorant but this does not matter. The educator must resist the temptation at this point of stepping in and offering any form of knowledge transmission!

3. Analyzing and brainstorming, suggesting possible causes (hypothesizing)

A brainstorm session is held to ascertain what is known (or is believed to be known) about the subject matter by any of the students at this point in time.

4. Systematic analysis of the problem, connecting problems with causes

Discuss the key issues that have been discussed. The teacher ensures that a clear list of what is known, what is unclear and what needs to be investigated in more detail is established. This is designed to help the group understand the issues surrounding the scenario/problem.

5. Deciding what type of information, ICT-enhanced skills, learning goals, and competencies are needed

The group agree on their learning objectives and the tasks that they will have to carry out before the next meeting.

6. Studying/task performing/obtaining information

Individual Study - members of the group collect the information identified in step 5. There is a choice of two routes here - either each student should tackle his or her own learning objectives, or each student covers all the learning objectives. The latter is more time consuming and may be off-putting for students and avoid inculcating the collaborative team based learning experience. However, the former option may result in gaps in an individual's knowledge and understanding. The teacher can provide a list of references to help guide students in their line of investigation.

5 ALMOST IDENTICAL CHARACTERISTICS

- The **problem comes first** - before any other information.
- The problem is **presented realistically**.
- Subject matter is **organized around problems** rather than disciplines.
- Students **drive** their own learning.
- Students **work in small group**.



7. Evaluation/result/Apply the information

The group meet for the second time. The Teacher asks to read out the learning objectives and each student has the opportunity to present their research to the rest of the group. It is suggested that this can be done either formally, i.e. in turn, or through questions.

This method is very similar to the Project-based Learning and was developed in the early 1970s in medical schools. Howard Barrows (1986), professor at the medical school of McMaster University in Canada, recognized that Dewey's theory could apply to his medical students who were frustrated with traditional lectures. Barrows developed a set of problems that went beyond traditional case studies: he required the students to research specific situations, develop appropriate questions, and come up with their own answers.

Main barriers for applying active learning

IMPORTANT

Each obstacle or barrier and type of risk, is worth overcoming.

Educationalists are aware of the common barriers to instructional change, including *the powerful influence of educational tradition; faculty's self-perceptions and self-definition of roles; the discomfort and anxiety that change creates; and the limited incentives for faculty to change.*

But certain specific obstacles are associated with the use of active learning including **limited class time; a possible increase in preparation time; the potential difficulty of using active learning in large classes; and a lack of needed materials, equipment, or resources.**

Perhaps the single greatest barrier of all, however, is the fact that the efforts of the teachers to employ active learning **involve the risks that:**

- students will not participate.
- students will not use higher-order thinking.
- students will not learn sufficient content.
- the teachers will feel a loss of control, lack necessary skills, or be criticized for teaching in unorthodox ways.

Each obstacle or barrier and type of risk, however is worth overcoming.



I*TEACH METHODOLOGY

THE IDEA

I*TEACH METHODOLOGY

Continuous, gradually accumulated experiences.

Students meet concrete **objectives** by performing **specific tasks** in different contexts.

Methodological framework –
Educational scenarios

The **I*Teach methodology** proposes is based on Project and Problem based learning methods.

The methodology idea is: to build ICT-enhanced skills is done through **continuous, repeatable and gradually accumulated experiences** and **expanded activities** leading to concrete **goals** by performing specific **tasks** in different **context**. The **goals** expected to work on some core skills and to be a **challenge** for the students and coming from a real live - **not just a problem** for somebody in the world. As in real life necessary skills to go to the final goal are complementary. That is why the idea of methodology is that ICT-enhanced will be build interwoven during the path to the goal.

The I*Teach methodology tries to find **the balance** between the full freedom (involving the risk of being lost in the jungle) and the full direction (following your master by leash and not being let to explore the environment).

Educational scenarios are foreseen as a **methodological framework**.

