ITEC - WP 3

D3.1 - REPORT ON DESIGN PROTOTYPES AND DESIGN CHALLENGES FOR EDUCATION

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ABSTRACT	This document corresponds to Deliverable D3.1 "Report on design prototypes and design challenges for education". It includes detailed descriptions of design challenges and design opportunities extracted from the 1st cycle scenarios. It also presents the prototypes, including learning activities and software tools, that were designed and produced to address those challenges. A detailed description of the design process sheds light to the work of WP3 and helps to understand how the prototypes were derived from the educational scenarios.
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EXECUTIVE SUMMARY

This document is a report of the design work of WP3 during the 1st cycle of the iTEC project.

The design process followed by WP3 is based on the principles of research-based design and contains four phases, which are (a) contextual inquiry, where deepening understanding of the European schools is gained; (b) participatory design, in which workshops and focus group sessions for close collaboration with teachers are organised; (c) product design, in which various prototypes are designed; and (d) production of software as hypotheses, in which functional prototypes are developed. The four phases happen in parallel and include close collaboration with stakeholders concerning. They are described in Chapter 1 of this report.

Nine educational scenarios received from WP2 started the design process. They were submitted to participatory design workshops with teachers. A careful analysis of the workshop results created a total of 28 design challenges in 6 categories. The challenge categories are: Learning process, assessment, time resources, motivation, social schools, and technology. The challenges helped narrow down the nine original scenarios to five feasible ones. The challenges are detailed in Chapter 2.

Further analysis of the challenges produced a total of 16 design opportunities in 5 themes: guiding for design, media production, forming small teams, reflection on documentation of learning, and other relevant opportunities. The design opportunities are illustrated in Chapter 3.

Potential solutions to the design challenges that leverage the design opportunities are called prototypes. They can be divided into learning activities, which are written teacher instructions, and software tool prototypes. In total, 13 learning activities were designed to facilitate teachers in creating their lesson plans. Three tool prototypes were developed and presented to teachers in focus group meetings. Based on these meetings, one of them, TeamUP, was further developed into a functional product. All prototypes are described in Chapter 4.

Pre-pilots in 18 classrooms in 7 countries tested the 13 learning activities in various combinations. Based on the results of the pre-pilots and the scenario selection criteria developed by WP4, a conclusion report was written (Appendix E). That report recommends two learning stories, six learning activities and one tool prototype for full scale piloting.

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INTRODUCTION

Reminder of the context

iTEC (Innovative Technologies for an Engaging Classroom) is a four year, large-scale and pan-European project that takes an informed look at the potential classroom of the future. Its key aim is to develop engaging scenarios for learning in the future classroom that can be validated in a large-scale pilot and be subsequently taken to scale. This will be achieved through an increased understanding of the ways in which new and emerging technologies can support more effective forms of learner engagement.

iTEC WP3 uses future classroom scenarios provided by WP2 to find design challenges and opportunities that can be answered with current technology. WP3 selectively develops and designs classroom scenarios into working prototypes and learning activities that can be piloted in large scale by WP4.

This report concerns the 1st cycle of iTEC. The 1st cycle is a testing ground in which all of the elements of iTEC are first tested, collaboration between partners is honed, and processes are defined. To ensure productive study grounds, the number of scenarios, tool prototypes, and schools included in the design process are lower during the first cycle than later cycles. This document describes and discusses comprehensively the design and research methodology. The reports from later cycles are expected to be more compact with references to this report.

Purpose and scope of the tasks T3.1, T3.2, T3.3, T3.4

The design process of WP3 consists of fours tasks that happen consecutively. They are repeated for every cycle of iTEC. This document reports on the 1st cycle.

Task 3.1: Scenarios for the future classrooms prepared by WP2 were analysed and commented. The final scenarios were further refined, and evaluated and discussed in nine teacher workshops around Europe to identify their feasibility and the challenges they may have. Based on the workshop result summaries, design challenges were extracted.

Task 3.2: Based on the design challenges identified during the previous task, design opportunities were recognised and documented. Work on design prototypes was started. Design prototypes aim to be functional software tools or learning activity descriptions that can be piloted in classrooms.

Task 3.3: Learning activities were sent to pre-piloting in several European countries. Pre-piloting is a cost-effective way to place the design prototypes in real world settings and see how they perform. Pre-piloting revealed unforeseen challenges and pointed out what needed to be improved and what was completely unfeasible.

Task 3.4: Results of the previous tasks were collected and reported to other partners and WPs, especially focusing on preparing learning activities and tool prototypes for WP4 for large scale pilots.

This document and its appendices are the main deliverable for the entire design process, covering tasks T3.1, T3.2, T3.3, and T3.4.

Relationship with other tasks

The design process consisting of tasks T3.1, T3.2, T3.3, and T3.4 takes as its input a collection of educational scenarios. These are produced by WP2, in task T2.8.

The final outputs of the design process are selected based on decision criteria developed by WP4 in task T4.3. The outputs (Appendix F) are then delivered to WP4 for full scale piloting, task T4.6.

Structure of the document

Chapter 1 presents the design process that was used in WP3. It includes general descriptions of the main phases, as they were adopted in this project from the original design framework model.

Chapter 2 presents the design challenges that were extracted from the scenarios the participatory design workshop results. The challenges are also summarised in Appendix C. During the 1st cycle, 6 groups of design challenges were recognised, covering a total of 25 challenges.

Chapter 3 discusses the identified design opportunities, and how they are thought to address the design challenges. The total of 16 opportunities are organised into 5 themes that represent recognised opportunity patterns and important design clues.

Chapter 4 describes prototypes, including 13 learning activities and three tool prototypes, that aim to address the design challenges by building and drawing on individual design opportunities.

Appendices A and B describe the Participatory Design workshops and their results, respectively.

Appendix C contains a compact reference list of the design challenges, which are fully described in Chapter 2.

Appendix D contains all the material that was given to pre-piloting teachers, and Appendix E contains a conclusion report of the pre-pilot results and recommendations thereof.

Appendix F illustrates the prototypes for cycle 1 full scale piloting in a way that is easily understandable by the national coordinators.

Impacts of the deliverable on the iTEC Project

The DoW for WP3 is relatively open, and other project partners have had difficulties in understanding what the design process is and what its outcomes are. Actually, even the design team did not know in advance what the outcomes would be like. As the first cycle for WP3 is finished, this report clarifies the process and the nature of the outcomes to all partners, making it easier for them to relate their to work to WP3 outcomes.

All objectives in the DoW for WP3 until the completion of this report have been completed on schedule. MS6 (Prototypes selected for pre-pilots), due 05/2011, was completed on time and was a necessary milestone for completing the 1st cycle design work and this report. 13 learning activities were included in pre-pilots as prototypes.

The outputs of WP3's design process, consisting of six learning activities and one tool prototype (see Appendix F) are sent to WP4 for full scale piloting.

This Deliverable D3.1 was completed on schedule, and is in its final version. Successive iterations of WP3 design will produce similar, but separate reports, each spanning two design cycles (deliverables D3.2 and D3.3).

As the work has proceeded according to schedule and without delays, there are no risks that affect the work of WP3 or other work packages.

Ethical issues

None

IPR issues

None

REPORT

1 Design Process

The design process of the Aalto University's Learning Environments research group has been developed internally during a decade of international research and development projects. It has been published in several peer-reviewed journals and produced good results, lastly in the CALIBRATE project (2006-2008) coordinated by the European Schoolnet. The design process followed by WP3 stems from the pragmatist philosophy of science. Pragmatism calls for intelligent practice instead of objective analysis (Eldridge, M., 1998). The designers made their informed decisions based on a grounded theory that arose from careful analysis of available data. These decisions are validated and refined iteratively in field tests.

The design process of WP3 (illustrated in Figure 1) is based on the principles of ***research-based design***, a process common in art and design tradition. In research-based design, with some similarities to ***design-based research*** within the field of learning sciences (Barab & Squire, 2004; The Design-Based Research Collective, 2003), artefacts, tools, or services are used as means to communicate between different participants during interventions, intending to avoid misunderstanding that can easily arise from using expert jargon. However, unlike in design-based research, in research-based design the design is also an essential outcome of the research activities (Leinonen et al., 2008, 2010). The design activities acknowledge that the design will be embedded in the everyday context of people. Hence, a research-based design process is iterative and takes place in close collaboration with various people concerned with the design. The iterative nature of the design process implies that phases of the process may happen side by side, as opposed to following a sequential process. (Leinonen et al., 2008, 2010)

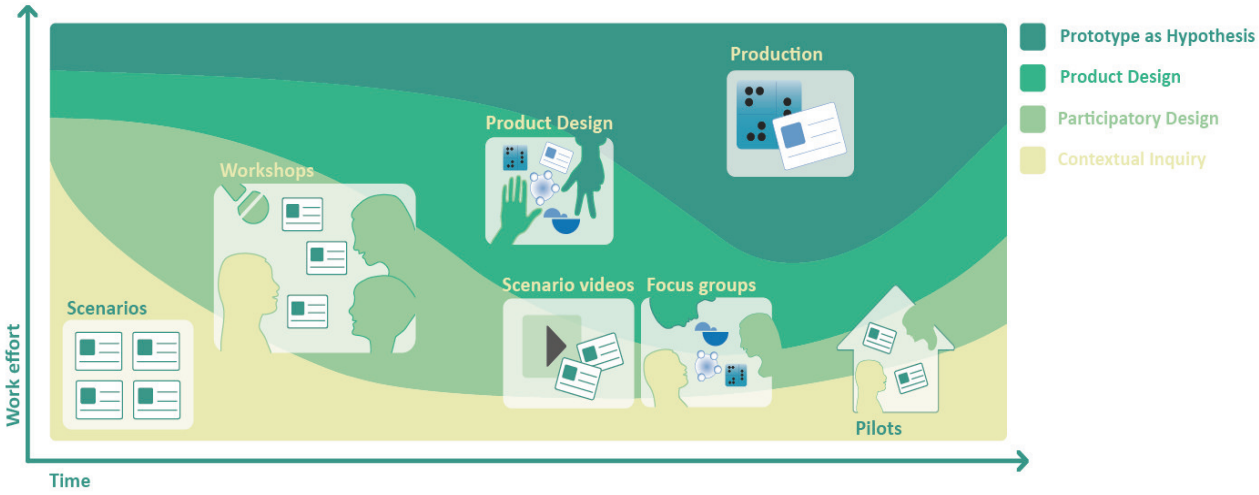


Figure 1: Phases in the design process of iTEC WP3.

The phases of the iterative process are illustrated in relation to iTEC in Figure 1 and are described here:

The first phase, **contextual inquiry**, is formed around understanding the context, in which the design is aimed to be placed (Leinonen et al., 2008, 2010). In iTEC, the contextual inquiry was carried out through careful study of the scenarios that provided context to the study and included preliminary design challenges and opportunities of school learning. This context was defined through the scenario development by Futurelab. This is described in more detailed in the next section. Contextual inquiry does not stop, but rather continues as part of all other design activities.

As alluded to earlier, in the research-based design process it is understood to be the right of the potential future user to be part of the design process (Leinonen et al., 2008, 2010). In the **participatory design phase** of the process, teachers across Europe were asked to participate in workshops and focus group sessions to gather their input to preliminary defined challenges and opportunities and prototypes. The workshops and sessions deepened the contextual understanding and based on the comments, suggestions and feedback of the teachers, the design team was able to start and further develop prototypes. Pre-pilots and pilots are a way to test the prototype designs with teachers in classrooms across Europe.

Prototypes were designed in the **product design** phase. The insights gained from the workshops and sessions with teachers were translated into concrete design ideas by the researchers and design professionals without the teachers. Early versions of the prototypes were tested and discussed with teachers in focus group sessions and further developed based on the analysis of the comments. This represents one example of the iterative process.

The **production of software as a hypothesis** phase represents the development of functional prototypes that are thought to improve the way in which learning activities are performed in the classroom. Based on the earlier phases of the process, also the software prototypes are further developed. In iTEC, the design results are not only software artefacts, but also learning activity descriptions, videos, guides and so on, so the production phase (regardless of the phase name) is not limited to software.

The starting point of the design process was the scenarios, advancing iteratively through the design process phases (see Figure 1). The phases and the progression of the phases in relation to the iTEC project are elaborated more closely in this chapter. During future cycles, the scenarios, design challenges, and opportunities that have been identified in previous cycles are included in the design work and will be expanded, annotated, and adjusted accordingly.

1.1 Contextual inquiry using scenarios

Scenarios are “narrative descriptions” of advanced learning practices, which illustrate how they are imagined to be performed in the classroom or elsewhere depending on the content of the scenario. They include examples of content for meaningful learning activities, allusions to future technologies, and describe openly how these can be utilised for learning without presupposing a particular technology used in a distinct way. All the aspects of a scenario such as resources, people, activities, aims, and content serve as inspirations to initiate discussion, generate concrete ideas, and improvements for future technologies. They also help to voice possible challenges that the scenario may present when realised. Scenarios are used as inspiration for teachers to project advanced learning ideas onto the present school learning conditions and practices, and – based on their expert knowledge – to recognise challenges and opportunities that advanced pedagogical ideas may pose.

20 mini-scenarios were developed by iTEC partners across Europe during a scenario development workshop, organised by Futurelab (coordinator of WP2). The development process was based on several global trends in education and technology, such as globalisation, 21st century skills and environmental questions. Further information on the scenario development method for iTEC can be found in the scenario section of the iTEC web page[1]. Although the scenarios were mainly created by WP2, WP3 collaborated in the scenario development process. Here is a list of activities by WP3:

- Participating in the scenario development workshops
- Analysis of the mini-scenarios and sending feedback
- Participating in the prioritisation of scenarios
- Feedback on the 1st cycle scenarios before the 2nd cycle started

Of the 20 mini-scenarios, the nine most convincing and desired ones were discovered based on a prioritisation protocol by iTEC partners. They were then fleshed out by Futurelab into detailed scenarios. These detailed scenarios presented the basis of the 1st cycle design process. The deliverable D2.1 “Summary Report of Scenario development Process” presents a more complete description of the scenario development process, and its appendix 1 lists all detailed descriptions.

When moving to the product design phases, videos of two scenarios were created and published online, for anyone to view. The initial soundtrack of the videos was recorded in English, and later in Italian. Subtitles were created and translated into several different languages by users of the dotSub community, a video hosting website that allows people to create subtitles for videos. These videos served as communication media that facilitated discussion between the WP3 team and a wide group of stakeholders, such as teachers and project partners. In the research-based design process, the videos represent an example of a feedback loop from participatory and product design phases to contextual inquiry (see Figure 1).

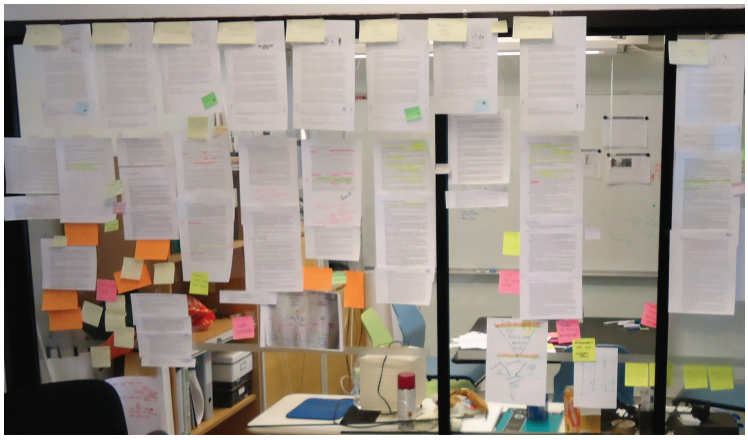


Figure 2: Scenarios and participatory design workshop summaries

As cycle 1 was a testing ground and most of the iTEC technical infrastructure was still in development, design was particularly focused on the scenarios that pose the least technical or organisational challenges. This was done to ensure a productive cycle that results in a strong design foundation. The scenarios that were not included in the 1st cycle pre-pilot testing are listed in the end of section 2.7, on page 21.

All nine scenarios were used as communication media that were discussed during participatory design workshops with teachers across Europe.

1http://itec.eun.org/web/guest/scenarios

The scenario development by WP2 was the starting point, but as contextual inquiry continues throughout the design process, the designers' deepening understanding of the everyday practices and challenges in European schools continued throughout the other phases of the process. Throughout the design process, the contextual findings were collected on a long wall (see Figure 2 on page 6).

1.2 Participatory design

Drawing inspiration from and building close to the context of everyday life can inform decision making in the design process. Informed decision making can rise from understanding the practices that constrain the everyday activities of people (Beyer and Holtzblatt, 1998). To attain informed understanding and inspiration from everyday constraints, participatory design workshops were performed. In participatory design, instead of in laboratories, prototypes are tested and discussed in the natural environment of the participants (Ehn, 1988). In our case these were first the scenarios and later the prototypes that will be reported in detail in Chapter 4.

The participatory design phase involved two main activities that iteratively advanced the process: Participatory design workshops, and focus group sessions. In the participatory design sessions, comments feedback and suggestions of teachers were gathered based on the scenarios. These comments were analysed to create prototypes in the product design phases. As the design process progressed, participatory design also included focus group sessions with teachers, in which the prototypes were tested and discussed, presenting further insights for the additional development. The participatory design workshops and the focus group sessions are elaborated here.

Participatory design workshops

*The **participatory design workshops (PD workshops)*** were organised discussion sessions. In iTEC cycle 1, they happened in the European pilot countries. They served to gather early ideas from teachers on what kind of technology they would prefer to use. The workshops were also used to help recognise design challenges (see Chapter 2) and design opportunities (see Chapter 3) that closely build on the everyday practices and the organisational structures in European classrooms, as well as inspirational material for prototype designs (see Chapter 4). The scenarios were the starting point of the PD workshops, serving as communication media and guiding the participatory design workshops.

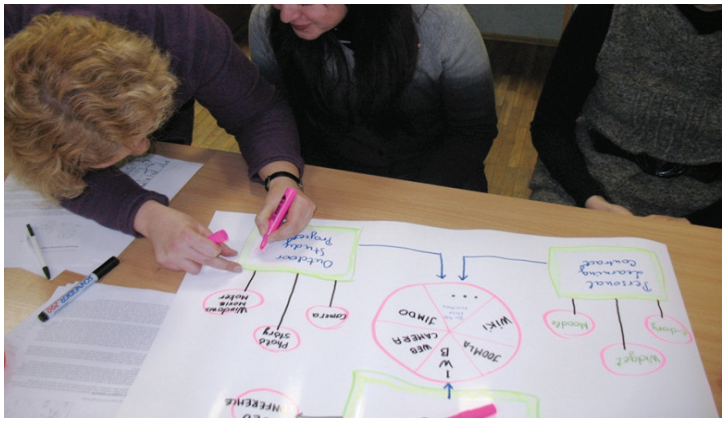


Figure 3: Participatory design workshop session in Lithuania, Photo by Asta Buinevičiūtė, 2011

Most national iTEC partners (usually Ministries of Education) were asked to perform participatory design workshops with teachers in their native country and language. Facilitating workshops in the participants' authentic working environment with the possibility to work in their native language is considered important in participatory design. Each national partner participat-

ing in the iTEC project may suspend performing participatory design workshops once during the iTEC project. During the 1st cycle, participatory design workshops were organised in 9 national partner countries: Austria, Estonia, Finland, France, Hungary, Italy, Lithuania, Portugal, and Slovakia. Each of them organised participatory design workshops based on 2 to 3 scenarios. Appendix B presents a detailed overview of which scenario was discussed during which workshop, including summaries of the discussions. Figure 3 is an image of the participatory design workshop performed in Lithuania.

In the beginning of iTEC, for all pedagogical activities across the entire iTEC project (specifically WP3, WP4, WP5, and WP6) each national partner identified one person to function as a National Pedagogical Coordinator (NPC). These NPCs had the task of organising and facilitating PD workshops in their countries as it was important to preform them with teachers across Europe. Guidelines on how to organise and facilitate the PD workshops were published on the WP3 iTEC wiki website. The guidelines included tips on preparation, participants, equipment, space, time, and process. For a detailed description of the workshop guidelines see Appendix A. Teachers participating in the PD workshops were not rewarded with money or other goods.

Each workshop resulted in an audio or video recording of about 2 hours, 10 to 20 digital photographs of the teacher discussion and the space in which the workshops took place. The facilitators summarised key points for each of the discussed scenarios in English, and delivered these summaries with the photographs to WP3. Overall, the summaries included thoughts and comments on the feasibility of mainstreaming the activities in the scenarios, suggestions for changes in the activities and the roles, as well as first signs of recognised challenges and opportunities.

Focus groups

Figure 4: Focus group session at the Viikki Normaalikoulu in Helsinki

Focus group sessions are relaxed but facilitated discussions between people who share the same interest, education, profession or other common factors. Their purpose is to receive feedback, comments, and suggestions on a prototype of a product, service, or other design. (Kruger and Casey, 2000) During the 1st cycle, three focus group sessions with 2 to 4 teachers of different grade levels and subjects were facilitated and moderated by 1 to 2 designers in Finland (see Figure 4). Often, focus groups are considered to be considerably larger, including 5 to 6 participants (Kruger and Casey, 2000). The ad-hoc organisation of focus groups was a compromise on the size of the group, but allowed us to consult teachers quickly in relevant phases of the design process to gather information and inspiration for more informed decision making and to discuss new design features.

Several focus group sessions need to be organised before implementing the comments of the participants so that similarities and differences in the discussions can be analysed to form informed design decisions (Kruger and Casey, 2000). Considering the time constraints and having the opportunity to arrange ad-hoc focus groups, informed design decisions were reached based on rapid iteration.

The focus group sessions were organised as iteration of the participatory design phase, after product design activities, in which visually advanced prototypes were developed. The scenario videos that were created in the beginning of the 1st cycle were presented to the teachers participating in the focus group sessions to introduce the basic context of the iTEC project to them.

In one of the focus groups three visually advanced prototypes were discussed, and in the other two the discussion focused on one advanced prototype. The prototypes will be illustrated in detail in Chapter 4 of this report. Facilitators moderated a lively discussion, encouraged everyone to speak and express their ideas early on in the session, while carefully listening to the comments, suggestions, and ideas inspired by the prototypes. After each session the key discussion points and new design leads were summarised to be taken further in the product design phase.

Pre-pilots and pilots

One of the requirements of iTEC is to test innovative practices in at least 1000 classrooms across Europe. During the 5 cycles of iTEC, full scale piloting activities are organised, where teachers will test these practices in a course they are teaching. To mitigate risks, smaller scale pre-pilots are organised in each cycle, so that the prototypes are first tested with just a few dozen classrooms, and improvements can be made before full-scale pilots.

Pre-pilots and pilots are also ways to involve teachers and get their opinions and insights into the design process. It is crucial for the WP3 design process to place the designs into real situations, because no artificial setting, workshop, or interview can reveal how the prototype will be used in everyday life situations.

1.3 Product design

Product design refers to design activities performed by expert designers to create prototypes that address the recognised design challenges and opportunities. Product design includes four iterative steps: Analysis, ideation, visualisation and programming.

To be able to test the scenarios in classrooms across Europe, learning activities were extracted from the scenarios. The learning activities, such as teaming up learners and creating a multimedia presentation, were linked to learning stories that exemplify how the advanced learning ideas come together. However, the teachers could arrange and choose to perform learning activities based on their particular situation and access to technology. The learning activities included teacher and learning motivation, equipment needed as well as a detailed description of the steps involved in an activity. As designed outcomes of the 1st cycle, the learning activities enable more targeted testing of the advanced learning scenarios. They are further discussed in Chapter 4 of this report.

In relation to the learning activities extracted from the scenarios, the summaries of the participatory design workshops were carefully analysed to produce design challenges and opportunities, discussed in Chapter 2 and 3. The body of challenges and opportunities evolved and was

further refined over time. Every time a summary arrived, it was printed and attached below the corresponding scenario on the long wall (see Figure 2).

Design opportunities were initially recognised as clusters that informed prototype ideas. The prototype ideas guided the recognition of further design challenges and opportunities, and refined the prototypes. The summaries were consulted over and over to complete the body of challenges and opportunities and to ensure that the prototype designs were grounded in the participatory design workshop summaries as well as driven by the design ideas.

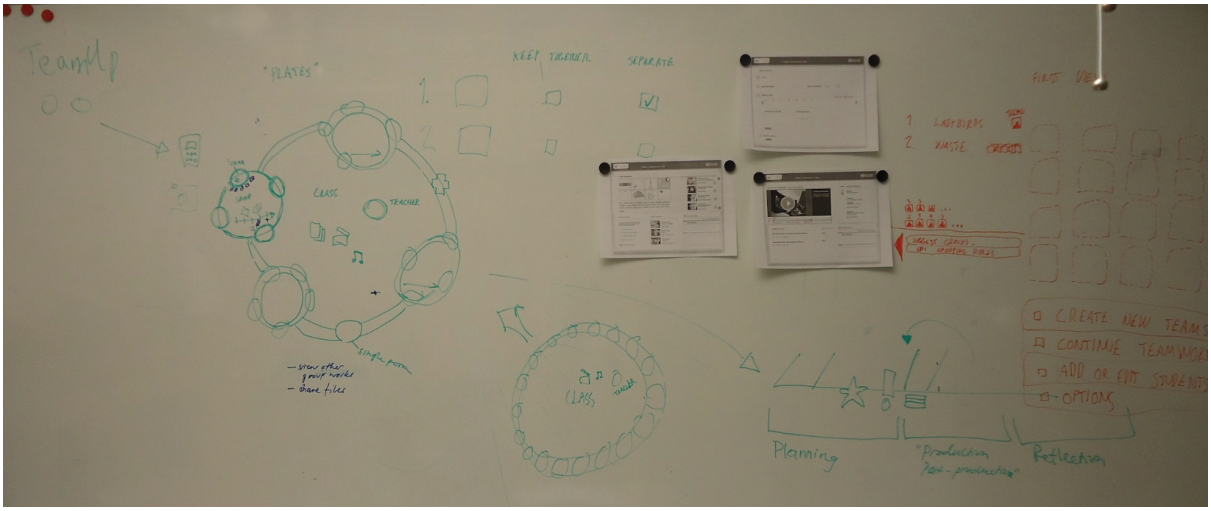


Figure 5: Whiteboard after the ideation session

During an ideation step the team discussed design features and navigational elements that tool prototypes should include, and deliberated their main aim and function. Post-it notes and whiteboard drawings were used to express the design ideas (see Figure 5).

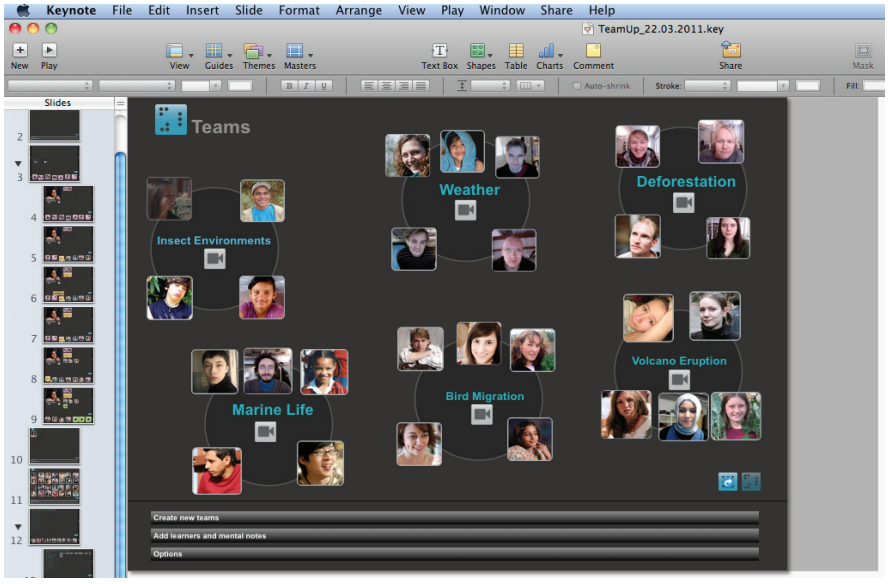


Figure 6: Screenshot of Keynote prototype created using presentation software.

Visual materials used during a design process can be rapid and low-fidelity, serving as methods of sketching and collaborating rather than as end products. Paper prototypes can be used for testing early interface designs. Often, they appear so sketchy that people participating in the

design process are encouraged to comment on the prototype freely, without censoring their criticism and thinking that a lot of work went into the prototype already. However, in cycle 1 the initial ideas were visualised in more detail as Keynote presentation slides. A presentation software was chosen because it enabled us to create prototypes that not only represent the way the tools look, but also to display how the work-flow proceeds from one screen to another. The slides presented the tools as they were intended to look without losing the wire frame and unfinished visual impression (see Figure 6).

The slides could then be tested or used as inspiration by teachers in the participatory design. Through the participant collaboration feedback on the idea and its functionality rather then the visual design was received. The most interesting results of the focus group sessions were the ideas of a simple video update of team activities after a team work session (see Figure 7), changes to the option areas, as well as interface simplifications to emphasis the tools learner centred instead of project driven quality. One focus group sessions was held in a school classroom, which presented the opportunity to project the intended visual appearance of the TeamUP prototype onto a wall under authentic conditions. It was recognised that some of the colours would have to change to improve the overall legibility of the interface.

In the following section, the development of the functional prototypes is discussed.

1.4 Production of software as a hypothesis

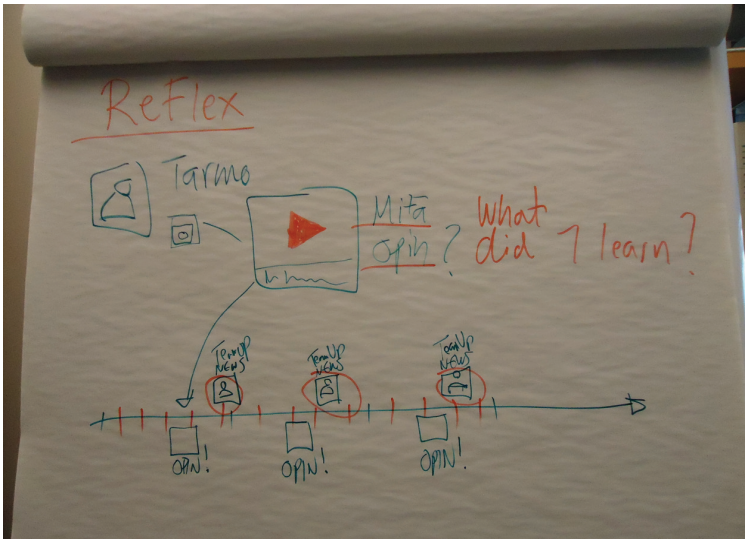


Figure 7: Resulting artefact of a focus group session

The title of this phase comes from the design process framework that was used. However, in this project, not only software, but also written guidelines and instructions for teachers were outcomes of the design process. All of the outcomes are considered to be hypotheses, as the way they are used and what they ***afford*** people to do in everyday school settings and practices cannot be fully predicted while the design happens[2]. These prototypes are therefore tested in pre-pilots and later in full scale pilots to validate them and to allow further adjustments to be made. A prototype (whether software or not) is a suggestion that could address some of the challenges in the everyday practice of teachers and at the same time introduce new educational practices into European schools that may support the personal development of individual students.

2 This is true of all software and product design. No design process can confirm whether a new innovative tool will work in the intended way, or how it will be used, before the tool is put into a real live situation. The design process used explicitly acknowledges this.

Production of prototypes was divided into two parallel activities. In the first activity, learning stories and learning activities were identified and written. Five learning stories and thirteen learning activities were designed for pre-piloting.

In the second activity, potential technological design solutions (or tool prototypes) to support those learning activities were identified, elaborated, and taken through an agile software development process. Ideas for three tool prototypes were identified. All three were explored visually and in focus groups, but only one, TeamUP, was developed into a functional prototype.

According to the DoW, during each cycle, WP3 needs to produce 5 to 6 prototypes, except for the 1st cycle, where 2 to 3 are called for.

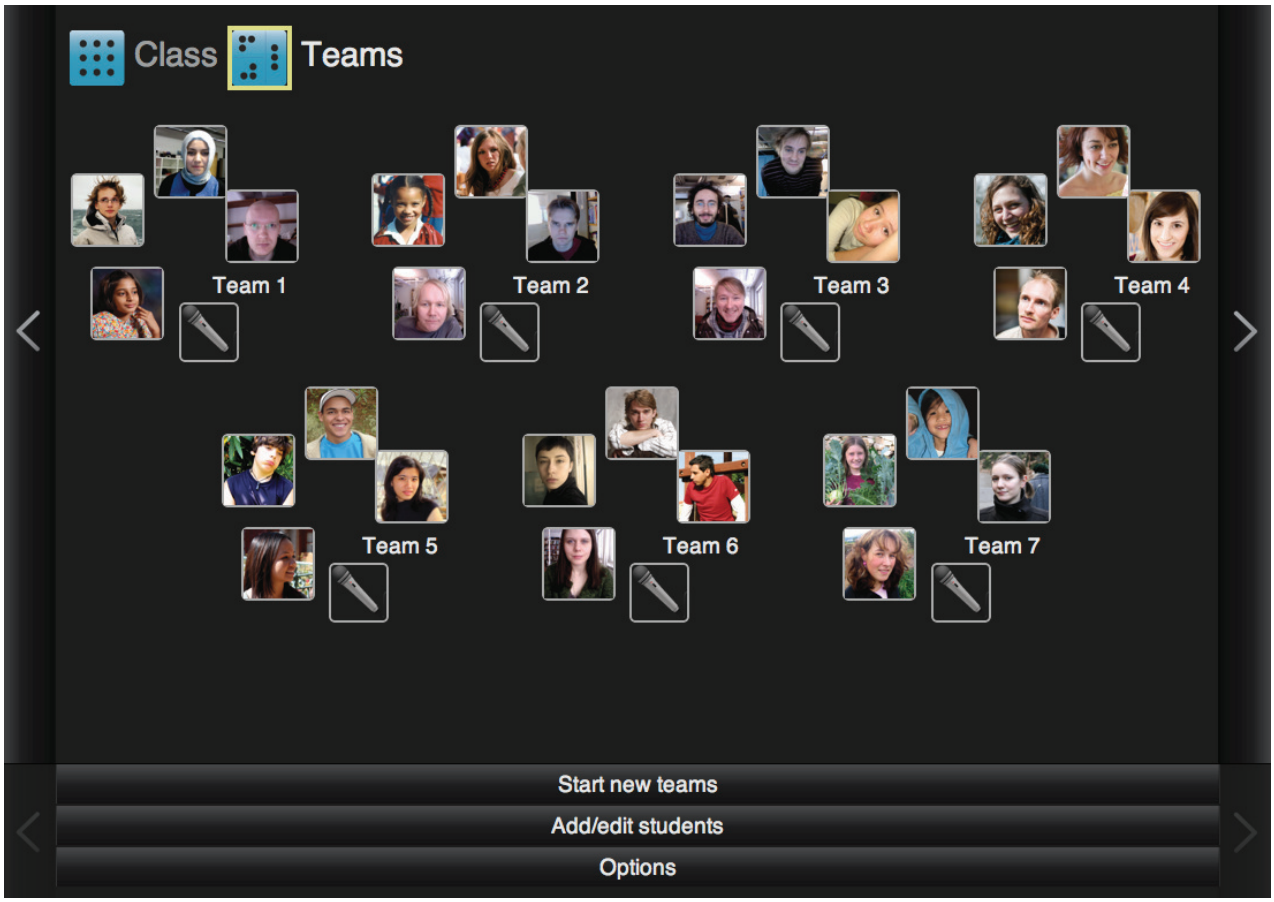


Figure 8: Screenshot of TeamUP web-interface

Development of the TeamUP tool started immediately after the ideation sessions. The keynote design prototypes were produced concurrently with the actual interface programming so that the design could negotiate with limitations and allowances of the selected technology. The development aimed for fast releases of functional web-based prototypes, which have been released[3] through the Trac project management system (see Figure 8). The development has proceeded top-down, from working user interfaces to data models and server arrangements that they necessitate. The chosen technologies for building the interface were jQuery, plain javascript and HTML5 for presenting the interface and manipulating it, Actionscript 3.0 and Flex 4.5 for building the Flash components for handling the camera and audio recording, and Wookie Widget Server as the data server

3 http://itec-wp3.taik.fi/prototypes/trunk/TeamUp/

2 Recognised design challenges

By analysing the summaries of the participatory design research workshops and the scenarios of the 1st cycle, we recognised 28 design challenges. Some of the design challenges were directly extracted from the participatory design workshop summaries, while others were recognised by careful analysis and cannot be related to any specific workshops and scenarios. This chapter describes all of the design challenges. The keyword annotations by the designers (see Figure 2) concerning each challenge were written into a short continuos textual explanation of each challenge.

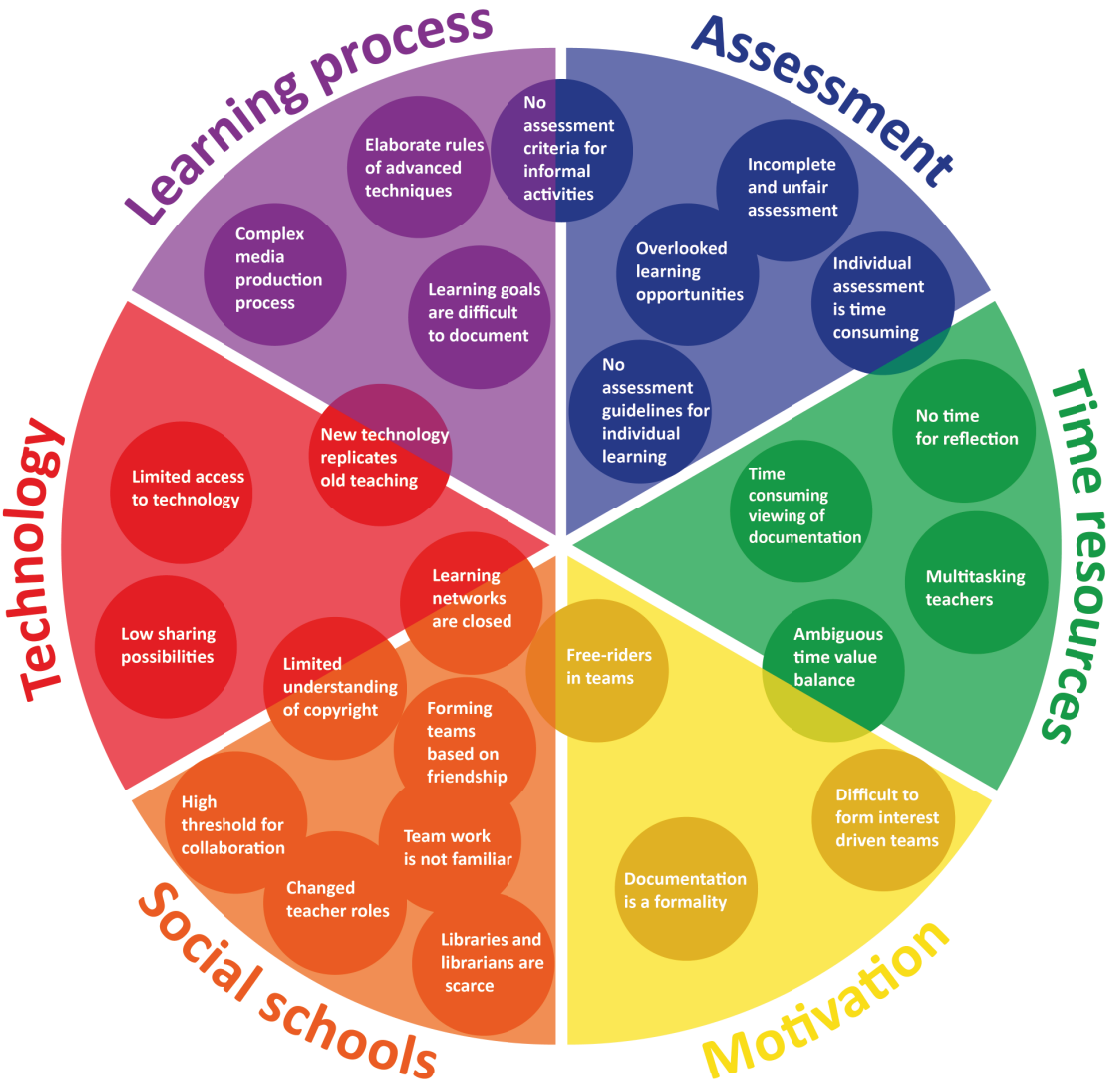


Figure 9: Overview of design challenges

The design challenges are based on concerns towards the integration of technologies and advanced learning activities into the current everyday practice and organisational structure of schools.

