Teacher Training

KEYCOLAB

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KEY COMPETENCES LABORATORY

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Introduction

Our European societies are rapidly changing, and we have to cope with exponential increase in information, with growing need for innovation, skills and knowledge (Tynjälä et al. 2012). Old jobs are disappearing and new jobs are emerging. Furthermore, our students will work more and more with ill-defined problems, in non-routine and abstract work processes, handling decisions, responsibilities and working in teams (Van den Bergh et al. 2006; Tynjälä 2012). How do we as teachers prepare the children to meet and cope with challenges of changing societies? How do our schools and traditions of learning and teaching support the students to become future experts and life-long learners in our rapidly changing societies?

The European Union stresses the need of promoting key competences for lifelong learning in Europe 2020 Strategy and in the Recommendations of the European Parliament and the European Council of 2006 (2006/962/EC). Key competences are defined as knowledge, skills and attitudes available for the learner in the learning context (2006/962/EC). However, as the "Developing Key Competences at School in Europe" (Euridyce´s 2012) reveals, there is a lack of more strategic and also practical approach in supporting the key competences and their integration into everyday school practice. Particularly the acquisition of the cross-curricula and transversal key competencies seems to require specific methods of instruction and support for teachers. Main challenge seems to be that many national or regional curricula are still mainly subject-driven. Key competences are not explicitly dealt with in everyday classroom. Furthermore, key competences are often organized and supported as outside school activity. However, the problems are more or less the same in all European countries regardless of the differences in teacher education and school systems. Hence the essential question we should be aware of is, how to support learners to become knowledgeable, able to solve real life problems, using digital tool and above all support competence to learning to learn.

The target of a the two year ERASMUS+ KEYCOLAB- project is to develop practices to support both teachers and students in learning key competences. This project deals with common key competences in primary education in five European countries (UK, ROM, SPA, BEL, and FI) in the framework of KEYCOLAB project. In the KEYCOLAB-project teachers are seen as key agents in the successful implementation of competence-based education (Caena 2011; Gordon 2009). Teachers are facilitated to understand the impact of their work in everyday school practice. Teachers are considered as adaptive experts who are diagnosing their students and looking for feedback during learning and who make use of that feedback in developing further their teaching processes (Hattie 2012). Teaching and learning is considered as complicated interaction taking place in specific learning environment.

The role of teacher in supporting key competences

One leading idea behind our KEYCOLAB teacher training is the research tradition on expertise (Hakkarainen et al., 2004), especially, on teacher expertise. Teacher expertise can be described to consist of following elements: 1) theoretical 2) practical 3) regulative (learning to learn) and sociocultural (Bereiter 2002; Tynjälä 2012; 2016). Theoretical knowledge can be seen as conceptual and explicit whereas practical knowledge is often implicit, being embedded in skills (Tynjälä et al. 2016). So KEYCOLAB teacher training will first offer teachers the possibility to deal with the theoretical basis concerning key competences,

especially the role of teacher, student and the characteristics of learning environment supporting learning of key competences. Teachers are given support from trainer and other teachers participating in the KEYCOLAB course. Teachers can be described as reflective practitioners who actively and critically deploy scientific, theoretical, knowledge to inform practice (Caena 2011). Teachers are expected to have critical and responsive attitudes to innovation and professional improvement such as learning to support key competences (Hagger & McIntyre 2006; Caene 2011).

In order to develop professional competence the integration of theoretical and practical knowledge is essential (Tynjälä et al. 2016). Teachers need time to study, think and "experiment" new ideas in classroom setting. It is difficult to see effects of new ideas without practicing. Teachers are supported not to be afraid of making wrong pedagogical solutions, but learning from these previous "errors" is emphasized. Because of that KEYCOLAB teacher training program offers the participating teachers the possibility to conduct a small-scale "project" in their own school setting and share ideas with colleagues.

The next important constituent of teacher expertise is self-regulative knowledge and skills, here called learning to learn. Teachers are supported for conscious reflection on their own activities and impact on student learning. Reflection can be seen as a process of self-examination and self-evaluation that teachers should engage in regularly in order to improve their professional practice (Husu et al. 2008).