SCENARIO

SCENARIO

A composition of tasks

- In the **context of an active learning environment**
- Leading the students to a general **goal** (producing a specific product)
- Via a **path** (working/learning process) traced by **milestones** (intermediate objectives/stages of the product development)

The **scenario** is a **composition of tasks** in the **context of an active learning environment** leading the students to a general **goal (producing a specific product)** via a path (working/learning process) **traced by milestones** (intermediate objectives/ stages of the product development) (fig. 1).

The density of the milestones depends on the students' age and experience – the younger and less experienced the students, the bigger the number of landmarks :

- When I*Teach methodology is applied with smaller or less experienced pupils **milestones** could be established **frequently**.
- When I*Teach methodology is applied in class with bigger or more experienced pupils **milestones** could be established **rarely**.

The milestones are positioned by the teachers in such a way that the students could build a set of ICT-enhanced skills naturally interwoven with the predetermined teaching objectives. **At each milestone** pupils are expected to have **finished a concrete stage of the product development** and *mastered a concrete skill*. By passing along the set of milestones the students/pupils would hopefully build up a set of *ICT-Enhanced Skills* **naturally interweaved** with predetermined teaching objectives.

Certain fragments (phases and tasks) might split into branches – this corresponding to the flexibility of the students when choosing a way to achieve an intermediate milestone.



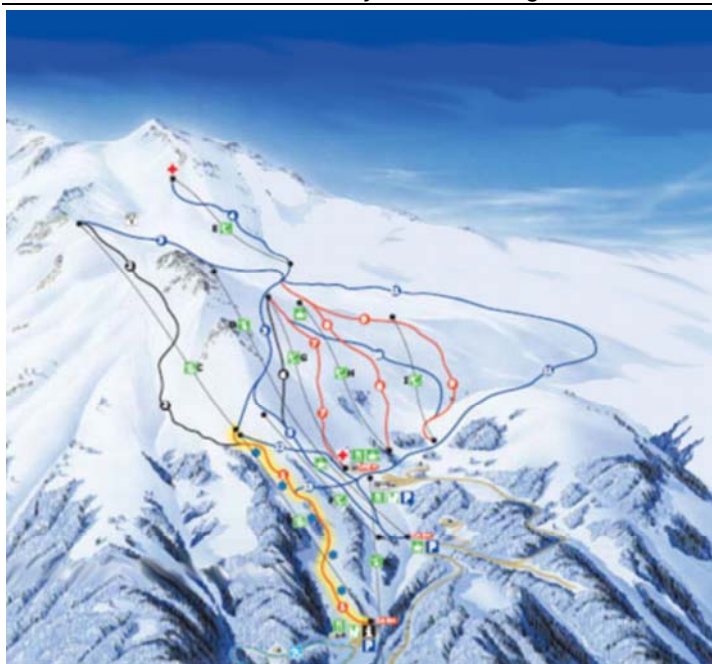


Figure 1 The *I*Teach* roadmap metaphor (source of picture: <http://www.skivitosha.com>)

TASK

TASK

- **Building elements** of a **scenario**
- Working on **concrete skill(s)/sub-skill(s)**
- Ensuring **reusability** in different contexts

The **task** is a **building element of a scenario**. Performing concrete task student/pupil will **work on concrete skill(s) or sub-skill(s)**. Describing the scenario as composition of tasks ensuring **reusability in different contexts**.

Task is a sequence of activities with concrete outcomes.

Depending on age and experience of student/pupils:

- in case of work with smaller or less experienced pupils list of tasks could be spited in more activities (more detailed description of path which pupil should go).
- in case methodology is applied in class with bigger or more experienced pupils tasks could be in more activities (more detailed description of path which pupil should go).