The challenges were grouped into six categories. The categories of the design challenges were created to present the design challenges according to a narrative structure based on the most prominent aspect of the challenges. This is not a definitive categorisation, as other overlaps might be possible. The main aim of this presentation is not to illustrate challenge intersections but to present the challenges in a coherent form. Figure 9 illustrates the categorisation and the overlapping of the design challenges. Each category and its associated challenges are described in detail in the following sections.

2.1 Learning process

In all the scenarios the learning process proposed for the future classrooms is different from the traditional model. Specific challenges related to the changing processes were extracted from the scenarios and from design workshop results.

Learning goals are difficult to document

Expected learning achievements of a learner and the course content may not match. The learning goals might also change and develop during a learning activity. Being able to explicitly recognise learning goals and the changes in these goals could give teachers and learners insight about the wishes, intentions, and learning gaps of learners. Teachers get feedback on where and how to further develop their teaching material to better meet the needs of individual learners. However, it is very challenging for young learners, and even for university level learners, to identify and document their expected learning goals, before performing an activity. In addition, the motivation for documenting their expected learning goals is not explicit, because no immediate reward is perceived.

Complex media production process

Several scenarios suggest media production related activities as a common task in school learning. The process of a media production is complex, because many iterative steps are involved and, depending on the project, may vary. The iterative nature of the media production process means that process phases proceed simultaneously without explicit outcomes from each phase. Teachers with little or no experience in media production might struggle with this, and have difficulties in guiding as well as assessing the media production process and result. The workshop summaries revealed that the teachers perceive the process as nontransparent, which also evokes a level of insecurity towards their role and professionalism. For further information, see Appendix B.

Elaborate rules of advanced techniques

Advanced group work techniques, such as progressive inquiry or jigsaw group work[4], can be very valuable for community building and personal development, because the rules are defined so that the learning of one learner depends on the knowledge of another. However, the complexity of the rules requires particular attention during the everyday classroom learning activities, especially when intending to arrange, manage and maintain well functioning groups.

2.2 Assessment

New learning practices imply a change in the roles and everyday practices of teachers and learners. Learners become active agents of their personal learning journey, creating rich information based on personal interests. Teachers see themselves becoming assistants and mediators, but also inspectors of learning, who need to manage and assess the rich information of the learners. Based on the workshop results, we recognised that teachers can imagine new media tools and technologies, such as electronic diaries and documentation of activities as well as personal profiles, to guide and facilitate the changes in roles and practices. The idea of being able to assess individual needs and achievements was considered by teachers a meaningful opportunity for the development of learners. Ideas such as the personal learning agent and database of assessment tools, although not fully designed, were embraced. Summative assessment was not really considered, as the scenarios focused on collaborative and project based learning.

The challenges related to assessment open up aspects of the current situation and the teachers' concerns about the design of tools that assess informal learning, onto which new assessment possibilities may have to build. For further information, see Appendix B: Collaborative Media Project (Finland, Portugal), Support Network of Experts (France, Austria).

Overlooked learning opportunities

Teachers explained that the curriculum presents learning goals in ways best achieved through traditional, formal classroom learning activities, such as lecturing. Some European schools register media production projects as playtime, the time in school during which nothing is expected to be learned. The learning that is achieved through participation in a media production project is not formally acknowledged; it is invisible. Although, for example media production projects and interdisciplinary team work activities are valuable learning experiences, ways of capturing, documenting, acknowledging and assessing this currently invisible learning are not documented, and, hence, not passed on.

Incomplete and unfair assessment

School project work often results in the creation of artefacts, for example posters, reports, or - considering informal team learning activities - video clips, websites and simulations. These artefacts embody information about decisions, information collection, and tests that a project team performed. The artefacts may also showcase skills and abilities that members of a project team

4 The jigsaw cooperative learning technique is a method, in which learners are grouped into home groups. Each member of a home group also enters an expert group. In the expert group the learner researches a topic that is essential for the completion of the home group work. Every learner in the home group has to listen to the expert group learners carefully in order to complete the project successfully.

acquired. However, despite this, teachers mentioned that a complete and fair retrospective analysis and reflection of the production process based on the artefacts alone is not possible.

No assessment criteria for informal activities

Rich team work processes can evoke equally rich learning achievements. These learning achievements vary from project to project and learner to learner. Recognition of this often invisible learning varies from teacher to teacher, based on individual biases and preferences. In relation to this, teachers also voiced concerns about the process of deciding the amount of accreditation to award. The teachers' concerns pointed us towards the question of how to categorise project work based on school subject areas and from which aspects the same project work can be accredited and evaluated. These, according to the teachers, are particularly relevant questions when cross-curricular skills are being developed.

No assessment guidelines for individual learning

Many scenarios included activities from a very wide range, including interviews with outside experts, media production skills, and independent research. Teachers were concerned about the assessment of learners entering the activities with different initial skills. For example, one learner may have more experience using expert jargon, foreign languages and interviewing techniques than another learner of the same age, who is more experienced in storytelling, bridging of subject areas and handling technology. It was unclear how a teacher should evaluate these two learners, as one may produce a very good end result without learning anything new, while the other may struggle to produce a mediocre result, yet learn a lot during the process. Should the criteria be the same for each learner, or be based on the amount of progress each learner makes? Furthermore, the teachers were concerned about possible requirements of the learners, for example being able to work autonomously with expertise before starting a learning activity, again stressing the fact that learners have different skill level and different ways of learning about the same topic.

Individual assessment is time consuming

Assessing rich individual information from each learner separately, for example through teacher and learner reflection, requires time. This time may not be available to the extent necessary to perform fair individual assessment with care.

2.3 Time resources

Many European schools are on a tightening budget, calling for more efficiency often at the cost of teaching quality. Many of the challenges in other categories also relate to insufficient teacher resources, but these challenges are mainly concerned with them.

No time for reflection

Reflection of learning activities can represent a valuable way for teachers and learners to understand learning interests, goals, and achievements as well as areas where further learning is required. However, existing practices do not include reflection of finished projects, because there are no time resources allocated for that in the formal curriculum.

Multitasking teachers

Future learning activities, such as media production project work require the class to split up into small teams. It is implied that the teacher manages several projects and groups, guide content learning and facilitates media production processes at the same time. Teachers were concerned that they have insufficient resources to properly oversee multiple small teams, and they cannot concentrate on the development of individual learners.

Time consuming viewing of documentation

Looking at the learners' documentation of their out-of-school activities, teachers can learn about youth trends, the personalities of the learners and how they handle technology. Teachers can use this learning to develop learning material that is building on the personal interests of the learners. Additionally, documentation of learning activities could be used to build learning networks or interest based groups among learners and teachers. These benefits were also recognised by the teachers during the workshops. However, the teachers mentioned that it is time consuming to view the documentation of all learners. Their motivation to invest time into viewing the documentation of learners who are not active participants in their class is low.

Ambiguous time value balance

Teachers are aware of the benefits of learner centred practices that consider individual needs and interests, as well as foster dialogical relationships between learners and teachers. For example, teachers know that paying attention to skills or talents that learners develop outside of school and actively incorporating them into school learning can further the self-expression and the self-esteem of learners. However, the amount of time spent with one project takes away from the time available for other, equally important learning opportunities. This results in ambiguity about the value of one practice above another. For example, preparing a personal learning contract with learners happens in only some European schools, and only irregularly, because the preparation and individual work that the practice includes can be overwhelming. See Appendix B: Personal Learning Contract (Lithuania, France), Recognising Informal Learning (Italy, Estonia, Slovakia), Support Network of Experts (France, Austria), Collaborative Media Project (Finland, Portugal).

2.4 Motivation

While many of the scenarios attempt to increase learner motivation, teachers saw some challenges that may undermine these intentions. Many motivational techniques are quite time-consuming, so teachers need to compromise.

Documentation is a formality

Documenting hobbies of learners with digital media was the main learning activity described in one of the scenarios. During the participatory design sessions, teachers reported that they see value for learning in that activity and consider it motivating for "lower performing" learners to use their favourite technology to document their hobbies. However, according to the teachers, this is not motivating enough to shift the tendency of active learners being most active. Integrating personal interests by way of documenting outside of school hobbies with digital technologies formalises these hobbies and the documentation of them for the sake of earning credits seemed like

a formality – a routine practice that may miss meaning. See Appendix C: Personal Learning Contract (Lithuania, France), Recognising Informal Learning (Italy, Estonia, Slovakia).

Difficult to form interest driven teams

Student-centric pedagogy emphasises that taking the learners' personal interests into account increases motivation. Most future school learning activities that build on that are often based on project work in teams. However, forming teams of 4 out of 20 to 30 learners, allowing each learners' interest to affect the team formation, and to place each learner into a team that focuses on a topic that personally interests them can be a time consuming and computationally challenging task.

Free-riders in teams

Unequal workload distribution between learners within teams has some learners working hard, while others only tag along.

2.5 Social schools

Schools are social environments, where friendships and personal attributes affect what happens. These challenges include aspects related to relationships, the social and cultural expectations of teachers and learners, personalities, and social norms.

Forming teams based on friendship

Letting learners form teams on their own often result in friendship cliques, that is, good friends coming together over and over. This reduces the possibility to learn how to work with different people. Furthermore, this can result in projects where learning outcomes are minimal, if friends with minimal study motivation come together.

Team work is not familiar

Although the PD workshops resulted only in a small sample of comments by teachers in European countries, it was recognised that many European teachers are not used to students working in small teams, and will not easily organise team work activities, despite the foreseen benefits. As only a small amount of comments by a limited amount of teachers was analysed, we should be careful in making generalisations about an entire country's educational practices.

High threshold for collaboration

Teachers expect that collaboration between teachers within the school, among schools, and internationally, as well as collaboration with outside experts will become more and more common. Currently, the levels of collaboration differ across European schools. Overall, it was noticed that collaboration with other teachers and with outside experts is not an everyday school activity.

There is a high threshold in establishing the initial connection with unknown people. Building learning networks and opening up existing networks is time consuming. Also, organising collaboration requires a lot of effort from teachers without assurance for success. In some countries it is a sign of something gone wrong when people are called into school – with the exceptions of field trips, camps, and similar nonrecurring events. Of the countries involved in the workshops,

only Portuguese students establish partnerships with universities and other organisations when doing team projects.

Collaboration between teachers differs across Europe. For example, in Lithuania strong competition among teachers both within a school and across schools makes sharing of learning materials rare. On the other hand, in most other countries, collaboration between teachers of different schools, also beyond the borders of a country, is anticipated. Some teachers use digital and online technologies for collaborating, sharing, commenting, and discussing with teachers of the same schools, mainly in pairs. In some European schools this is extended to teachers of different schools. See Appendix B: Support Network of Experts (France, Austria), Teacher support network (Lithuania, Finland, Portugal), Collaborative Media Project (Finland, Portugal).

Learning networks are closed

To share learning material, exchange experiences, and to learn from each other, some teachers in some European countries establish and maintain learning networks informally, without support from the school management. Teachers who participate in such informal learning networks report that the networks have vague structures and goals. They mention that tool utilisation could be optimised. For example, sharing of learning material and discussion happens in several places, and teachers establish networks with other teachers and outside experts of their own field that are inaccessible for others. Mainstreaming the use of learning networks implies the involvement of classroom and school management.

Changed teacher roles

Teachers recognise a change of their role in several of the scenarios from “Sage on stage” to:

- Guide, who points learners at connections between school learning and topics outside of school
- Moderator, who comments and mediates the learning process
- Technician, who is skilled at using technology and cares for the hardware
- Advisor, who has an eye on the future and recommends areas for deepening skills and knowledge
- Facilitator, who gives the learners the opportunity to participate in learning projects
- Listener, who learns about new topics that the learners are interested.

This changed role of the teacher would be better in line with the European competences for lifelong learning, forming a relationship that supports personal development for both teachers and learners. Currently, the new teacher roles might not be socially well accepted in some European countries. For example, a teacher mentioned that contacting another teacher to improve learning materials during class could be considered by the learners as failure of the teacher. The humiliation was not something this teacher was willing to risk.

Regarding changes in the organisational structure of European schools, when working outside of the school building, the responsibility for the safety of the learners rests with the teacher, even when parent permissions were given. This may limit how locations and events outside of the school may be utilised in education. See Appendix B: Support Network of Experts (France,

Austria), Teacher support network (Lithuania, Finland, Portugal), Recognising Informal Learning (Italy, Estonia, Slovakia), Collaborative Media Project (Finland, Portugal).

Libraries and librarians are scarce

Growing up in a world where most information is accessed digitally online, it is important for young learners to learn digital literacy skills, such as understanding basic copyright issues or identifying meaningful and credible sources online. Skills for responsible and productive navigation online are needed. In two scenarios, the idea of libraries as centres for digital literacy skill training are mentioned. The suggested learning activities are based on the librarian with digital literacy skills with a leading role in the scenario.

However, in many European schools, libraries are not part of the school landscape and if they are, most librarians have limited skills in performing research with digital technologies, or supporting learners directly. Most librarians are therefore not able to pass on digital literacy skills and knowledge about copyright related issues to learners. The availability of librarians is limited to library opening hours. Additionally, contradictory opinions were expressed concerning whether learners develop sufficient digital literacy skills when teachers and librarians guide them towards safe places. See Appendix B: Practising Research Skills (France, Austria, Italy, Estonia), Library as learning space (Finland, Hungary).

Limited understanding of copyright

Copyright related issues arise from media production projects, when resources are downloaded from and uploaded to the Internet. Learners and teachers need to know the rules to follow when remixing images, videos and other data from the Internet in their own productions and then publishing these works. However, copyright law is a maze that European teachers are not able to navigate.

2.6 Technology

With the iTEC project it is suggested that innovative technologies are means that may facilitate advanced learning activities in school. Consequently, revealing and addressing the challenges related to the technologies currently used in classroom, the concerns of teachers using the technologies and the systemic challenges related to technology are of relevance to the project. need to be revealed and addressed in the iTEC project. The challenges related to technology that were recognised during the 1st cycle are reported here.

Low sharing possibilities

Sharing work in process in learning communities and with teachers, as well as between teachers, learners and people outside of school is central in several scenarios. Workshops revealed that this kind of sharing is not very common, but that teachers would like to see more of it. Current sharing and media production solutions are difficult to use and require time to learn. This lowers the possibilities and motivation for adapting learning activities based on sharing.

Limited access to technology

Teachers recognised that some of the scenarios would be best performed in a 1:1 setting, with one computer or other device for each learner. However, according to the teachers, resources such as cameras, and laptops are limited in schools and computer equipped classrooms are only available when the class is scheduled to use them. Digital technologies are assigned to locations, not to learners.

Some teachers, however, stated that, high quality video footage is not needed for the learning activities mentioned in the scenarios, suggesting that the learners could use their personal technological equipment, such as camera mobile phones. Other teachers consider this problematic, because tools and services are not available to all learners equally. While some learners blog about their hobbies at home, others don't own a private computer. Teachers also said that it is difficult for schools to influence what technology the parents purchase for their children.

Regarding spatial arrangement, teachers mentioned that classrooms with fixed row settings are not suitable for the future scenarios. Laboratories for self study are needed. See Appendix B: Practising Research Skills (France, Austria, Italy, Estonia), Personal Learning Contract (Lithuania, France), Recognising Informal Learning (Italy, Estonia, Slovakia), Collaborative Media Project (Finland, Portugal).

New technology replicates old teaching

The advanced learning activities presented in the scenarios suggest new practices in schools. Future classroom technologies can be seen as the tools that support, enable, and formalise these changes of practice for example towards cross-curricular learning, learner centred activities and mixed age group learning. Teachers consider technologies to provide them and the learners access to the entire world of knowledge, or offer ways of establishing community in the classroom. Teachers report that some learners use their mobile phones to check the meaning of words on the Internet, when the teacher's explanation does not make sense to them. Teachers dream of classrooms without row seating arrangements, where project and self study activities with laptops and devices or reflective discussions guide the arrangement of the space.

These practices are currently not part of the day-to-day routine of schools, and not considered in the design of learning technologies that are used in the classroom today. Teachers report that many educational technologies used in schools, such as interactive whiteboards, slides, and pictures on the web, replicate existing teaching styles. Teachers complain that the technologies are not "as disruptive as they should be." See Appendix B: Teacher support network (Lithuania, Finland, Portugal), Library as learning space (Finland, Hungary), Practicing Research Skills (France, Austria, Italy, Estonia).

2.7 Selection of scenarios for pre-piloting in cycle 1

Based on the Participatory Design workshop summaries, it became evident that some of the scenarios were not suitable for pre-piloting during cycle 1. They may, however, be revisited during future cycles. Overall, it can be stated that these scenarios do not merit testing, because they assume organisational and practical terms and conditions that the current pre-piloting facilities and processes cannot accommodate. The particular scenarios and the reasons for not testing them during the cycle 1 pre-pilots are:

Personal Learning Contract Testing this scenario would exceed the scheduled time frame of the pre-pilot tests, as the scenario would have to be performed by teachers for longer than one semester to present relevant results. Furthermore, in Tallinn University, studies are being conducted around this scenario and initial results are expected to be available within one year. These results will provide a base for deciding on whether or not to pilot the scenario.

Teacher support network Teacher learning networks (TLN) take time to build. Currently a few teachers in some European countries have established a TLN informally. For pre-pilot tests, it cannot be assumed that the teachers have established networks and are willing to open these networks up to other teachers. It would take too long to establish a TLN before the pre-pilot tests. Currently the role of the teacher as facilitator as described in this scenario is socially not well accepted in some European countries and there are no iTEC technologies that support this change of practice.

Library as learning space Testing this scenario would mean to actively include the librarian into the pre-pilot tests. In some European schools there are no librarians, and in others the librarians do not have the digital literacy skills that the scenario presupposes. For the pre-pilot testing, schools with advanced ICT teachers, not librarians, were identified.

Practising Research Skills Similar reasons for not recommending the “Library as learning space” influenced not recommending this scenario for pre-pilot testing. The ‘Practicing research skills’ scenario also assumes the possibility to work with a digitally literate librarian, which is, given the current state of the European schools and the iTEC project, a challenge that cannot be tackled during pre-pilot testing. Limited opening hours of libraries also impact this scenario.

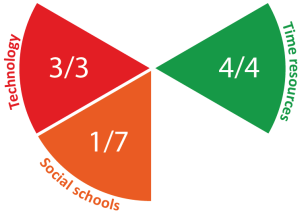
The other five scenarios were developed into learning stories and learning activities and were pre-piloted (see Appendix D):

- Outdoor study projects
- Support network of experts
- Collaborative media project
- Recognising informal learning
- Reacting to student feedback

3 Design Opportunities

While analysing the participatory design workshop summaries and relating them to the detailed scenarios and the design challenges, 16 *design opportunities* were identified. A *design opportunity* represents an angle from which design challenges may be addressed, a guidepost that may lead to a concrete design result and/or prototype. In their nature, the opportunities are often suggestive of a concrete design, however not explicitly describing one. This is done because not all design opportunities can be addressed with advanced tool prototypes in this cycle, but it is important to document the guideposts in order to be able to return and add to them in later cycles. They may serve as source of inspiration for further prototypes. Chapter 4 mentions concrete prototypes that realise many of these design opportunities.

The identified design opportunities were grouped based on 5 themes. Each theme addresses particular design challenges. This chapter outlines the themes, presents the individual design opportunities and lists the addressed design challenges. Figure 10 illustrates the design opportunity themes, which individual design opportunities they comprise of, and what design challenge categories they address.



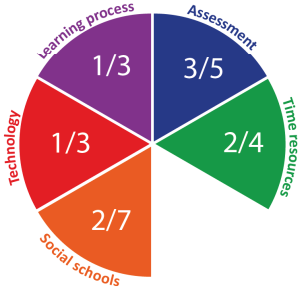
Theme 1: Guiding for design

Intuitive navigation saves time

Clearly state motivations, durations and learning outcomes

Value adding technologies

Design towards change of the role of the teacher



Theme 2: Media production

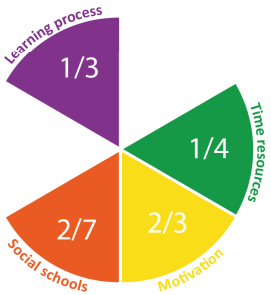
Transparent and guided media production

Recommending documentations to others

Translating meaningful tasks of librarians

Design towards wider access to technology

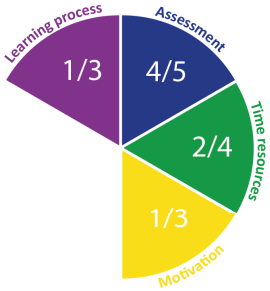
Attribution tips and copyright practices



Theme 3: Forming small teams

Supporting team work

Teams based on the interests of learners



Theme 4: Reflecting on documentation of learning

Guided and fast documentation

Step-by-step documentation

Visible learning achievements and learning journeys

Immediately perceived value

Theme 5: Other relevant opportunities

Formal support for learning networks

Figure 10: Overview of design opportunities and themes

3.1 Theme 1: Guiding for design

The first theme consists of design opportunities that are general guides to the design process and actually influence all other themes as well. The challenge areas that these meta-level opportunities address are illustrated in Figure 10 a.

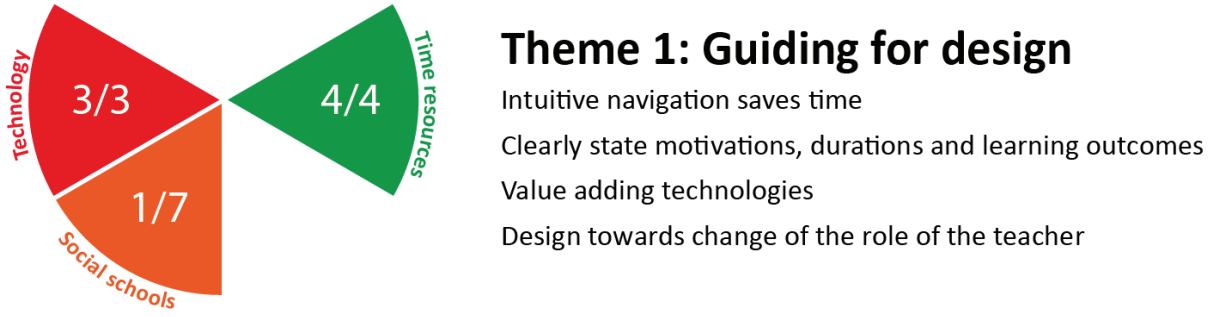


Figure 10 a: Overview of theme 1 design opportunities

Intuitive navigation saves time

Improved interface and interaction design of digital tools (e.g. small number of steps for sharing media pieces or a structured walk through the media production process) can minimise time resource consumption. Interfaces that guide teachers and learners through learning activities or visually simplify navigation may lower the learning curve and facilitate the management of concurrent projects, such as the media production process or digital documentation of learning achievements. This opportunity will be elaborated more concretely in the following themes. Here it is important to note that interfaces commonly used allow for significant improvements through visual simplification and proper UI design.

ADDRESSED CHALLENGES

2.6 Technology
Low sharing possibilities
Limited access to technology
New technology replicates old teaching

2.3 Time resources
No time for reflection
Multitasking teachers
Time consuming viewing of documentation
Ambiguous time value balance

Clearly state motivations, durations and learning outcomes

Teachers choose meaningful learning activities from a pool of learning activities by balancing available time, learning outcomes, and motivations. To support them in their choice it was recognised that teachers can reach an informed decision more quickly when the approximate performance time, the explicit motivation for teacher and learner, as well as concrete learning outcomes of each learning activity are stated clearly. Furthermore, we recognised that teachers would benefit from an overview of all available choices at one glance.

ADDRESSED CHALLENGES

2.3 Time Resources
Ambiguous time value balance

Value adding technologies

Addressed challenges

2.6 Technology
New technologies replicate old teaching

Based on the summaries of the participatory design workshops, teachers recommend that the iTEC design process should consider what activities are difficult to perform with only non-digital tools. Examples of these: building on other learners' work; collaboratively contributing to the same goal; gaining knowledge and inspiration by watching the works of earlier groups. Technologies, teachers recommend, should add value to learning and present activities that would not exist without the use of technology.

Design towards change of the role of the teacher

Addressed challenges

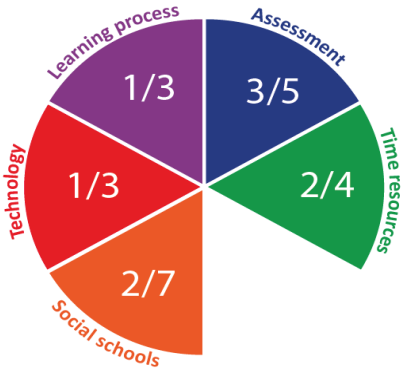
2.5 Social Schools
Changed teacher roles

2.6 Technology
New technologies replicate old teaching

Changing teacher roles is a slow process that can only be mediated by a change of practice, which in turn requires change in the organisation of each school. Introducing change is likely a longer process than what the iTEC project can offer alone. However, the prototypes as well as learning stories and activities piloted in iTEC can contribute to the process of change by presenting interfaces that support advanced learning activities, requiring teachers to act as guides, listeners, advisors, or mediators. Examples that were discussed during the workshops are ad hoc matching of learners, online calls as well as live chats between classrooms and to online outside experts. Teachers also suggested that, instead of class teachers transforming into technicians, resource teachers[5] could take this role.

3.2 Theme 2: Media production

Researching and creating content for multimedia work presents subject learning opportunities, but also the possibility of acquiring media production skills, such as creating a digital video. These skills will results in additional ways in which to navigate the world and to express insights or opinions. The ability to create digital content can be seen as a form of an additional literacy and a tool to support learning.



Theme 2: Media production

Transparent and guided media production
Recommending documentations to others
Translating meaningful tasks of librarians
Design towards wider access to technology
Attribution tips and copyright practices

Figure 10b: Overview of theme 2 design opportunities

5 Resource teachers here are understood through their role in Finnish schools. They are supporting teachers that can be asked to assist whenever a second teacher in a classroom would be useful.

In five of the nine detailed scenarios, media production related learning activities were recognised. The identified design opportunities that relate to the Media Production theme are addressed in the challenge areas illustrated in Figure 10b.

Transparent and guided media production

Addressed challenges

2.1 Learning Process
Complex media production process

2.3 Time resources
Multitasking teachers

During the participatory design workshops, teachers noted that media production follows a complex process that is difficult to perform with the entire class. During the project it is important to know what activity follows which and to have clearly defined roles. A large part of the preparation for a media project goes into preparing a step-by-step plan. Although teachers recognise that there are similar steps for each media project, they are not well versed in the process. This leads to creating the step-by-step plan anew for each project to suit the project's specific needs.

Teachers expressed that a guide explaining the process in simple words would support them in guiding the class. Relevant here was also that the guide should include an overview of the successive steps and that it should be adaptable to individual situations and projects. According to the teachers, being able to mark tasks as complete could add to learners' and teachers' transparency and satisfaction of the process, reminding both that every phase includes a learning purpose.

The teachers also mentioned that open ended project work might be completed by learners in a very short time. A guide should take this into account and lead learners to engage in their project with sufficient depth.

Recommending documentations to others

Addressed challenges

2.2 Assessment
No assessment criteria for informal activities

2.3 Time resources
Time consuming viewing of documentation

The large amount of time required to view a learner's documentation of, for example, their voluntary out of school learning activities is not motivating for teachers.

According to the PD workshop summaries for scenario 6. 'Recognising informal learning', teachers are practicing social assessment methods, such as self-assessment, peer feedback, and collaborative assessment criteria development. Teachers are also open to learning new ways of integrating learners into the assessment process. Hence, recommending documentations to individual teachers based on their area of expertise was identified as a social practice that could draw the attention of a teacher to a particular work. Teachers would save time spent on viewing documentations that are irrelevant for them and their expertise.

Recommending a documentation to someone requires responsible consideration of the expertise and time available of the addressee, as well as of the documentation at hand. If anyone may recommend documentations to anyone, the subjectivity inherent in this method will be reduced.

Although the matching of projects and expertise are addressed this way, questions about how many times and from how many angles the same documentation and project may be assessed are left to be answered.

Translating meaningful tasks of librarians

Digital literacy skills and being able to select relevant information independent of the medium may lead to more critical reading and can deepen subject understanding. Two scenarios included learning activities in which learning of digital literacy is strongly tied to libraries and librarians. However, changes to the set-up of school facilities, regarding furniture, wall arrangements or libraries are not in the scope of the iTEC project.

Addressed challenges

2.2 Assessment
Incomplete and unfair assessment
Individual assessment is time consuming

2.5 Social schools
Libraries and librarians are scarce

The summaries of the participatory design workshops suggest that learning digital literacy does not need to focus on libraries and librarians. Understanding the meaningful tasks of librarians and translating them into other learning activities was an important revelation. For example, a skilled librarian uses online databases and the Internet as a tool for information reference. Providing learners access to library resources, such as online databases and catalogues from outside of the library and the school systems could allow learners to search for resources on their own, in groups or with the teacher at any time and place. It may also be possible to use the iTEC person registries to provide learners and classrooms with access to properly skilled professionals, if their own school lacks them.

Being able to access information alone is not enough for learning digital literacy skills. Teachers mentioned the importance of sharing and networking capabilities to support learners in their research. Learners could recommend, cite and compare relevant sources and references and comment on the reliability of references. Teachers further noted that presentations and feedback are important for self-assessment and motivation. Sharing knowledge through different forms of documentation, such as individual and collaborative writing, referring, and linking, can be motivating for the learners. Teachers concluded that peer evaluation, taking active part in defining evaluation criteria, and self-assessment can build digital literacy and cooperation skills among learners.

Design towards wider access to technology

Addressed challenges

2.6 Technology
Limited access to technology

Policy changes, budget allocations and interference with the home learning culture would have to be considered in order to fully address the learner's limited access to technology. iTEC alone might not be able to answer this challenge in its piloting activities, but these barriers could be brought to the attention of policy makers for consideration.

However, the limited access to technology can be taken into consideration in the design of iTEC prototypes and learning activities, for example by decisively supporting sharing of digital technologies. Another possibility of addressing the challenge is offering alternative ways of performing a learning activity. In the "Learning stories and learning activities" document used for pre-pilot testing in cycle one this opportunity was already seized.

Teachers recommended to manage technological equipment in schools by way of hiring out equipment to learners, teachers, or a class based on learning activities and needs, instead of following the current assignment of equipment to locations.

Attribution tips and copyright practices

Addressed challenges

2.5 Social schools
Limited understanding of copyright

When working on media production projects and similar learning activities, learners and teachers quickly stumble into copyright issues. Often, learners and teachers cannot tell how and if a media piece downloaded form the web can be used. Considering the vast amount of public domain and Creative Commons licensed material on the Internet, it would be supportive to automate attribution (along the lines of Scratch or YouTube video editor) and to present recommendations for best practices to learners and teachers. This could sensitise teachers and learners to copyright and the consequences copyright poses to their work.

3.3 Theme 3: Forming small teams

Forming teams is a prerequisite in six of the nine scenarios. Here, teams are considered to be groups of people that share the same goal and a sense of togetherness. Each individual member contributes to the achievement of the goal. The design opportunities that are discussed here address the challenge areas illustrated in Figure 10c.

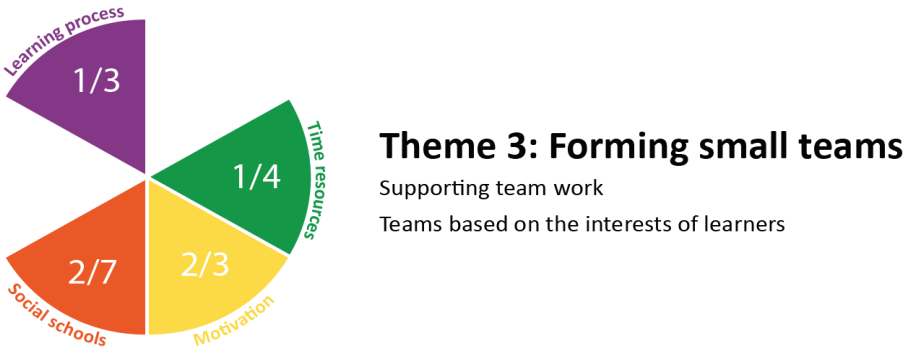


Figure 10c: Overview of theme 3 design opportunities

Supporting team work

Addressed challenges

2.1 Learning Process
Elaborate rules of advanced techniques

2.3 Time resources
Multitasking teachers

2.4 Motivation
Difficult to form interest driven teams

2.5 Social schools
Team work is not familiar

Keeping an overview of several small teams in the classroom can be time consuming and pose a challenge to performing teamwork. Teachers should be supported with the management of several small teams. This is especially important for teachers who are not used to working with teams in the classroom.

One way to guide teachers towards working with teams is to help them to form teams quickly. A visual overview of teams and their current status could support teachers in managing several teams and their works, allowing teachers to focus on the development of the learners instead of managerial and administrative tasks. Further-

more, a visual overview of teams could also support teachers to perform advanced learning techniques with elaborate rules, such as jigsaw or progressive inquiry, because the visual clues can represent the relations between teams.

The traditional methods available for teachers are learners self-organising into teams, the teacher selecting the team members subjectively, or randomly assigning learners to teams. Self-selection often results in poorly performing teams while teacher selections may be met with resistance. Teams that are formed by an external authority such as a computer may be more acceptable to learners and can potentially create better team configurations than random assignments.

Teams based on the interests of learners

Addressed challenges

2.4 Motivation
Difficult to form interest driven teams
Free-riders in teams

2.5 Social schools
Forming teams based on friendships

Working on a topic that is personally relevant to a learner is motivating and offers the opportunity to focus on the learning outcome. Teams that are formed based on learners' interests fluctuate and learners learn how to work with different people. They are unlikely to be based on friendship alone.

While personal interest refers to a topic or skill that a learner would like to learn about, it also refers to what is best for the personal development of each individual learner. Teachers develop tacit knowledge about their learners, such as what languages a learner speaks, their special skills, personality traits, or the social circle of a learner. The tacit knowledge is noted down mentally by a teacher, possibly into a private note book. These mental notes indicate and affect the way teachers work with the learners. Externalising the mental notes and automating their use for team formation may facilitate forming of teams based on the interest of the learners. Making the practice of using mental notes as criteria for teaming up learners widely available to other teachers may result in forming teams that support the learning outcome, motivation and development of learners.

Forming teams based on topics or skills that a learner would like to learn about, as well as the skills learners already have could also reduce the amount of free-riders, because of the rising motivation and the highlighting of their individual expertise. Highlighting an expertise as opposed to assigning roles may lead learners to take responsibility over a particular task or role, without limiting their activities to the same.

More directly, when the learners are split into teams, each tackling a common theme from their own viewpoint, taking learners' personal interests into consideration will improve motivation. Some facilitating solution is needed to take into account the personal interests of all the learners and finding the optimal team configuration.

3.4 Theme 4: Reflecting on documentation of learning

The third theme we recognised in eight of the nine scenarios was 'reflecting and documentation of learning'. Documentation of learning refers to something like a portfolio. The Italian Ministry of Education has actually unsuccessfully introduced portfolio work into everyday school learning activities in 2004. The memories of the teachers connected to this attempt are negative, and the notion of an e-portfolio may carry unintended meanings in Italy. Here, we use the more descriptive term learning documentation.

Documentation of learning achievements can give learners the opportunity to reflect on their learning process. Reflecting can be a tool for learners to understand how their past learning activities can inform what they would like to learn or would have to improve in the future. The challenge areas that are addressed with the design opportunities are illustrated in Figure 10d.

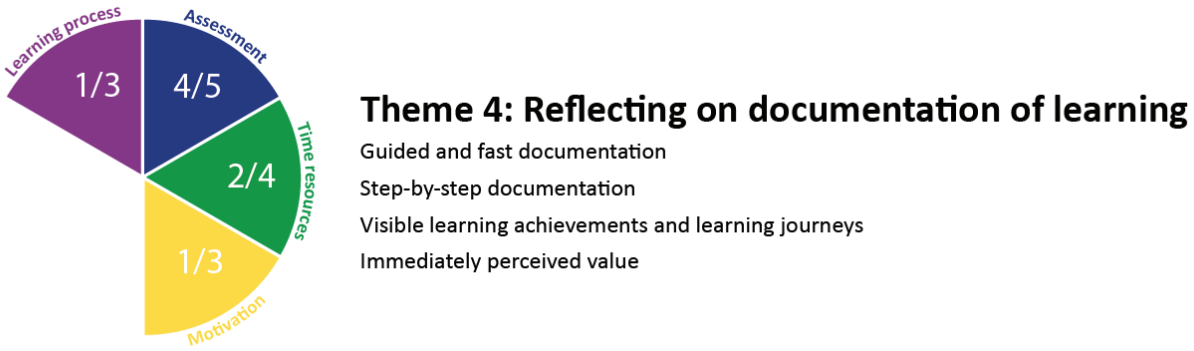


Figure 10d: Overview of theme 4 design opportunities

Guided and fast documentation

Through recommendations, the amount of time spent in evaluating and assessing learners' works can be shortened. Time requirements can be cut even more by limiting the way learners document to a particular format and time-frame. Framed and timed creation of documentation minimises the time used for creation, and may support the establishment of documentation as an everyday practice. Learners may be motivated by a simple and easy to access documentation format that can be shared with different communities across different media with minimum effort.

Addressed challenges

2.1 Learning process
Learning goals are difficult to document

2.2 Assessment
Individual assessment is time consuming

2.3 Time resource
No time for reflection
Time consuming viewing of documentation

Step-by-step documentation

It was recognised that asking learners to identify their learning goals before starting a learning activity is too challenging for them. However, reflecting on documented learning goals and their change over time can result in meaningful insights for learners and teachers. A way to address this challenge could be regular documentation of steps taken during a learning activity. Reflecting on this step-by-step progressive documentation, for example by comparing starting points and present point in a learning journey, could make personal future learning goals easier to recognise, frame, and phrase.

Addressed challenges

2.1 Learning process
Learning goals are difficult to document

2.2 Assessment
Overlooked learning opportunities
Incomplete and unfair assessment
Individual assessment is time consuming

The documentation of project steps can also be used for assessment. Teachers consider that they can assess the presentation and negotiation skills that learners develop as they explain the

tasks their hobbies involve to a teacher. To learn the humility and courage needed for presenting a project, the learners could consult with the teacher about what could and should be presented and clearly define the expectations together, before presenting their work during an exhibition.

Teachers suggested that young learners require commitment from their parents to document out of school activities.

Visible learning achievements and learning journeys

Addressed challenges

2.2 Assessment

No assessment guidelines for individual learning

As mentioned in Chapter 2, learners may enter a learning activity with different sets and levels of skills. They may also approach the learning activity with a different challenge level, for example trying something that they have never tried before as opposed to deepening an existing skill. Unless the teacher follows the learners in the class carefully, these elements may be hidden to the assessment of a teacher. It is seen as an opportunity and a guideline to the design of iTEC prototypes to consider making both the learning achievements and the path visible to the learner and the teacher, so that assessment can take both into consideration. It should be noted that assessment sources may differ from learner to learner.