The fourth component of teacher expertise is socio-cultural knowledge and skills embedded in social practice and tools and artefacts used in teaching practices in everyday classroom (Hakkarainen et al 2004). Also multi-literacy, competence in using different texts and visualizations and media facilitating individual and group learning belongs to sociocultural component. The core of teachers' work is providing guidance in learning, which is an interactive process (Tynjälä et al. 2016).   The key competence approach therefore requires a change of paradigm from traditional teacher-centered to student-centered learning and necessitates a revision of the role of teachers (Gordon et al. 2009)

The role of learner in learning key competences

Recent EU and regional policy documents have indicated that our European schools do not support pupils to learn competences needed in 21st Century. There have been worries that learning in schools often remains inert. Teachers are criticized for designing learning environments emphasizing   memorizing the knowledge that students are to reproduce in examinations. Furthermore, previous studies have indicated that reproduction-oriented teaching produces often inert knowledge which is not applicable in outside school context. Furthermore, students study often alone in school and are not able to work effectively in teams. In sum, students seem not often acquire transferable skills to be productive in changing world. (Resnick 1987; Tynjälä 2012). Also the lifelong learning paradigm underlines the importance of transversal competences (such a learning to learn, digital, civic competence within the eight key competences required in changing world (Caena 2011).

 The last 20 years of learning research has shown that learners are not "tabula rasa" but they bring lots of prior knowledge, skills and attitudes to every learning situation in and outside school context. In some cases previous knowledge can facilitate learning in schools. In other cases pupils prior knowledge may contradict the scientific view taught in schools and so hinder student learning. Therefore learning in school

context often suggests reorganizing one's existing knowledge structures. (Södervik 2016; Södervik 2014; Vilppu 2016; Vilppu et. al. 2013; Mikkilä-Erdmann et al. 2008; Mikkilä-Erdmann 2001). Hence, teachers should know what their pupils already know and what kind of personal goals and learning to learn skills students have.

Our students as novice learners are also acquiring theoretical, conceptual, mostly factual knowledge, skills such as learning to learn- skills. In order to support key competence learning in everyday classroom following design principles (Tynjälä et al. 2012) can be applied to support student learning: learners' previous knowledge, beliefs, misconceptions are taken into account in instructional design (e.g. pre-diagnostic). Attention is paid on learning to learn skills. Students are supported to collaborate. Through collaboration students become aware their skills and get support from their peers. The role of learning materials- print or digital- is essential in facilitating learning (Mikkilä-Erdmann et al. 2014). Students should also be supported to make use of multiple representations (text, visualizations, digital materials etc.). Authentic environments (or simulations etc.) can be used to support outside school relevance of learning. Learning processes are considered more problems solving than reproduction. Learners are supported to be active in learning. Emotional support is also given. Teachers' role is to facilitate the learner. Assessment procedures are embedded in the learning process e.g. through portfolio.

Characteristics of learning environment supporting acquisition of key competences

Learning environments play an important role in supporting students to learn key competences in primary school. By learning environment we mean the physical, social, and emotional environment in which learning takes place in schools. In our KEYCOLAB teacher training we want to emphasize following design principles which can be applied in teacher training (Tynjälä et al. 2016). First, membership and belonging to a small group is created among the teachers in order to make use of peer support, mentoring, and shared teaching. Second, teachers are supported to be active in participation e. g. developing a scenario, conducting a project in giving and receiving feedback. Third, reflection on practical experiences with the help of theoretical knowledge and conceptual tools is facilitated by observations, learning logs and portfolio work. In sum, the above mentioned characteristics of learning environments can also be applied in designing learning environments for primary school pupils.

Special approach for KEYCOLAB

The approach how key competences are implemented into the national curriculum differs a lot. Also the national key competences in the national or regional curriculum are different (see KEYCOLAB CASE STUDY). Regarding the survey done in May 2016 the time frame for the teacher training differs between the partners from 6 hours to 40 hours. Additionally the educational background of primary school teachers varies a lot. The course is partly traditional face to face training and it partly offers the opportunity for blended learning. The training program is designed for 40 hours. The course can be adapted to the needs of the participating teachers, but there should be at least four hours of face to face lessons (see Appendix time schedule). An example for an adapted training program is attached in the appendix (see Appendix Example).