HOW TO APPLY I*TEACH METHODOLOGY

To apply I*Teach methodology, first you need to apply active learning methods. In our view (see fig. 2):

- Learning situations should recall problems and methodologies adopted in **professional contexts**. Authentic tasks should be presented, combining two different approaches (see fig. 3):
 - tasks of interest for the students;
 - task allowing to connect with the extra-scholastic world.
- Activities should be **flexible** enough to allow their adaptation (to some extent) to different time needs, learning difficulties, abilities involved, This is needed for the development of project working abilities at different levels of complexity (see fig. 4)



- Activities should suggest **interdisciplinary** connections and collaboration, to be representative of actual project working, where usually it is required to integrate different capabilities and competences (see Figure 5).
- Suitable **scaffolding** should be provided, and should be adapted to the students' level of performance. Scaffolding is a metaphor introduced by constructivist researchers, and refers to the student-teacher interactions that produce learning [Wood, Bruner, & Ross 1976]. Scaffolding is related to Vygotsky's studies about *the zone of proximal development*, that is the zone between what someone can do by himself, and what someone can do with the expert's help [Vygotsky 1978]. In practice, scaffolding refers to all kinds of stimuli, suggestions, supports intentionally aimed to help students to tackle a task [Jonassen, Mayes & McAleese 1993]. Scaffolding is crucial in supporting students to become an active part in constructing learning [Rasku-Puttonen, Eteläpelto, Arvaja & Häkkinen 2003]: all activities, and tools provided to carry out them, should be organised taking into account this fact. Examples of scaffolding tools aimed to facilitate the learning of project working abilities are given in Table 4, Part 2; different types of scaffolding are considered, together with examples of possible developments and tools.
- Activities should be **clearly presented** to students, in order to increase motivation, connect the work to previous knowledge, prevent disorientation. The teacher must describe objectives, prerequisites, abilities and content expected to be learnt as a result of the work, and he/she must give any information about time needed, tools provided, overall organisation, task to be completed, and evaluation.
- Activities should **integrate the learning of specific competences** (content, methods and tools) **with that of working in a project**, that is to handle and articulate a problem, to actively participate, with different roles, into planning, monitoring, evaluating and adjusting its execution, taking into account views and contributions of all involved into the project. This includes (group) evaluation, self-evaluation, reporting activities, collections of good practice, discussions, organisation in subtasks of a complex work, etc.

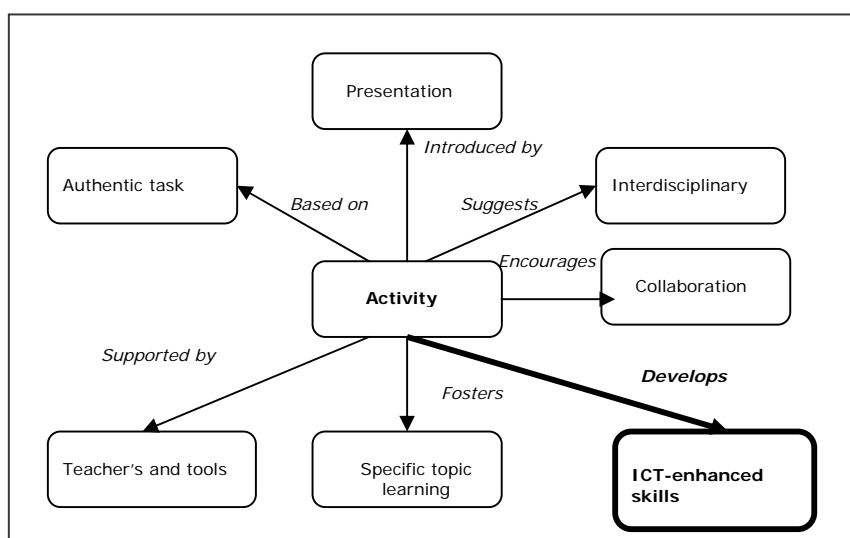


Figure 2. The main characteristics of an I*Teach activity

Example

Aim: To increase motivation, by proposing, within the learning of a well defined topic, tasks of real interest

Problems

- Creation and maintenance of the school journal, or of a forum on a topic of interest
- Creation and maintenance of the school web site
- Evaluation of usability of a web site
- Peer review activity

Figure 3. Examples of learning situations

Example

Aim: To help students acquire capabilities of integrating results

Problem Prepare an electronic presentation on application software, with particular reference to electronic presentations and spreadsheets. Use as operative examples ppt and excel respectively. Your presentation is oriented towards beginners, non-technical people.