Furthermore, the documentation could serve as evidence of currently invisible learning or as reference points for discussions. Including explicit information about the way a learning activity was approached and the decisions that were discussed and taken to reach the final result could produce more complete and fair retrospective analysis and present the individual progress of a learner or group of learners in a more transparent way to the teacher.

Immediately perceived value

Addressed challenges

2.4 Motivation
Documentation is a formality

2.3 Time resources
No time for reflection

To avoid documentation of learning activities to be considered a formality and only for earning credits, it was recommended to design an activity to be otherwise motivating and immediately rewarding to learners. It is important to address the multitude of requirements the learners have for documentation. For example, some learners may prefer a school-provided space, while others may want to use their own blog or other social media environments. These goals may be reached by supporting the learners with a channel through which they can share their learning outcomes and transfer their knowledge to a larger community in school, their parents, and friends outside of school.

3.5 Theme 5: Other relevant opportunities

This section contains opportunities that do not fit into any other themes. The challenge areas that these opportunities address are illustrated in Figure 10e.

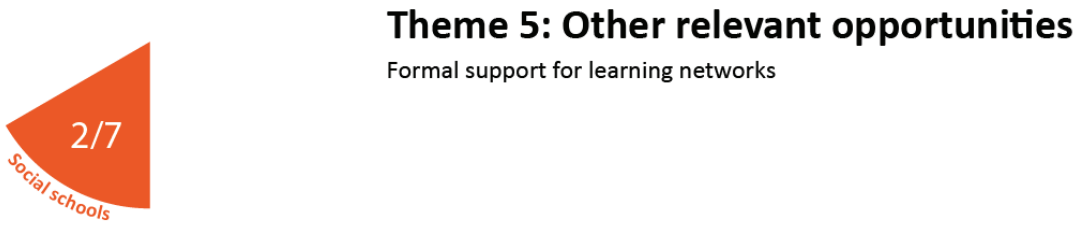


Figure 10e: Overview of theme 5 design opportunities

Formal support for learning networks

Addressed challenges

2.5 Social schools
High threshold for collaboration
Learning networks are closed

Formally introduced communication and sharing tools could lower the threshold for teachers to establish learning networks, getting teachers to comment on resources, and to improve them. Europe-wide school-supported teacher learning networks could help the informally established networks of teachers to become part of the everyday learning and teaching culture. According to the participatory design workshops, this would turn the profession of the teacher from individual and isolated to an open, informed, and collaborative profession that strategically embraces contacting outside experts as well as sharing, commenting, and collaboratively improving learning resources. Changing the competitive culture in some European countries would need accredited formal networks and sharing to be valued as professional assets.

4 Prototypes

Prototypes are evolving design ideas that aim to address the identified design challenges based on the design opportunities. The prototypes that are presented below are evaluated in pre-pilots and finally in pilots.

Based on PD workshop summaries, some of the original scenarios were chosen to be further developed into prototypes that would be tested in pre-pilots. These took the form of five learning stories, which refer to various learning activities. Additionally, tool prototypes were designed to address the most promising themes of design opportunities. Figure 11 represents the development stages of all prototypes. Based on pre-pilot results, some of the prototypes will be developed further and taken forward to full scale piloting. Pre-pilot and pilot results will also give more insight into the various design challenges and opportunities.

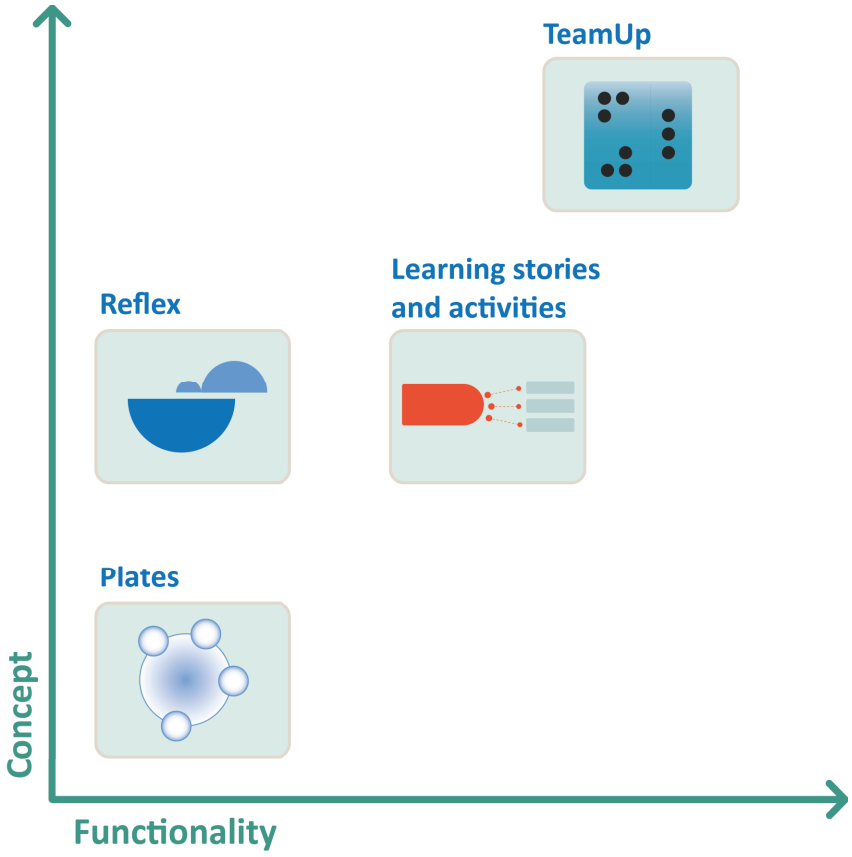


Figure 11: The stages of the prototypes regarding functionality and conceptualisation.

The learning stories and learning activities as well as the three tool prototypes are described in this chapter. Figure 12 illustrates the relation of design opportunities to the three tool prototypes. It shows that all tool prototypes are based on the opportunities in *Theme 1: Guiding for design*, and that each is predominantly based on at least one additional theme. The figure is presented for each prototype separately again in the sections where the prototypes are described. In the beginning of each prototype description, the design opportunities that the prototypes draw on are listed.

Although some opportunities were not addressed during the product design phased of the design process of the 1st cycle, these opportunities are none the less important for the design process of future cycles. Here is a list of the yet unexploited opportunities:

- Theme 2: Media production
  Translating meaningful tasks of librarians
- Theme 5: Other relevant opportunities
  Formal support for learning networks

Figure 12: Tool prototypes address various design opportunities

- Learning stories and learning activities

The original scenarios were meant as inspiration for the design process. They were intentionally abstract to inspire teachers rather than to guide in lesson planning. Therefore one activity of the design team was to create more concrete learning stories that exemplify to teachers what a scenario might look like when it is actually implemented. As many of the learning stories con-

Figure 13: Learning stories and learning activities for pre-piloting in cycle 1. Each of the stories derived from the scenario with the same title, with the exception of the "Alternative outdoor study project", which is a variation of the same scenario.

tained overlapping parts (as has been noted earlier in this report), it became apparent that those common parts need to be

extracted from the stories. The outcome in the 1st cycle was 6 learning stories and 13 learning activities, which are depicted in Figure 13 and included in Appendix D. The learning activities showed teachers how they could realise a certain interesting or innovative activity, with the help of existing technology.

The aim of the pre-pilot phase was for teachers to test the learning activities in various combinations. Teachers were asked to choose one of the learning stories as a base, but were free to modify it and create their lesson plan with relative freedom, choosing those learning activities that they wanted. The learning stories and activities are included in Appendix D and the results of the pre-pilot are in Appendix E.

Based on the pre-pilot results and the scenario selection criteria developed by WP4, some of the most promising learning activities were chosen to be taken forward to full-scale piloting. These learning activities were modified and further developed based on the comments received by teachers who took part in the pre-pilots. The conclusion report (Appendix E) discusses the pre-pilot analysis results.

In cycle 1, the conclusion was to develop one tool prototype into a functional product, and create two learning stories for piloting. These were delivered to WP4 and are included in Appendix F.

4.1 TeamUp

TeamUP (see Figure 14) is a working prototype of a tool that allows teachers to try out team formations based on their perception of the skills and strengths of each learner, represented as icons. TeamUP also lets learners vote and suggest topics for teams and calculates teams that should satisfy the needs of both, learners and teachers. TeamUP was designed to make the learning activity of forming teams and mental notes about learners easier and less time-consuming.

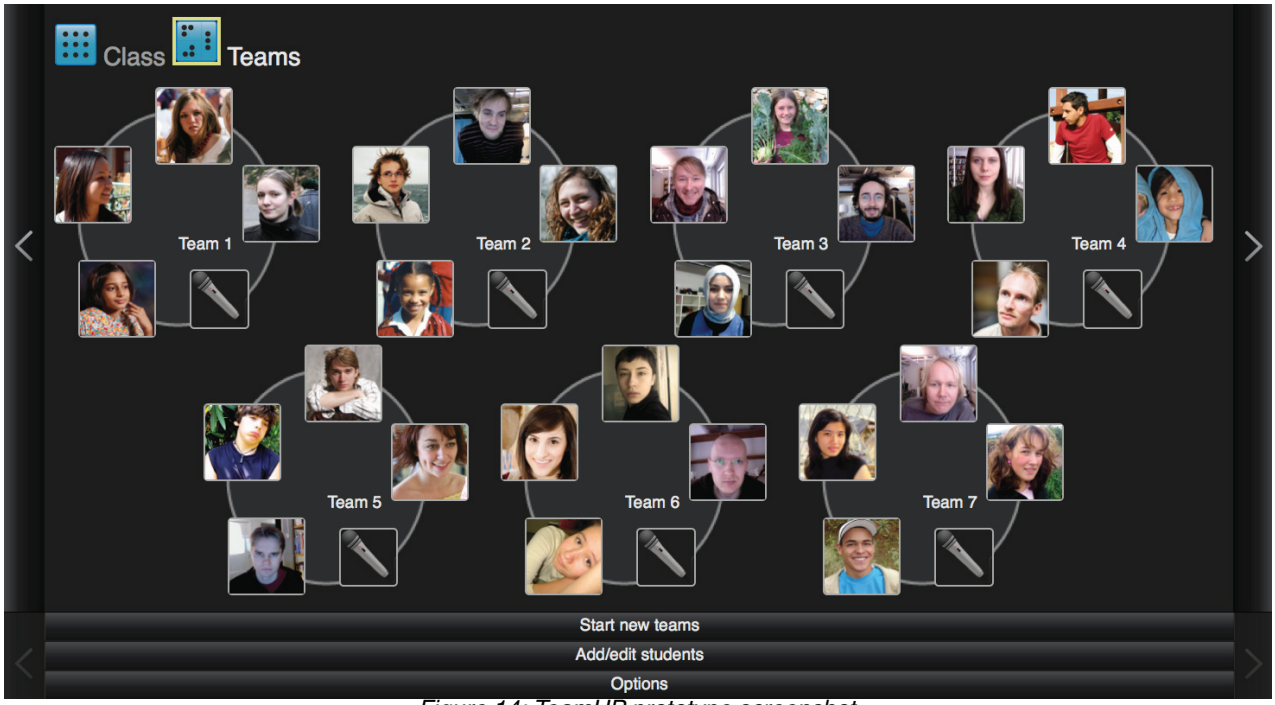


Figure 14: TeamUP prototype screenshot

Figure 11a presents the opportunities that guided the design of the TeamUP prototype.

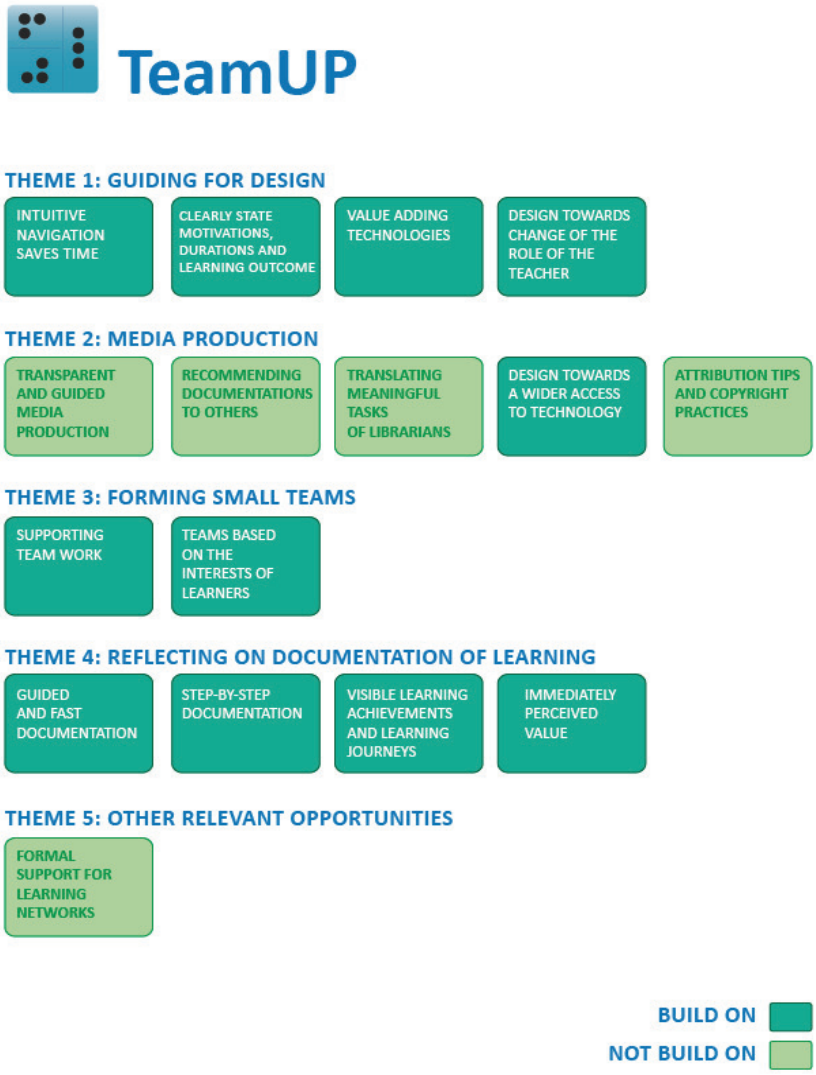


Figure11a: Design opportunities that TeamUP builds on

The TeamUP tool addresses the challenges that are linked to these opportunities. During the design of the prototype, it was important to make the motivation for using the technology clear to learners and teachers. The TeamUP prototype is considered valuable and meaningful for teachers, because it provides a method for forming functional and heterogeneous teams quickly. Teachers can also quickly review each group's progress after class, store notes about the students for future reference to consider when forming teams.Also, teams formed by a computer are more readily accepted than those dictated by the teacher. The learner's motivation for using TeamUP is based on the prototype's deliberate support of their personal learning interests. Learners can suggest topics of personal interest and vote to work with the topics they find most intriguing. By supporting teamwork, shared use of technology is encouraged. This way the access to technology is indirectly widened.

The TeamUP tool is described in more detail in Appendix F, including the distinctive functions and interactions of the TeamUp tool, and how they draw on the opportunities.

4.2 ReFlex

ReFlex (see Figure 15) is a prototype of a tool for learners to document and annotate their personal learning case, using digital video. As in the TeamUP prototype, 60 seconds recording time limits the time spent on review and assessment.

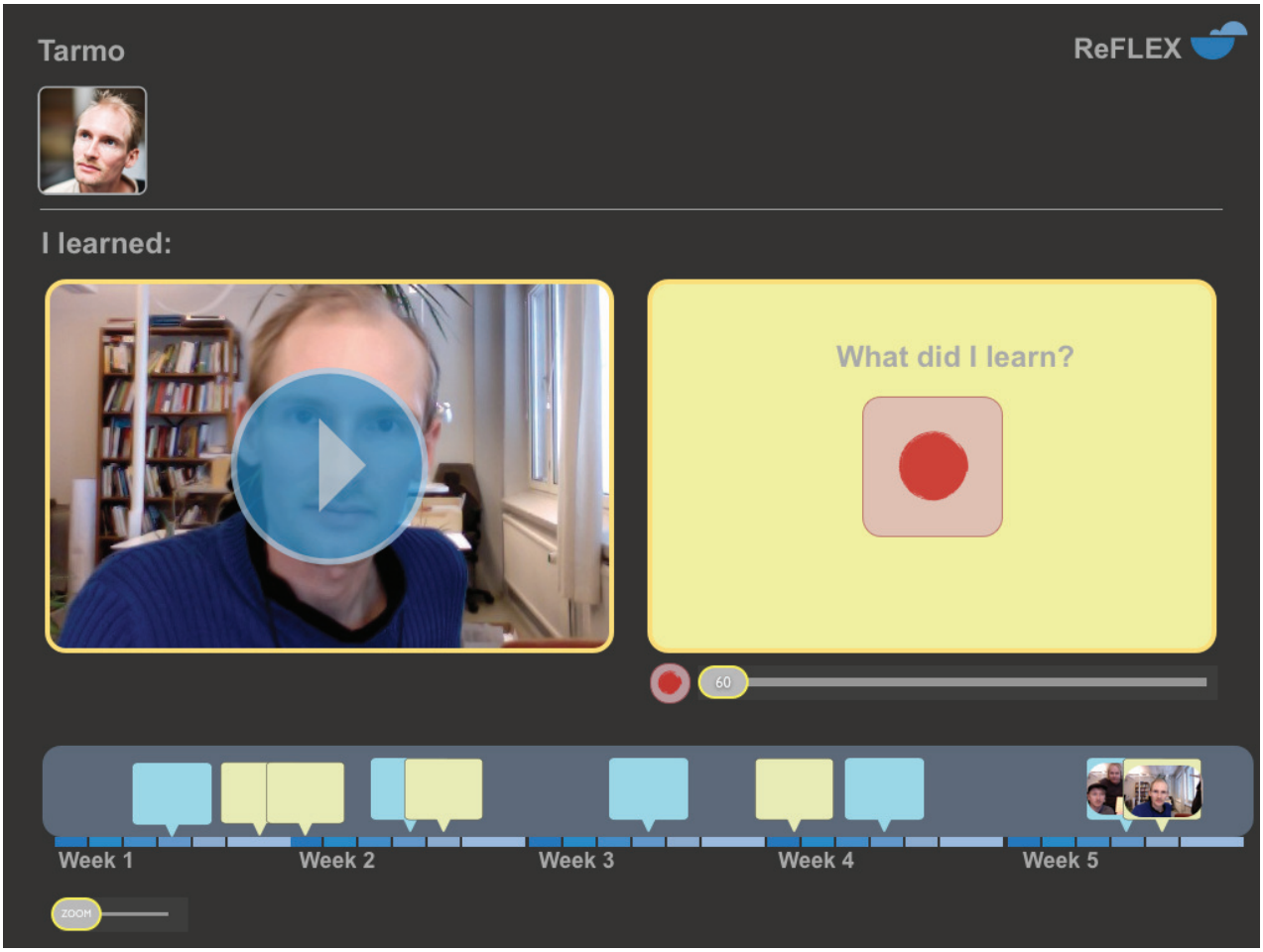


Figure 15: ReFlex prototype screen shot

The opportunities that the ReFlex prototype draws on can be viewed in Figure 11b.

The main aim guiding the design of the ReFlex prototype is to support a motivating activity that leads learners to be able to identify future learning goals based on their previous learning achievements. Hence, predominantly addressing the design opportunities of Theme 4 and making the learning activities 'video documentation of work process', 'creating a multimedia presentations', 'peer feedback', and 'presenting results' more concretely performable in classrooms.

Considering the youth practice of recording, sharing and commenting tutorial videos, how-to-guides, ideas and projects online with popular online video sharing platforms as a way of socially interacting with other youth, recording individual video documentation and annotations can present a fun challenge for young learners. They can share, present and transfer their learning and knowledge to others with moving images by way of a more private and safe platform. The video documentation and annotation of individual learning, insights and questions can also be motivating for teachers. Learners can choose to share individual documentation with a teacher, turning the documentation pieces into reference pieces used in teacher-student feedback ses-

sions. The teacher can quickly and easily see how each project is progressing, comment on the process, and observe what activities the students perform well and what they need to practice more.

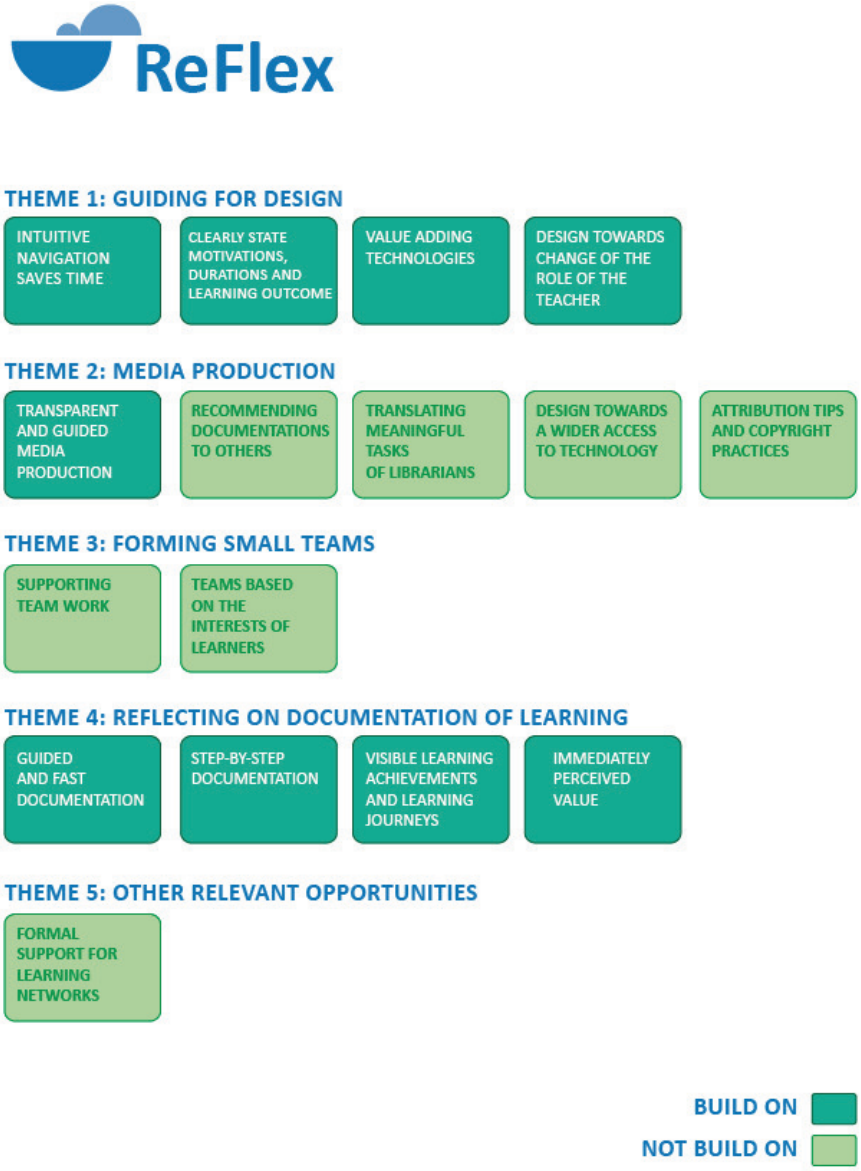


Figure11b: Design opportunities that ReFlex builds on

In the TeamUP prototype description, it was discussed that learners who are working independently in teams post periodic status updates so other learners and the teacher can easily see what they are doing and how they are progressing. The documentation can also be used by an individual or a team to quickly understand where the project was left off last and what steps have to be taken next. Learners learn in depth about a specific topic, and surface other topics by observing what other learners are working on.

4.3 Plates

Plates (see Figure 16) is an early design of a tool for viewing, sharing and publishing digital media within a group, a classroom, a school or to the entire online world. Plates is designed to make the learning activity of sharing files more feasible in school.

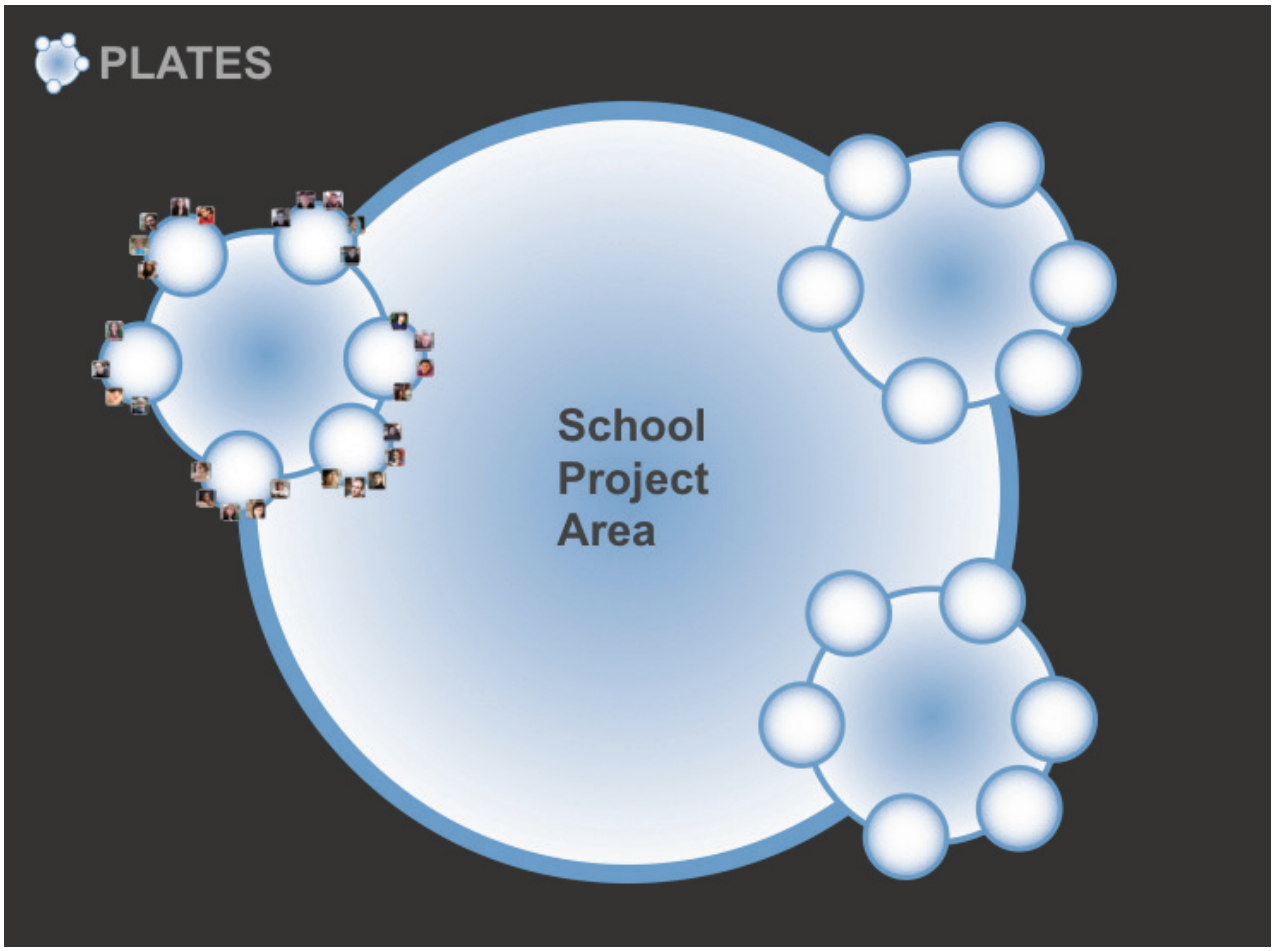


Figure 16: Plates prototype screen shot

The opportunities that the Plates prototype draws on can be viewed in Figure 11c.

In several future learning platforms the activity of sharing media pieces is an essential part of learning activities. As mentioned in the previous section describing the ReFlex prototype, young people share digital media works on the Internet with each other, comment and discuss them and recommend them to their friends and acquaintances. This sharing of the media pieces on the open Internet involves several arbitrary steps, such as logging into a profile, navigating to the uploading section of the sharing platform, clicking upload, selecting the file to upload, clicking *OK*. Besides mixing, mashing and uploading media pieces that were created by the person uploading the videos or their friends, often pieces of the media work, such as images that appear for a few seconds or sounds that represent background music are first downloaded from the Internet and then mixed into the personal media work. However, in most of these cases the young learners are not aware of the copyright regulations that the media pieces prompt.

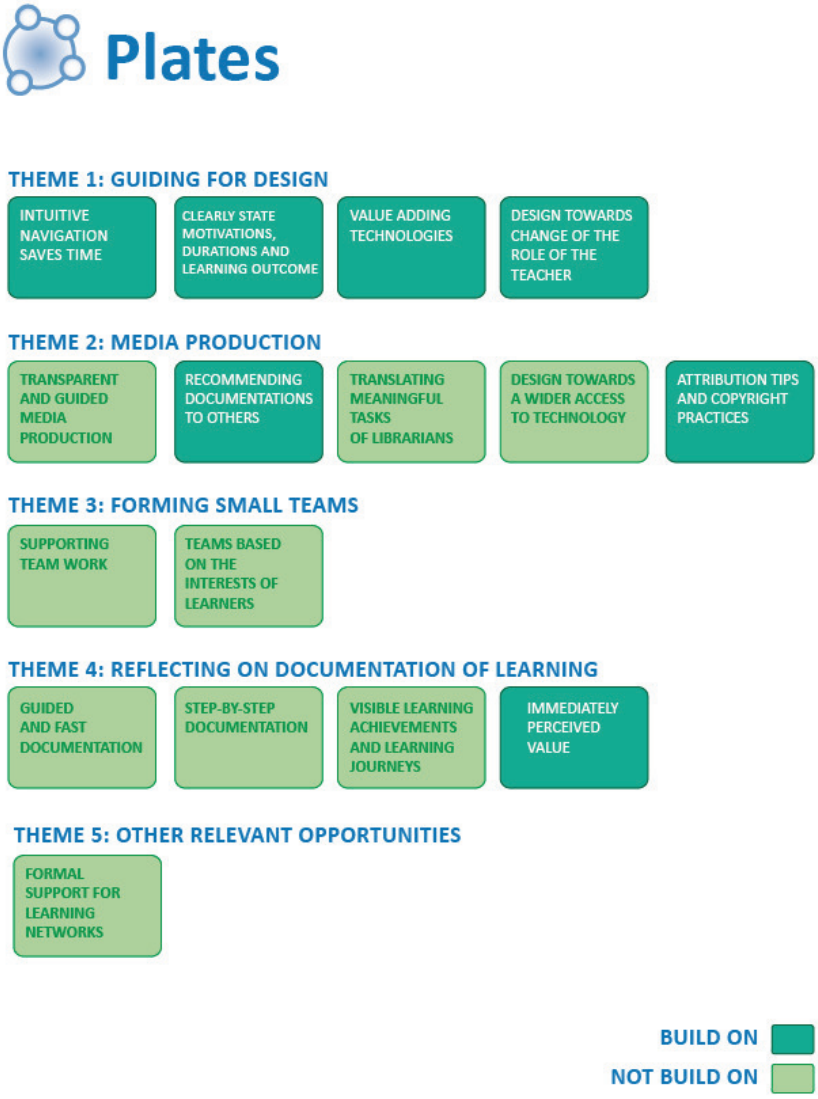


Figure 11c: Design opportunities that Plates builds on

This is intended to support peer learning and tutoring, because instructions and files can be shared easily across different groups of people linked together with plates.

5 References

Beyer, H., & Holtzblatt, K. (1998). Contextual design : defining customer-centred systems. San Francisco (CA): Morgan Kaufmann.

Ehn, P. (1988). Work-oriented design of computer artefacts. Stockholm: Arbetslivcentrum.

Kruger, R. A., & Casey, M. A. (2000). Focus Groups : A Practical Guide for Applied Research. Thousand Oaks (CA): Sage Publications.

Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. Journal of the Learning Sciences, 13(1), 1–14.

The Design-Based Research Collective. (2003). Design-based research: An emerging paradigm for educational inquiry. Educational Researcher, 32(1), 5–8.

Eldridge, M. (1998). Transforming experience: John Dewey's cultural instrumentalism. Nashville: Vanderbilt University Press.

Leinonen, T., Purma, J., Põldoja, H., & Toikkanen, T. (2010). Information Architecture and Design Solutions Scaffolding Authoring of Open Educational Resources. IEEE Transactions on Learning Technologies, 99(1). doi:http://doi.ieeecomputersociety.org/10.1109/TLT.2010.2

Leinonen, T., Toikkanen, T., & Silfvast, K. (2008). Software as Hypothesis: Research-Based Design Methodology. In The proceedings of Participatory Design Conference 2008. Presented at the Participatory Design Conference, PDC 2008, Indiana University, Bloomington, IN, USA: ACM.

CONCLUSIONS

A truly user-centric design process is often unclear and produces results that surprise both the designers and the target audience. The design result takes shape and may be refined or radically altered during the process. This is quite natural for a design process, and as the project emerged partners in other work-packages began to comprehend the process as well as the design results better. Collaboration, coordination, and communication in iTEC is expected to improve after this first project year, as the expected outcomes are now better graspable for the partners in other work-packages. Hopefully this report further adds to clarifying the WP3's design process and the nature of the WP3 results.

Limiting the educational scenarios produced by WP2 to only function as inspiration to the design process was difficult, because for a long time during cycle 1 they were the only concrete result of the project. Deconstructing them in order to move on to the design of other artefacts that are more usable in the day-to-day school context was most challenging. Most of the project consortium was expecting WP3 to produce scenarios. This might have been a semantic issue based on a logical slip in the DoW. The first sentence of WP4 states that their task is to “validate project scenarios (from WP2) that have been developed into **learning and/or assessment activities** by WP3”. However, scenarios are mentioned in various downstream tasks in WP4 and other WPs, while learning and/or assessment activities are not mentioned. Even prototypes are mentioned only rarely in the DoW outside of WP3.

The designed prototypes attempt to address challenges teachers saw in these innovative educational scenarios. The tool prototypes provide functionality and a carefully designed user experience to guide teachers and learners towards new ways of working and learning. The learning activities, in turn, attempt to direct teachers towards pedagogically meaningful activities and the use of appropriate existing technologies to support those activities. Both artefacts, as outcomes of WP3, are prototypes in nature, meaning that they are not considered finished products. Pre-piloting has given them some credibility, but only after full scale piloting and their evaluation will we know whether they work as they are, if they need to be further refined, or if they are failures.

In practice, the developmental and expansive process means that already in the near future the prototypes will be – most likely – slightly different to the way they are described in this report. The updates done to the prototypes will be implemented to improve and simplify carrying out their underlying principle objectives. For example, the prototypes will be further developed based on the results of the pre-pilots and the cycle 2 scenarios. Through the cycle one pre-pilot analyses, we are anticipating to recognise further design opportunities and challenges that inform the further design of the prototypes. Based on the learning activities of the 2nd cycle scenarios, we will be able to determine, which of the prototypes presented here make sense to support taken forward into European classrooms during later pilots.

LIST OF ABBREVIATIONS

ACRONYM	MEANING
PD	Participatory Design
MoE	Ministry of Education
DoW	Description of Work
WP	Work Package

TBDL

Appendix F includes a description of the TeamUp tool. It requires input from the National Co-ordinators and WPs in charge of piloting that will be provided after the submission date of this deliverable. For reference purposes, a draft version is included here.

APPENDIX A: DESCRIPTION OF PARTICIPATORY DESIGN WORKSHOPS

iTEC

Designing the future classroom

Description of participatory design workshops, cycle 1

Appendix to D3.1

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5.8.2011

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DESCRIPTION OF PARTICIPATORY DESIGN WORKSHOPS

In preparation of the participatory design workshops, the facilitators were asked to translate the scenarios that they will use in the workshop into the native language of the 2-3 teacher they recruited to participate, to book a space and to reserve a time for the workshop. Each 2 to 3 hour long lasting workshop, was recommended to be facilitated by a researcher or designer in the teachers' authentic, working environment, such as a classroom or a teachers' office. The space should be quiet and private with chairs and tables for writing and possible drawing.

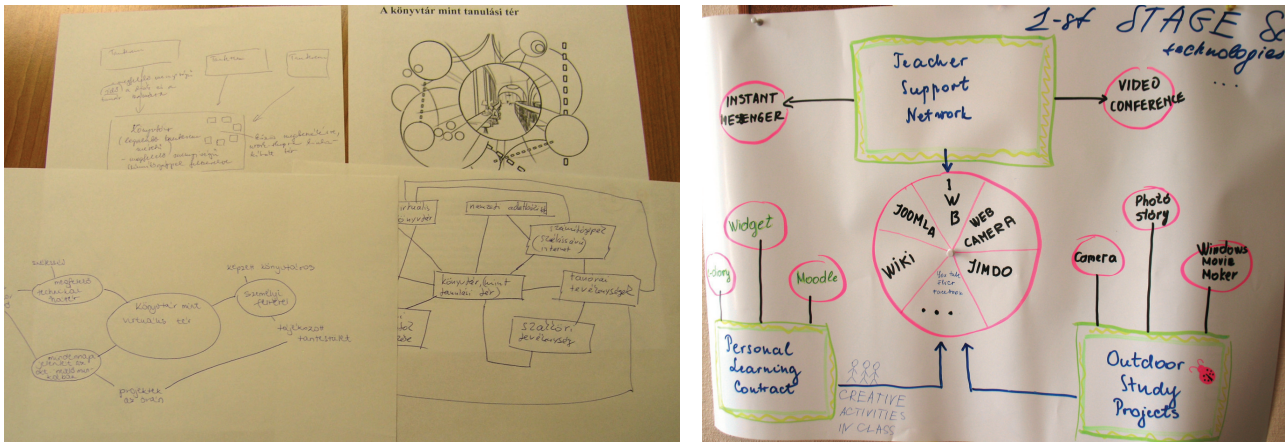

Figure 1: Mind maps drawn during participatory design workshops

Notes of important comments may be taken during the discussion either by the facilitator into a notebook or by all participants together onto large sheets of paper. For example, during some of the participatory design workshop, such as in Lithuania and Hungary, the teachers and the facilitator drew a mind-map of the relations between the scenarios (see Figure 1). The facilitators were asked to document the workshop using digital still photo cameras and audio recorders with microphone. Alternatively, they could also use video cameras for documentation. To add context to the discussion, it was advised to record the space along with the teacher discussions. After initiating the workshop, including a brief introduction of the facilitator, the iTEC project, as well as the aims and the course of the workshop, the recording can be started. For clarity, the facilitators should inform the participating teacher about this, but also mention that the recordings will be used for research and design purposes only.

The atmosphere in the session should be non-formal, as opposed to an interview with right and wrong answers. A cup of coffee for all can initiate a relaxed atmosphere. Other examples for maintaining the relaxed atmosphere are permitting irrelevant ideas and comments that seem off-topic, letting the teachers speak without interruption, providing everyone with a chance to speak, ensuring that no one dominates the situation, and encouraging quiet participants. Encouraging everyone to participate right from the start can support participants in overcoming inhibitions.

In order to initiate the discussion and get everyone to start speaking early on in the session, it was recommended to ask the teachers some basic information, such as about the length of their professional teacher experience, and how long they have used computers in teaching. To distract the teacher's attention from the audio or video recording and to further break the ice, the facilitators were asked to circulate printouts of comic strips, ask what was funny and why and if this kind

of discussion is common among children in their class. The comic strips were provided by WP 3 on the iTEC wiki. This step was optional. If the teachers knew each other, were comfortable with the recording and the atmosphere was relaxed, the facilitator could chose to skip this part.

After that the scenarios were distributed to the participating teachers one by one. They read the scenarios and a discussion followed. The discussion was guided by the following questions:

- Did the story generate any thoughts?
- Is this a possible story?
- Is there something you would like to change in it?
- Could you imagine themselves in the role of the teacher?
- What part would you find most difficult to manage if you were in the role of the teacher?
- How would the story continue?