Goals of the teacher training

The goals are:

· Develop a common understanding of key competences (G1)

 · Applying theoretical and practical knowledge regarding key competences (G2)

· Fostering learning to learn, especially reflection skills (G3)

· Supporting teachers' efficacy concerning key competencies (G4)

· Promoting collaborative working among teachers (G5)

· Developing appropriate professional attitude (G7)

· Developing teaching and learning practices in everyday school context concerning key competences (G7)

Structure of the training

The training consists of four modules: Introduction, Scenarios, Project and Reflection.

Picture 1. Flow of modules

Module 1 Introduction	Module 2 Scenarios	Module 3 Project	Module 4 Reflection

Module 1: Introduction

The module 1 has two parts. In the first part the course and the general set-up are introduced, discussed and adapted to the needs of the teachers. In the second part the scientific background of the key competences and their implementation is discussed. Teachers become also familiar with the current EU-policies and guidelines concerning key competences.

Goals

A common understanding of key competences is developed. The teachers are aware of the concept, the value and the implementation of key competences. They know the approaches how key competences are implemented into the curriculum and what the key competences require from the schools and the teachers. The teacher becomes aware about the significance of key competences and the scientific background of key competences. Furthermore, they know the significance of KEYCOLAB for this course.

Setting

The course starts with an overview and the main goals of the course. The KEYCOLAB project is presented. The teachers deal with the theoretical background, the policies and the curriculum concerning key competences. Furthermore, the teachers' previous knowledge and attitudes towards the key competences are discussed. Also the expectations concerning the KEYCOLAB training will be discussed and taken into account in customizing the final set-up due to course settings. The concept of the learning and reflection log is presented. A Pre-evaluation (self-efficacy and competences) is conducted.

In the second part of module 1 the concepts of key competences and their implementation into the policies and curricula are elaborated. The teachers prepare summaries of scientific articles and discuss the curriculum and policy documents on the European, national and regional level. The summaries are saved in the learning and reflection log. Teachers write reflection concerning the Module 1 in the learning and reflection log.

Possible structure of the session

- **PART 1: Introduction**
    - Introducing KEYCOLAB
      The teachers get an overview about the KEYCOLAB project.
    - Overview over the training course.
      Explaining the goals, the timeframe, requirements, set-ups, etc. of the teacher training.
    - "Warm up" or "Get together" (introductions, game …).
      The teachers become acquainted with the colleagues and the training environment.
      The teachers construct a basis for collaboration.
    - Discussion of the main focuses of the course.
      Dealing with the expectations, needs and motivation for this course.
    - Introducing the learning and reflection log and start working with it (template 4) .
    - Pre-evaluation (template 1)
    - Adapting the course settings
- **PART 2: Dealing with Key Competencies**
    - Preparation task based on reading materials
      Reading the EU material (e.g. and national documents regarding key competences in primary education (e.g. curricula), some scientific articles (see literature list). Teachers prepare short summaries of the selected articles, guidelines and policies.
    - The teachers present their summaries.
      The summaries are filed in the learning and reflection log.
    - The summaries are discussed to promote the awareness of key competences. The mode can be a discussion, a forum, a panel discussion or a small group discussion.
      Proposal for core points to be discussed:
      - What is new in the actual/EU/national/regional key competence approach?
      - What differs from the traditional concept?
      - How do the key competences face the future requirement of the society in the future for the students?
      - What are the challenges for teachers to teach key competences?
      - How the key competences deal with the social changes in the society?
      - How the cooperation between teachers should be arranged to teach the key competences especially the transversal competences?
      - How to evaluate key competences?
      - What are the roles of the teachers and the learners?
- Teachers write reflection concerning the module 1 in the learning and reflection log.