Method 1 (Initial level). Students are given two or three presentations referring to the topics of interest and are required to build their presentation starting from them

Method 2 (advanced level). Students are required to look for material on the web (given a list of websites), select valuable material, and build their presentation starting from them. A discussion of the selection criteria completes the work.

Figure 4. Examples of different approaches to the development of a project working ability



Example 1

Aim: To help students acquire cognitive and metacognitive capabilities of envisioning a problem in its whole, recognising the different aspects, understanding their mutual dependences, planning a solution; social capabilities of learning from each other, integrating different view, ...

Activity

Prepare a presentation about 'The house in ancient Rome', analysing the problem from both the historical and the architectural points of view

Example 2

Aim. To help students identify similarity and differences of situations, work out common methodologies, plan a negotiated solution

Activity

Individual work

- Prepare an annotated sitography about 'web resources for learning English'
- Prepare an annotated sitography about 'Web resources for learning French'

Work in pair: Read and comment the sitography prepared by your mate. Devise a common procedure for preparing an annotated sitography about 'Web resources for learning a foreign language'

Classroom discussion Can the proposal be extended to learning other languages? Is the proposal apt to students of different languages and cultural backgrounds? ..

Figure 5. Examples of project working oriented activities that require collaboration and involve various disciplines

I*TEACH TOOLS

You could apply I*Teach methodology just **following it core idea**. You could use your own description of your practices or even without description. In the beginning this seems to be the most natural application.

When you test in practices one and like it, may be you will like to share your experience with your colleagues, or even for your use later or in different situation with some modifications as well as to generate later new scenarios from already available tasks we propose you to use some of the I*Teach tools.

One type of tools are **scenarios and tasks description templates**. The **scenario description template** is presented in Appendix 1. The **task description template** is presented in Appendix 2. Working with template you will **look carefully which ICT Enhanced skills** you could build together with your main goal. Using them you could suggest to your pupils different tasks and scenarios so they to work on different ICT Enhanced skills you would like they to build. In such a way together with them you could prepare for each you pupil the ICT Enhanced skills portfolio.

Second type of tools you could use to generate easily tasks and scenario in I*Teach template are **XML Tools**, helping you during your work with task and scenario template in **Office application** and preparing them in form shareable to the other Innovative Teacher.

When you would like to share your experience with your colleagues applying I*Teach methodology, then you could go to the **I*Teach repository**, which is a third type of tools we would like to propose you.

The I*Teach repository could be use from the experience users to put their scenarios and tasks as well as from the beginners to find there suitable, tested and already approved in practice examples how to start Applying I*Teach methodology.

CONCLUSIONS

What benefits and outputs could you expect

By mastering the *ICT-Enhanced skills*, which integrate the competences of using ICT and of possessing important *soft skills*, the students and trainees will be equipped with means to work successfully in the context of knowledge economy and life long learning. Since these skills are considered important from an employability perspective and are interdisciplinary in their nature, the people who possess them will have higher chances for employability and will be able to adapt to the increasing job performance requirements and problem solving contexts.

Through the products and training/learning mechanisms, developed set of skills and competences, important for the labour market and for life long learning are promoted. The methodology and the sample curriculum developed within the project will allow a very flexible and adaptive approach with respect to when and how to integrate the teaching of these skills within different forms of training (initial or continuous) and curriculum settings. The very essence of the concept of enhanced ICT skills is closely linked to the process of consolidation of technological and organisational change by equipping the people with the skills needed to successfully carry out both changes and thus, be capable to work towards their integration.

The addressed ICT enhanced skills equip the trainees with integrated abilities to effectively apply technology skills and soft skills in resolving real work problems within professional and business settings. This set of ICT enhanced skills reinforces and stimulates the abilities of the people who possess them to think and work innovatively and adaptively to the fast changes in their work environment. Both the acquisition of the ICT enhanced skills themselves and the way of their teaching to the learners by using the developed methodology and the associated products and tools, increase the personal competitiveness, entrepreneurship, and inventiveness of the trained people, thus contributing to the leverage of the business entities competitiveness and entrepreneurship.



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