The facilitator was asked to ensure that each teacher adds a remark to each question, to take pictures of the teachers talking about the stories and to ask the same questions during the discussion of each scenario.

It was important to save a few moments at the end of the participatory design workshop, to gather specific design ideas. The facilitator asked the participants about their ideas on what kind of technology will be developed in the iTEC project. To support the teachers in the expression of their ideas, the facilitators could assist by asking them to explain what the system should be like, encouraging them to illustrate their explanation with drawings or diagrams using pen and paper.

The workshops concluded by collecting the teachers' contact information, asking to contact them later in case more question would emerge at a later stage, and thanking them for their participation.

Each participatory design workshop should result in an audio recording of about 2 hours and 10-20 pictures of the session. WP provided the iTEC partners with instructions of how to report their participatory design workshops and share summaries of them. The instructions included listening to the audio recording and summarising the key points in English, referring to teachers by their first name or alias.

The participatory design workshop guidelines were sightly improved for the 2nd cycle. A sentence was added offering the iTEC partners who are facilitating participatory design workshops the option to invite the same, different of a mix of teachers they worked with in previous workshops. Regarding the process, a doodle pole was created for the workshop facilitators to mark which scenarios they plan to discuss in the workshops. The pole was created to ensure that each scenario would be discussed with teachers.

APPENDIX B: PARTICIPATORY DESIGN WORKSHOP SUMMARIES

iTEC

Designing the future classroom

Participatory design workshop summaries, cycle 1

Appendix to D3.1

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APPENDIX B. PARTICIPATORY DESIGN WORKSHOP SUMMARIES

These are the summaries of the participatory design workshops written by the workshop hosts (usually National pedagogical coordinators) in English.

Austria

Date and Time: 10.2.2011, 15.00 - 17.00

Participants: Two teachers; Peter: director of a primary school – Wolfgang: math/computer teacher in a secondary school Researcher / Designer: Harald

Setting (pictures at_pd_01 to at_pd_03): The workshop took place in a primary school (Volksschule am Unteren Stadtplatz Hall in Tirol). In this school there are 8 classes with about 180 pupils. This is an average size of primary schools in Tyrol except of a large amount of very small schools we have.

All classrooms are equipped with interactive Whiteboards and IT-workplaces for the use of pupils; there is a set of learning response systems available; 10 classmates are in use; the school has two IT-rooms with 10 PCs each; all rooms are connected to the internet (broadband).

Participants and designer met in one of the IT-rooms of the school (pic at_pd_04).

Basic information: Peter (pic at_pd_05): teacher since 34 years; primary and secondary school (pupils from 6 to 11); headmaster since 25 years; working with ICT in schools since 1992; one of the first primary schools working with PCs in Tyrol Wolfgang (pic at_pd_06): teacher since 35 years; secondary school; working with ICT in schools since 1981; worked with platforms like blackboard from the beginning; system administrator of 13 schools with about 1400 pupils, 500 PCs and 20 servers; is now working with interactive whiteboards

Scenarios discussed: Support network of experts, Practising research skills, Reacting to student feedback (pic at_pd_07 to at_pd_09)

Support network of experts

The idea to incorporate experts isn't new. But today those experts are living in the neighborhood. New is the idea to contact experts living and working away from the school location. This means: the principal concept is working today and therefore the expansion using the internet and social networks will work probably too.

A problem might be, that experts have enough time and if it is possible to bring in the experts during the school-lessons. But if we expand the network of experts and incorporate parents or elder students in other countries (native speaker or foreign language able experts), then it will work.

Another idea is to bring in eTwinning, because this is a good platform to find these experts and get contact with them. This is a very realistic scenario. One of the teachers has already done a project like this with some schools and a research station in the Antarctic. In the meantime all needed software is included in LMS and therefore for most of the schools it is possible to work like in the described scenario.

A project like this has to be limited to 4 to 6 weeks. Then it will be very enduring. The role of teachers has to change from teacher to trainer/moderator like the trainer in soccer ('from sage on

the stage to guide on the side'). Teachers must take care about the hardware and give students some advice, but the work has to be done by the students themselves.

Practising research skills

Starting point of the work in this scenario must be the local library.

Very important is the role of the librarian: he has to be an agent of knowledge. In former days the librarian recommended only a book. In this scenario his work is upgraded to recommend different ways to knowledge, databases and so on.

It is important to guide the pupils not to use only one source of knowledge.

The librarian or the teacher has to provide a range of online-databases which are reliable and the information in there is on a level a students can understand them. Normally students mostly use only Google.

Students know many things and in this scenario they are forced to share their knowledge to the others or write it down. This will be a very good motivation for them.

It is not a good idea to allow students to compare with the curriculum because they don't know nothing about curriculum and they are not interested in this kind of work.

To compare different sources and to evaluate them is very important. There should be a focus on this.

Reacting to student feedback

This scenario depends strongly on the presence of a learning response systems. They are very expensive today, but in our schools there are such systems available so this scenario is possible.

It is an expansion of the buddy-system which works properly throughout the whole school system in different situations. Students are working as learning-buddies and the teacher uses the response system to mentor/assess them.

The trainee changes to the trainer.

A high 'emotional quotient' is useful and will be trained. Even infirm students (in common understanding of school) can be very important for their classmates.

One teacher has a critical point of view according to the use of app stores. He thinks about the danger of high costs for the pupils using such stores in privacy.

Learning response systems are means to help the teachers in their role as observer and guide within the classroom. Pupils are working at different speed and with response systems it is easier for teachers to observe them and to react fittingly. Therefore the lessons will be more individually. It is important not to abuse such systems as perfect testing systems!

Specific design ideas: (pic at_pd_10 and pic_at_11)

Peter (drawing at_pd_12): because of the fact, that a large amount of equipment is very expensive and the financial problem isn't solved, he wants to concentrate hardware at a 'knowledge center' within the school. He remembers the libraries or reading rooms in monasteries in former days, where all the knowledge at that time was concentrated alike the working materials such as light, pens, place to work together and so on.

Wolfgang (drawing at_pd_13): School is like a street of knowledge with different means and different ways to different aims. Teachers have to define the aims and to help pupils on their way.

ICT is one of the important means, teachers have to help students in using ICT in the right way. But nowadays he recognizes a lack of activities in the teacher-training to instruct young teachers in that way.

Estonia 1

Date and time: 14.01.2011, 15.00-16.00

Participants: 3 teachers from a secondary school in Tallinn (800+ students)

- english teacher who is active user of ICT and experienced teacher trainer
- biology teacher who is experienced in creating digital learning resources
- head teacher who has a good overview of situation in different subjects

Researcher / Designer: Hans

Scenarios discussed: Outdoor study projects, Practising research skills, Recognizing informal learning

Scenario 1: Outdoor study projects

- The first impression was that this is a realistic scenario. However, teachers didn't understand how the chosen topic (population of ladybirds) is connected with geography.
- The teachers had impression that actually there are more activities inside (analysing the data, writing scenario, editing the movie) than outside. They estimated that the whole project could be carried out during four lessons.
- It is complicated to carry out this kind of project with a large number of students.
- Interviewing local people is complicated with younger students (the population of ladybirds is a suitable topic for grades 6-7).
- It is important that the teacher must do a preparation work and find an authentic and realistic study problem for the project.
- It is important to plan the movie scenario beforehand in groups. Only then the students will be able to film and edit their parts and the final result would still look consistent. "If every student will do part of the scenario and part of the movie, then the outcome will be a mess".
- In the current national curriculum teachers do not have time for this kind of projects. In autumn 2011 the schools will start transition to the new national curriculum that should reserve more time for study projects. However, the teachers were not sure if in reality the new curriculum will guarantee sufficient amount of time for study projects.
- The scenario doesn't specify what kind of measurement equipment (such as thermometers) the students use and if it is possible to capture the numerical data automatically to the computer.
- This kind of project could be repeated during several years in order to compare the results.
- The teachers have created videos with their students and published in Web 2.0 environments such as YouTube and FlixTime. Teachers do not think that publishing videos to YouTube? will rise privacy issues in this kind of projects. "The students are proud if their work is publically available".

Scenario 2: Practising research skills

- Online safety is mentioned in the first paragraph but no further details are given in the following sections.

- In Estonia the school librarians responsibilities are limited to managing books. The librarians are not educated about digital literacy issues and majority of librarians are not ready to advise students in these topics.
- How can the students learn to evaluate the quality of resources when they are given access to “repositories that are recommended by their teacher or the librarian to ensure the quality of the research resources”?
- Othervise this scenario is quite realistic and all three teachers could imagine themselves in the role of the teacher.
- The most complicated part with this scenario is to involve the school librarian.
- The technical solution (repositories, wikis) looks simple for the teachers. They all have experiences with wikis (but that cannot be said about all Estonian teachers).
- The scenario should continue with presenting the student works. This is important part of doing research and getting feedback.
- All the wikis should be grouped/linked together. It would be good to refer to good examples from previous years when doing this kind of research projects.

Scenario 3: Recognizing informal learning

- The teachers are afraid that majority of Estonian teachers do not understand the concept of e-portfolio and are not able to create their own e-portfolios.
- Teachers like the scenario but think that it is the most difficult one to implement in the Estonian contect.
- A lot of hobbies do not fit under one subject and therefore it is complicated to decide which teacher will assess the evidences.
- What will happen with students who do not have specific hobbies? A lot students are just “sitting behind the computer” or “hanging out on the streets”
- Informal learning can be wider than just hobbies. It may include going to theatre, watching a movie, etc. Students could write reviews of theatre plays and movies they see, books that they read, etc.
- How the teachers will notice students with hobbies that are close to their subject? Should they browse through all 800 portfolios?
- It should be class teachers responsibility to keep an eye on her students’ portfolios and suggest teachers who could review the evidences.
- Teachers think that the most complicated part is to notice interesting portfolios. All teachers in Estonian schools have lack of time.
- There is already a number of students who blog about their hobbies.
- In their school the teachers already have several project days in a year. Presenting the informal learning could be part of these project days.
- Teachers find it strange that Paulo is presenting his willing to present his portfolio to the teacher but doesn’t want to share it with the parents. Otherwise the teachers find that it is good, if the students can limit access to their porfolio. Some hobbies may be quite personal (writing poems, etc).
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Teacher’s assumptions on what we are doing in iTEC

- An environment with wikis, blogs and tools for sharing learning resources / media files.

- Every student has a personal space in that environment.
- This solution could have two benefits compared to using open Web 2.0 environments: everything is in one environment and it is easy to set access rights for the content.
- These three teachers have no problem with using several Web 2.0 environments but they agree, that for students it would be easier to access everything from one URL.
- e-Portfolio will be the main component of this system.

Estonia 2

Teachers: T1 - Teacher of Art - 20 years - 16 Feb 2011, T2 - Teacher of English- 10 years - 18 Feb 2011 Both are using ICT for preparing lessons and giving tasks to students (mostly essays).

S1 Outdoor study projects

T1: Students like very much to study outside - in the Tallinn old town - drawing on streets. And history (in the museums) and biology (in the parks) teachers are practicing this.

T1: Co-work between teachers is possible only when they are friends (based on personal relations not professional).

T2: I don't know anybody who are not willing to co-operate. More important is how to integrate different subjects.

T1: this is totally realistic. this is happening already now. E.G. team work for students - search signs of spring. It is realistic when weather is fine. Students are visiting museums, concerts ... after that there will be discussion. Making photos and videos is not so common.

T1: At the moment only teachers are publishing students works online. Not students.

T1: If the environment is good then why not to let students to upload their works - it seams like she is willing to have environment that belongs to the school. She don't see how students can use open and distributed environments.

T1: It's not likely that students present their work also to parents (e.g. it's recommended that study works are in closed environment).

T1: Usually teachers don't co-operate. They usually even don't share interesting ideas about learning activities and brilliant outcomes.

T2: How to use this in English. I know that teachers of biology and geography are doing this already. But I guess biology can be integrated with English. This story is realistic.

T2: No ideas how to change the scenario. It could be nice to have subject independent template.

T1+T2: since now they have not used taking photos as learning activity but this is good idea.

S5 Practicing research skills

T1: I cant imagine how teachers and library workers can work together?

T2: This is positive that co-operation is established among teachers and other school workers.

T1: I cant see what will be the role of librarian in the study project.

T1: How familiar is the librarian with the digital references? In reality educational technologist has overview about that (but educational technologist is for supporting teachers, not students).

T1: Library keeper is a worker with low skills. His major task is to take in and lend out books. She has no time for anything else. And salary is very low - she has no motivation for extra work.

T2: In the library the workload is to big. At least 2 workers are needed then. At the moment when there is only 1 worker, it's not realistic.

T1: It's easier to me when I show to students the digital resources. Why should I ned librarian?

T1: If the teacher does not force students to use references they will not do that.

T1: So teachers must have overview about the textual material and make recommendations to students? But there is so many resources!

T2: This is very demanding story concerning the teacher - teacher must have overview of good resources. Before giving the task to student she must have overview of references. Teacher must have good basic overview.

T2: Who will set up the topic for the research? If teacher then the pre-owerview is needed. If student then ... teacher must to lot of extra work.

T1: It's nice when teacher and students set the evaluation criteria together - so teacher will change evaluation criteria based on students input. - She cant see that students will set up the criteria by their self.

T2: I don't see how students can form evaluation criteria. This must be the task to teacher.

T1: students are commenting and evaluating other students work - at the moment they are able to grade but they will never comment - comments are affected by that who is who's friend.

T2: This is realistic for older students - secondary school. Younger students are not able to comment others works. I don't believe that those comments can be good or meaningful. Comments are affected on friendship.

T1: can't imagine how grades provided by the students can affect the final grade. How to organize this? And who will create the evaluation form? How the final result will be calculated? Will this be a part of learning environment, or ...

T1: Because in Estonia we have new curriculum and there is lot of activities about thinking and doing. In this sense this kind of research activities will be more popular.

T2: Teacher must constantly supervise this work.

T2: This scenario will be realistic because study search as learning activity will be more and more popular among teachers - because of new curriculum. And to learn how to work with references and how to refer is very important.

S6 Recognizing informal learning

T1: Student can present she's hobbies but only during one lesson.

T1: I cant imagine how the hobby corner should look like.

T1: For hobby exhibition - the deadline is very important.

T1: I think this is god idea - it gives chance to the student who is not strong in major subjects.

T1: The corner of hobbies can be also virtual - schools have electronic information walls - pictures and photos can be presented there.

T1: Students are mostly shy. They don't share their passion with teachers and students.

T1: To art teacher it is already common practice that some of the practical works can be graded based on students activities outside of the school.

T2: This is very interesting. It's usually visible if student have a hobby and if they present it during the lesson - free topic for the presentation - some students like it very much and the presentations are very interesting.

T2: Can't see the reason or example where to give grade because somebody is very good in doing something ... e.g when is traveled or studied in England or US - it will not give reason to put marks only because of that. They have anyway stronger background and thats why it's easier to them to get better results.

T2: Maybe it depends on subject but students who are active in English (outside of the school) are also active in the school. Even if the student have lived longer period in England then there is always something to learn - how to express yourself by writing, literature, ...

T2: From other hand it is positive that student can do something based on hobbies but how to relate this with grading? It is very interesting. Possible to implement during one subject - E.G. presenting the history or analyzing the music of favorite band.

T2: Usually students who have strong hobbies they are mostly also active in the related subject.

Conclusion

None of the scenarios require development of new environment. Functionalities mentioned in the stories: making video from photos, wiki and e-portfolio. But they mentioned that they would like to have (closed) environment that belong to school and those functionalities are available inside of that bigger environment. T2: it's easier to find your learning materials if the range of users is limited by the school range. T2: Most of the students works must be in closed environment because of low quality and violation of copy rights.

Environment must be comfortable. To T1 comfortable is html web page. T1 feel need for desktop graphical design environment (gimp).

Both of the teachers actually did not have previous experience with virtual learning environments. T2: had LeMill training but have not using this in work.

Finland

Date and Time: 27.1.2011, 13.30 - 15.30

Participants: Three secondary school teachers: language teacher, math/computer teacher, Finnish language teacher

Researchers / Designers: Teemu, Anna

Scenarios discussed: Collaborative Media Project, Teacher Support Network, Library as learning space

1. Collaborative media project

- The age of participants and the school subjects are questioned. Within middle school (classes 7-9) the subjects are so differentiated that this would be easier to do with 5/6 graders.

- Maybe together with Arts and ICT (computer/media), if city planning is understood as architecture. Then the media project is easier to place and this kind of collaboration with subjects would be possible with voluntary subjects in grades 7-9.
- Possibility to join different study-subjects in one project.
- One of the teachers has already done film productions as parts of foreign language teaching (english). Students made their own films, usually veering towards thrillers or detective stories, with requirements for using specific syntactic structures like imperatives etc. in the script and while directing. In a sense it had its rubric there, when these requirements were specified and the works evaluated. The other learning goal was to learn to use the technology required, editing software, principles of editing, music et cetera.
- The goal in scenario, developing research skills, is questionable. **There should be some framing of the research problem**, introducing the methods and the traditions of the research. Maybe more of this with older students.
- There is some kind of mini-research projects already with 3rd grade students, but it is mainly about **finding knowledge from different sources**.
- Bigger issue within finnish culture is reaching out from school to outside experts. **Contacting and asking help from parents or other familiar people is feasible**, but the threshold for calling to unknown people and ask if they could help is too high.
- Often in school culture parents (or other parties) are connected when there is a problem - this frames the collaboration.
- One had good experience with borrowed video editing expertise and equipment from Nuorisoasiainkeskus, but then again the contact was made by asking from city planning office if they would have anyone to recommend.
- **It is not part of school culture to have outsiders** there. Usually it is a sign of trouble, or that something has gone wrong.
- Organizing "camp schools" (overnight school trips) is one reason for contacting outsiders. But they are unique events and always require a lot of extra effort from class teacher.
- There is a systemic level challenges when trying to fit this kinds of projects to curriculum or learning goals. What needs to be learned is described in such way that it is best achieved with standard methods, but **what is actually learned in projects is missing from curricula**.
- **We would need assessment** that is looking learning results gained with this kind of methods.
- In Finland we do not have schools that are based on the idea of "open learning environment", **schools without classrooms** where there are laboratories, media laboratory etc. for students to workout their study work.
- Time, it is always away from something else that should be taught.
- Motivation, making sure that groups are on their tasks and not just fooling around.
- Responsibility. It is a great risk to let students outside the school during a schoolday, as everything that happens is still at **teacher's responsibility**. Even with parent's permission, it is still teacher's responsibility and the burden of proof is with teacher to prove that every possible safety instruction was given.
- A project requires a lot of preparation, every phase should be planned beforehand, who is doing what and when, and what should be done after that, what are the roles. A challenge is for the teacher to find time for this preparatory work or maybe find an existing, good enough plan. Also the plan should really be motivating and interesting for all of the students, and deep enough that those who want just to skim through cannot do it in 15 minutes.

- **Using an existing plan from someone else is not a problem**. Some adjustment will happen, of course, but generally the idea of following an exact structure with 1 a) b) c) is very familiar for teachers — exercises are organized like that, after all.
- Because projects often don't fit that well to existing curriculum, they are often understood as a play time, when you don't have to do any learning. Worst examples are the theme days, when there is actually an awakening to that, oh this had some learning purpose too.
- These **matrices or rubrics can help to remind that there are learning goals** in every phase. It will make the progress a bit more satisfying for students when they can **mark tasks completed**.
- There are currently no video cameras for every group, but they can be shared or **pupils can use their own equipment**. No need for high quality, mobile phone video cameras could be enough.
- There are 'resource teachers' at some schools who can be borrowed to participate in other classes and can give their expertise, for example in computers or video. This kind of support would be necessary for teachers to be not limited by their technical knowledge. One of the interviewed had as a resource teacher helped a finnish teacher to make a wiki project.

2. Teacher support network

- This has been tried out and **a challenge is to get people in it outside the "contact people"**. It distributes very slowly. For instance, teacher training schools have their networks, for example teacher trainees in physics and chemistry have their working collaboration and exchange network.
- With older teachers there may be key persons in schools involved in networks, but difficult to mainstream to everyone. Works well for those key persons.
- Participating and following networks takes time and time is not available, but **many teachers are already following their own field** - trying to keep track of latest development in their subject area.
- Some schools have **teachers to work in pairs** preparing classes and it is found a good model.
- Teacher network is feasible **if networks are introduced as a part of the whole learning and teaching culture and system** — something that teachers, pupils and everyone does. Some kind of online learning environment could be **introduced as a part of the whole system** and teachers would join. Wilma of the City of Helsinki is a good example of taking new tools in use.
- Many of the new educational technologies (interactive whiteboards, slides / pictures from web etc.) are just replicating existing teaching style. Its not disruptive - it should be. When technology will provide students access to the entire world and then used in teaching and learning it is a new situation.
- With full wall projection, made possible from any of the students laptops/devices **in a 1t:1 class teacher would provide randomly screen of each student** to the shared screen with possibility to stop and go back to some of them. This would naturally require that there is a **clear objective and well-set instruction for students**' individual or group work with the laptops/devices.
- Teacher told a story: It was not long-time ago when I said to one student in a class: please could you now put away your mobile phone. He replied: sorry **I am just checking what is lagoon, because you explained it in some strange way**. Teacher realized that it was true, she was not exactly sure if her explanation was exact or good at all.
- Ideal class would be that there is a space for using laptops/devices and then space for discussion and other activities. The class could be fully without school desks at all.

- Today we use paper notebooks very similar way how we imagine laptop/devices to be use. With the **notebooks students do their own study work**: write, do exercise etc. The **possibility to continue other students work and work together in a wiki-way** is a real promise that is difficult to implement with paper notebooks.

3. Library as learning space

- Schools already try to unify tools available in each class, so that switching classrooms wouldn't cause problems for teachers.
- Document cameras have surprisingly low resolution.
- In Lukio, there is only 20 minutes of dedicated time for whole class issues ('luokan-valvojatunti') weekly. Students form groups more based on interests and friendships than classes and tend to then choose same courses.
- Friendship-based groups do not have any specific own space for them.
- Classrooms end up looking like their teacher or their main subject matter.
- Decorating and furnishing the classroom is extraneous work, once you get interested in making the classroom nice, you can spend endless amount of effort in it.
- Culture has been shifting to more comfortable and friendly classrooms. Colorful sofas have been brought to corridors and libraries. There is also intent to display more student works everywhere.
- Less props for teachers than used to be, more for students.

Scenario

- Scenario doesn't feel very realistic, too positivistic: all things presented in course of the day are directly serving school learning, when usually it isn't so.
- Using library to reach resources that would be otherwise unavailable is a great idea. Searches beyond googling are not widely used yet.
- There is a school library, otherwise as described in scenario, but still has a technical challenge of providing wlan for all students.
- Knowledge finding, critical reading and copyrights are difficult skills. Especially copyright is very difficult to understand. It is easily assumed that if something can be found in internet, it is allowed to take and copy it. And if some copyright issues are recognised, they are argued against by saying that 'I won't pay, I don't have money'. Issues of copyright, knowing them and teaching them would require national effort.
- Letting students publish something in the internet requires understanding of copyright to avoid students getting into trouble with it.
- Teacher trainees also have difficulties in understanding copyright.
- The whole ethics of copyright and information reuse are interesting to discuss with students, but it is difficult to be on solid ground with the facts.

Teacher's assumptions on what we are doing in iTEC

- Learning content for tablets
- Learning environments that make possible to use new devices
- Tools for project work
- There already are lots of learning environments, won't be needing these
- Children need to have their personal devices, projects and working methods don't feel natural without them.
- Something to support communication and presenting self, not only through devices.

- Cloud-based environment, where everything is approachable from students own interests, not dictated from teacher.
- Device-independent communication
- One teacher has made research on how does a review/guidance session change when it can be replayed and revisited. (As an example how social web changes interaction).

France

Date and Time: 09.2.2011, 14.30 - 17.30

Participants: Two secondary school teachers: (1) English language teacher since 1986, he implemented a Moodle learning platform for his students and was for 16 years the school's ICT coordinator, experimented the use of netbooks associated with Moodle in a class for one year (2) Mathematics teacher since 1998, an IWB user, he is currently the school's ICT coordinator.

Researchers / Designers: Mônica

Scenarios discussed: Personal Learning Contract, Support Network of Experts?, Practising Research Skills

1. Personal Learning Contract

- Both teachers found the scenario very interesting. "This is what we should be doing with our students"; "We should teach them to 'learn how to learn'", they said. They perceive it as important to take students' individual needs into account and to develop a more dialogic relationship between teachers and students.
- In some ways, teachers estimate that they are already pursuing these goals. However, in their view it would be difficult to fully implement the scenario in France, because French teachers do not have enough time for individual work with students, and it would involve teaching in a way they are not always familiar with. Moreover, students' access to computers is somewhat limited. One computer/pupil would be necessary to fully implement a personal learning contract.
- "It makes me think of Northern Europe", one teacher said. For him, the scenario evokes a "Scandinavian model".
- Students would have to become more conscious of their needs and develop a more active approach to learning, while teachers would have to change their traditional role, by acting more as mediators than simply as "lesson givers".
- A possible way to implement the scenario is to reduce the hours of whole class teaching and replace it by individual work. Students could work on their own learning plans, by using materials from a virtual learning environment, while teachers could assist them whenever needed. "Lower performing students need someone side-by-side", one teacher said. "In whole class teaching, sometimes we act more as 'the police' than as instructors", he completed.
- The idea of conducting pre-tests with students in the beginning of the year is considered useful. Teachers already use different tools (tests, exercises) to assess student's performance in their discipline, but a database of assessment tools would be even more efficient to help establish students' individual needs.
- One of the main tools proposed in the scenario, the personal learning agent, does not currently exist or current versions are not fully satisfying. If such software was made available to teachers by iTEC, this would be an important contribution of the project.
- ICT are considered a way to help teachers implement personal learning contracts, because they facilitate the management of materials and tools, and in some cases are easier to use than former technologies (e.g., MP3 and streaming video are easier to link

to and to gather together in a single page, as compared to handling several video cassettes and tapes).

- One problem is that current school classrooms are not suited to the use of computers and mobile technologies. Most of them have desks set in rows, which cannot be easily moved to different configurations. There is not much flexibility in current classrooms, although plans are made in one of teacher's school to allow students to use their own equipments at school and to link to the elearning platform via wifi.
- Managing different "rhythms" (students that learn at different paces) in a group of students is a challenge for teachers. It is difficult to handle different study plans at the same time by a single person. Having all the learning materials available online could be of help.
- According to teachers, the goals in the context of a more "individualized" pedagogy, such as proposed in the personal learning contract scenario, should be to be able to "put things in perspective", to assist students in defining learning goals, and adopt a more dialogic approach with pupils.

2. Support network of experts

- This is a more ambitious (and less innovative) scenario in the view of both teachers. It requires a great deal of preparation, time, student autonomy and expertise.
- The scenario resembles what is called in France "travaux pratiques encadrés (TPE)", interdisciplinary projects developed at the high school level (pupils aged 15-17 years). Some experiences have also been tested at the lower secondary school level (pupils aged 11-14 years).
- One of the teachers had developed such a project with his students (13-14 year olds) in 2009-2010. They selected "sustainable development" as a topic and students had to work in small groups to define a sub-topic, which was negotiated with the teachers, leading to a final report and/or different sub-products. For instance, one group decided to study the "life cycle of yogurt cups" and as a result of their work they created a practical guide with recommendations for people to recycle yogurt cups easily. In this project, the teacher worked with a colleague (a chemistry teacher) to define the main goals and procedures to be adopted. Together they contacted the local government and non-governmental organizations to find partners, as well as financial support for the project. At the end of the school year, all participants were satisfied with the results, but the teacher notes that he and his colleague had to spend a lot of time preparing and managing the project. The efforts put in this kind of project leaves less time for other activities and this needs to be evaluated carefully.
- The scenario suggests that students will contact local, national and international experts via synchronous and asynchronous tools, such as videoconferencing and email. Teachers consider this activity to be difficult for students even at high school level, because it requires very good language skills, the knowledge of interview techniques, and the use of sophisticated technologies. "Most students do not speak English well enough to conduct a whole interview with an expert", they said. Moreover, an expert might use words and texts that are too complex for secondary students.
- Such projects are suitable for small groups of students (2-3 people), not the whole class. Giving assistance to every group is the main challenge.
- The idea of using networks of experts and teacher colleagues is considered a good one. Teachers already make use of such networks in their practice and consider it useful.

3. Practising research skills

- Both teachers found the scenario interesting, although there was not a perfect consensus on how digital literacy skills should be taught at school. One teacher argues that the most important is to prepare students to select information from the Internet (be-

cause of the lack of materials in the school library and because information can be easily accessed from outside school), while the other thinks students should also be encouraged to use the paper media at the library (e.g., to browse popular science magazines in search of interesting topics to them). Both agree that the central goal is that students be able to select relevant information from among the vast amount of data currently available by different means.

- The ideas of engaging students in the definition of evaluation criteria, and using peer review in the evaluation process are considered as very important. Students should be active participants in evaluation, in order to understand what they are doing and become more critical readers.
- To some extent, teachers are used to working with the librarian at their school. The above mentioned project on sustainable development was one occasion where the librarian had a direct participation, by selecting links relevant to students, guiding them in their searches on databases and the Internet. However, there is currently little time for interdisciplinary work in the school schedule.
- One way teachers approach digital literacy is by sensitizing their students on the importance of citing sources. “Students copy-paste information from the Internet without even citing the source and I try to show them that cited information can be wrong and they must be able to retrieve its author at a minimum”, one teacher said.
- A wiki is considered a good tool to use in digital literacy projects, because students can enrich the results of their searches as they find new information, and they may share it with other groups. Few teachers use this tool with their students nowadays. One possible barrier is the need to verify that copyright issues are respected in every page.
- Teachers think the scenario should include students’ self-assessment, in addition to peer assessment and teacher assessment, as part of the evaluation process.

4. Specific ideas concerning iTEC technologies

- At the end of the session, teachers were able to express a clear representation of the kinds of technologies being developed in iTEC. They think different software tools will be presented in a virtual environment, and also specific applications to the IWB. They see the environment as student-centered, open, and aiming student autonomy. One of the teachers expressed a concern with the possible effects of IWB use, which might in the worst cases encourage teacher-centered practices at a time when responding to individual students needs should be prioritized.
- Teachers said they would be willing to use these technologies, provided that they “do better” than current technologies such as Moodle, freely available to them on the Internet.
- A learning agent that helps them assess individual/group work and find relevant learning activities is considered particularly useful. “We currently have several assessment tools, but nothing to go further…”, one teacher noted.
- Another added value of iTEC would be to make educational resources (content) easily available, through effective indexing and usable search tools. Teachers expressed the need to have resources specifically designed for e-learnig, with the use of international standards (like SCORM, for example) and that can be integrated easily into e-learning environments. These resources could be classified according to existing frameworks such as the Common European Framework of Reference for Languages. They could, for example, include advanced interactive exercises.

Hungary

Date and Time: 22.02.2011, 15.00 - 17.15

Participants: Three secondary school teachers: Kriszta, English/ICT teacher; Géza, science/biology/geography teacher; Tímea, English/Russian teacher.

Researchers / Designers: Attila, Gabriella, Ildikó

Scenarios discussed: Library as learning space, Reacting to student feedback

Library as learning space

The general impression of the teachers was that the scenario was unrealistic on the whole, although most of the details in themselves could be realised happen after some modification in average Hungarian schools.

Issues regarding actions

Géza's opinion was that the student in the scenario was unrealistically self-sufficient and motivated. All the three teachers expressed their doubts about students spending so much of their free time in the school library instead of going home and accessing the VLE or other systems from there, or using a smart phone if they have one.

Students will first ask Google, not the librarian.

According to Géza, Tímea and Krisztina's experience, students rather spend their whole day at school, but they typically do not have activities at school late in the afternoon or in the evening. The participants could imagine the film making workshop as an activity which might be offered during the afternoon and once a week. The participants suggested that the film making workshop should be conducted by an expert (ICT or arts teacher) who might not be identical with the librarian. They said that it might be possible that the librarian was not present at all and the expert opened and closed the library.

Géza and Tímea said that the school library in their schools had very limited opening hours,and only during the day. Tímea even added that this scenario could not be realised in this form, in the school library. The participants suggested to make the afternoon lesson an online activity although Kriszta expressed her doubts about the effectiveness of working online compared to face-to-face meetings.

Krisztina said that it was not clear how the librarian and the history teacher worked together. Some kind of collaboration was a must for this scenario.

Géza said that project work in Hungarian schools was not yet typical, though forms of co-operation were fairly known and used. The three participants agreed that with reasonable alterations this part of the scenario could be realised.

All the three participants said that it was not typical that students took part in group learning sessions that involve students of different ages, working on cross-curricular projects.

The participant teachers became anxious about how they could conduct a film making workshop.

Issues regarding infrastructure and tools

Géza and Krisztina said that they had an LMS intheir school, but Tímea's school had no one, and their common opinion was that it was not typical in Hungarian schools. They said it depended on the school management. Tímea said there was no possibility to reach the school library system from outside the library eitherl. In Krisztina's opinion individual teachers used online applications, such as grou.ps, ning, edmodo, and students accessed them typically from home. In this scen-

ario, as they said, these tools should be used instead of LMS-s, since they had document sharing and networking functions.

All participants expressed their doubts whether the librarians had the professional skills to provide sufficient help or whether the librarian had enough time to help each individual learner. The participants agreed that it might be the case in some schools but could imagine this sort of service more in higher education than in a secondary school.

The online National Audiovisual Archive (NAVA http://www.nava.hu/) is available in a great number of libraries. This archive can be used for educational purposes only, so the learner can not access them from home, only from the so called NAVA points. School libraries are very likely to be NAVA points. Anyhow, it is not allowed to download or to share these films because of copyright issues.

Some ideas came up concerning the design of the library as a learning space. The library should be at least as big as a classroom and should have a relatively separated work area with easy-to-move chairs, where people are allowed to discuss and drink tea not disturbing others. Several smaller separate rooms may be attached to the library..

Kriszta and Tímea agreed that the library could be used as a virtual learning space if a little bit more (more than it is typical in Hungary) computer stations were present and the librarian were qualified to provide sufficient help.

Reacting to student feedback

All participating teachers agreed that this scenario was easier to implement than the previous one.

Issues regarding actions

The participants welcomed the idea that the teacher got regular feedback from his students with the help of the response system and than planned the differentiation according to the results.

Tímea didn't like the idea that specific resources were linked automatically to the 'graduated lesson plan', she would prefer to delegate the resources and tasks herself when she thought it was appropriate. The participants saw a great potential in peer tutoring and also in learning from other students' works.

The teachers could imagine the scenario in a time frame longer than a single 45min. lesson. They suggested that a detailed evaluation should take place outside the classroom during the teacher's preparation for the next lesson, but some questions might help during the class to make ad-hoc decisions.

Géza said that realising the scenario demanded a great deal of concentration from the teacher not just for managing the digital tools, but also to make the right decisions in order to differentiate.

Issues regarding infrastructure and tools

The participants agreed that both LMS-s and Learner's Response Systems were rare but the latter were easier to access since a set might be borrowed locally.

The participants and the researchers did not know about any system that merged data from LMS and Response System.

It is probable that a classroom management system is also needed in this scenario.

The teachers collected ideas about how the LMS could be substituted. They agreed that if it was not necessary to see both assessment data and Response System data on the same surface, than virtual classrooms, google docs or even e-mails could replace LMS when delegating resources and tasks. The participants expressed their concerns about the insufficient amount of digital learning materials. Tímea suggested that digital and non-digital materials should be mixed. Tímea imagined that the graduated lesson plan was filled up by the teacher with his or her own collected materials. Attila suggested that the graduated lesson plan can be as simple as a collection of links.

Tímea asked how we should understand app store, if it was a collection of teaching contents offered to them, or if it was a result of individual searching activities led through a period of time.

Krisztina and Tímea asked if app store comprised only digital contents or any kind of teaching resources.

Italy

Summary

Date and Time: 15.02.2011, 14.30 - 17.30

Participants: Three teachers: 1 primary school teacher (she teaches all subjects to 6-11 years old students), 1 junior secondary school teacher (he teaches Italian to 11-14 years old students), 1 senior secondary school teacher (he teaches Math and Physics to 14-19 years old students).

Researchers / Designers: Laura (Pedagogical NC), Leonardo (NC), Tania

Scenarios discussed: Practising research skills, Recognizing informal learning, Outdoor study projects

1. Practising research skills

- Teachers agree this is a scenario that fits all school levels and doesn't introduce any particular technical difficulty.
- They point out that there is **no librarian** in the majority of Italian schools. When a librarian is present, he/she seldom is a person that can teach research skills with digital technology. Anyway they think that, at least for the scenario, the most ICT skilled teachers in the school can replace the librarian.
- Since research skills are not clearly defined within the curriculum, this kind of activities tend to be considered an **extracurricular work** that teachers may or may not decide to perform according to their attitude and their own level of digital competence.
- The junior secondary school teacher likes the idea of research skills **as a cross-curricular competence**, but he also suggests that teachers should work a lot on shared criteria to link the evaluation of digital skills with the curriculum.
- The primary school teacher thinks that, generally speaking, her colleagues consider ICT as a topic of Computer Science or at least of Math. **They may not see the point of assessing digital competence while they teach other subjects**.
- The primary teacher suggests that this scenario requires **tools and services that not all the schools or families may be able to provide to kids**. In her school, for instance, there are many immigrant families that do not own a computer or an internet connection at home. The majority of schools, in her opinion, are not equipped to provide alternatives to **disadvantaged kids**. One of teachers agrees with her, while the other suggests that more resources could be available involving parents and the city council.

- All teachers think that the project based approach in this scenario is still not very common among their colleagues. A **very rigid time schedule** is one the main constraint to the adoption of this methodology.
- Since many classrooms are not equipped with computers, teachers would need to plan this activity according to the **computer lab availability**. This is also perceived as a constraint.
- The primary school teacher suggests that this kind of activities requires to develop **cooperation skills** among kids. If performed only occasionally, teachers may face some **classroom management issues**.
- This kind of activity requires also a strong support from the **school management**. All teachers agree that this doesn't happen very often. For this reason they think that the scenario, though a very possible one, may not become a common practice very quickly.

2. Recognizing informal learning

- All teachers think the scenario is very interesting. They agree this is a “possible” scenario as it doesn't introduce any particular technical difficulty. Anyway, they think **the approach and the objectives may result quite uncommon** for the average Italian teachers. The senior secondary teacher points out that this scenario may hardly become a common practice.
- They all appreciate the idea to make a stronger connection between school and students' life out of school.
- All teachers point out that **portfolios are not very popular in Italian schools**. In 2004 the Ministry of Education tried to introduce this tool but it never really entered the ordinary teaching practice. They also point out that, where used, portfolios are still mainly on paper.
- The primary school teacher thinks that this kind of activity would be very important in Italian schools. **Teachers should start to appreciate skills and talents** that are not directly connected to the curriculum, especially **to motivate underachieving students**.
- The scenario **requires teachers to learn about a lot of new topics** (in this case, skateboarding, but it could be hip hop music or anything else). They should also to be aware of trends in youth culture. Teachers find this quite challenging, as it may become a very time consuming task. They all agree, however, that this task is very interesting.
- According to the teachers, this scenario requires students to be skilled with ICT as they have to document their activity with digital tools. Teachers point out again that **the “digital divide” among students** could be an issue.
- The junior secondary school teacher suggests that this activity may have a positive impact on **self-expression, motivation and self-esteem. Portfolios may also help to start a social network among students**, supporting the creation of interest based groups. The online school learning environment should be designed to favour this process.
- It's not clear from the scenario if all teachers share a common set of criteria to give a credit for an informal activity. **The recognition of informal learning seems to be too subjective**.
- One teacher suggests that **a kid may develop a skill that cannot be included in any subject, but may still be very valuable** (he mentions cross-curricular skills). How are teachers supposed to deal with these cases? Who is going to decide if the activity is worth a credit?
- The primary school teachers would like to put the scenario in practice, since she has a very low performing student who happens to be very good at horse riding. Anyway, **she thinks that recognizing informal learning in the early years of primary**

school may be very difficult. This scenario would require a strong commitment from parents.