Module 2: Scenarios

This module prepares the teachers for the project work. A scenario is a series of actions outlining a learning process. The purpose of the scenario is to explain ideas how to teach and learn key competences in everyday learning and teaching situations at school. The scenario describes in a sketchy way the objectives, the tools and the learning materials, the subjects, the participants and the roles of the participants, the methods and instructions, the tasks, the time schedule and the learning environment. The sharing of ideas and knowledge is essential for a learning community. Collaboration skills are essential. During this module the teachers will develop some of the scenarios so that the scenarios can be a basis for the project work.

Goals

Working on scenarios promotes the collaborative working. The goal is to brainstorm both more traditional and very innovative ideas and approaches how to teach and learn key competences in everyday classroom practices. Furthermore, the goal is to improve these ideas and approaches so that some of them are the basis for the next module project work. A cycle of creating, elaborating, giving and receiving feedback is set up. The teachers can select their scenarios regarding their individual challenges and the support from the colleagues.

Setting

The teachers come to the course with their experiences and ideas for improvement concerning teaching and learning transversal key competences. These practices and knowledge from the teachers are collected, systematized and used for the basis of the project. A scenario is a good and short way to explain the main idea and approach to the other teachers and share it. The scope for the scenario defines, e.g. how many key competences and which of the key competences should be included; which grade and how many and maybe which subjects. In some cases the theme and time can be provided and can cause restrictions (e.g. "newspaper week", "Sustainable development and energy", "David Bowie", "Dancing and singing performance in the break"). Through the presentations and discussions of the scenarios ideas and approaches will be developed and customized. The scenarios are elaborated and the most appropriate ones will be further developed and prepared to be basis for a project.

Possible structure of the session

- **Preparation task:**
  Every teacher or group of teachers generates a scenario regarding the requirements
  e.g. the theme is provided as: "newspaper days", teaching 4 key competences within 3 subjects, every pupil will get the daily newspaper during week 12 for two days, 6th grade, in the school environment.
- **Scenario elaboration.**
  All the scenarios are presented and discussed.
  The core items of discussion can be:
  - How realistic is the scenario?
  - What seems to be the goal(s) of the scenario and will it be reached?
  - Which key competences the children are learning?
  - What is the role of the teacher and the learners?
  - Does the scenario show an everyday learning environment?
  - Is the scenario meaningful for the children?
  - Are the children motivated to learn the key competences concerning the goal?
  - How the learning environment can be enhanced?
  - What about the students' view?

- **Project ideas:** Based on the discussion about the ideas and approaches of the scenarios the project ideas are created by the following items:
  - Meaningfulness
  - Feasibility
  - Fitting to the requirements
  - Time
  - Budget
  - Challenge
  - Risk
  - Workload
- Every teacher or group of teachers elaborates one of the chosen project idea. This idea is developed as the basis of the project.
- Teachers write reflection concerning the Module 2 in the learning and reflection log.

Module 3: Project

In module 2 the teachers present their scenarios with their ideas and approaches concerning learning and teaching of key competences. Therewith the basis of a project was generated. In Module 3 the teachers will plan and realize the project.

Goal

The teachers plan and realize a project in everyday school context. The teachers develop their teaching and learning concerning key competences by doing experimentations and enhancing their reflective practices, e.g. self-evaluation and peer reviewing. Furthermore, the feedback method promotes the collaborative working. The pupils learn concerning the learning goals set by the project.

Setting

The project is realized in collaboration with other teachers if possible. The teacher or group of teachers plans and organizes the project, designing the learning environment consisting of assignments, tools, learning materials and instructions. The project has a pre- and a post-evaluation for the pupils. The project follows the plan. An observation in one of the lessons during the project is made by a colleague. The teacher receives feedback by the colleague (feedback template). Instead of observing the feedback can be given in another mode e.g. through interview or by video. The feedback is saved in the learning and reflection log. Every teacher should be at least once in the role of giving feedback to the colleague and once in the role of receiving feedback from the colleague. The teacher or group of teachers generate a report of the their projects, e.g. power-point presentation, video, describing the strengths and weaknesses of the project plus lessons learnt and how successful the project was concerning teaching and learning key competences, especially under the aspect of transversal key competences and the collaboration of teachers. The project report will be saved in the log file.