- The senior secondary school teacher points out that this activity **may help teachers to see students in a different perspective and to understand their personality**. He is experiencing something similar reading his students' papers from Literature classes. These readings are helping him to design better learning experiences in Math and Science.

3. Outdoor study projects

- All teacher agree that the scenario represents **a common practice** for them and for many of their colleagues. This approach is very common especially in primary and junior secondary schools. One of the teacher describes the **scenario as "normal"**.
- One of the teacher says that **mobile technology** is helping him to perform this kind of activities as often as possible.
- In primary schools, **not all teachers use digital technologies for outdoor study projects**. A lot of them require pupils to create paper posters after the experience "on the field". The three teachers agree that to change this habit we should work more on **teachers' digital competence**.
- For one teacher this kind of scenario is very suitable even for activities on **cultural heritage**.
- As for the first scenario, all teachers point out that this kind of activities requires to develop **cooperation skills** among students. The senior secondary school teacher suggests that even parents should be more informed on cooperative learning, especially those with high performing children. They often question this methodology because they tend to be very competitive.
- The scenario is so familiar that none of the teachers would change a thing.
- The senior secondary school teacher suggests **that different "on the field" activities** may require **different technologies**. It would be interesting to map them according to the subject and the students' age. For instance, a science activity in secondary school may require sensors, an art project in primary school may require a tablet pc and a very intuitive drawing software...
- Another teacher states that **Iphone and Ipad** may be good resources for all kind of activities as they provide a growing choice of learning applications.
- The primary school teacher thinks that is very important to perform these activities as they preserve **concrete learning**. They also help teachers modeling an "healthy" relationship with digital technology. Sometimes, she states, **teachers tend to think that iconic representations and simulations can substitute "on the field" experience**. In her opinion, this is a strong misconception.

Teachers' assumptions on what we are doing in iTEC

- A safe social media and networking environments for all European students
- A repository of selected learning resources with reviews. This is perceived as highly desirable, as the research of resources is very time consuming. A push technology is considered a precious add on.
- A management system to maintain and update school computers from a remote server. Many teachers are not able to manage utilities and applications, they cannot deal with very simple functioning problems and many Italian schools do not have a technician: a remote application would help a lot.
- Easily manageable school learning environments
- Deployment of one-to-one computing
- New models of school buildings

Lithuania

Date and Time: 11.02.2011, 10.00 – 13.00

Participants: Pedagogical NCs – Asta; Technical NCs – Virginija; three basic and secondary school teachers: math/computer science teacher, science teacher, primary education teacher

Researchers / Designers: Jevgenij, Natalija, Alvida, Inga

Scenarios discussed: Personal Learning Contract, Teacher Support Network and Outdoor Study Projects

1. Personal Learning Contract

It is personal contract, i.e. students with teacher makes contract. Such method sometimes is used in Lithuanian schools. But with some exceptions.

Teacher acts there as an assistant, inspector of students achievements (i.e. if student achieved planned goals).

Technologically- Brigitte is creating e-portfolio. But the questions are: how does she create? How teacher does inspect all this? How teachers do manages? Maybe in Moodle, Wiki or somewhere else?

In case we are using e-diary (something like learner information profile + Widget (or other "personalization" technology)) in Lithuanian schools, so may be there possibility to join some how e-diary and e-portfolio? In order to avoid additional work for teachers.

A project requires a lot of preparation and additional time, if we are planning to implement this project to whole school community.

But this project could be used for the special needs or gifted and talented students.

May be this project could be used in classifying pupils by knowledge or by other classification scales. For classifying various on-line tests could be used. Scenarios for pupils could be prepared (offered) depending on the test results.

It is time consuming for teachers (if this scenario will be used for all students he/she teaches). We must have strong motivation in order to explain this scenario for other teachers. Because other teachers can ask us why do they need this big and time consuming work? How we will motivate other teachers?

This scenario can be used for primary school pupils. Teachers are working there only with one group of pupils. Or this scenario can be used only with small group of basic school pupils (but not with all basic school / class pupils).

Self – study, personalization, friendly and easily understandable user environment, empower to individualize student's homework … There are the main requirements from teachers in order to use this scenario for primary school students.

2. Teacher support network

Teachers would like to find everything they need for their lessons in one place; there could be various discussion groups (e.g. forum) + resources (LO) repositories.

Lithuanian teachers encounters problem in this scenario – outside experts. This scenario is with outside experts (scientists, businessman,..), but it is really difficult to find and to attract them.

So may be we can try to implement this scenario without outside experts… In Lithuania we don't have such networks of outside experts (e.g. scientists). We do not encounter pedagogical problems, if we will talk only about networks of teachers (colleagues). It would be nice to know more about foreign countries on how they are attracting scientists to such networks.

Another problem – not all Lithuanian teachers wants to collaborate and share experience. This is due to high competition among the teachers.

May be this scenario will allow bringing up in one virtual place teachers which are eager to share their experience, to discuss, to solve various problems…

At the beginning there could be small group of teachers. May be we can create groups of teachers-experts (not outside experts). We need to encourage Lithuanian teacher to share their experience, to discuss, to collaborate.

We are not encountering technological problems. We can use Moodle, various discussion groups (chats, messengers), collaboration groups, Wiki, LO repositories and so on. But there must be easy acceptable technologies for teachers.

Conception of this scenario is very interesting, but in case it is compulsory to have outside experts in network, so such scenario could not be implemented in Lithuania (as we do not have outside experts networks in Lithuania).

3. Outdoor Study Project

"Ladybirds are beautiful!"

Students work a lot. All students work together. Nice technological decision. Films made by pupils could be seen by everybody (parents, other pupils and teachers).

It can be used not only in biology, but in various subjects, so we can rename it as exploratory work.

Teachers told about similar project they worked. Students like such projects.

In this scenario everything is clear and enjoyable, and it could be developed eagerly.

Teachers' told that they need more technologies (video cameras, Smartboards, iPad, and software for films, websites, etc.) for such scenarios. Not all Lithuanian school are quite well equipped with ICT.

Lithuanian teachers' have implemented similar project in 2003. It was quite successful project. But teachers there played students' roles.

Portugal

Date and Time: 11.2.2011, 17.00 - 19.30

Participants: Three secondary school teachers: (1) Maria Manuel, teaches Physics and Chemistry. She has been a teacher for 24 years and is very keen on implementing projects with her students in a subject called Project Area: (2) Sofia, teaches Mathematics. She has been a teacher for 13 years and is a regular user of ICT for preparing her classes. She uses ICT with her students and the local Moodle platform; (3) Rui, teaches Mathematics teacher. He has been a teacher for 13 years and is a "compulsive" user of ICT. He is a teacher trainer in the educational use of ICT in Mathematics education and manages the local Moodle platform as well as the school site.

Scenarios discussed: Collaborative media project, Outdoor study projects, and Teacher support network

1. Collaborative media project

All three teachers found this scenario very interesting. It is a motivating project and it exemplifies what teaching nowadays is about: linking what is taught at school to reality "outside", connecting syllabi to what goes on in "real life", parents being asked to come to school and experience what their children have been learning and doing (that is, parents are asked to come to school for "good reasons"). Students' interests are taken into account and that adds to their motivation to learn. The use of VLEs as a tool to support the student as she is developing her project was also seen in a quite positive way.

The image depicts a few very attentive students. The learning environment is very relaxed and this seems an almost idyllic scenario which is not at all the reality of a school's daily life.

In Portugal, there is a subject which has no syllabus of and in itself. It is called Project Area and teachers teaching it should adopt the kind of practice that is depicted in this scenario. One of the teachers in the group declared "This is what I do in my Project Area classes." One of the big differences between this scenario and what she has been doing lies in the number of students in each of her classes, in the fact that in her case students work in groups and the establishment of partnerships with universities and other relevant entities and organisations.

This way students learn and deepen and enhance their knowledge and skills, and these may be useful in their future life.

The presence of an external expert was particularly liked and was deemed of paramount importance in the success of the project to be undertaken.

This kind of project adds in a positive way to a teacher's daily routine.

In order to implement such a project, students must be mature enough and have by then acquired the necessary skills in smaller scale ones.

Small classes and a relaxed learning environment are really important. All the necessary resources must be readily available and the interaction with the expert was considered very important too.

Self-assessment was considered essential as well as the feedback the student received from others (teacher, expert), which led her to reflect on her learning trajectory and inflect it if and when necessary.

All teachers agreed that this kind of scenario is terribly time-consuming, for teachers involved must work "round the clock" in order to get things done in due time. Assessing a whole class this way would be almost impossible in a "regular" subject, unless some kind of team teaching scheme was put into practice.

All of them said that the extinction of Project Area from next year is a great loss.

This is a scenario that is difficult to implement in "regular" subjects other than "Project Area". All three teachers also agreed that it would be rather hard to do this with younger students.

All three teachers thought that this scenario should be advanced through further projects. On the other hand, they were also of the opinion that other students might profit from watching the videos and "extract" ideas for their own projects. Finally, they believe that it would be interesting if the project had some real impact on "life outside school".

2. Outdoor study projects

Once again it was stated by all present that the so-called Project Area was most suited to implement this kind of project. In “regular classes” it would be much more difficult to “make it happen”.

One of the teachers said that she did this kind of activity in her regular classes, namely when students study biodiversity. What her students do is very similar to what is presented in the scenario: in her case, students collect water samples in the fields both inside and outside school. They collect data, take pictures and film their outings. They then use various software programmes to put everything together and present the results not only to their classmates but also to students from other classes. They keep a blog where they post the results of their research, where students from other classes leave comments and ask questions. Even though this actually works, this teacher says that this is much harder to implement in regular classes than in Project Area.

Another teacher said that she did not undertake this kind of project with her students but that it would be interesting to do something similar when they are learning Statistics. Interacting with other colleagues teaching subjects such as Biology and Geography would add to students’ motivation. ICT teachers should also be part and parcel of the group of teachers involved.

However, it was also added that interdisciplinary work implies open minds, lots of meetings to find “connections” and “proper timings” between subjects and added motivation on the part of all those involved. A third teacher added that this kind of activity should be done when and only when it makes sense to implement and not only because it is fashionable or considered somehow innovative.

One of the drawbacks of these projects is that they are time-consuming for both teachers and students. For the former mainly because they have to monitor the whole enterprise.

They all considered the image to reflect what the scenario is about. However, the number of students is still rather small when compared to classes comprising around 26-28 students in Portugal.

3. Teacher support network

All three teachers agreed that this is a feasible, useful scenario. They all work with colleagues both from their own school and from schools distant from the ones where they teach. This, according to them, is the way forward.

Sharing is crucial in a profession that is rather “individualistic” and more often than not “lonely”.

One of the teachers pointed out that he is part of an informal network of teachers teaching the same subject, with whom he shares materials, tests, ideas, etc. However, it would be really useful if there was a more formal network. This could include communication tools but also a repository of educational resources created by all members of the community who would share what resources they had created. The other colleagues would in turn comment on them and help improve them.

The fact that Miss James – the teacher depicted in the scenario – contacts one of his colleagues during class to get help with a resource she had been showing her students was received with mixed feelings. They all thought that it would be great to be able to do it as the class was unfolding, but that this could be construed by students as a failure on the teacher’s part. What she did corresponds to the notion that all of them share that a teacher should act as a facilitator rather than the sage on the stage. However, this kind of “teaching behaviour” is something that is still not socially well accepted and it may take quite a while before it is.

4. Specific ideas concerning iTEC technologies

After discussing these three scenarios teachers were asked to describe what kind of technology they saw as fit to implement them.

All of them were unanimous in that the system would revolve around a collaborative platform of some kind, including not only interaction tools but an educational repository which might be added to by the different members of the teacher community. They felt unable to actually draw such a system.

This collaborative platform should be open to student-student interactions as well as those between students and teachers and teachers with their own peers. It should also be open to those experts who might be asked to help. Finally, if possible, the platform should include authoring and editing tools.

Resources would include computers themselves, Internet access, IWBs, and any other materials and technologies which would be deemed useful or necessary to implement projects with students.

Slovakia

Date and Time: 1.3.2011

Participants: Three secondary school teachers: (1) Maria, teacher (Informatics, Physics and French), Secondary Grammar School. (2) Monika, teacher (Mathematics, Informatics), Secondary Grammar School, (3) Peter, Headmaster, Secondary Grammar School

Scenarios discussed: Recognizing informal learning, Reacting to student feedback, Outdoor study projects

1. Recognising informal learning

Teachers really like the presented idea. It could be very interesting for students to presents their out of schools activities but several issues were mentioned:

- selection of the presented activity should be consulted with teacher first,
- some definitions of what is expected are needed, sure creativity is required from student mostly
- motivation (grades) to do the task should be interesting for them,
- portfolio for such sharing is missing at the school, but any internet available platform should be accepted.

Older teachers (in general) probably will not accept such way of presentation due to their lack of modern technology skills.

Although this scenario is targeting students who do not like formal learning, teachers expect that the most active ones will be medium and better students.

Teacher will need to find the key how to encourage shame students to present their out of school activities.

Motivation is that students are encouraged to use technology they like – teacher will see how they are able to present it using “their generation” language/technology.

Both teachers see the problem also in sharing students outputs with other teachers at the school – how to motivate other teachers to find time for seeing the portfolio if many students attend such a presentation.

Subjective grading – if teacher do not like the presented activity (like graphitti) grading could be worse (presented subject could hide the work of the student).

For some teachers it could be motivating to participate in such way of teaching – not only because some of the student activities are interesting, but also they will see many new technologies at work.

Presentation of activities which are close to presenter (students) should help to evolve presentations skills – not so focused on what to present, but how to present it in an attractive way.

2. Reacting to student feedback

Learning Management Systems as tools are very welcome by teachers and they see them as great tools not only for students but also for themself.

Problem that was presented by teachers immediately after reading the scenario could be summarized as “missing LMS installation in school” and “missing administrator” for such tool – rest of the discussion is presenting scenario that we have such tool and unlimited sources for usage of that tool. There are free LMS available (comment of TC at meeting).

LMS will be probably attractive only for good/active students. We were not able to find motivation factor for “lazy” students to “wake up” and use offered source of content for study (even from app store ;-).

(fast) Feedback from students – great! For teacher who is interested in quality of offered curricula this will definitively help. But it will require a lot of time to spend with feedbacks and with finding of attractive and user-adapted learning sources.

Time is the weakest point in this scenario. Teachers like when provided “tools” save their time. Here it will ask a lot of their time resources and the adaptation phase, but of course later it will be great storage of learning objects.

Software solution for voting should be the only possible way for feedbacks. Insufficient funds for some hardware solution at most of the schools.

Due to school reform (in progress) in Slovakia some subjects do miss officially approved books – LMS should be great for students in meantime.

We need such teachers like Mr. Kowalski in Slovakia ;-)

App store – great idea! We miss such a repository in Slovakia. No matter if content will be for free or not – learning objects are hard to even find for many teachers. What about of trading of student created learning materials by students? Motivation?

Generally, this scenario was welcomed by teachers. Maybe it is more attractive for teachers than for students.

3. Outdoor study projects

great idea, great possibilities for teachers, great potential to be attractive for students – many superlatives mentioned for scenario BUT

- How big the groups should be? If small – good for the results, good for the involvement of every member. But more teachers have to go out with the group during activity (given by law) – missing teachers.
- Typical school hour has only 45 minutes – too short time period to go out and do something.

Teachers are sceptical that this can be done during normal subject hours – a lot of formal learning has to be done during normal classes – it is defined by national curriculum plan. This activity should be only as part of after school activities.

Students for sure will like such learning – it is new for them, they're out of class, they can work with technology.

Case "Where are ladybirds?" should be replaced by some other attractive topic ;-)

Outdoor activities will be limited only to school surrounding – again – more teachers at the same time needs to be involved.

School needs to buy some technology (video cameras, cameras, microphones, GPS, sensors ...) in order to implement this scenario. Multiple same type devices are needed – problem for many primary schools.

If multiple groups are outside for outdoor activity – every group should have a different task. Same topic is demotivating for the groups.

Overall feeling from scenario is very good, but implementation is possible only as part of after school activities.

4. Teacher's assumptions on what we are doing in iTEC

Helping them in their work – to teach better by provided supporting materials and to motive students to like what they learn.

To find some really good teaching/learning scenario and provide all the supporting material required.

To learn something new ... what tools are available to use in their subject.

To have access to some learning platforms based on Web 2.0.

To find a way how to motivate every student to somehow actively participate in learning process.

To meet other active teachers from different schools.

APPENDIX C: SHORT VERSIONS OF RECOGNISED DESIGN CHALLENGES

iTEC

Designing the future classroom

Short versions of recognised design challenges, cycle 1

Appendix to D3.1

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SHORT VERSIONS OF RECOGNISED DESIGN CHALLENGES

By analysing the summaries of the participatory design research workshops and the scenarios of the 1st cycle, we recognised 28 design challenges. The design challenges are based on concerns towards the integration of technologies and advanced learning activities into the current everyday practice and organisational structure of schools. Figure 1 presents and overview of the recognised design challenges and the way they were categorised. The individual challenges are described briefly below.

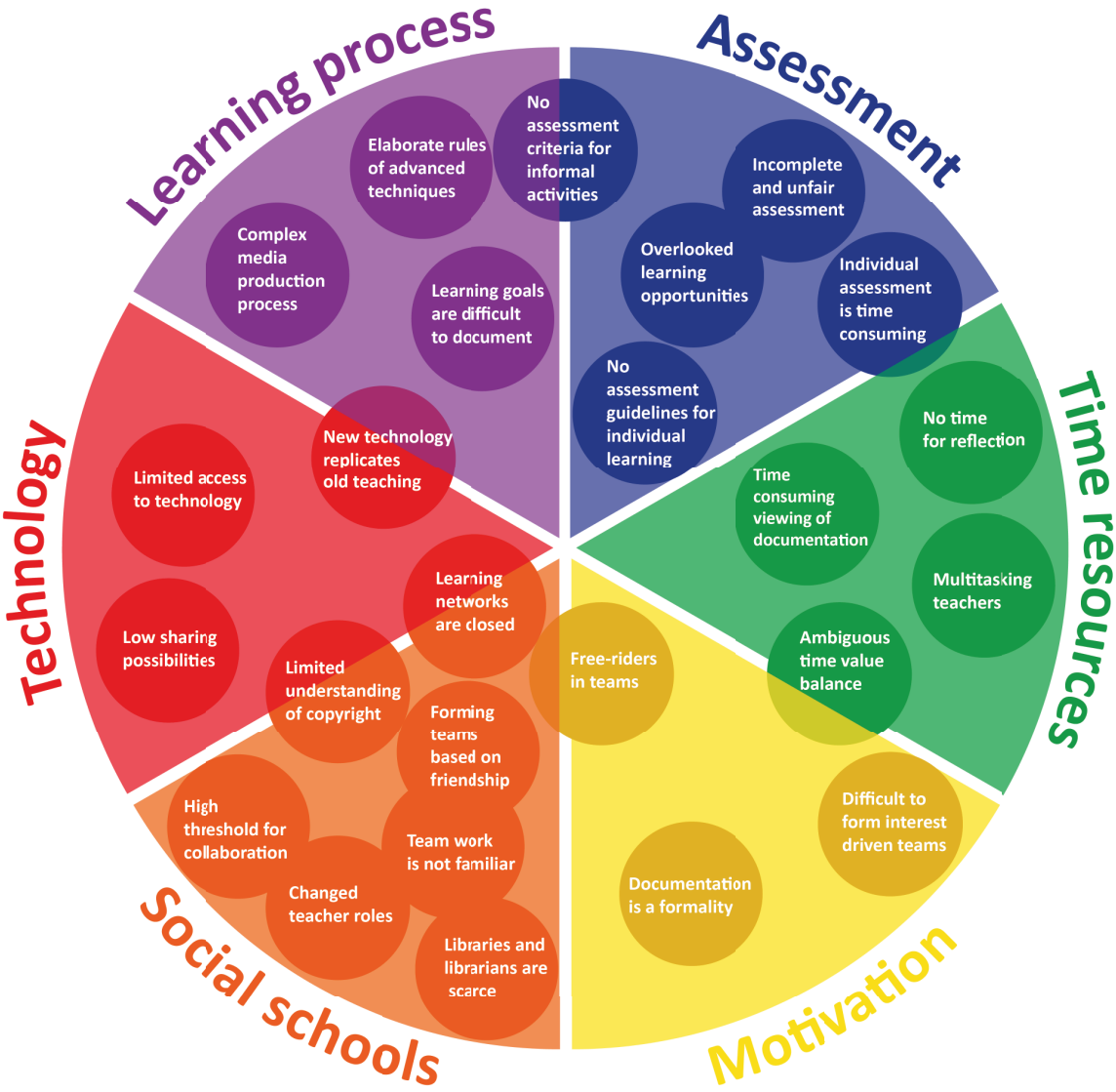

Figure 1: Overview of design challenges

3.1 Learning Process

Learning goals are difficult to document and identify before performing an activity. The motivation to do so is not explicit either, but documentation of learning goals and their changes over time can offer insight about the wishes, intentions, and learning gaps.

The process of a media production is complex, because many iterative steps are involved and, depending on the project, may vary. but many advanced learning scenarios include media production related learning activities.

Elaborate rules of advanced techniques requires particular attention during the everyday classroom learning activities, especially when intending to arrange, manage and maintain well functioning groups. However, the rules of some advanced group work techniques are defined so that the learning of one learner depends on the knowledge of another, supporting community building and personal development.

3.2 Assessment

Overlooking learning opportunities happens, because the learning that is achieved through participation in a media production project is not formally acknowledged; it is invisible. Media production projects and interdisciplinary team work activities are, none the less, valuable learning experiences.

Incomplete and unfair assessment results from **analysing** the production process of a school project retrospectively based on outcome alone. School project work often results in the creation of artefacts that embody some information about the work process of the learners, but not all.

No assessment criteria for informal activities exist, making the amount of accreditation and the categorisation of rich learning achievements subject to the teachers' individual biases and preferences.

No assessment guidelines for individual learning of learners entering an activities with different initial skills. A learner may produce a very good end result without learning anything new, while another may struggle to produce a mediocre result, yet learn a lot during the process. Should the criteria be the same for each learner, or be based on the amount of progress each learner achieves?

Individual assessment is time consuming. This time may not be available to the extent necessary to perform fair individual assessment with care.

3.3 Time resources

No time for refection is allocated in school. However, reflection of learning activities can represent a valuable way for teachers and learners to understand learning interests, goals, and achievements as well as areas where further learning is required.

Multitasking teachers, who manage several projects and groups, guide content learning and media production processes at the same time, are implications of advanced learning scenarios. Cognitive overload means that teachers are not able to concentrate on the development of individual learners.

Time consuming viewing of documentations lowers teachers' motivation to view documentations of learners, especially the ones who are not active participants in a their class. None the less, viewing learners' documentation of their out-of-school activities affords teachers, for example, to develop learning material that is building on the personal interests of the learners.

Ambiguous time value balance arises due to the fact that time spent with one project takes away from the time available for other, equally important learning opportunities. Although teachers are aware of the benefits of learner-centred practices that consider individual needs and interests the uncertainty about the value of one practice above another is there.

3.4 Motivation

Documentation becomes a formality, when it is practices for the sake of earning credits. Although teachers consider it motivating and valuable for learners to use their favourite technology to document their outside of school hobbies, documenting them with digital technologies to integrating personal interests may formalise the hobbies.

It is **difficult to form interest driven teams** of large amounts of learners, that allow each learner's interest to affect the team formation, and to place each learner into a team that focuses on a topic that personally interests them, because it can be a time consuming and computationally challenging. However, student-centric pedagogies emphasise that formal learning activities that take the learners' personal interests into account increase motivation.

Free-riders tag along, while some learners work hard. This creates an unequal workload distribution between learners within teams.

3.5 Social schools

Forming teams based of friendship may reduce the learners' possibility to learn how to work with different people and lead to minimal learning outcomes.

Team work is not familiar to many European teachers. These teachers will not easily organise team work activities, despite the foreseen benefits.

High thresholds for collaboration between teachers within the school, among schools, and internationally, as well as collaboration with outside experts exists in relation to establishing initial connections with unknown people, building learning networks and time consuming opening up of existing networks without assurance for success.

Learning networks are closed, and informally established learning networks with vague structures and goals are inaccessible for teachers from different fields. However, teachers recognise that learning networks are good for sharing learning material, exchanging experiences, and collaborative learning.

The **changed teacher role** from "sake on stage" to guide, moderator, technician, advisor, facilitator, listener, etc. is not be socially well accepted in some European countries.

Libraries and librarians are scarce in schools, but the idea of libraries as centres for digital literacy skill training suggests the librarian with digital literacy skills as a protagonists. If libraries are part of the school landscape, most librarians have limited skills in performing research with digital technologies, or supporting learners directly.

Limited understanding of copyright is a challenge for media production based learning activities, in which resources are downloaded from and uploaded to the Internet. Copyright law is a maze that European teachers are not able to navigate.

3.6 Technology

Sharing possibilities are low, because current sharing and media production solutions are difficult to use and require time to learn. Contrarily, sharing work in process in learning communities and with teachers, as well as between teachers, learners and people outside of school is central in several scenarios.

Limited access to technology and resources, such as cameras, laptops and computer equipped classrooms makes the performance of scenarios that would be best performed in a 1:1 setting, with one computer or other device for each learner, impossible.

New technology replicates old teaching, because advanced learning practices are currently not part of the day-to-day routine of schools, and not considered in the design of learning technologies that are used in the classroom today. None the less, future classroom technologies can be seen as the tools that support, enable, and formalise changes of practice.

APPENDIX D: LEARNING STORIES AND LEARNING ACTIVITIES

iTEC

Designing the future classroom

Learning Stories and Activities cycle 1

annex to D3.1

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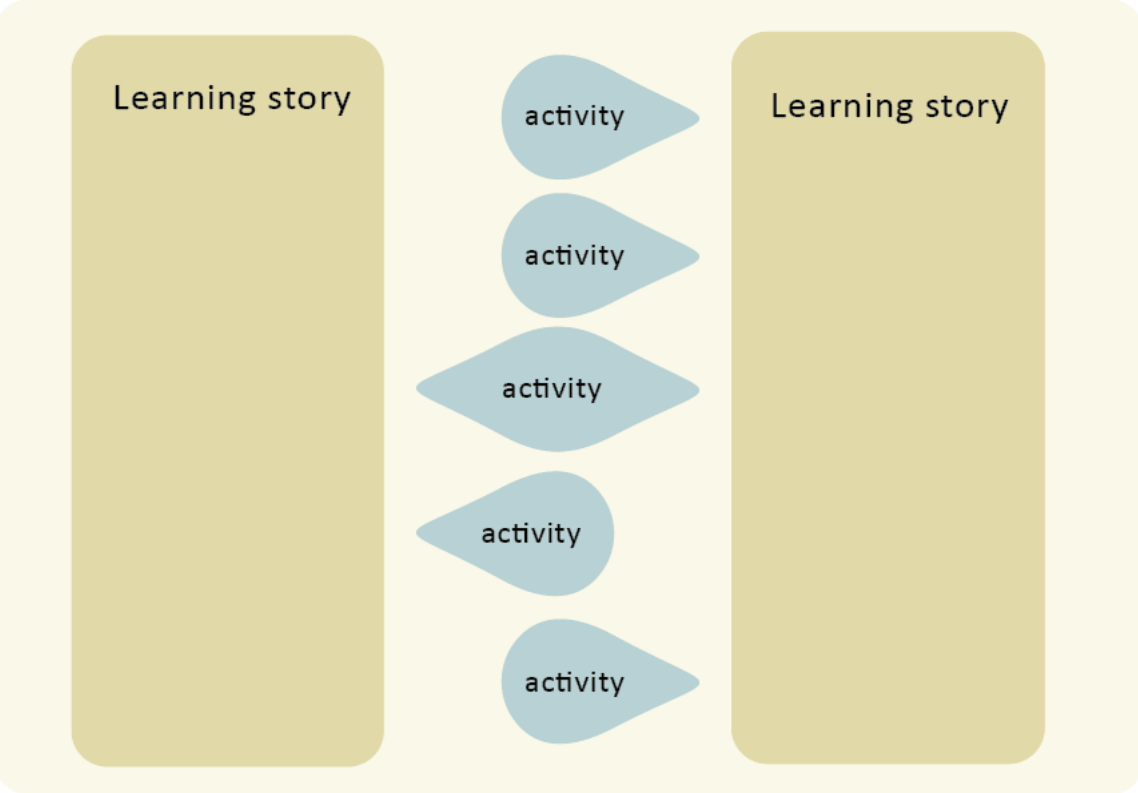
Table of content

1. INTRODUCTION

This document describes Learning Stories and Activities. The Learning Stories are based on the original scenarios from FutureLab. The Stories show how several Activities can be used in a consistent and meaningful learning experience. In this document, the Learning Stories refer to several Activities and an Activity can be a building block of several Learning Stories. Figure 1 illustrates the building block structure of this document. Figure 2 illustrates the design process that WP 3 followed during Cycle 1 to design this document. For more detailed information, see the concept map on WP3 key concepts.



The Activities contain information on specific tools and other resources needed to implement Stories. They also include teacher guidelines that detail how the teacher should prepare for an activity, and how the activity can be adapted to a course or lesson.

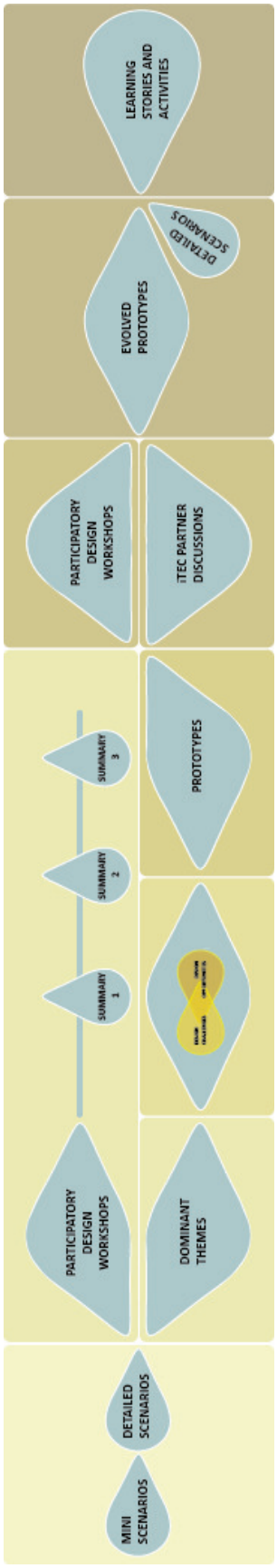


Figure 2: Design Process, WP 3, Cycle 1

The Activities are presented in two separate documents. These documents are meant for the National Pedagogical Coordinators (NPCs) and National Technical Coordinators (NTCs) as they prepare for pre-pilots. They need to select Activities they deem suitable for their national educational context and localise them. Besides translating them, the NPCs and NTCs should also modify them to fit their national context, for example:

- mention specific tools or services their schools have at their disposal
- include local laws and customs that may affect the scenarios

The localised versions of the Activities and Stories can then be presented to individual teachers who can select which of them they want to try out in their pre-pilot. When preparing for the pre-pilot, the teachers should select a suitable mix of Activities and adapt them into a lesson plan (or course plan) in a format they are comfortable with.

2. LEARNING STORIES

The original scenarios are meant as inspiration for teachers in seeing how various new learning activities may be used together. Some of these scenarios are not recommended for pre-piloting in cycle 1 due to practical difficulties, lack of technical infrastructure, or other issues. These will be detailed in D3.1, “Report on design prototypes and design challenges for education”.

The scenarios recommended for pre-piloting have been rephrased to be more useful to teachers. They are now called “Learning stories”. Figure 3 shows how these Learning stories relate to various innovative or engaging Activities. The stories are meant to be inspirational examples of how the activities will play together. Pre-piloting teachers are free to do their own variations and choose activities that they can work with in their pre-piloting teaching activities.

Figure 3: Illustration of the connections between Learning Stories and Activities

2.1 Learning story 1 «Outdoor study project»

Students form small groups, each focusing on a topic within the course theme. They may go outside of the school to observe and collect media. They may contact outside experts as part of their project. They then collaboratively analyse that data and build a presentation using a diverse range of media showing their results.

Example Story

Ms Rossi, a history teacher, decides to get the group to work collaboratively on a problem based activity related to civics and the local environment. When deciding on a specific activity for the class she liaises with the art teacher to ensure the chosen activity could also support learning in art.

She sets her class the challenge of finding out about the history and heritage of their town. She presents the topic to her class with the help of a few online videos illustrating their town's citizens and culture. Using the TeamUp tool on her interactive whiteboard, she prompts her class for topics they would like to discover. She uses her judgment in deciding and writing ten topics on the board. The students then use their personal responders to select three topics they each find most interesting. The TeamUp tool creates teams of four so that each students gets to work on a topic they find interesting.

The team work starts and each team records a 1 minute film that introduces their project, essentially recording their learning goals, planned steps and the requirements for a successful project. Carmen's team decides to find statues around the town and find out what they represent and mean.

Carmen goes outside with her team to collect real data to help their investigation. They take geo-tagged images of statues they find, and take snapshots of the plaques on the statues. They also interview a few passers-by and ask whether they know something about the statues nearby, or if they can point them to statues they have not yet found. At the end of the day the team records a one minute news flash video of what they have done.

Ms Rossi lets the students work together in groups so she can take the role of observer and coach. She notes down what skills the students need to develop and practice to help her design future learning activities. She realises the group need more training on contacting strangers in a constructive manner, guidance on finding more in-depth information, and how to set specific group goals.

Carmen comes back to class with her team the next day. They share their data and findings with each other and the other teams of the class. They start online searches to find more information about the people that the statues they have photographed are of. They collect the information on an online shared document and start building a visual timeline of people and important events. At the end of the lesson they record another 1 minute video documenting the day's activities. They explain what they did, their future steps and summarise encountered difficulties.

After their research is complete, they start working on their presentation. They use the shared document as a basis for their script, decide to include the visual timeline as well as a map of the statues' locations. They write a storyboard and record new

video segments, then they edit everything together into a 10 minute film. This film is posted on the school's learning platform for the class to view for homework, and for students in another class, who are doing similar work, to comment on. The group also decide to post it on the public area of the learning platform so they can show it to their parents or carers when they get home.

The comments that the team receives on their videos are later reflected on by the team. They also come back to the short news flash videos they made during the process to reflect on their work together with the teacher and other students. This helps them understand what they could do better next time, what skills they need to practice, and what areas of knowledge they could explore in more depth.

Lastly, the group creates a short "Future steps" video to document their overall learning outcome, a summary of the received comments and possible future steps. This video is stored along with all the other material onto the online repository, making them available for individual reflection at any times in the coming years.

Tags

group work, outdoors, media project, outside

Relevant Activities

Introduction to a theme | Forming teams | Video documentation of work progress | Collecting data outside of school | Joint course of two teachers | Mental notes about the students | Sharing files | Creating a multimedia presentation | Peer feedback | Presenting results

2.2 Learning story 2 «Alternative outdoor study project»

A portion of the school's students go out on a field trip, but the budget does not allow all students to go. The students that stay at school form a headquarters, which receives photos, reports, videos and other material from the field trip and edits it in real time into a public presentation.

Example Story

The school receives a grant to take one busload of students to visit a wildlife reserve. All biology teachers of the school are involved, across all grade levels. From all classes some students are selected to go to the field trip, while others stay at school. Those that stay form a headquarters that is constantly communicating with the students on the field trip.

The students figure out for themselves what technology they will use. The school can provide them with some smart phones and tablets, as well as a charging station.

Each class has a planning session during a biology lesson, where they see what devices they have and what they will use. Class 3A sees that they have 6 smart phones in total as well as an iPad. The teacher recommends some services the students may use to communicate: sms, Google Talk, Yammer, Skype. She also recommends some media sharing methods: mms, Flickr, Bambuser, Qik, Picasa, Posterous. The students try out the suggested tools and choose the ones that they want to use. They decide to use Skype and Google Talk to communicate between the headquarters and the field team. They will use Bambuser to stream live video, and Picasa for storing photos.

When the field trip starts, the field team send video, photos and quick messages which the HQ team use to update the class blog with edited articles. They use the media they receive, do additional research online and with the help of the biology teachers that circulate among the HQ teams, which are located in a large hall, each in their own table.

In a biology lesson after the field trip, the class goes over the material they've gathered and the reports they wrote, and give feedback to each other.

Tags

Field trip, mobile phones, communication

Relevant Activities

Forming teams | Collecting data outside of school | Sharing files | Creating a multimedia presentation | Peer feedback | Introduction to a theme | Video documentation of work progress | Mental notes about students | Sharing files | Presenting results

2.3 Learning story 3 «Recognising informal learning»

Students document and reflect on their informal learning that occurs outside of school. They place their documentation into a portfolio and share their learning with teachers and parents where appropriate.

Example Story

Students document and reflect on their informal learning that occurs outside of school. They upload this onto a portfolio and share their learning with teachers and parents where appropriate.
Ms Fierro recognises that Paulo, like several of the students in the class, does much work outside of school but is less interested in the formal curriculum. As a result the school has created a possibility for students to share their out-of-school experiences as part of their formal school curriculum. This offers students the opportunity to get formal credits for their out-of-school activities where appropriate.

Paulo collects and documents evidence about the skills and knowledge he gains when involved with his hobby, skateboarding. He collects evidence in a range of formats including scans of the designs he created for skate logos and skate clothing, photos of the different stages of him building a ramp, and a video of other skaters using his ramp at a competition. He captures this evidence using a range of different tools, including his mobile camera, a friend's video camera, uploaded computer created designs, and paper drawings which he scanned at school.

Paulo collects an ActivInspire Studio file from the school. This file will support Paulo to document and reflect on his activities. The result is a presentable Studio file. Paulo can choose to present his work at a class that he thinks is appropriate for his work. In this case, he selects "design and technology." Ms Fierro teaches design and technology and decides that she can use Paulo's evidence to support his accreditation in this subject, particularly in the areas of "use of materials and their construction."

Paulo can choose to export his Studio file into a PDF and publish that on his personal blog or Facebook wall.

Tags

Relevant Activities

Collecting data outside of school | Creating a multimedia presentation | Presenting results | Incorporating out-of-school activities | Sharing files

2.4 Learning story 4 «Collaborative Media Project»

Students are set open projects involving experts to develop research skills and subject knowledge in areas that they are interested in. The students are asked to create a multimedia presentation about their findings to convey a message to an audience. To enhance their understanding, the students are also involved in the collaborative development of assessment criteria with the teacher and experts.

Example Story

Mr Walker's class has been talking about "greenwashing" by big multinational companies. He decides to involve his class in investigating this further. He presents the task: choose an industry and interview representatives from a local company to find out how they address social responsibility or energy and resource conservation.

Mr. Walker uses TeamUp to collect topics from students and allows them to vote on topics they are interested in. Helen's father works as a dry-cleaner, so she suggests that Mr. Walker calls one topic "Cleaning industry." After other topics have been collected and everyone voted, Helen is assigned to the cleaning industry team.

Helen's team decides to produce a piece of media to highlight how the environment is considered in the everyday of the cleaning industry. Mr Walker then challenges the team to identify a purpose and a suitable audience. The team is brainstorming and by the end of the class, they record a 1 minute video explaining the purpose and audience and initial ideas for a multimedia presentation.

The next day, Mr Walker initiates a group discussion about the benefits of using different types of digital media. Helen's team decides to produce a 5 minute documentary film, including interviews of workers of the dry-cleaning place her father works at and showing their day-to-day activities. Again, they record a 1 minute video explaining what their decisions, the planned steps and what they suggest might be difficult during the production.

Helen's team and Mr walker then contact the manager of the dry-cleaning centre through Helen's father. The two 1 minute videos help the team to communicate their plans to the manager. The manager agrees to act as expert, who co-develops assessment criteria for the team's project together with the team and Mr Walker. The assessment criteria is developed to ensure that the team can be clear about what would make a good subject-based video and builds on the environmental report of the dry-cleaning service. During a face-to-face meeting, the assessment criteria is developed with help from Mr Walker, the dray-cleaning manager, and the team into what would make a powerful video that could convey a challenging narrative to the audience. Once the criteria is finalised and all students in the team can explain the component parts of what is required, the production process begins.

As the team creates storyboards and begins to record the films. After each day, the team records additional 1 minute videos explaining their activities of the day, their planned future steps and problems that were faced. These videos are stored on the school's Virtual Learning Environment (VLE) and can be viewed by way of the TeamUP tool by Mr Walker, the expert and the team members. The team can use the videos to quickly get an update on where to pick up their work the next day. Mr Walker can provide iterative comments to the team based on their progress, so they

can add further detail to the assessment criteria to create a detailed picture of what success will look like for Helen's work.

Mr Walker is aware that by co-designing the assessment rubric in this way, the team is developing a greater understanding of the subject content, as well as an understanding of film production and storytelling. Further, Mr Walker invites community experts in to add to the criteria, to support the team's project, but also to ensure that the school builds on the expertise of the community.

At the end of the development process, the team presents their video to an audience of teachers, peers, the expert and members of the local community. During the presentation the team provides a live commentary answering questions from an audience and hears, first hand, their feedback on the video, the content and the overall message. As part of their self-assessment, the students in the team then take notes against the assessment criteria, whilst Mr Walker collates the audiences' feedback for their next student–teacher tutorial.

Tags

personal study project, media creation, experts, co-developed assessment criteria

Relevant Activities

Collecting data outside of school | Working with outside experts | Collaborative assessment | Introduction to a theme | Mental notes about students | Sharing files | Creating a multimedia presentation | Presenting results | Peer feedback | Forming teams | Video documentation of work progress

2.5 Learning story 5 «Reacting to student feedback»

Building on the 1 minute videos that students create to document their work progress, teachers have access to students' recorded responses based on activities performed, plans of further activities and problems encountered. With this information the teachers can adapt their teaching style appropriately.

Example Story

Mr Kowalski uses the TeamUP video news flashes that the students create to increase the amount and quality of support he gives to his students as to provide more tailored formative responses to his students' progress.

Mr Kowalski is encouraged to investigate his students' understanding by watching and analysing the progress videos via the TeamUp tool. Mr Kowalski asks a mixture of open and closed questions throughout the lesson, and depending upon the student's responses (which are returned as short video clips that are fast to watch, yet include rich qualitative information) he changes his pedagogic approach to make sure he revisits areas that students are challenged by and quickly builds upon areas where they have good understanding.

Seeing two student's videos without problems encountered, Mr Kowalski firsts speaks to them about the reasons behind this, and after realising that they their work has progressed smoothly, he asks these two students to sit with four students who struggled with a previous activity or question to act as peer mentors, whilst he revisits some work with another group of students.

The student videos can also be made visible to other teachers to give them a better insight into students' progress and development. By using this more detailed understanding of his students, Mr Kowalski alters his mental notes of the student in the TeamUp tool to ensure more productive team formation. He also revises the activities he sets the students based on his findings.

To provide greater structure for his students' learning, Mr Kowalski uses this more detailed understanding of his students' interest and knowledge and collects appropriate resources, such as explanatory films, books, videos by other students, etc., for different students. He does that by searching the web, the TeamUp videos and asking fellow teachers. Mr Kowalski adds specific resources to the names of different students that he thinks will benefit from a particular resource. He does that on his laptop or his paper notebook and provides the students with the material via USB stick or simply hands the students resources that are not digital. The four students who were struggling with some key concepts have access to a video of an older student explaining a key issue, whilst two students who demonstrated a good understanding access a set of challenges that ask them to plan an applied project.

Mr Kowalski continues to monitor the students' work through their 1 minute video reports and by talking with students as they continue with their work. Towards the end of the lesson, Mr Kowalski asks each group to record a video about the resources that they have used. This will help Mr Kowalski to improve his resource selection. Mr Kowalski

develops a deeper insight into the progress of each student, which informs his use of the graduated lesson plan for future lessons.

Tags

Student feedback, work progress, mental notes, resources

Relevant Activities

Video documentation of work progress | Mental notes about students | Sharing files

2.6 Learning story 6 «Support network of experts»

Students are asked to devise and complete a project that involves resources from different subjects in the curriculum and requires they involve external experts. Guidelines and an assessment checklist that fulfil curriculum requirements have been agreed by teachers and students.

Example Story

Ms Galinis wants her class to learn about environmental issues in different countries. She'd also like them to work with outside experts and practice their foreign language skills. She chooses a motivating video from the web and uses it as she presents the topic to her class. She then gathers topics the students are interested in and form 3–4 person teams.

Juan ends up in a team with Maria-Elena and Pablo and their mutual topic is to investigate and analyse different recycling practices in countries across Europe. They agree to specifically compare practices in countries that speak languages they have been learning at school. They discuss their goals, and decide that their project will give recommendations on recycling improvements for their own locality and country, and the project outputs and recommendations will be reported back to the other teams, as well as the local expert they work with. They present their plan to Ms Galinis, who suggests that they create a webpage or blog so that their outputs and recommendations can be easily accessed.

Ms Galinis then works to connect the student groups with experts they need to complete their projects. She uses her teacher networks within the school and local education body (through online social networking sites and the virtual learning environment) to identify and contact specialists from near and far who offer the information and resources the students need. Each group also researches experts in their fields to find others they should speak to. With the help of Ms Galinis, Juan and his friends contact the recycling coordinator for the local region, a civil servant in the government who works on environmental issues, and a professor at a university conducting international research in the area. Ms Galinis also uses these online networks to get support from other teachers and ICT coordinators on how to use synchronous communication effectively.

Using instant messaging and videoconferencing tools in the school library, the group interviews their 'experts' over the course of a week, both in class and in their own free time in school. The experts also share documents and resources with the group through email and document-sharing services. In addition to the environmental experts, the groups communicate by IM or video with language teachers who have been found by Ms Galinis to follow up any questions they have around confusing information in the different languages. They post daily updates of their progress for the experts and teachers to see.

Once the research and interviews have been completed, the group analyses the information and creates a report on a web page of their findings, including recommendations on local and national improvements. They can choose to present their information through different multimedia formats. Their project is assessed using the original project guidelines and from feedback from their teacher, peers and the experts they share the information with.

Tags

group work, outside experts, IM, video calls

Relevant Activities

Forming teams | Working with outside expert | Joint course of two teachers | Introduction to a theme | Video documentation of work progress | Sharing files | Creating a multimedia presentation | Presenting results | Peer feedback

3. ACTIVITIES

3.1 Activity 1 «Forming teams»

Small teams of 4-5 students allow students to find subjects and viewpoints that are interesting to them and encourage communication and reciprocal teaching. Forming good teams is a challenge that can be aided with computer tools. The teacher gathers each student's interests and motivations and puts everyone into a team with a topic they find interesting. The teacher also avoids putting best friends together every time, or people known for not working well together.

Learning outcomes

- Students will learn to work with different people, not just their usual friends. Shy children won't have trouble finding a group.
- Reciprocal teaching inside the teams will help both the more advanced students and less advanced students to better understand the basics of the team's subject matter.
- Increased motivation by being able to work on a topic of personal interest will most likely increase student engagement and learning outcomes

Motivation

Teacher

- Forming groups or teams is essential for many learning activities. It is good to have a method for forming functional and heterogeneous teams quickly.
- Computerised teams allow teacher to quickly review each group's progress after a class.
- Store mental notes about the students for your own future reference.
- Mental notes are considered when forming the teams.
- Groups formed by a computer are more readily accepted than those dictated by the teacher.

Student

- Fun, visual way to see groups form.
- Supports personal learning interests, because student can suggest topics of personal interest and can vote to work with topics of personal interest.

Reasons for using technology

It is difficult to keep in mind all the variables required for teams to function well. If the teacher focuses on having students to work on subjects that they want to work, the teacher may forget some other aspects, etc. The TeamUp tool will solve this and allow the teacher to easily form groups that take into account each student's motivation. TeamUp tool will also store and display the team setups to allow quick continuation of work at next lesson.

Guidelines

Required time

- TeamUp: 10-15 minutes for collecting team topics and setting up teams
- otherwise: assigning students to interesting topics is challenging and can take some time
- TeamUp: Initial setup (beginning of semester) with new students may take 30 minutes of preparation time and 25 minutes of class time
- Actual team work usually spans multiple lessons

Preparation

- TeamUp: First time setup, when starting to work with a new class of students:
    - Open the TeamUp tool in your IWB or VLE.
    - Add student names.

Add photos if you have them. Alternatively you can have the students come up to the IWB or teacher's computer to have their picture taken – great fun!

Present the general theme of the coming lesson or project (see activity 6). Ask students to think about what they're interested in within that theme.

Ask students to suggest themes. Use your judgement to rephrase, alter or reject suggestions.

- TeamUp: Open TeamUp and show it on a projector or IWB. Click "Create new teams." Collect up to 10 suggestions.
- Google Docs / Etherpad: Have students simultaneously write their suggestions. Edit appropriately.
- otherwise: use a board or flip board to collect ideas

Have the students say what topics they are interested in.

- TeamUp: Use the response system to get votes, or have the students come up to the IWB and drag their 3 votes to the topics they're interested in, or have them say them out loud and mark their choices yourself.
- Google Docs / Etherpad: Have students add their names next to topics they are interested in.
- otherwise: Add student names next to topics.

Assign students to team topics they are interested in. Try to make the teams heterogeneous, but use your pedagogical judgment to group similar students (in some aspect) together.

- TeamUp: Move the icons of mental notes to the "Bring together" area. Click "TeamUp." The optimal teams are computed and created on screen. You can go back and change the bring together settings if you want, and you can manually drag students from one group to another.

- Google Docs / Etherpad: Try to find a good match of students and topics. You can try allowing the students to figure out a good configuration (although then friends tend to cluster together).
- otherwise: as with Google Docs

Have students start their group activities. You may think about working with the students to come up with assessment criteria (see activity 9).

If the team work spans multiple lessons, you can have each team do a status update after each lesson (see activity 7). Remind students at the beginning of each lesson on what the team topics are and who is in which team.

- TeamUp: You can each day open TeamUp and click on the Teams icon to show everyone the current teams.
- Google Docs / Etherpad: Show the document that has the team topics and members.
- otherwise: Store the team setup on a flip board page, or take a photo of it for later use.

Assessment

- You need to decide whether you grade teams or individuals.

Technology support

TeamUp tool or Google Docs or Etherpad

Technical details

Technology

required: TeamUp tool OR real-time collaborative writing tool

recommended: VLE or IWB

nice to have: 1 laptop for each group, 1:1 response system

Resources

Events: none

Places: none

People: none

Tags

Teams, group work

3.2 Activity 2 «Collecting data outside of school»

Students go outside of school to collect data. This data can be either in the form of multimedia, or scientific observations. Either the entire class may go, or only some of them.

Learning outcomes

- Learn to plan a research project (chose and plan activities that will lead them to learn about the chosen frame) and develop research skills.
- Learn how to use tools for investigation, collecting data and evidence.
- Learn different ways of collecting information.
- Directed exploration may cultivate creativity and critical thinking skills may develop.
- Learn how to make content choices and how to frame a topic.

Motivation

Teacher

- If a parent or someone else is available as a guardian, this frees the teacher to do other things while students are outdoors.

Student

- Going out of school building is a refreshing change.
- Hunting for data or objects can be exciting.
- This can be turned into a game for added motivation.

Reasons for using technology

- Students can use their personal mobile phones (or phones or devices lent by the school) to gather photos, audio and video material from their surroundings. Considering their area of focus, they may also use other sensors to gather data, such as geo-location information, temperature, air quality, weather, etc.
- Use of the netbooks and laptops supports sharing of data between students and other people.

Guidelines

Required time

- 1 lesson to prepare each team's topic, framing, and plans for the outside excursion.
- Monitoring of team progress, intervention if necessary.

Preparation

- Each team should have a motivating topic to pursue (see activity 1 "Forming teams")
- Arrange for adult supervision of student teams as necessary.
- Arrange devices

- Collect examples of information gathering

Present examples of collecting data in the field to students. Discuss the benefits and drawbacks of media with the students.

Let the students try out and practice using the information gathering devices.

Group discussion about the data that they need to gather to support their topic.

Deciding on where outside to collect data at, what data to collect and how to document the findings.

Each team can document a status report about their team's decisions (see activity 7).

Teams collect data outside and investigate. They may share their data to others as they collect it (see activity 9).

- Teams with Promethean and a netbook/laptop: Use the "Breath of fresh air" student flip-chart to record findings.
- Teams with a mobile camera phone or a netbook/laptop: Take pictures and short video clips, record sound, measure temperature, etc.
- Netbook/laptop: Take digital notes

While the students are outside, the teacher or guardian takes notes of the team work progress and on what could be improved or practiced further.

- Mobile camera phones: Take pictures, video and audio recordings, as needed.
- Netbook/laptop: Take digital notes

After data collection, the students may create a multimedia presentation of their findings (see activity 10).

Assessment

- Compare the teams' decisions and plans before collecting data with the steps that were actually performed.

Technology support

TeamUP, VLE, Promethean IWB, mobile camera phones, netbooks/laptops, pens, notebooks, paper

Technical details

Technology

Required: none

Preferred: photo, video, audio recording devices, geo-tagging

Nice to have: none

Resources

Locations: A varying set of safe natural or urban outdoor environments near or within the school premises.

Events: Possibly a community event that is relevant to the theme.

People: A parent, teacher or other guardian to accompany the students

Tags

excursion, data collection, outdoors

3.3 Activity 3 «Working with outside experts»

Students get additional or deepening knowledge from an out-of-school expert of a relevant field.

Learning outcomes

- Students practice contacting experts outside of school, present their case, ask for collaboration.
- Students learn how to argue and negotiate with teachers and experts.
- They learn to incorporate expert views into their own plans, and this way the students understand how their chosen topic relates to the activities that are happening in the wider society outside of school.
- Experts' assessments cultivate critical thinking skills and give students new directions they may have not thought yet.

Motivation

Teacher

- Build collaboration with outside experts to open and link school activities to the broader society.
- Teacher is not required to know everything, but can rely on an expert of the field to support the students' inquiries.

Student

- Linking topics of personal interests and school activities to the wider audience is motivating for students, because they see how these topics matter in a wider range than the school ground.
- Contacting a professional is exciting and challenging.

Reasons for using technology

- Initial contact and in some cases also the follow up contact with experts by video call, chat, or email is more feasible than meeting them face-to-face.

Guidelines

Required time

- 15-30 minutes of class time to talk about potential experts the team could contact.
- Few hours of preparation time to find and contact potential experts. This depends on schools preparedness for such work and may reduce to minutes once the network of familiar experts has been established.
- Monitoring of student progress, keeping in touch with the experts involved.

Preparation

- Prepare possible topics and connections to experts to support students while they select a topic of interest. It may be useful to discuss topics and potential experts in one lesson, and find relevant contacts for the next lesson.

Teacher and students identify experts, prepare a project introduction and possible questions for the experts.

Students contact the experts by telephone, voip call, visit, e-mail or letter.

- A good way to find experts is through LinkedIn.
- People working in academia often have a flexible schedule and find it motivating to pass on their expert knowledge to young students.
- The young student's parents can be consulted as experts as well.

Students, teacher and expert agree on the involvement of the expert in the exercise or teamwork activity, such as that the expert is available for interviewing, giving support in form of assessment co-development, or feedback. The expert may be involved in defining the assessment criteria (see activity 5).

Students may visit the expert at his working location to gather more information (see activity 2).

The students, the teacher and the expert collaboratively decide on how their communication can happen during the project

- 1. E-mail conversation
- 2. Skype calls
- 3. Online blog or wiki space documentation and feedback discussion by way of commenting functions.

Assessment

- The expert's view on student performance should be taken into account.

Technology support

Skype, e-mail, regular phones, letters, LinkedIn

Technical details

Technology

Required: none

Preferred: Skype, email

Nice to have: phones, mobile phones

Resources

Locations: none

Events: none

People: Experts relevant to the theme of the course.

Tags

experts, collaboration, voip, call, Skype

3.4 Activity 4 «Joint course of two teachers»

Teachers of two subject areas plan a project together that benefits both areas.

Learning outcomes

- Learn about the interconnectedness of different areas of knowledge, such as possible combination and overlapping of subject areas
- Further cross-disciplinary understanding of the curriculum

Motivation

Teacher

- Collaboration with teachers of the same school broadens a teacher's understanding of subject overarching themes.
- Guidance responsibility for the project is divided between two teachers.

Student

- Possibility to earn grades in two subject areas in a single project.

Reasons for using technology

- Use of an online collaboration space allows for flexible collaboration in classroom and at home, and allows both teachers to easily follow progress and give guidance.

Guidelines

Required time

- 1-3 hours of teacher discussion to come up with a suitable cross-disciplinary topic.
- Monitoring and guiding the project work (outside of class time, or allocating class time for that).

Preparation

- Brainstorming: Teachers discuss collaborative projects that include two subject areas.
- Teachers decide on a theme, an activity and the assessment of the projects. They may decide to assess together, or each teacher may assess and grade the work independently.

The theme, activity, and assessment criteria are presented to the class preferably by both teachers, or, if scheduling doesn't allow both teachers to attend, just by one. The teacher who is not able to attend may record a short introduction video that is shown to the students (see activity 6).

Both teachers address their own viewpoint of the project in their classes. Both teachers follow the teams' progress and give comments and guidance as necessary.

Assessment

- Both teachers assess and grade the students' work independently or may decide to assess together.

Technology support

An online collaboration space that allows the teams to share their work in progress with teachers makes monitoring of the work easier.

Technical details

Technology

Required: none

Preferred: online media sharing, online writing, online editing

Nice to have: none

Resources

Locations: none

Events: none

People: two teachers of different subject areas working together

Tags

cross-disciplinary, teacher cooperation

3.5 Activity 5 «Collaborative assessment»

All parties involved in a learning project collaboratively develop assessment criteria for the project. This is an iterative process, which means that the assessment criteria is revised collaboratively during the project. For example, the different views can be:

- Teacher: Subject criteria
- Student: Audience and purpose
- Expert: Expert field guidelines

Learning outcomes

- Learn to negotiate with teachers and experts.
- Learn to incorporate expert views into plans, and understand how a topic relates to outside of school activities in the wider society.
- Develop in-depth understanding of subject content.
- Become clear about what would make a good subject-based project.
- Directed exploration may cultivate creativity and critical thinking skills.

Motivation

Teacher

- School builds on the expertise of the community.
- Learn more about a theme.

Student

- Transparent evaluation criteria.
- Personal interest can shape the evaluation criteria.

Reasons for using technology

Technology can support the iterative development of the assessment criteria, because progressive versions can be created and rapidly shared with the parties involved. Also, all parties might not be available to meet face-to-face when an update is needed.

Guidelines

Required time

- Initial assessment criteria 20-45 minutes.
- Ongoing throughout the project.

Preparation

- *Optional*: Arrange a meeting with an expert.
- All parties prepare their personal starting point for evaluation criteria and/or motivation.

The teacher's existing assessment criteria for a class can be used as a basis to adapt and modify collaboratively by all parties involved to address the motivations

and points of view. This can, for example, happen in a wiki environment or through a Google document that all parties involved have access to.

The initial setup of the assessment criteria is crucial and it is recommended to happen during a face-to-face meeting with all parties involved (see activity 3, working with outside experts).

Meet again over the course of the project to reassess the criteria. It is good to include all parties involved in these meetings, but teacher and student are the required participants here.

After the project concludes, for example with a presentation (see activity 12), the students make notes of audience response against the collaboratively developed assessment criteria, as part of their self-assessment. The teacher also collects audience response for the next student-teacher meeting. Other parties involved may do the same.

Feedback and reflection session between students and teacher that can be joined by the other parties as well, in which all notes and documented audience comments is related to the assessment criteria for evaluation.

Assessment

- Assessment criteria is collaboratively developed by students, teacher and other parties involved before the production starts, and during the production.
- Students are able to explain the requirements.
- The audience comments, collected by students, teachers and possibly other involved parties during the presentation, is used to gauge success on the selected assessment criteria.

Technology support

wiki, google document, Internet access, netbook, personal computer

Technical details

Technology

Required: none

Preferred: email, Skype

Nice to have: LinkedIn

Resources

Locations: Classroom, meeting room

Events: Several meetings

People: Experts, students, teachers

Tags

collaboration, assessment, experts

3.6 Activity 6 «Introduction to a theme»

At the beginning of a longer lasting project, it is a good practice to introduce the theme to the students as a broad overview.

Learning outcomes

- A basic understanding of the main aspects of a theme.
- Realising one's limited knowledge on the topic and identifying areas, which more can be found out about.
- Motivation to learn more about a theme.
- Introducing a broad theme and initiating students to brainstorm about relevant areas can be considered directed exploration, which may cultivate creativity and critical thinking skills.

Motivation

Teacher

- Getting students motivated makes the rest of the learning process smoother.

Student

- An interesting way to learn about a new theme, not just reading from a text book.

Reasons for using technology

Teachers may use various multimedia resources or other activating methods to get students interested and at the same time convey their message.

Guidelines

Required time

- 30-45 minutes preparation
- 10 minutes presentation plus 30 minutes brainstorming

Preparation

- Decide on the methods to introduce the topic.
    - A short intriguing video
    - Get an expert representative to give an introduction by way of video call or a prerecorded video (see activity 3).
    - A science experiment on the school grounds
    - A stroll through relevant Internet pages with interesting visuals or sounds
    - Locate appropriate multimedia resources and people for the presentation, if needed.
- Locate appropriate multimedia resources and people for the presentation, if needed.

Use different techniques to get the students' attention.

You can take advantage of the students' curiosity and build suspense. For example:

- Start a video at the beginning of a lesson without explaining it at all. Afterwards, ask the students why you showed the video, what they found interesting, what was new to them, etc.
- Collect online resources, print out QR codes for them, and place them around the school with tips on where to find other codes. Have students hunt them all to answer a question on the topic, and give a reward to the first student or team to come back with the answer.

Do something surprising, for example:

- Start the class as usual and let a prearranged expert call interrupt the class with an assignment, message or introduction to a theme. Negotiations between the students and the expert can start right away. While the expert is on the phone brainstorming with the class about what they find interesting and what they would like to learn more about can be initiated.
- Tell the students that their textbooks on this topic are incorrect (assuming you can find an out-of-date, incorrect or fuzzy passage). Have them figure out what might be wrong. Allow them to use their tablets and other devices. You can also give them out a handout from a news paper or similar that has questionable information.

Assessment

- There are no assessment criteria for the students, because their ability to participate depends on many factors, such as teacher's ability to present and entice anticipation and motivation in the theme that you suggested to them. However, the student's involvement in finding areas for further exploration can give the teacher a hint towards what way of introducing a topic worked for them.

Technology support

Technical details

Technology

Required: Computer with speakers

Preferred: projector and speakers for multimedia presentation, IWB, Internet access

Nice to have: Skype, student smart phones (1:1 or 1/team)

Resources

Locations: none

Events: An event relevant to the topic is good way to introduce a topic.

People: Getting someone relevant to the topic to introduce it is an engaging option.

Tags

presentation, broad theme

3.7 Activity 7 «Video documentation of work progress»

When students are working independently (either alone or in teams), they post periodic status updates so other students and the teacher can easily see what they are doing and how they are progressing. The documentation can also be used by an individual or team to quickly understand where the project was left off last and what steps have to be taken next.

Learning outcomes

- Students learn in depth about a specific topic while working on it, and surface other topics by observing what other students are working on.
- Learn to summarise and communicate your work and work in progress.

Motivation

Teacher

- These notes and the documentation of the students can also be used for reference during the teacher-student feedback session.
- The teachers can quickly and easily observe what activities the students perform well and what they need to practice more.
- The teacher can quickly and easily see how each project is progressing and comment on the process at any time.

Student

- The students can use the videos to present their learning and to transfer their knowledge to others.
- Doing news flashes is a fun challenge.

Reasons for using technology

- Creating videos with mobile camera phones or through the TeamUp tool allows for documenting the process.
- Creating a 60 second video that is split into three parts (what we did, what we will do, encountered problems) enables the teacher to be updated fast.
- Storing the documentation enables students to reflect on their work process and learning later. Individual students can add additional videos to add personal learning achievements.

Guidelines

Required time

- Teams may need up to 30 minutes to create their first video update.
- Once the students have practiced documenting their progress, each video can be created in 2-10 minutes.

Preparation

- Form teams (see activity 1).

- Set up a shared space where students can post their updates.
  - TeamUp: Divide students into teams using TeamUp and use it for gathering updates.
  - VLE: Each student or team of students can post their videos onto a shared course space for others to view.
  - Promethean: Use the “Breath of fresh air” whole class introductory flip-chart.
  - otherwise: Updates can be as printed photos or work in progress or interesting situations that are posted onto the classroom wall.

When starting a project, instruct the students to post a daily update of what they’ve been doing. Let them know that these updates are shared with other teams and you, and you will give additional support if needed based on what they say in their update.

Instruct them to make their daily update in the style of a news flash (like on TV news) and that it should be no longer than 1 minute (so that the teacher can easily check updates from all teams in just a few minutes). Ask them to answer 3 questions: (1) What we did. (2) What we’re going to do. (3) Any problems?

- TeamUp: Show the team view and tell them to use the record button on their team to record a daily update.
- Mobile camera phone: Show them how to record video with their (or the school’s) mobile camera phones.

Share the videos (see activity 9 “Sharing files”)

- TeamUP: Show the students where their videos will be saved and viewable in the application.
- Promethean: Show the students how to add their videos to the flip-chart.
- VLE: Show the students how to upload images and other data to a shared space.
- IWB: Load the videos to the teacher’s computer who shared the files on the IWB.
- otherwise: Show the video to the entire class through the computer screen or passing on the mobile phone.

Ask the students to view the news flashes of the other students or teams and to comment on them.

- The comments can be made digitally if the tool allows
- The comments can be written on a piece of paper or given orally
- Video replies can be created if the tool allows

At the end of the project, students document their overall learning outcome, summarise the comments, explain possible future steps to deepen understanding, in a 1-2 minute video.

Assessment

- Use the daily updates to gauge the team’s work and individual participation levels.

Technology support

TeamUp supports team work and quick status updates, as well as reflecting on them later.

Technical details

Technology

Required: one video recorder for each team (mobile phone, team up, laptop with integrated camera, etc.)

Preferred: online sharing of videos

Nice to have: none

Resources

Locations: none

Events: none

People: none

Tags

Teams, status, updates, video

3.8 Activity 8 «Mental notes about students»

The teacher makes mental notes about students after class. These notes are based on observations of how the students work, who they like to work with, what their specialities are, personality traits, and interests.

Learning outcomes

This is not visible to students, so there is no direct learning outcome for them.

Motivation

Teacher

- Teachers form mental notes about their students all the time, but recording them allows them to reflect on them, see student progress, and to remember them more fully.
- A substitute teacher can get invaluable help from the mental notes of the class teacher.

Student

none

Reasons for using technology

- The TeamUp tool allows the teacher to record mental notes easily, and can also utilise those notes to generate team configurations that are heterogenous and avoid problematic teams (like the class bully and his victim being in the same team). The mental notes are represented by icons that the teacher can give personal meaning to.

Guidelines

Required time

- A few minutes after class or once a week to record mental notes.

Preparation

- Decide where to store your mental notes. Consider if you want your students to see them or not.
  - TeamUp: Can store mental notes using badges that the teacher assigns meaning to (e.g. the “bumblebee” badge can mean that a student is fussy, easily distracted, hard working, likes to move about, etc.)
  - otherwise: Use any technology to store notes.

After class, review your notes and update them.

- TeamUp: Go through each student in edit mode and add or remove any badges on an intuitive basis.
- otherwise: Update your notes.

Assessment

- You may use your mental notes as a guide in assessing student performance and improvement.

Technology support

TeamUp

Technical details

Technology

Required: none

Preferred: TeamUP

Nice to have: none

Resources

Locations: none

Events: none

People: none

Tags

Mental notes, teacher notes

3.9 Activity 9 «Sharing files»

Students share files, such as documents, photos, videos, etc., within teams, across teams, with the teacher, and even with people outside of the school, such as parents, friends, etc.

Learning outcomes

- Learn how to present findings to others and how to utilise conversation to make sense of data.
- Other students learn about the projects, data, topics of other teams and receive a wider subject overview this way.

Motivation

Teacher

- The teachers can observe what activities the students perform well and what they need to practice more.

Student

- Sharing, presenting and teaching other students about project findings is rewarding.

Reasons for using technology

- Without ICT, sharing media is very difficult.
- Students can share data that was gathered with personal mobile phones (or phones or devices lent by the school), such as photos, audio and video material or even geo-location information, temperature, air quality, weather, etc.
- Use of the netbooks and laptops supports sharing of data between students and other people.
- Use of an online collaboration space allows for flexible collaboration in classroom and at home.
- Use of IWB visually supports the sharing of data with the entire class.

Guidelines

Required time

- Usually an easy-to-use sharing tool makes the learning process smoother and does not require any additional time from the teacher.
- A difficult tool may require the teacher to help the students familiarising with it.

Preparation

- Decide on a sharing platform, or provide options for the students to choose from.

Teams share their data using appropriate sharing platforms.

- VLE: If your school VLE supports media sharing, you may decide to use it. Upload images and other data to a shared space.

- IWB: Load images to the teacher's computer who shares the files on the IWB, handing out the collection to everyone at the end of a lesson.
- Flickr and Picasa: Most smart phones support sending files to Flickr and Picasa. If your students have accounts on Flickr (Yahoo) or Picasa (Google), sharing photos through them may be a good option.
- Posterous, Blogger, Wordpress: Sending media from phones and laptops by email to a blog is an easy way to publish them.
- Qik and Bambuser: Services that allow real-time video streaming from smart phones.
- Google Docs: Allows for collaborative document editing as well as uploading of files.
- DropBox: Simple free service to share 2GB of files with others. Works on Windows, Mac, Linux and most smart phones. A more advanced alternative could be SugarSync.
- AudioBoo: Easy way to share audio recordings.
- Wikispaces, PBworks, Wetpaint, Google sites: Wiki platforms where students can collaboratively create a websites.

Assessment

None

Technology support

TeamUp

Technical details

Technology

Required: Computer, Internet or USB sticks

Preferred: Online file sharing tool, IWB, smart phones, mobile phones with bluetooth

Nice to have: none

Resources

Locations: none

Events: none

People: none

Tags

Sharing, files, upload, media, photos, video

3.10 Activity 10 «Creating a multimedia presentation»

Instead of a written report, the students create a multimedia production. This can be, for example, a video, a collage or an audio story.

Learning outcomes

- Learn how to document their activities and how to present the collected evidence to communicate the learning that was achieved.
- Understand the process from collecting to presenting evidence.
- Learn how to convince someone.
- Learn about the benefits and drawbacks of different media.
- Learn how to use different media
- Learn how to differentiate important aspects from less important ones, and how to capture these important aspects.
- Directed exploration may cultivate creativity and critical thinking skills.

Motivation

Teacher

Students can often help each other with multimedia work, as they have learned certain editing software skills on their own. The teacher often is not required to support in tool use.

Student

Sharing, presenting and teaching other Creating a multimedia presentation can be encouraging and rewarding to students, because they get to work on a product that they can share with fellow students, other teachers, friends outside of school and their parents to present what they did and learned in school. They can also use the videos to transfer their learning to others.

Reasons for using technology

Technologies such as digital video cameras and audio recording suggest the creation of videos that are rewarding to look at after the project concluded.

Guidelines

Required time

- Depends on the size of the project

Preparation

- Usually a multimedia production is quite challenging, hence, having students work in teams is a good idea (see activities 1 and 7).
- Students should have chosen a theme and have a clearly defined audience and a purpose of their production.

- Teacher should prepare a presentation of the benefits and drawbacks of different media
  - Call in a multimedia expert to speak to the students
  - Online research
  - Personal experience in previous projects
- Collect data and observe: Students may go outside of the school (see activity 2), contact outside experts (see activity 3), or document their work process with video (see activity 7)
- Analyse data collaboratively
- Students, teachers and experts can collaboratively design the content of the student project and its assessment criteria (see activity 5).

After the teams analyse the information they found they can build a presentation using a diverse range of media showing their results.

The teacher present the benefits and drawbacks of different media of representation to students to initiate a class discussion.

The students chose a purpose, an audience and a medium for their presentation.

They create a storyboard that visualises the narrative of the media presentation and decide, which of the collected files, such as photographs, video clips, voice recordings of interviews, geo tags, etc., they could use to represent their conclusions in a meaningful way to a particular audience.

The teams collect missing multimedia elements and information, such as photos, a script, record voice, audio and video, interview people, make animation, etc., and upload it to a computer (see activities 2 and 3).

Teams build and design the presentations. They edit their data and information to fit the storyboard narrative.

- Teams with geo-tagged information can create a map visualisation.
- Promethean: Fill in the “Breath of fresh air” student flip-chart.

During the process, the students think about the production process, planned steps and requirements. This can involve collaborative assessment (see activity 5) and documentation of works progress with videos (see activity 7). Teams may share their data and their work in progress with other teams and the teacher (see activity 8).

Assessment

- May be co-developed by teacher, students and other parties involved

Technology support

Promethean “Breath of fresh air” flip-chart, TeamUp

Technical details

Technology

Required: photo recording, tools for drawing, writing and combining different parts of the work

Preferred: video recording, audio recording, geo-tagging, online file sharing, video editing

Nice to have: some teams might require paper-prototyping material to perform quick and dirty tests, such as transparent boxes and sheets, collection boxes and pins, plant press, microscopes, looking glasses, post-its, threads, etc.

Resources

Locations: none

Events: none

People: none

Tags

Team work, multimedia, production, presentation

3.11 Activity 11 «Peer feedback»

Students view each others' work and give feedback, praise and criticism.

Learning outcomes

- Learn to accept criticism from others and how to productively use that criticism to review own work and identify opportunities for improvement.
- Learn to give criticism in a constructive way.
- Understand the value of audience feedback and learn about reflecting on the design process.

Motivation

Teacher

- Peer feedback is useful for the teacher in deciding what kind of additional guidance students need.
- Peer feedback can be used in assessing students' performance.

Student

- Concrete project outcome and documentation can be shared with fellow students, other teacher and parents to illustrate what was done and learned in school and to teach or transfer their knowledge to others.
- Sharing, presenting and teaching other students about project findings is rewarding.

Reasons for using technology

- An online portfolio allows for comments from the wider community.

Guidelines

Required time

- 2–20 minutes for allowing students to give feedback on what they have seen others present or work on.

Preparation

- The students should have viewed the projects of other students and are ready to comment.

Peer feedback can be used when students present their project outcomes, but it can also be used as part of a knowledge building activity, when students are discussing about a challenging topic. If students can see what other teams have been discussing, they can give valuable contributions to them.

Assessment

- Quality of peer feedback can be considered a merit to the one giving the feedback.

- Peer feedback can be used in assessing the performance of the one who received the feedback.

Technology support

Technical details

Technology

Required: none

Preferred: none

Nice to have: none

Resources

Locations: none

Events: none

People: none

Tags

feedback, peers, comments, criticism, praise

3.12 Activity 12 «Presenting results»

Students present the outcomes of their work. This can be an in-class activity, a school-wide show-and-tell event, or a public venue.

Learning outcomes

- Learn about presenting your final work in a concise and appealing manner.
- Learn to discuss their process, findings, and results.
- Learn to speak or perform in public.
- Learn to accept criticism from others and how to productively use that criticism to critically review own work and identify opportunities for improvement.

Motivation

Teacher

- Presentation of student work can be used as an open feedback and reflection session between students and teacher.

Student

- Concrete project outcome and the documentation can be shared with fellow students, other teacher and parents to illustrate what was done and learned in school and to teach or transfer their knowledge to others.
- Sharing, presenting and teaching other students about project findings is rewarding.

Reasons for using technology

- ICT allows the students to create an engaging multimedia presentation.
- Promethean: Use the “Breath of fresh air” whole class activity evaluation flip-chart

Guidelines

Required time

- 1-2 lessons

Preparation

- Students may do a multimedia presentation as their final work (see activity 10).
- Teacher should prepare to guide students in planning and rehearsing their presentations.

Discuss different ways to convince an audience, and different speech and performance techniques.

You can use a video camera to record a rehearsal and use it for immediate feedback and reflection.

Presentation of project outcomes and viewing of the documentation. View presentations of other teams and comment on them. Recognise comments on project outcome and documentation.

The comments received during the presentation can be summarised in a 1 minute video that documents the overall learning outcome, explain possible future steps to deepen understanding.

- TeamUp: Teams record their final status video for the project.

Assessment

- Quality of peer feedback can be considered a merit to the one giving the feedback.
- Peer feedback can be used in assessing the performance of the one who received the feedback.

Technology support

TeamUp may be used in collecting and documenting the process, which helps in making the final presentation.

Technical details

Technology

Required: none

Preferred: projector OR IWB

Nice to have: video recording, TeamUp

Resources

Locations: none

Events: Possibly a show-and-tell event at school, or another appropriate venue (science fair, etc.)

People: none

Tags

Presentation, conclusion, end of project, comments

3.13 Activity 13 «Incorporate out-of-school activities»

The students collect evidence about the learning achievements of their out-of-school activities. They present their evidence and documentation to a teacher to receive credits for their out-of-school activities.

Learning outcomes

- Learn how to view a hobby under the aspects of formal school assessment.
- Learn how to relate out-of-school activities and the learning of a hobby to school subjects and school work.
- Recognise the interconnectedness of different areas of knowledge.

Motivation

Teacher

- A relatively quick way of assessing and gaining knowledge of students' skills and interests as well as giving accreditation.
- Student: Integration of personal activities into school activities. Getting credit from multiple subject areas. A concrete outcome, the presentations can be used to share their hobbies with their friends and relatives as well.

Student

The students' personal interest are considered in school activities

Reasons for using technology

Using, for example, the ActiveInspire Studio file supports the documentation and collection of evidence. The documentation can be stored and used later for reflection and sharing with others.

Guidelines

Required time

- 1 lesson to introduce the idea and possible technologies that the students can use
- 1-3 weeks of independent work by a single student
- A few hours of support by teacher
- Meeting time for presentation and accreditation
- *Optional: Preparing a show and tell event*

Preparation

- Confirm that you have permission to accredit students for out-of-school activities.
- Consider the role of the students that covered a particular subject in their informal assessment that will also be covered during a school class later on.

Will they be given free time, will they work as peer tutors, do they participate like others (maybe on a higher level)?

- Decide if this is a class activity or an activity for willing students only.
- Decide if there will be a show-and-tell event, before which all work should be completed. If so, decide on the place, and consider any special requirements in terms of what can be presented.

The teacher introduces the idea to the students (see activity 6).

Students document their evidence at home.

- Promethean: Fill in the ActivInspire Studio file that the students collected from the teacher
- Use personal mobile camera phones to take pictures or record videos.
- Lend equipment form the school.
- Scan drawings and other evidence.

Optional: Teacher supports the students in finalising their presentations during class time.

Students contact teachers that they want to present their work to. Students meet the teacher and present their work.