Possible structure of the session

- **Project:** The teacher or group of teachers plans and conducts a project.
    - Planning
    - Adapting students' expectation and experience questionnaires (template 5 and 6)
    - Organizing
    - Performing
    - Pre- and post-evaluation of the pupils
- **Observation**: Observation and alternative ways of giving and receiving feedback by a colleague.
- **Report:** The teacher or group of teachers generates a report of the project, e.g. power-point presentation, video.
- Teachers write reflection concerning the Module 3 in the learning and reflection log.

Module 4: Reflection

In module 3 teachers performed a project and generated a report. In module 4 the reports are presented and discussed. The individual learning and reflection logs or rather a summary is generated and presented by every teacher. Evaluating the effectiveness of the project concerning the goals both the individual and the collaborative levels are important to put into consideration.

Goal

Reflection is based on writing and an efficient method for learning and developing the learning to learn competence. Reflection supports the teacher to foster the learning to learn competence and to develop an appropriate professional attitude. A report of the course is generated.

Setting

The teachers prepare their individual learning and reflection logs so that every teacher can give a short presentation on the main points. The project reports are presented and discussed. Especially the item teaching and learning key competences and the pupils' view and experiences are underlined. Every teacher gives a short presentation on the main and most interesting points from his/her individual learning and reflection log. The evaluation is conducted. The course summary is generated.

Possible structure of the session

- **Preparation task**:
  Every teacher generates a summary of his/her individual learning and reflection log, e.g. especially concerning pupils' view and teaching and learning key competences.
- **Report:** The teacher or group of teacher is presenting the reports.
- **Feedback:** Constructive feedback is given by the other teachers (template 3).
- **Log:** The teachers are presenting their summaries of their individual learning and reflection log.
- Closing the individual learning and reflection log.
- Conducting the evaluation (template 2.).
- The summary of the lessons learnt and possible best practices are created and saved. Both teachers and students perspectives should be dealt with.

Appendix

Time schedule

		face to face	online possible	School environment	Time h	h
1.	Module 1: Introduction					5,5
1.1.	Introducing (KEYCOLAB, objectives, …)	x	(x)		1	
1.2.	Pre-test (competencies)	x	x			
1.3	Dealing with key competences					
1.3.1.	Preparation task		x		1,5	
1.3.2.	Presentation	x	x		1	
1.3.3.	Discussion	x	x		2	
1.4.	learning and reflection log		x		0,5	
2.	Module 2: Scenarios					6,5
2.1.	Preparation task		x		1	
2.2.	Elaboration of scenarios	x	x		2	
2.3.	Discussion	x	x		2	
2.4.	Elaboration of project ideas	x	x		1	
2.5.	Learning and reflection log		x		0,5	
3.	Module 3: Project					19
3.1.	Planning		x		2	
3.2.	Organizing and Preparing		x	x	3	
3.3.	Lessons			x	4	
3.4.	Observation / alternative			x	4	
3.5.	Report		x		4	
3.6.	learning and reflection log		x		2	
4.	Module 4: Reflection					9
4.1.	Preparation task		x		0,5	
4.2.	Presentation	x	x		3	
4.3.	Discussion	x			2	
4.4.	learning and reflection log	x	x		3	
4.5.	Questionnaire and course report		x		0,5	
	Sum					40

Templates / Questionnaires

Template 1. Questionnaire Pre-evaluation self-efficacy for key competences (Likert scale 5,
agree: 1: Strongly agree, 2= agree, 3=Neither agree nor disagree, 4=Disagree, 5=Strongly disagree))

1. I feel confident understanding the theoretical background concerning key competences.
2. I feel confident that I can conduct lessons supporting the learning of key competences.
3. I feel confident I can effectively teach key competences on a transversal level.
4. I feel confident that I can evaluate the key competences of the children.
5. I feel confident that I can realize meaningful everyday learning environment for the students.
6. I feel confident that I can collaborate with other teachers for the transversal approach in teaching of the key competences.
7. I feel confident that I can teach the key competences according to the current requirements.

Based on Puttman (2014).