Optional: Invite teachers to a show and tell event where students present their work.

Teacher accredits their work in context of their subject area.

Assessment

- Depends on the content and the subject area that the student chose to be accredited for

Technology support

ActivInspire Studio file

Technical details

Technology

required: image capture

preferred: video capture, audio capture, scanner, pens, paper, computer, camera mobile phone, Promethean Studio

Resources

People: none

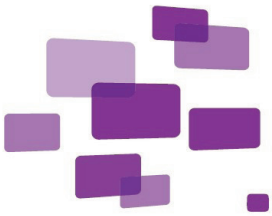
Events: optional show and tell event

Locations: optionally open space inside of the school for the show and tell event.

Tags

out-of-school, media, production, individual work**,** hobby, personal interest, low tech, presentation

APPENDIX E: CONCLUSION REPORT, CYCLE 1



iTEC

Designing the future classroom

Conclusion report, cycle 1

Appendix to D3.1

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5.8.2011

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Coordinated by European Schoolnet

The work presented in this document is partially supported by the European Commission's FP7 programme – project iTEC: Innovative Technologies for an Engaging Classroom (Grant agreement Nº 257566). The content of this document is the sole responsibility of the consortium members and it does not represent the opinion of the European Commission and the Commission is not responsible for any use that might be made of information contained herein.

Conclusion report, cycle 1

annex to D3.1

Purpose of this document:

- This is a report from the pre-pilot test results. It will be provided to all project partners and discussed in a GA before a decision on full-scale pilots is taken.

Abstract:
Teachers reported success with their lesson plans. Reflection of learning activities was terse and often the reported activities didn't match with the activities as they were described for teachers. Collecting data from outside the school was found to be a motivating and enjoyable activity and we recommend it to be used as a basis for pilots. The lesson plan for pilots should be more specific in describing where each activity should take place to allow enough focus and time for teachers to truly innovate and experiment with that activity. TeamUP tool will be used to support 3 of the suggested activities.

Introduction

Pre-pilot testing for cycle 1 was conducted in May 2011 by 24 teachers in 9 countries. Teachers were asked to choose one learning story and to create their own lesson plan based on selected story. They were directed to a planning form to support the creation of lesson plan and to report back on their plan. After the pre-pilot was conducted, the feedback for the learning activities used were given by using a reflection form.

The process and assumptions leading to pre-pilots is described in deliverable D3.1.

Results

Situation on 22th June:

- 24 lesson plans submitted
    - 9 from Turkey
    - 3 from Finland
    - 3 from Portugal
    - 3 from Hungary
    - 1 each from France, Lithuania, Norway, Austria, Belgium
- 18 reflections submitted
    - 6 from Turkey (3 missing)
    - 3 from Finland
    - 2 from Portugal (1 missing)
    - 3 from Hungary
    - 1 from Slovakia (2 identical, counted as one)
    - 1 from Norway, Austria
    - no reflections from: Belgium, France, Lithuania

- Learning stories chosen for pre-piloting:
    - 13 Outdoor study project
    - 6 Collaborative media project
    - 3 Reacting to student feedback
    - 2 Recognising informal learning
    - 0 Support network of experts
- Learning stories with pre-pilot results:
    - 9 Outdoor study project (4 missing)
    - 4 Collaborative media project (2 missing)
    - 2 Reacting to student feedback (1 missing)
    - 2 Recognising informal learning
    - 0 Support network of experts

Figure 1 displays what learning activities are included in which learning stories.

Figure 1: Relations between learning stories and activities

Table 1 shows the distribution of feedback for each activity by each country. Some of the feedback reports seemed to be labeled under the wrong activity, copies of the other activities or the activity was understood in such way that the response wasn't related to the original activity description. The second number in the table is the corrected number of feedback reports.

	Austria	Belgium	Finland	France	Hungary	Lithuania	Norway	Portugal	Slovakia	Turkey	Total
Forming teams	1/1		2/2		3/3			2/2		2/1	10/9
Collecting data outside of school	1/1		1/1		3/2		1/1	2/2	1/0	0/1	9/8
Working with outside experts	1/1		1/0					1/1	1/1		4/3
Joint course of two teachers	1/0						1/1		1/1		2/2
Collaborative assessment	1/0						1/0				1/0
Introduction to a theme	1/1		1/1		2/2		1/1		1/1		6/6
Video doc. of work	1/1		1/1		1/0				1/1		4/3
Mental notes ab/ students					1/1						1/1
Sharing files	1/1		1/1					1/1	1/1	4/4	8/8
Creating a multimedia presentation	1/1		2/2		1/1		1/1	2/2	1/1	1/2	9/10
Peer feedback	1/1				2/2		0/1		1/1	5/4	9/9
Presenting results	1/1		1/1		2/2		1/1	2/2	1/1	1/2	9/10
Incorporate out-of-school activities	1/1				1/1			1/1	1/1		4/4
# of teachers	1	0	3	0	3	0	1	3	2 (1)	5 (7)	

Table 1: Breakdown of reported learning activities by country. The first number is the amount of activities reported by each country, and the second number is the corrected value, after incorrectly labeled reflections were relabeled.

Analysis

Overall, the reflections that were received by the teacher are general and brief. This lead us to assume that teachers felt that there are obvious seeming observations and experiences did not need to be mentioned in the reflection form. For the pilots we are anticipating to receive more detailed reflections, and, hence, the feedback form needs to explain more explicitly what the teachers are expected to write about.

A general observation is that many project summaries do not match the learning stories and activities that were selected in the planning form. It seems like iTEC pre-pilots are perceived by many teachers as an opportunity to implement a study project that they have planned before and can implement now.

In this section of the report, we are reporting on the findings that were recognized to each learning activity separately.

Forming teams

- 9 results: Austria, Finland, Hungary, Portugal, Turkey

One of the nine teachers reported that forming teams based on topics that the students are interested in was more important for this teacher than forming equal-sized teams. For the further development of the TeamUP tool, this needs to be further investigated.

A game-like “motivational letter” with project introduction combined with a form were handed out by one teacher to collect information about interesting topics and other relevant information that can be used for forming teams.

Another teacher employed manual tools to collect students’ votes without friend biases, to ensure that friend cliques would not emerge in the team formation. This represents a signal that invisible voting, for example by way of pen and paper, SRS[1], 1:1 or other methods, seems to be quite important.

In other notes, teachers expressed the need to form small teams. They also reinforced the challenge that following multiple teams is challenging, which was identified when analyzing the participatory design session.

Collecting data outside of school

8 results: Austria, Finland, Hungary, Norway, Portugal, Turkey

With this learning activity, it was anticipated for the students to physically move outside. However, two of eight teachers included web research tasks in this category. It should be stated

[1]student response system

more clearly that the activity requires students to go outside, and not only to search data originating from outside the school.

Some teachers reported that students were assigned roles within their teams before starting the outside activity. In other lesson plans it appeared that the teacher appointed all of the students with the same tasks during the field trip.

Using the personal mobile phones of students was an alternative to using school-supplied technology often reported by teachers. Related to the use of technology, some teachers reported for example, lost, blurry and uninformative images because a lack of experience in taking photographs. This could be addressed by spending more time testing and trying out the equipment in the classroom before starting the outside event.

Instead of being a scheduled classroom activity, one teachers exemplified that collecting data outside can also be arranged as homework. As homework, the students were given the choice to either work independently or in groups. Bikes represented a good way to get from place A to place B.

In the reflection reports, none of the teachers reported the planning procedures they underwent in order to organize the learning activity. The reflection forms also don't mention planning activities of the students before the outside event. We suggest that the under-reporting was caused by the fact that teachers may assume that the planning and organizing procedures are either obvious or, compared with the outside data collection activity itself, less important to reflect on. We assume that planning is necessary of the successful implementation of the activity. We further consider planning activities by the students highly relevant for the success or failure of the outside activities and motivation of the students. We should ensure that the teachers reflect on their own planning as well as the planning activities of the students.

Overall, the activity appeared to be motivating for teachers and learners. Hence, the reflections of the teachers lead us to consider this learning activity as an overarching theme for a pilot study project.

Working with outside experts

3 results: Austria, Portugal, Slovakia

Although only three teachers reflected effectively on their collaborating with outside experts, these teachers seemed to enjoy this learning activity. They reported their low barriers for contacting outside experts. Considering the challenges recognized based on the participatory design session, one reason for the low frequency of performing this activity could be that other teachers found it difficult to contact. However, this can only be guessed, because reasons for not testing this activity were not reported.

One of the teachers who did reflect on the activity, reported having contacted one of the school's graduates who was studying higher education biology at the time of the pre-pilots, to act as

expert. The expert was contacted at the end of the process to look at the students' results, to help reflect on the results from his area of specialty, and to understand the way in which experts approach similar phenomena. Together with the expert, the students and the teacher went back outside to the initial study site, the trees that were worked with in the experiments.

Analyzing the reflection forms we recognized explicit changes for the description of the activity. The activity description should clearly point out the different stages, in which experts may be involved in. The idea of employing experts to recall, review and reformulate learning outcomes should be added.

Overall, this activity seemed challenging because only a low amount of teachers chose to perform it. However, the teachers who did chose this activity, considered the activity rewarding. Based on this, the activity could represent a more challenging overarching theme for a pilot study project.

Joint course of two teachers

2 results: Norway, Slovakia

In one case the two teachers took different roles. One of the teachers went outside with some students to collect data, while the other stayed inside with the rest to receive and analyse the data coming in from the field. This method allowed the teachers to follow and guide the students better than if the entire class would have gone outside. Also teachers who were able to follow the work of several teams reported that this can be difficult to organise. Based on this reflection, two teachers may address the challenges and difficulties of following the work of several small teams (see section *Forming teams*). The low number of teachers who chose this activity supports the assumption of the challenge reaching across Europe.

An organizational challenge we recognized is making two teachers available at the same time.

Collaborative assessment

0 results: -

A few results were reported, but the content of these reflections revealed that the way the activity was performed by the teachers did in fact not include a way to collaboratively create assessment criteria. For example, none of the reflected activities happened at the beginning of the pre-piloting activity.

A reason for the low amount of reflections for activity could be that the start of a course is possibly very busy. As a course consists of several learning activities that need to be initiated in the beginning, scheduling all invitations as well as assessment discussions may be challenging in the beginning.

Introduction to a theme

6 results: Austria, Finland, Hungary, Norway, Slovakia

One teacher presented the results of a similar project performed earlier. Presenting an example was an easy way to guide the students towards thinking about the work to be done, and to start the discussion about the assessment criteria. This is, of course, not possible when teaching the project for the first time.

Presenting the theme as a plenary activity is important, if the students are intended to evaluate each other. One teacher mentioned that the introduction should include more interaction than was mentioned in the activity description for the pre-pilot. Students could, for example, write their knowledge about a topic on the board, or make their existing knowledge visible in other ways.

This activity may need a clear, good practice. The structure of the first few lessons can become complex when many activities have to be initiated. Introduction to a theme is easily understood as the main topic of the first lesson, but it can be sidelined by issues like team formation, collaborative assessment criteria and presentation formats.

Video documentation of work progress

3 results: Austria, Finland, Slovakia

Some teachers reported multimedia production in this category. The points towards the need of creating a more focused activity description.

Although categorizing it as “mental notes”, one teacher reported a variation of the “video documentation of work process” activity. The teacher asked the students to write entries into a learning diaries at the beginning and end of each class.

Overall, although this activity was only performed three times, it seems to be a meaningful activity that produces valuable outcomes if the technological challenges can be overcome. Difficulties of handling video are further analyzed in *Sharing files*.

Mental notes about students

1 result: Hungary

Teachers take notes that help them assess students after class. However, it is unclear whether teachers spend time recording notes about their students after each class or less often. This needs to be studied further.

This learning activity tries to promote the taking of notes that improve the learning process, not only the assessment. The reflection forms indicated that teachers may easily slip into using the notes for assessment only. In the activity description assessment was mentioned as a possible

use for the mental notes as last point. This may have guided teachers into thinking about assessment.

One teachers mistook mental notes to be about a learning diary, done by students themselves.

The concept of ‘mental notes’ is easily misunderstood, and “mental notes” is, in fact, not the correct name for externalised mental notes. Hence, it was decided to use the term “stickers” when manipulating externalized mental notes with a software or presenting them as externalised notes. The term “sticker” was considered, because the notion of the notes being arbitrary can be easier derived from the term “stickers”.

Need to study: what kinds of notes teachers make and when.
Other option: opening ‘mental notes’ in TeamUp for whole class.

Sharing files

8 results: Austria, Finland, Slovakia, Turkey, Portugal

Uploading videos is especially time and bandwidth consuming. The Internet connectivity may represent a challenge.

Teachers solved sharing of files in different ways. Many teachers used dedicated media services like YouTube, Vimeo, Picasa and Flickr, but some had problems with students’ reluctance to create accounts. Eventually, the teachers used their own accounts to upload data. Also Google Docs was used for text, statistics and miscellaneous data sharing, and memory sticks as well as e-mail were used for file transfer. Sharing via Facebook worked for one teacher, as all students were already members of the social media networking site. However, downloading files from Facebook to copy them to a different location is slightly difficult. Additionally, creation of accounts to 3rd party services cannot be forced.

In general, students seem to be willing to share files they found or created. Sharing files allows for asynchronous reviewing and commenting of others’ works. If there are various channels for publishing the works, the commenting will also be divided to all of the channels, which can be challenging to moderate. If the files are published online, the teacher may also utilise them in future courses.

Many of the reported issues that affected the progression of the course related to challenges with transferring videos or photos from devices to computers, and transferring video from computers to the Internet. The challenges related to the process of uploading data from devices to computers is beyond our scope. The only way to address this challenge is for lesson plan to allow time for unexpected difficulties. Sharing files within the class could be helped by recognising the demands of large video files on the network beforehand, and by preparing alternative options. An example to address this challenge could be a dedicated storage or presentation computer that files can be transferred to with a memory sticks.

Creating a multimedia presentation

10 results: Austria, Finland, Hungary, Norway, Portugal, Slovakia, Turkey

Teachers often associated the word ‘presentation’ with Powerpoint presentations. This was recognized, based on the teachers directing the students to create a Powerpoint presentation, instead of using the more challenging and interesting multimedia formats. It was also reported that some students explicitly chose to create a Powerpoint presentation. This lead us to conclude that the activity has to be re-titled.

Several teachers reported that the presentations were of “poor quality”. This was considered negatively. We suspect that the term “presentation” is too broad of a category to guide students to produce presentations that follow a meaningful structure. Instead of presentation, the goals could be, for example, a documentary film, an informational or appealing poster, a picture story, a podcast or a radio program, a staged scene, a board or card game, a research conclusion, or a visualization of a phenomenon

The respondents who reported that their students did created video productions, also reported that creating videos require a lot of work and time resources. To balance the work and time load, it was reported that larger teams were working on a video production. None the less, all of the reflections for this activity mentioned uneven workload distribution within teams, which in turn was often tied to large team sizes. We recommend that not more than four students should create one video production together. We further recognized that it is especially challenging in video production, to follow several teams simultaneously if each team is working on a very different production.

Sharing images, charts, and other data makes creating a conclusion or multimedia presentation a richer experience. If all students are on Facebok, Facebook is a good tool for sharing and commenting on images, but it is quite hard to download images from. Picture sharing sites, such as Flickr are recommended above Facebook.

Some suggestions related to reported problems:

- Students shouldn’t embed videos into Powerpoint presentations. Playing a video on a separate video player at the right time is more reliable.
- When documenting and taking photos, students should take multiple photos from different angles to reduce the risk of failed shots.
- Use one dedicated computer for collecting and showing all presentations and videos. Students can use, for example, a USB memory stick to transfer files to the dedicated computer. Make sure that all of the presentations are in the computer before the presentations begin.
- Different versions of the same software might cause compatibility issues of files. Ask the students to provide PDF versions of their presentations in case different versions of the same kind of software are in use.
- Do not allow slide transitions. Encourage the students to focus on their own content, not on the presentation software.

- If possible, ask the students to share their basic resources, such as photos, audio-clips, collected samples, text pieces etc. to a common pool to allow more imaginative use of resources.
- Multimedia production doesn't have to involve computers at all.

Peer feedback

9 results: Austria, Hungary, Norway, Slovakia, Turkey

A suitable feedback channel should be found. For one teacher, a Facebook group worked. From the teacher feedback, we recognized that the teacher should moderate the feedback discussions actively, particularly watching out for personal (ad hominem) comments.

Giving constructive feedback is challenging. Having the assessment criteria or a rubric visible for the students will help. The rubric could, for example, be shared in the beginning of the course. Giving feedback based on the criteria helps the students to understand the criteria.

When collecting feedback online, the teacher should understand that they need to follow it in real-time and moderate when necessary. One teacher was successful with a combination of giving credit for good comments (+1 or "like" from teacher) and interfering and replying to overly negative or topic unrelated comments. Based on the moderation demands, we recommend that there should be a dedicated time for feedback. Also, switching between online and face-to-face commenting may be challenging to follow for all.

One teacher reported using SRS (student response system) for giving peer feedback, but found that it made the process very rigid and gave less opportunities for discussion.

Most teachers agreed that this activity helps foster spontaneous discussion and is helpful for giving and receiving criticism.

Presenting results

10 results: Austria, Finland, Hungary, Norway, Portugal, Slovakia, Turkey

All in all the students were engaged to the task. Few teachers reported that a few bad presentations were given that bored some of the listening students. Two teachers reported that people from outside the class attended the student presentations, which was perceived as successful.

Presenting in front of a wider audience than the day-to-day classmates expectations towards the outcome, but also the anxiety of the presenters is likely to rise. It can be worth the effort to organize the presentations in form of a special event, and to practice the presentation before stepping in front of a larger audience. Teachers may not be prepared to guide students in

planning and rehearsing their presentations. An outside expert may be of help here. The presence of experts may be an additional encouragement for the actual presentations.

One teacher who reported about low-quality presentations saved the situation by posing easy questions to help the students proceed with their presentation. The teacher also tried to direct the bored students towards the interesting aspects of the presentation. This kind of involvement should be encouraged.

Technical problems were reported by some of the teachers. These can be addressed with good preparations. Section '*Creating multimedia presentations*' includes a list of practical tips.

Team work between students was praised, with few exceptions, and it allowed them to combine their strengths and get a good grade.

Incorporating out-of-school activities

4 results: Austria, Hungary, Slovakia, Portugal

Many teachers did not really understand this activity, or were not able to implement it due to time or other organisational restrictions. This activity cannot be properly performed by only one teacher, because the accreditation of out-of-school activities could happen in any subject area. It is also quite challenging to do in a pre-pilot time frame, but could be doable in full pilots.

The activity description should make it clear that this is not a teacher-led activity.

General overview

When teachers created lesson plans for their teaching, the discreet learning activities linked to learning stories tended to mesh together or disappear. The feedback for learning activities was often terse and mislabeled under some other learning activity. The general description of a lesson plan was often more useful for understanding the activity than the specific feedback for learning activities.

We are still certain that iTEC pilots should be used to find good learning activities instead of lesson plans or reproducible learning stories. The pilots should be organised in a way that teachers have time to properly focus on each learning activity: in preparation, in implementation and for reporting. For this purpose we created a table to evaluate the problems we found for each learning activity.

One of the possible reasons for activities to mesh together or drop out is that many of them have to be done at once in the first hours of the project. In Table 2 column *phase* indicates the relative place of the activity in course work flow. If a learning activity can be performed in a familiar or accustomed way, it can be passed without too much thought and with missing the chances for improvement. These are marked as *too easy*. *Confusing* activities are those where the activities were often mislabeled or implemented in a wrong way.

As recommendations for pilots we decided to remove some activities which were rarely selected in pre-pilots and recommended clarifications for most of the activity descriptions. In next section we further refine the lesson plan for the pilots so that the activities are easier to understand and implement.

	Phase	Too easy	Confusing	Org. challenge	Technical challenge	Recommended?
Forming teams	1				X	yes, with TeamUP tool
Collecting data outside of school	2		X			yes, with clarifications
Working with outside experts	any					yes, as an optional activity
Joint course of two teachers	1			X		no
Collaborative assessment	1		X			???
Introduction to a theme	1	X				???
Video documentation of work progress	2		X		X	yes, not requiring video; with TeamUP tool
Mental notes about students	2		X			yes, with clarifications and TeamUP tool
Sharing files	2		X		X	yes, with clarifications
Creating a multimedia presentation	2	X	X		X	yes, needs rewriting
Peer feedback	3	x				yes, with clarifications
Presenting results	3	X			x	yes, with clarifications and combined with peer feedback
Incorporate out-of-school activities	none		X	X		no

Table 2: Aspects of the learning activities based on pre-pilot results.

Recommendations

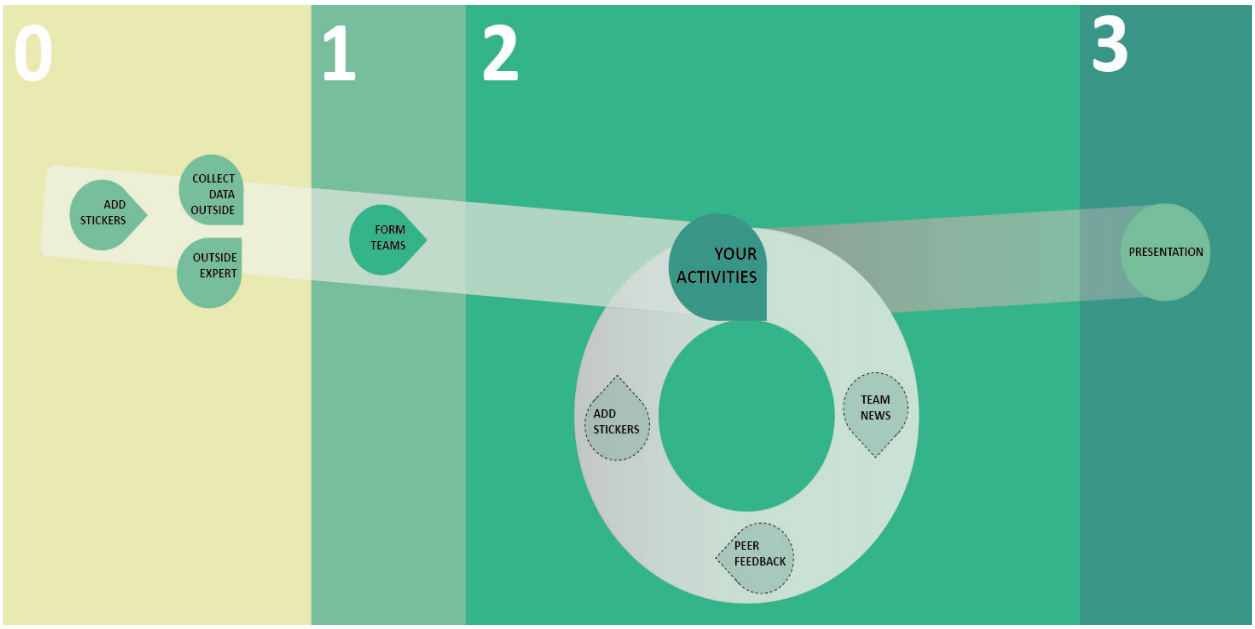

Figure 2: Preliminary visualisation of recommended pilot activity work flow.

We recommend pilots to focus on improving team work and related activities. Two of the activities have been recognised as motivating, overarching themes, which connect schools to the outside society. Leveraging these, the two alternatives from scenarios or learning stories for full scale piloting could be:

1. Outdoor study project
2. Working with outside experts

Both alternatives involve students working in small teams. The TeamUP tool prototype will be ready for full scale piloting and will provide technical support for team related activities.

In terms of learning activities, the recommendation is as follows:

- Forming teams
- Video documentation of process
- Mental notes about students
- Peer feedback
- and **one** of:
    - Collecting data outside of school
    - Working with outside experts

We will prepare a visualisation, probably resembling a game board (Figure 2) to better represent the activities and their position in the lesson plan. Instructions for pilot should emphasise these activities and give several examples or suggestions for each. TeamUP tool will directly support some of the activities, but there will be instructions on how to perform these without it.

We recognise that some or most of the activities may be familiar and not challenging for some teachers, but even in these cases we believe that there is room for improvement, either in activity itself or the tools supporting it and the results from the pilot will point towards these possibilities. Conscious re-evaluation of a familiar activity can be worthwhile.

APPENDIX F: PROTOTYPES FOR PILOTING, CYCLE 1

iTEC

Designing the future classroom

Prototypes for piloting, cycle 1

Appendix to D3.1

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Coordinated by European Schoolnet

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PROTOTYPES FOR PILOTING CYCLE 1

PURPOSE OF THIS DOCUMENT

This document contains the prototypes that are used by teachers in iTEC 1st cycle full-scale pilots. The prototypes consist of 2 learning stories, 6 learning activities, and 1 software tool prototype, TeamUP.

INSTRUCTIONS FOR NATIONAL PEDAGOGICAL COORDINATOR

The chapter titled “Instructions for the piloting teacher” and everything that follows are meant for the piloting teachers.

Also the files called:
2-TeacherInstructions and Learning stories
3-A. Collecting data outside of school
4-B. Working with outside experts
5-1. Teamwork
6-2. Team newsflashes
7-3. Peer feedback
8-4. Mental notes about learners
9-TeamUp support

are meant for the piloting teachers. The parts in this document as well as the above mentioned documents have to be translated for the teachers. You may also modify the learning activities to match you local national environment (e.g. rules that must be followed, or tools that must be used).

INSTRUCTIONS FOR NATIONAL TECHNICAL COORDINATOR

You as NTC need to look through the learning activities and specifically their sections titled ‘Ideas for using technology’. Your task is to support teachers in acquiring the required technology to complete the learning activities. In most cases, the teacher may have some opinion on what they’ll need, and you need to negotiate with them to find a feasible solution.

There is only one technical tool created by iTEC that is involved in the 1st cycle of piloting, the TeamUP tool. You as NTC must make sure that the piloting teachers have access to it during course preparation and teaching periods.

Technical support for NTCs is provided by WP6 via the iTEC NTC conference. (contact information: ???).

TeamUP is distributed as a W3C Widget (.wgt). It can be added to any widget-supporting learning/content management system (Moodle, Liferay, .LRN, etc.) or a dedicated widget server like Apache Wookie.

The TeamUP widget can be downloaded from:
http://leibniz.uiah.fi/projects/itec-wp3/wiki/download
A live demo of TeamUP is available at:
http://itec-wp3.taik.fi/prototypes/trunk/TeamUp/.
The demo does not save changes made in the classroom between the sessions so it is only usable for demonstrating the tool.

Please note: For TeamUp to run properly, Flash 10.3 or higher is required. You can check your current Flash version here:
http://kb2.adobe.com/cps/155/tn_15507.html
You can download the latest version of Flash here: at:
http://get.adobe.com/flashplayer/

TeamUP works best when using following browsers:
Mozilla Firefox, download from: http://www.mozilla.org
Google Chrome, download from: http://www.google.com/chrome
Safari, download from: http://www.apple.com/safari/

Source code for TeamUP is available at http://leibniz.uiah.fi/projects/itec-wp3/wiki .
Subversion check out for source code can be done with following command:
svn co https://leibniz.uiah.fi/svn/itec-wp3/trunk/TeamUp
TeamUP is published under GNU General Public License 3. Users are allowed to copy, modify and distribute this work as the original license text is kept with the source code and the source code is distributed with the software in a readable and accessible form.

INSTRUCTIONS FOR PILOTING TEACHER

Welcome to the iTEC project's 1st piloting phase! This document explains what you need to do with your class during the autumn 2011. As the first Cycle is the very beginning of the iTCE project there is one piece of technology for you to pilot: the **TeamUP tool**. In addition, among the six learning activities proposed you would have to choose **five**.

Well before starting, you need to take a careful look at the learning activities and the TeamUP tool, and choose which course you will use them in. Then create a lesson plan including the 5 chosen learning activities and planning the use of the TeamUp tool. In the following, the Learning Activities and the TeamUp tool are described.

LEARNING STORIES

There are two alternative learning stories, of which teachers can choose to pilot one. The learning stories consist of learning activities, which are shown in Figure 1 and 2. When creating your lesson plan, choose one of the learning stories as your base. Then have a look at the learning activities related to the learning story that you have chosen and include their essential parts into your lesson plan.

You should consider the learning story on as an **example** of how the learning activities can work together. The focus is on piloting the learning activities. **You can create your lesson plan for any subject area and choose how the learning activities are combined.**

LEARNING STORY A: OUTDOOR STUDY PROJECT

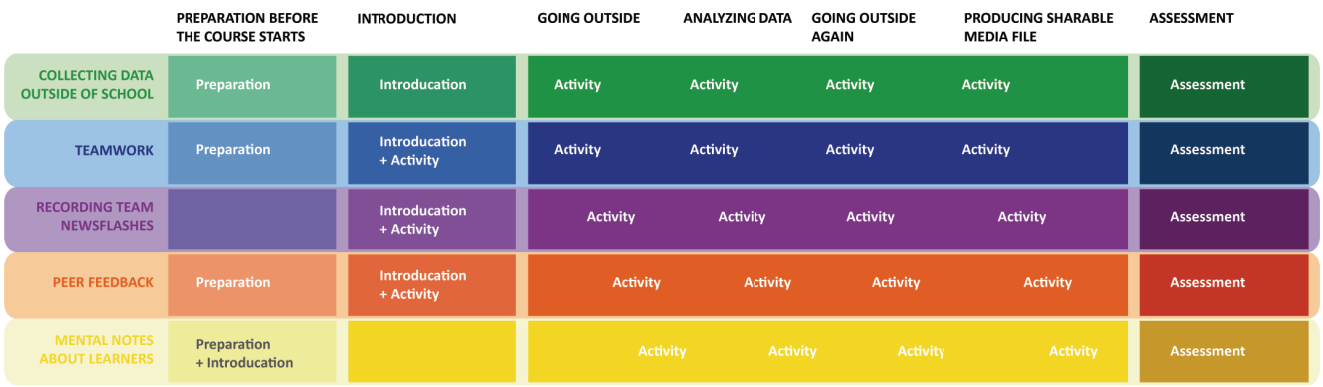


Figure … Visualization of learning story example according to the learning activity guidelines

Preparation before the course starts

For your upcoming course in history, you decide that the learners will search for information about the history and heritage of your town. This, you plan to happen in teams and outside. You research and create a list of potential sites the learners could visit, and think of potential viewpoints the teams could have. You ask the parents of the learners whether some of them could accompany the teams.

You set up your class in TeamUp by filling in your learners' names and pictures from the school database. As you already know most of the learners, you enter some mental notes about each learner into TeamUP. You decide that the course will end with the teams presenting their results, with one team giving written feedback about each presentation. The teams should also follow each other and give comments when needed.

Mental notes about learners - preparation and introduction
Collecting data outside of school - preparation
Teamwork - preparation
Peer feedback - preparation

Introduction (1-2 lessons)

You present the topic and the goals of the course, show a historical short video about your town, a YouTube video of teens skating around the central park, and some pictures of graffiti around town. Then launch TeamUP on your interactive whiteboard and start the teaming process by asking the learners for topics they would be interested in. They propose various topics, some of which you accept the way they are, some you modify to be more fruitful, and some you reject since they do not fit into the course objectives. Once you have 10 topics, you allow the learners in your class to select which topics they find interesting. They come to the interactive whiteboard one by one and select three of the topics. Once voting is complete, TeamUP creates the teams.

You instruct the teams to plan where they need to go and what data they need to collect. You help each team to create their plan. Carmen's team decides to search for statues around town, and find out what they represent and mean.
Homework: At the end of the lesson you tell each team that they need to record a 60 second newsflashes in TeamUP, explaining their plan, what they will do next, and if they see some problems or challenges in their plan. They should also look at the newsflashes of other teams before the next lesson so they are aware of what the others have planned, and might get good ideas from them.
After the lesson you look through the newsflashes the teams made, and make notes on what advice each team should get before they go outside.

Teamwork - introduction + activity
Collecting data outside of school - introduction
Team newsflashes - introduction + activity
Peer feedback - introduction + activity

Going outside (1-2 lessons, or after-school activity)

Carmen goes outside with her team to collect real data to get their investigation started. They take geo-tagged images of statues they find, and snapshots of the plaques on the statues. They also interview a few passers-by, and ask whether they know something about nearby statues, or if they can point them to statues the team has not noticed yet.
Homework: At the end of the day the team records a one-minute newsflash of what they have done.
You look at the team newsflashes and make notes on how the teams are doing. You realise that Carmen's group needs more training on contacting strangers in a constructive manner, guidance on finding more in-depth information, and how to set specific group goals. You update your mental notes in the TeamUP tool.

Collecting data outside of school - activity
Mental Notes - activity
Teamwork - activity
Team newsflashes - activity
Peer feedback - activity

Analysing data (1 or more lessons, or after-school activity)

The next day, Carmen comes back to class with her team. They share their data and findings with each other, and the other teams of the class. To analyse their data, they start online searches to find more information about the people represented by the statues. They collect the information on a shared document online and start building a visual timeline of people and important events. At the end of the lesson they record another 1 minute newsflash documenting their day's activities. They explain what they did, their future steps and summarise encountered difficulties.
Homework: You remind the teams to look at other teams' newsflashes and send constructive criticism and advice on how they can improve their work, what other things they should find, and so on.
You look at the newsflashes and update your mental notes.

Collecting data outside of school - activity
Mental Notes - activity
Teamwork - activity
Team newsflashes - activity

Peer feedback - activity

Going outside again (1-2 lessons, or after-school activity)

The teams embark on another excursion to locate the data they still need to complete their inquiry. Carmen's team makes another newsflash at the end of their trip by using a laptop of one of the team members.
You check the newsflashes and update your mental notes

Collecting data outside of school - activity
Mental Notes - activity
Teamwork - activity
Team newsflashes - activity
Peer feedback - activity

Producing sharable media file (1 or more lessons, or after-school activity)

The teams come back to the classroom to do online research, categorise their findings, and formulate their conclusions. After their research is complete, they start working on their presentation. They use the shared document as a basis for their script, include the visual timeline as well as a map of the statues' locations. They write a storyboard and record video segments, then they edit everything together into a 10 minute film. This film is shared with the other teams of the class to view and to comment on. All teams decide to post their presentations and videos to an online blog so they can show it to their parents or carers when they get home.
They record newsflashes at the end of each working day to document their progress.
Homework: The teams continue to work on their project after class. After the final lesson, as homework, students will have to look at all the projects made by the other teams. Each team is assigned another team to review. The team members will write down their comments about the other project.
Finally, each team creates their final newsflash where they summarise their work on the project.

Collecting data outside of school - activity
Mental Notes of learners - activity
Teamwork - activity
Peer feedback - activity
Team newsflashes - activity

Assessment after the course ends

Look at the final newsflashes of the teams and compare with the first one the teams made. As necessary, look at the intermediary newsflashes as well. Consider each team's process, end results, as well as the peer feedback they received and gave, and estimate the individual effort each team member gave. Finally give out the grades.

Collecting data outside of school - assessment
Mental notes of learners - assessment
Teamwork - assessment
Peer feedback - assessment
Team newsflashes – assessment

LEARNING STORY B: WORKING WITH OUTSIDE EXPERTS

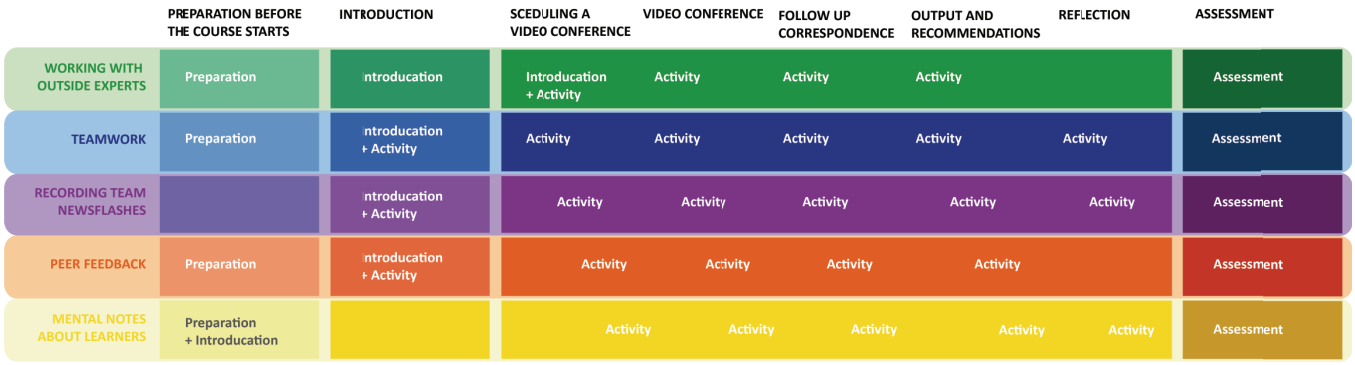


Figure 2: Visualization of learning story example according to the learning activity guidelines

Preparation before the course starts

The environmental school weeks are approaching. You would like your class to learn about environmental issues in different countries. You would also like them to work with outside experts and to practice their foreign language skills. The learners should come up with topics and connect each topic to an expert. Since you would like each learner to be in contact with all the experts and to learn about all the topics, you are planning to apply the 'learning cafe' method, where learners move from topic to topic and work in numerous groups.

As you already have a few interesting topics in mind you search online the local university research for appropriate scholars that the learners in your class could contact and learn from. You contact four scholars working in four different areas dealing with environmental issues via email and they agree to support the learners in your class. You ask the experts for lightweight and visual information material that describes their area of expertise. You will then review, simplify, and present to the learners in your class to introduce the topic and to inspire the learners.

You decide that the learners and the experts can agree on additional interaction, but should hold at least one videoconference and one email correspondence. Because the experts are located in different cities across Europe, it is impossible to arrange a meeting with them at their office for further inquiry about the topics. Depending on when the experts are available, this kind of visit would be great, so you keep it in mind for the next time.

One by one, you add your learners' names and pictures to TeamUP by letting all learners line up in front of your computer. As you already know most of the learners, you enter some mental notes about each learner into TeamUP. You add the bonfire and scissors icons to Juan's profile. You do this because you feel that these icons represent Juan's interest in outdoors activities and his ambition to use his hands to create objects.

As you will have rotating teams, you decide that each topic will be documented on an online blog. You also decide that each learner will be required to review, to give feedback, and to react to the feedback that the experts provided on the work done by their team and the other teams. This way, once team formations change, the learners will be ready to pick up a project that was started by another team. You

decide that the review and feedback tasks for the first rotation will be homework for the learners, and that for the other rotations the review will happen during class time.

Working with outside experts - preparation
Teamwork - preparation
Peer feedback - preparation
Mental notes about learners - preparation and introduction

Introduction (1-2 lessons)

You present the topic and the goal of the course to the learners, and show them the information material that the experts and you have compiled. In the computer classroom, you open the TeamUP application with your teacher computer that is connected to the video projector. You gather topics that the learners are interested in and enter them into the TeamUP tool. As you fill in the topics to TeamUP, you modify them slightly and add one or two of your own as well. After you collected ten topics, you ask the learners to vote for three topics of their interest. You share the address of TeamUP, so learners can access it on their own computers and vote. After voting it is clear that five topics achieved most of the votes. As the other topics did not receive any votes, you delete them, and form the first round of 4-5 person teams using TeamUP.

Juan is teamed up with Maria-Elena, Pablo, and Sarah. Their team topic is to investigate and analyse different recycling practices in countries across Europe. They agree to specifically compare practices in countries that speak languages they have been learning at school. They discuss their goals, and decide that their project will give recommendations on recycling improvements for their own locality and country. They set up a blog where they will report the project outputs and recommendations back to the other teams, as well as the local expert they will work with. This way, the outputs and recommendations can be easily accessed. They present their plan to you, and you help them improve it. At the end of the lesson you introduce the way teams can record newsflashes and let them practice for a while.