Template 2. Course Evaluation (Likert scale 5, agree: 1: Strongly agree, 2= Agree,
3=Neither agree nor disagree, 4=Disagree, 5=Strongly disagree)

1. I felt always comfortable during the course.
2. This course has helped me to develop my teacher expertise.
3. This course has helped me to develop my competencies as teacher concerning key competences.
4. This course has helped me to develop my competencies to collaborate with other teachers.
5. The workload was sometimes too heavy.
6. The project group supported my learning efficiently.
7. The entire group supported my learning efficiently.
8. I supported the other group member efficiently.
9. I dislike this kind of group work.
10. I learnt a lot of doing the project.
11. I learnt a lot in discussion with the other teachers and the trainer.
12. This course has helped me develop my ability to work in collaboration with other teachers.
13. This course has improved my knowledge of key competences.
14. This course has improved my teaching skills of key competences.
15. Overall, I am satisfied with this course.

Template 3. Feedback template

	Item
1	*Mention three items which were well performed.*
2	*Mention two items which can be improved.*
3	*Which elements of your project can be a "good practice" in future?*

Template 4. Teachers' learning and reflection and reflection log

- Every teacher writes a learning and reflection log reflecting following items (attitude, skills and knowledge):

	Attitude	Skill	knowledge
1. What did I learn so far?			x
2. What is new for me?			x
3. What I like to improve?	x	x	
4. What kind of ideas have I gotten during the course, which I like to try out?	x	x	
5. Do I feel motivated to participate in the course?	x		
6. How efficient is the collaboration basis between teachers for you?		x	x
7. What is my assumption regarding my input into the community of teachers?	x	x	x
8. How children' learning (of key competences) can be enhanced through my teaching practices?	x	x	
9. In what sense the course will be useful?	x	x	x

Template 5. Students' expectations (😊 😐 🙁 ; Agree; Neither agree nor disagree; disagree)

1. I like project work.
2. I look forward to the project.
3. "*Project theme*" sounds very interesting.
4. I think I will learn a lot in the project, especially "_____ ".

Template 6. Students' experience

1. I liked the project work.
2. The group learnt very much.
3. The "*Project theme*" was very interesting.
4. I learnt a lot in the project, especially "_____ ".
5. I helped my group to learn.
6. My group helped me to learn.

Example – Pilot Learning Program

Settings. Five teachers from a primary school in Turku (FIN) are trained concerning key competences. The teachers are all classroom teachers for the 5th grade. They are teaching three normal classes with each ca.20 – 25 pupils and two special classes with each ca. 6 - 10 pupils. One class for special needs pupils, the other for immigrant children, all in all a very heterogeneous group. Professional development should always be tailored to the needs of the learners.

Structure. In the first meeting we present the project, evaluated the expectations, the understanding of key competences, ability of cooperation and pre-knowledge of the teachers. The project set-up is discussed and customized. The teachers have a very good knowledge and competence concerning key competences, the actual curriculum and project work in a collaborative manner. All of them have a Master degree. We discuss possible scenarios for learning and teaching key competences in that school. In the second meeting we select one scenario and develop it further on. Finally we generate a project plan (see below). The key competences, which will be learnt and taught concerning the need of the teachers are: 1. Learning to learn (C1) is the most basic competence concerning lifelong learning, is a pure transversal competence, which is not built from basic skills in a certain subject and learning to learn is a huge challenge for the teachers; 2. Digital competence. (C2) is a huge demand in Finnish schools. How to establish a good digital learning environment and efficient teaching and learning methods are in discussion; 3. Multi-literacy (C3) is a combination from communication in the mother tongue and foreign languages plus some additional items; this competence is an everyday challenge for all; and 4. Social and civic competences (C4) is in this heterogeneous group a special challenge, but also in general working in groups as well as working with pupils from other classes is challenging. "Energy" was chosen as learning content of the project. Energy is a multidisciplinary topic and a basic part of the subjects: Physics, Chemistry, Biology, Environment studies, Arts and Handicraft. The children write a learning and reflection log for every session. The classes are partly taught together. The learning material is provided by different sources, but the material differs from class to class due to special needs. The methods of teaching and learning has a high range, e.g. games, drama, presentation, discussion, group work. Every group generates and presents a product for a "mini-conference". This can be a poster, a video or a game. In the last session there is a "mini-conference", in which all the "products" of the project are presented to the 6th graders of the same school. The scope of work is planned, e.g. the meetings during the project, the single project steps with tasks, the support- and feedback system, the evaluation of the pupils, the project and the teachers' observation and self-evaluation. The project lasts 8 times 2 hours in the class room, and 2 times 2 hours is planned for the face to face onsite-support of the teachers at the school. Additionally there is support for the teachers available by phone, email etc. There is a final face to face meeting for reflection.

Face to face meetings with the teachers. Beside the Introduction and planning meeting there are four meetings planned. Meeting 1 takes part after the first session. The goal of this meeting is to enhance the planning and performance. These will be done by discussing the feedback and improving the learning environment. The plan has to be adapted and better solutions have to be developed, e.g. due to the different needs of the heterogeneous groups.

Evaluation. The evaluation of the students will be made by an individual written learning and reflection log, a pre- and post-evaluations (questionnaire) as well with the final product (peer- and group-review). For the evaluation of the teacher a questionnaire and a feedback discussion is conducted.

Lesson plan. The 8 sessions will have following goals and tasks:

1. Session:
   a. Goals:
      i. Understanding the project, goals, tools, time, etc.; (C1)
      ii. understanding the term energy (C3)
      iii. understanding the use of a learning and reflection log (C1)
   b. Tasks:
      i. Introduction to the project (goals, timeline, etc.)
      ii. energy (game, discussion)
      iii. keep the learning and reflection log

2. Session:
   a. Goals:
      i. Understanding and making group work for learning purposes (C4)
      ii. Use of questioning ("Why") (C3)
      iii. Understanding the search process in the Internet (C2)
   b. Tasks
      i. Introducing Group work as learning group
      ii. Creating interesting questions concerning "energy" and finding answers in textbooks (Group work)
      iii. Internet search game (group work)
      iv. keep the learning and reflection log

3. Session:
   a. Goals:
      i. Developing search strategies for the Internet (C2),(C1)
      ii. Developing the evaluation of text sorts from the Internet (C3)
      iii. Understanding the search process in the Internet(C2)
   b. Tasks
      i. Searching with certain search words the Internet and
      ii. Evaluation of the search results
      iii. Creating questions, planning a search strategy, searching the Internet and evaluation of the search results (group)
      iv. Keep the learning and reflection log

4. Session:
   a. Goals:
      i. Understanding the process of synthesis of different texts (C3)
      ii. Developing the working with texts (C1) (C4)
   b. Tasks
      i. Selecting out of 10 texts the 3 most relevant texts concerning a certain task
      ii. Writing a synthesis out of this three selected tasks concerning the task
      iii. Keep the learning and reflection log

5. Session:
    a. Goals:
        i. Developing the information processing competence (C1) (C2) (C3) (C4)
    b. Tasks
        i. Finding and interesting and challenging issue concerning "energy"
        ii. Creating questions concerning the issue
        iii. Creating a search strategy (search words etc.)
        iv. Searching the Internet (if necessary repeating from 1 or 2 or 3)
        v. Evaluation of the results (if necessary repeating 1,2,3,4)
        vi. Selecting 3 most relevant texts
        vii. Writing the synthesis
        viii. Keep the learning and reflection log
6. Session: Session 5
7. Session:
    a. Goals:
        i. Reflection of the project (C1)
        ii. Preparing for presentation (C4)
    b. Tasks
        i. Preparing for the "fair" a final product
        ii. Reflection of the project
        iii. Keep the learning and reflection log
8. Session:
    a. Goals:
        i. Developing presentation skills (C4)
        ii. Developing organization skills (C4)
    b. Tasks
        i. Presentation on the fair
        ii. Organization of the fair
        iii. Internet search game

Literature recommendations

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National and regional curricula.

http://ec.europa.eu/education/policy/school/competences_en

Material for scenario-ideas:

Some links to videos:

http://www.clohe-movingtoys.eu/www/Home_EN/Home.htm

http://www.artined.eu/

http://www.popullar.eu/

or descriptions

http://www.artined.eu/use-case-scenarios.html

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