Homework: After the practice round, you instruct the teams to each record a 1 minute newsflash in TeamUP, explaining their project plan, what they will do next and the problems they foresee. All team newsflashes and blogs should be viewed and commented before the next lesson. At this point you also remind the learners that the teams will change soon, and that it is important to follow up on what has been done by the other teams. Before the next lesson, you look at the newsflashes and blog entries created by the teams, and take notes on what advice each team should get before contacting an expert.

Working with outside experts - introduction
Teamwork - introduction + activity
Team newsflashes - introduction + activity
Peer feedback - introduction + activity

Scheduling a video conference (1-2 lessons)

In the beginning of the lesson, you ask each team to listen to their own newsflashes to refresh their memory on where they left of last, and what their planned next steps were. As they already know the expert they will work with, you offer each team to also review the information material of the expert that they will contact

today, before asking them to compose a message to the expert asking about scheduling at least one video conference, their available time to communicate with the team via emails and blog comments. You are there to help them compose their messages and to send it to the expert, for example via email or a phone call. Juan's team cannot reach the expert by phone, so they decide to email their expert. After the lesson, you again ask the learners to record a newsflash about what they did, including the status of their expert feedback, their planned future actions, and the possible issues they encountered.

Homework: Each team is required to review the newsflashes of the other teams and their additional blog posts. You remind the teams that it is especially important to review and comment this time, because in the next lesson the team formations will change. As Juan's team has not received an answer from the expert after the end of the lesson, their team is required to update their blog with the comments of the expert as homework before the next lesson starts. You are using the newsflashes and the comments to revise your mental notes about the learners.

Working with outside experts - introduction and activity
Teamwork - activity
Team newsflashes - activity
Peer feedback - activity
Mental notes - activity

Video conference (1 or more lessons)

In the beginning of the lesson, one learner of each team is chosen to stay with their old topic. You arrange new teams with the remaining learners based on the existing topics by dragging and dropping learners from one topic circle to another using the team view in TeamUP. Juan, Maria-Elena, Pablo and Sarah are now teamed up with different learners, but Juan stays with the same topic. During the last lesson, a videoconference was scheduled with the professor/expert who is conducting international research in the area of recycling. With your help, Juan and his teammates prepare questions for the videoconference. The team contacts the university professor and discuss the questions via videoconference. You decide to get advice from ICT support on how to use synchronous communication effectively.

After the videoconference, Juan and his teammates are excited to share all of the information they learned from the expert on the topic's blog. With respect to the copyright laws, they collect images on the Internet from pages such as Wikimedia Commons and Flickr Creative Commons search to visually supplement their findings. You help them to write a very detailed summary for the other groups of learners. You also show them how to credit the photographers of the pictures they are using.

Homework: At the end of the lesson, you require each team to record a one-minute team newsflash that describes what happened during the session, the planned future steps, and possible difficulties they encountered. You also remind the teams to look at each other's blog posts to stay updated about the activities of the other teams, because the teams will rotate again during the next lesson. Again, you are viewing the newsflashes, the blog posts and comments by other teams and revise your mental notes.

Working with outside experts - activity
Teamwork - activity
Team newsflashes - activity

Peer feedback - activity
Mental notes - activity

Follow up correspondence (1 or more lessons, or after-school activity)

Again, the teams will rotate, while one learner stays with the topic. Using the TeamUP tool you rearrange the teams as you did before. Juan is excited, because this time he is teamed up with learners who are working on a project that deals with the electricity consumption in public spaces, a project he had enjoyed following a lot. The team discusses about what information they would need in order to make their outputs and recommendations more valuable. You help them create a list of information they still need to gather. Using instant messaging and videoconferencing tools, the team interviews their experts over the course of a week, both in class and in their own free time in school. The experts also share documents and resources with the team through email and document-sharing services such as Dropbox. In addition to the environmental experts, the teams communicate by instant messaging or videoconferencing with language teachers who you connected them with. This is a good way for the learners to clarify confusing information in foreign languages.

Homework: You request the teams to post daily updates of their progress for the experts and teachers to see as well as daily newsflashes for their later reflection. Also, everyday the learners are required to read the blog posts of the other teams to stay updated for the next team rotation. You update your mental notes based on newsflashes, blog posts and comments.

Working with outside experts - activity
Teamwork - activity
Team newsflashes - activity
Peer feedback - activity
Mental notes - activity

Output and recommendations (2 or more lessons)

Once the research and interviews have been completed, the teams change again. This time, all learners change their topics. You try to arrange the teams so that each learner works with a topic they had not worked with before. The teams analyse the information and create a report of their findings, including recommendations on local and national improvements. They can choose to present their information through different multimedia formats. The report, including the multimedia files, is posted to the blogs. The teams contact the experts, who were supporting and advising the work on the topics and ask them to use the online commenting function to give feedback on their reports.

Homework: At the end of the lesson you remind the learners to record a newsflash about their work, the possible future steps and the problems they encountered during this lesson. You use the newsflashes to update your mental notes using TeamUP. The learners are also required to view and comment the reports of the other teams.

Working with outside experts - activity
Teamwork - activity
Team newsflash - activity
Peer feedback - activity
Mental notes - activity

Reflection

Using the comments of the other teams as well as the newsflashes that were created during the project work, the teams reflect on the progression of the project and on what they could improve next time. You support them to access all the data that they need to view. In the end of the lesson, each team records a newsflash summarizing the insights of their reflection.

Teamwork - activity
Team newsflash - activity
Mental notes - activity

Assessment

You assess the project work by using the original project guidelines and the feedback from you, the peers and the experts the teams shared the information with. You look at the final newsflashes of the teams and compare with the first one the teams made. As necessary, you look at the intervening newsflashes as well. You consider each team's process, their end results, the peer feedback they received and gave, and estimate the individual effort each team member gave, and give out the grades. You use your mental notes to guide your assessment of the individual learners.

Working with outside experts - assessment
Teamwork - assessment
Team newsflash - assessment
Peer feedback - assessment
Mental notes - assessment

LEARNING ACTIVITIES

When creating your lesson plan, you must include elements of the learning activities described below. Depending on the learning story you chose, you need to include either activity A or activity B, but not both. You also need to include activities 1, 2, 3, and 4. In total, your lesson plan should consist of five learning activities.

If an activity seems overpowering to you, please contact your NPC or NTC for additional assistance. If some parts of an activity are clearly impossible to complete, you may leave them out, as long as you let your NPC know about this.

Some of these activities may seem trivial if you already practiced similar methods in your teaching. In that case, take a look at the optional advanced parts of the activity, which are coloured grey in each activity document, and challenge yourself.

A. COLLECTING DATA OUTSIDE OF SCHOOL

Students go outside of school to collect data. The data can either be in the form of multimedia or scientific observations. Either the entire class goes outside, or only some of the students.

You can look forward to…

… a refreshing change by going out of the school building.
… an exciting time looking for data in the environment.
… additional motivation by turning data gathering into a game.
… possibly freeing your time for other duties while the students are outdoors, in case a parent or another guardian is available to assist you.

Your learners may learn…

… to plan a research project and develop research skills, including choosing and planning activities leading to deep engagement with the chosen frame.
… to use tools for investigation, collecting data and evidence.
… to take responsibility for their own learning.
… about different ways of extracting information from data.
… to develop their creative and critical thinking skills.
… to make content choices and how to frame a topic.

Ideas for using technology

Data collection

Personal or school loaned devices, such as smart phones, mobile phones, net-books or laptops can be used to collect photos, audio and video material from the surroundings. Based on their area of focus, also other sensors and scientific measurement instruments, such as microscopes and thermometers can be used to gather data, such as geo-location information, temperature, air quality etc. These tools should be provided by the school.

Sharing data

Use of the notebooks and laptops supports sharing of data.

Taking notes

Mobile phones or dictation devices can be used to make audio notes. Pictures or video can also be used, or notes can be taken using pen and paper.

A. COLLECTING DATA OUTSIDE OF SCHOOL

1. Preparation

Chose a general frame for the group work.

Decide whether the outside activities happen during class time, or are assigned as team homework.

Arrange for adult guardian

Arrange devices

Collect examples of information gathering

2. Introduction

Form small teams, each with a separate topic linked to the theme of the course. See activity 'Forming teams'.

Each team should come up with a schedule about when and where to collect data. They should also have backup plans in case of bad weather or other unforeseen issues.

Support each team with their schedule design, i.e. deciding what data to collect, where and how to collect it. Review the plan with each team.

After completing their schedules, each team records a newsflash about their schedules. See activity 'Recording team news flashes'

Present examples of collecting data to learners.

Discuss the benefits and drawbacks of different data capture methods and devices with the learners.

If the information capturing devices are unfamiliar, let the learners practice using them through free exploration.

3. Activity

Teams investigate and collect data outside. Outdoor data can be of very different kinds: it can be measurements of the natural environment, photos of culturally interesting sites, interviews of local people, or statistics.

Teams should store and analyse their collected data.

Teams may share their data with others as they collect it.

Teacher or guardian who supervising the teams, should take notes of teamwork progress, and of what each team could improve or practice further.

4. Assessment

After the outdoor activities are completed, each team records a newsflash summarizing their work and work experience.

Compare the teams' schedules with the decisions taken, the steps performed and the data their collected.

It is unlikely for you to follow each team's progress evenly. Use the team newsflashes to stay updated about their progress.

Ask the learners to grade their teammates' contributions to the outside activities. You may use the learner grades as help for forming your own assessment.

B. WORKING WITH OUTSIDE EXPERTS

Students receive additional and/or deeper knowledge from an out-of-school expert of a relevant field. In addition to a video interview, the expert may be involved in following teamwork and commenting on it.

You can look forward to…

… building collaboration with outside experts
… linking school activities to the broader society.
… referring to an outside expert instead of having to know everything about a topic yourself.
… showing the learners how their personal interests and school activities
… matter in society by linking the topics to a wider audience.

Your learners may learn…

… to contact professionals, present their case to them, and ask for collaboration.
… to discuss and negotiate with teachers and experts.
… to incorporate expert views into their project
… to cultivate critical thinking skills

Ideas for using technology

Finding experts

You can use professional sites such as LinkedIn to locate experts in the field of study. You can use social networking services that you already use to inquire after an expert on a topic.

Communicating with experts

The initial and the follow up contact with professionals can be conducted by way of a video call, chat, or email. This is often more feasible than meeting a professional in person. Skype is quite commonly used in academia and is business. Apple Facetime and Google Talk are other good options. An online blog or wiki space with commenting functions can also be used. A slightly more distant, yet content rich way of connecting with experts can be established by using Twitter. This online service can be a good way to connect to, and follow everyday discussions of experts in the field of your interest, but who are located further away from your classroom.

B. WORKING WITH OUTSIDE EXPERTS

1. Preparation

Prepare possible topics and locate appropriate experts.

Plan the medium of interactions between students and experts. At least one video interview with an expert needs to be arranged.

People working in academia who often have a flexible schedule and find it motivating to pass their expert knowledge on to young learners.

2. Introduction

Present the activity to the learners and explain that they are required to interact with outside experts to complete this course.

Brainstorm about possible topics, experts, and reasons for using experts.

When the topics of inquiry are known, contact experts (or ask the learners to contact them) and inquire whether they are interested in participating.

Present example topics and possible experts to the learners to support their brainstorming process.

You can ask your learners whether they know of suitable experts: their parents or other relatives. Finding appropriate experts can be left as an exercise to advanced learners.

3. Activity

Together with the learners and the expert, agree on the involvement of the expert: video interview, giving feedback on student work, participating in assessment, etc. Decide on communication methods and protocols. Make a schedule of when the interactions happen.

Students prepare for the interview by coming up with questions they need answers for.

Monitor the learners' progress and keep in touch with the involved professionals.

Have the students practice with the chosen communication tools, so they know how to use them.

When teams interact with the experts, the learners may contact them independently and arrange a suitable time for the interview.

Learners may visit the expert at their work location to gather more information.

A video interview can happen as class or team activity.

4. Assessment

In case the expert followed the progression of the teamwork, their expert view on the learners' performance should be considered.

The expert may be involved in defining the assessment criteria.

1. TEAMWORK

You divide the class into small teams of 4-5 learners that are optimal for collaboration. Each team has their own topic of inquiry that is related to the theme of the course. You let the learners suggest topics they are interested in and use the TeamUP tool to match learners and topics, using information stored in mental notes.

You can look forward to…

… forming functional and heterogeneous teams quickly
… leveraging mental notes in team formation
… less resistance from the learners as the teams are generated by a computer and not suggested by you
… added motivation as each learner gets to study something they are interested in
… a fun, visual way to see the teams form

Your learners may learn…

… to work with others than just their friends
… a deeper understanding of a topic their team is studying
… the basics of numerous topics that other teams are studying
… social skills

Ideas for using technology

Forming teams

It is difficult to manually divide 24 learners into 6 teams, taking into account which topics each learner finds interesting, and also considering team dynamics. The TeamUp tool solves the team formation problem. Use it on a computer that is connected to a video projector.

1. TEAMWORK

1. Preparation

Set up the TeamUp tool for your class by adding names, portraits and mental notes of learners. See TeamUp tool manual, part 1 ‘Add and edit learners’ for more information.

Your learners will be working in teams of 4, each team with a specific topic. Plan your course (or part of it) accordingly.

Decide whether you grade teams or individuals.

2. Introduction

Present the theme of the course in a way that gives students some basic information, but leaves open many questions.

Ask learners to think about what they would like to study in this theme.

3. Activity

Team work usually spans multiple lessons, often an entire course.

Ask students to suggest topics for inquiry. Use your judgment to rephrase, alter or reject suggestions.

Collect topics in the TeamUp tool.

Let learners vote for their favorite topic and create the teams. See TeamUp tool manual, part 2 ‘Forming teams’.

Ask learners to start their teamwork. Starting each lesson, show the TeamUP team view to remind everyone of the teams and their topics.

4. Assessment

Include contributions to teamwork into your assessment.

You may brainstorm assessment criteria with the learners.

2. TEAM NEWSFLASHES

Independently working individual learners or teams of learners post periodic status updates for other learners and you to be able to follow the independent activities and progress.

You can look forward to…

… quickly and comfortably reviewing team progress
… seeing when you need to intervene
… learners having fun when recording newsflashes

Your learners may learn…

… to summarize and communicate their work in progress
… to plan ahead
… to evaluate themselves
… digital communication skills
… to provide and receive criticism
… to reflect on their past performance

Ideas for using technology

Recording updates

Team updates can be recorded in many ways. Audio and video updates may be more engaging than textual ones. However, looking at videos from many teams can be time consuming. The TeamUP tool supports audio newsflashes with images, and limits the recording time to 60 seconds. This ensures that you can follow all teamwork activities in under 10 minutes per day.

1. TEAM NEWSFLASHES

1. Preparation

No preparation.

2. Introduction

When starting independent work activities, instruct the learners to post an update on their recent activities. They should record an update every day when they work on the project. Let the learners know that the updates are shared with other teams and you.

Instruct learners to make their daily update in the style of a newsflash (like on TV news). Let them know that it must be exactly 1 minute long. See more information in the TeamUp manual, part 3.

Show the TeamUP team view and tell the learners to use the record button on their team area to record a daily update. Tell them that recording their first update may take some time, but with experience the time used for creating newsflashes decreases

3. Activity

Follow the teams in TeamUP and check their updates. Make sure they produce updates every day they work on the project.

Intervene to support teams if you need to.

Remind the learners periodically to view the newsflashes of others as well.

At the end of the project, to deepen understanding learners should record a final newsflash, where they summarize all of their project activities, explain possible future steps, and mention some problems that they overcame or needed to work around.

4. Assessment

Use the daily updates to gauge the teamwork and individual participation levels.

3. PEERFEEDBACK

Learners view each other's work and provide feedback, praise, and criticism. Peer feedback can be used when students present their project outcomes, but it can also be used as part of a knowledge building activity, when students are discussing about a challenging topic.

You can look forward to…

… recognizing need for added guidance
… making your assessment task easier
… sharing project finding, outcomes and documentations with learners, other teacher and parents to illustrate school learning activities, and to transfer knowledge

Your learners may learn…

… to accept criticism from others
… to provide constructive criticism
… to value audience feedback
… to reflect on work in progress

Ideas for using technology

Feedback discussions

An online blog or a wiki can be used for textual project documentations. The commenting functions can be used for feedback discussion, also from a wider community. The TeamUp tool may be used to record teamwork documentations. See activity 3.

3. PEERFEEDBACK

1. Preparation

Decide whether peer feedback is presented as a classroom activity or whether it will be given directly to the recipients, and the communication method used.

Collect or generate examples of constructive peer feedback.

2. Introduction

Explain to the learners what peer feedback means and that critical but constructive comments are asked for.

Ask all learners to view the projects of other learners and make private notes about what they find interesting, excellent, poor, or otherwise noteworthy.

Present examples of constructive and non-constructive feedback.

3. Activity

Ask the learners to prepare their constructive peer comments and present them to the recipients or to the entire class, as appropriate.

4. Assessment

Quality of peer feedback can be considered a merit to the learner providing the feedback.

Peer feedback can be used in assessing the performance of the one who received the feedback.

4. MENTAL NOTES ABOUT LEARNERS

You record mental notes about learners. These notes are based on your observations of their working habits, personality traits, social connections, hobbies, and special skills. The mental notes aid in forming functional teams and also support your interactions with your students. You use the TeamUP tool to record your notes.

You can look forward to…

… recording your mental notes quickly after class
… using mental notes to create more functional teams
… providing invaluable help to substitute teachers by passing on your mental notes
… storing mental notes for your future reference and reflecting on student progress

Your learners may learn…

… how their abilities affect their learning progress

Ideas for using technology

Recording notes

The TeamUp tool allows the teacher to record mental notes easily. The recordings of mental notes can be utilised to generate team configurations that are heterogeneous and based on the learners interest. The mental notes are represented by icons that the teacher can give personal meaning to, for example the 'bumblebee' icon can mean that a student is fussy, easily distracted, hard working, likes to move about, etc. See the TeamUP prototype documentation for more information.

4. MENTAL NOTES ABOUT LEARNERS

1. Preparation

If you know your students before the course starts, you can add your initial notes about them in advance.

Consider if you prefer the learners in your class to be able to see the notes or not.

2. Introduction

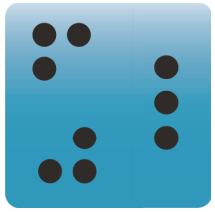
Take portraits of the students into the TeamUP tool. See TeamUp tool manual, part 1 ‘Add and edit learners’ for more information.

3. Activity

Record mental notes after class, and revise them once a week: Go through each student in edit mode and add or remove icons on an intuitive basis.

4. Assessment

You may use your mental notes as a guide in assessing student performance and improvement.



TeamUP

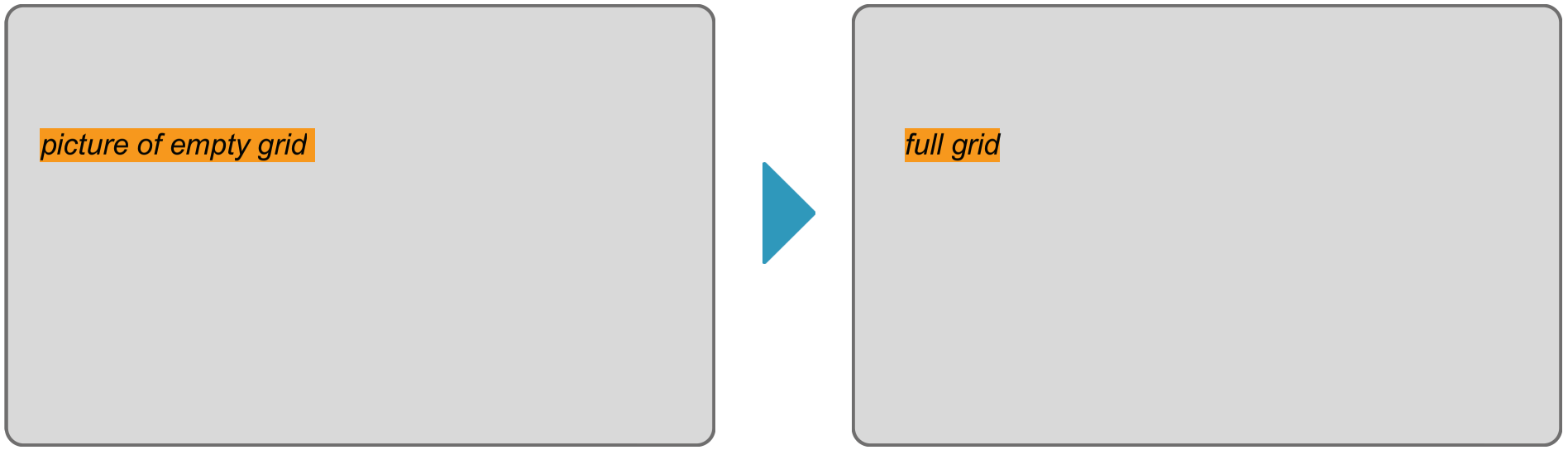
TeamUP helps teachers to form teams based on their perception of the skills and strengths of each learner. Learners can suggest topics for teams and vote on them. TeamUP forms teams that will satisfy the needs of both learners and teachers, leveraging motivational and group dynamic advantages.

MANUAL CONTENT

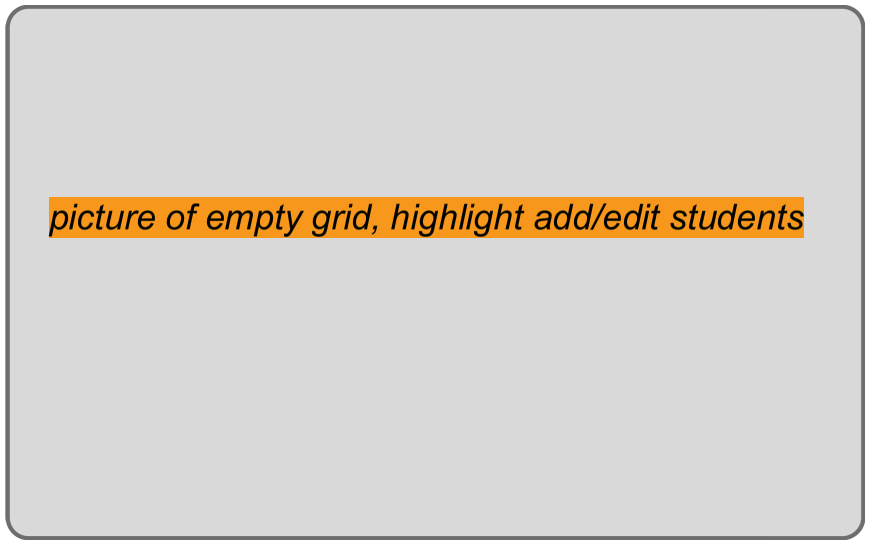
Authors: Anna Keune, Tarmo Toikkanen, Jukka Purma, Teemu Leinonen
Translation and localization:

Version 0.7, 9/8/2011

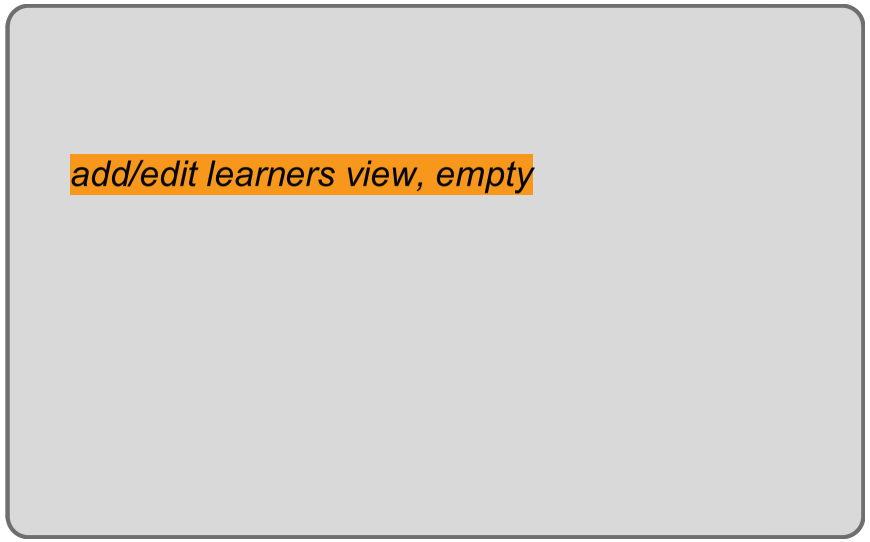
Part 1: How to add and edit learners



Part 1: How to add and edit learners



When you first use TeamUP, it starts with an empty grid. To add learners to the grid, click 'Add/edit learners'.



For each learner you can enter their first name, a portrait, and your mental notes.

TIPS

What are mental notes?

Teachers take mental notes about their learners all the time. TeamUP allows teachers to save their mental notes, so that the notes can be used to guide team creation. The mental notes may be used to represent different aspects of lear for example personality traits, skills, relationships with other learners, languages, and gender. They are attached to learner profiles as non-descriptive but suggestive icons. The teacher decides on the meaning of each icon.

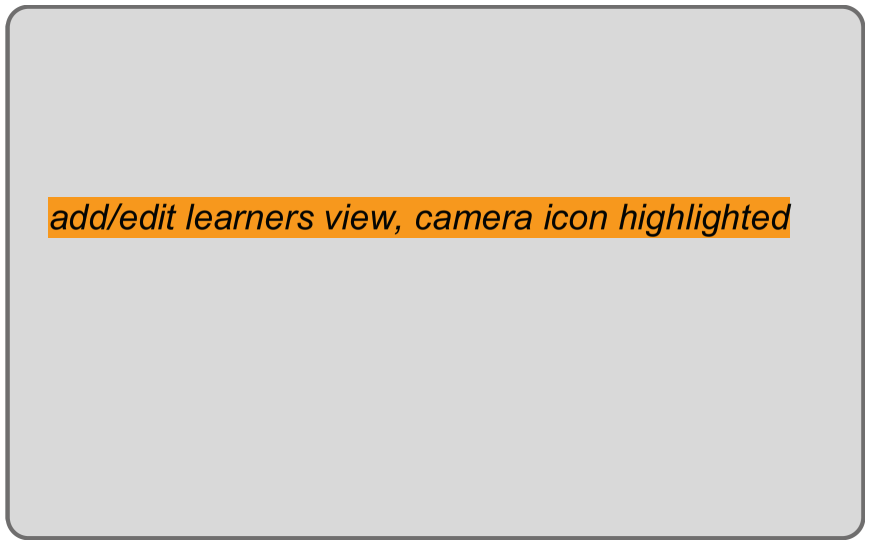
Using mental notes to create teams

If the TeamUP holds mental notes of each learner, heterogeneous or homogeneous teams function better than random teams or teams formed by the learners can be created by the tool.

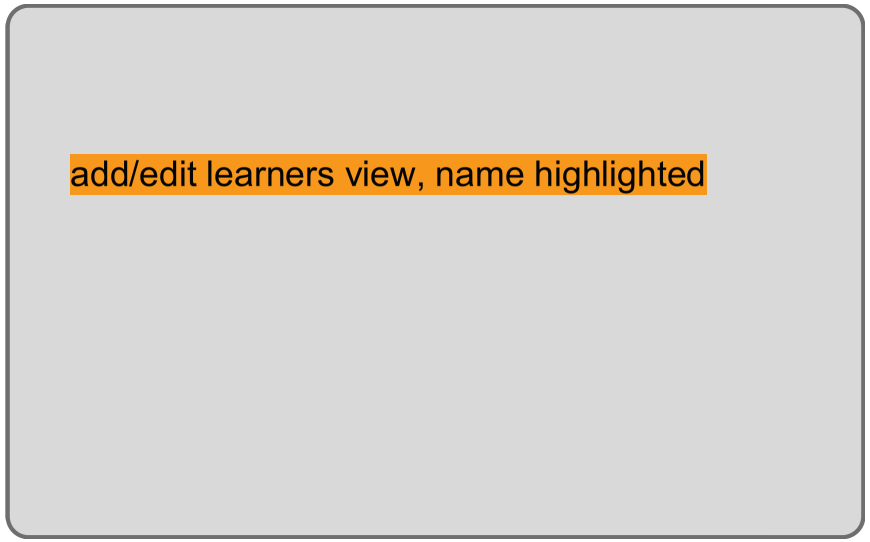
Another way to edit learner profiles

Double click a learner portrait in the class view or team view or edit their information, including notes.

Part 1: How to add and edit learners



Click on the camera icon to take a portrait of the learner with your webcam.



Click on the name field below the portrait to enter or change the learner's name.

TIPS

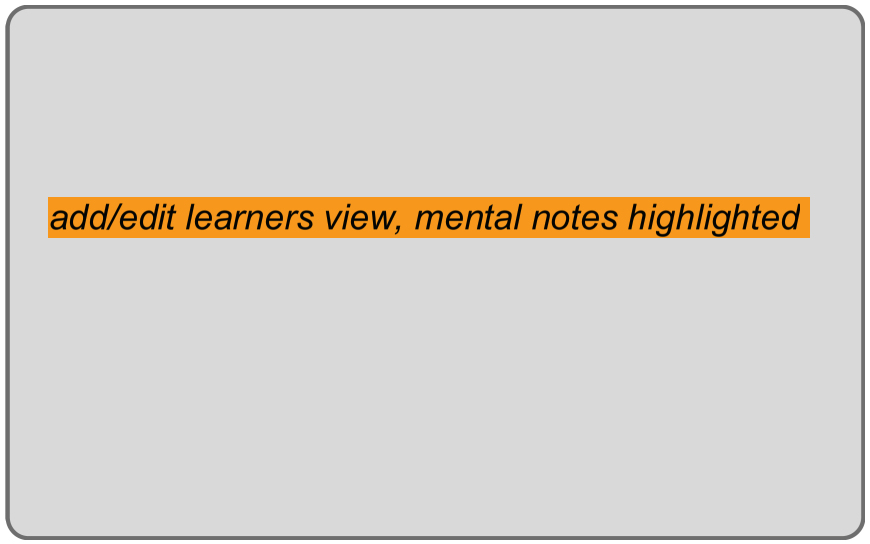
Quickly adding all portraits of a class

Ask the learners to line up in front of a computer that has an in-build camera or web-camera. Start with the first learner, take a picture with the camera, click the right arrow to get a new empty sheet and continue until all pictures are taken.

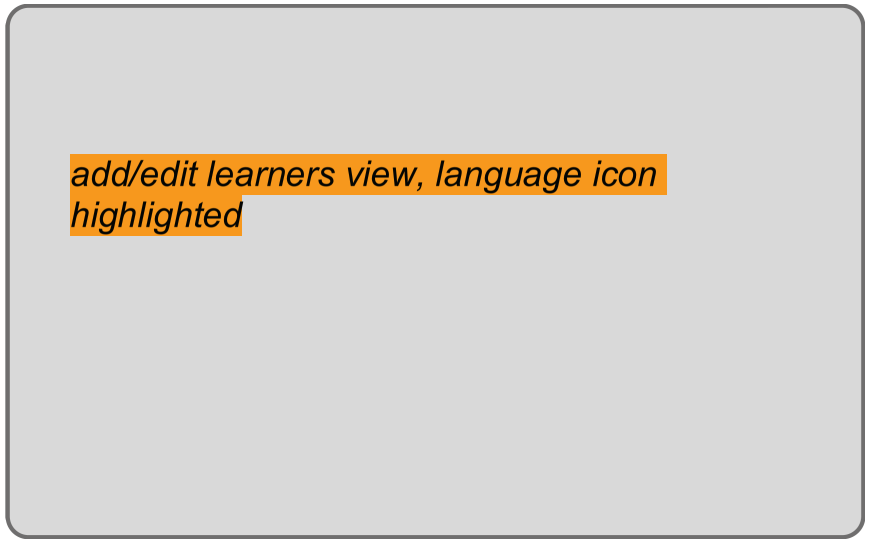
Using images you already have

If you have your learners portraits as digital images, you can use them and have everything ready before the semester starts. You can copy their portraits from a learning management system, for example.

Part 1: How to add and edit learners



To add mental notes, drag icons from the bottom menu bar to the profile. Clicking the left and right bottom arrow shows more icons.



To see more languages, click the plus sign on the language icon.

TIPS

Keeping mental notes private

You may not want your learners to see what mental notes you added to their profiles. The mental notes are only shown when you edit learner information. The notes are not always visible and you can safely use a video projector.

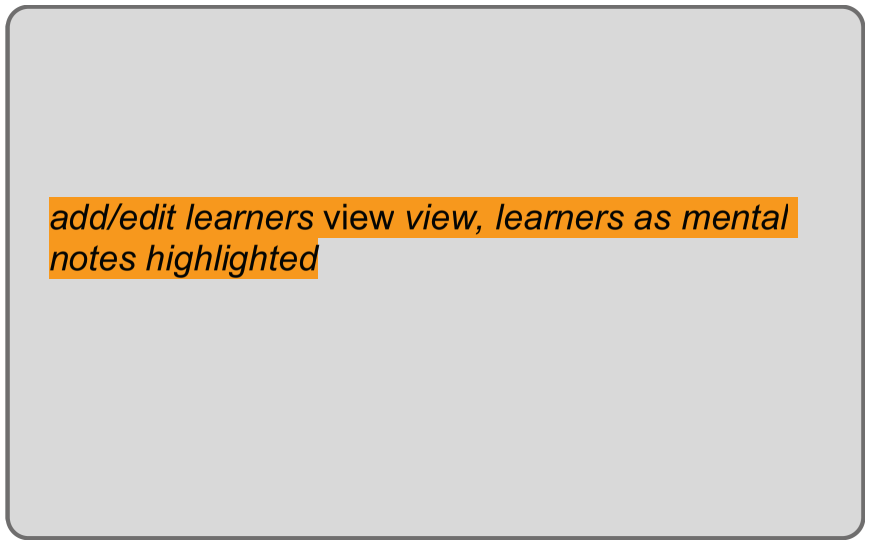
Sharing mental notes with learners

The mental note icons are not descriptive. You can consider showing them to the learners, without offending them.

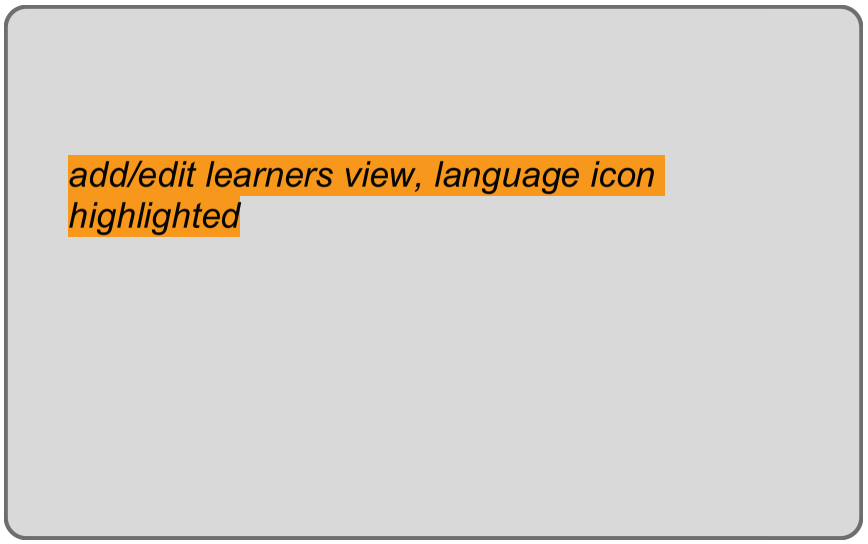
Best time to edit mental notes

You can add mental notes before your course starts or after the first lesson if you already know the learners. Otherwise, you can browse through your learners' profiles and change your mental notes as you get to know them better, periodically, for example between lessons.

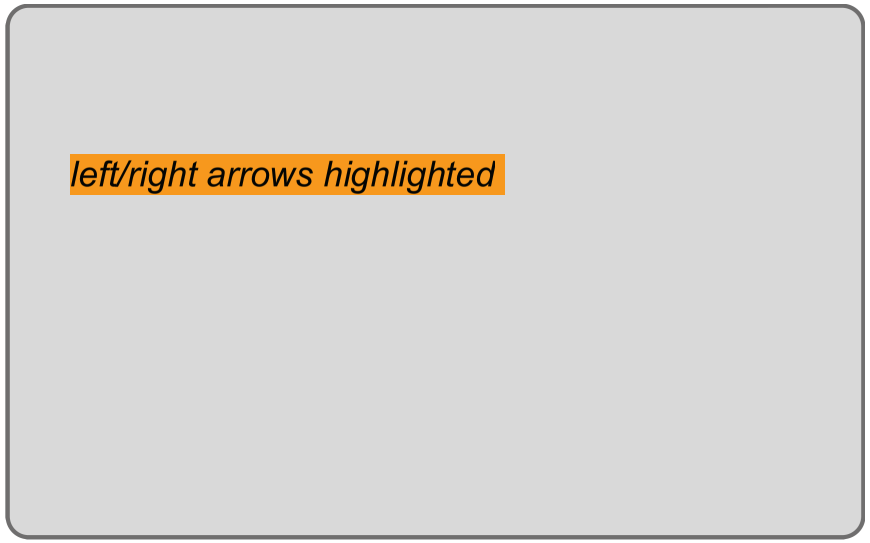
Part 1: How to add and edit learners



To represent relationships between learners, drag icons of other learners to a profile. To toggle between friendly and antagonistic relationships, click on the icon.

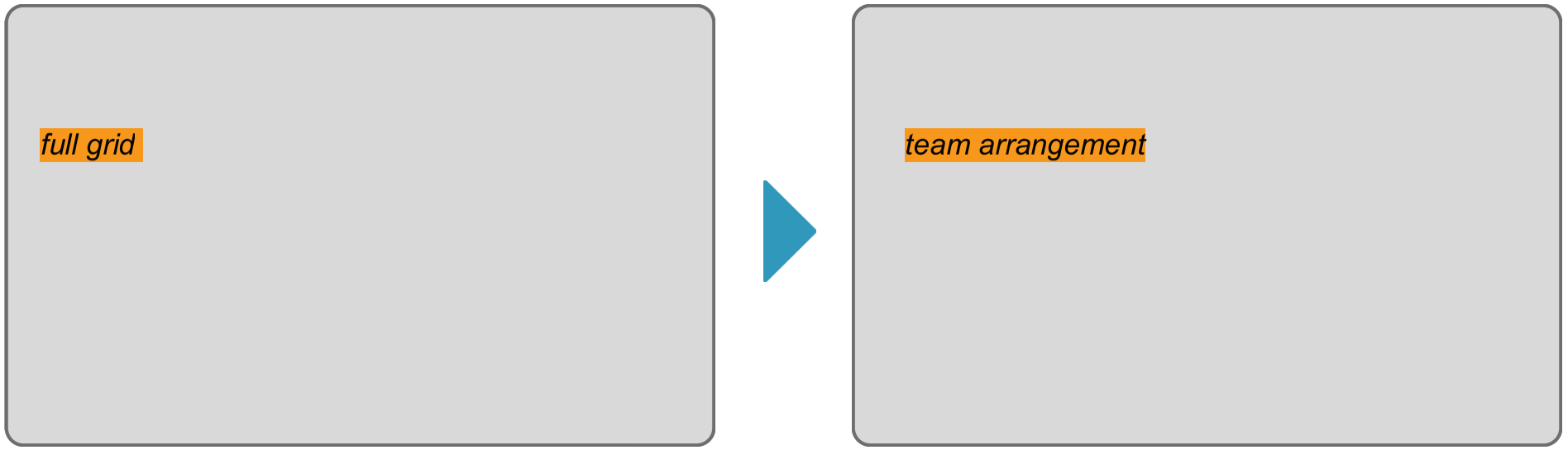


To leave the add/edit learners mode and return to the class view, click the class icon.

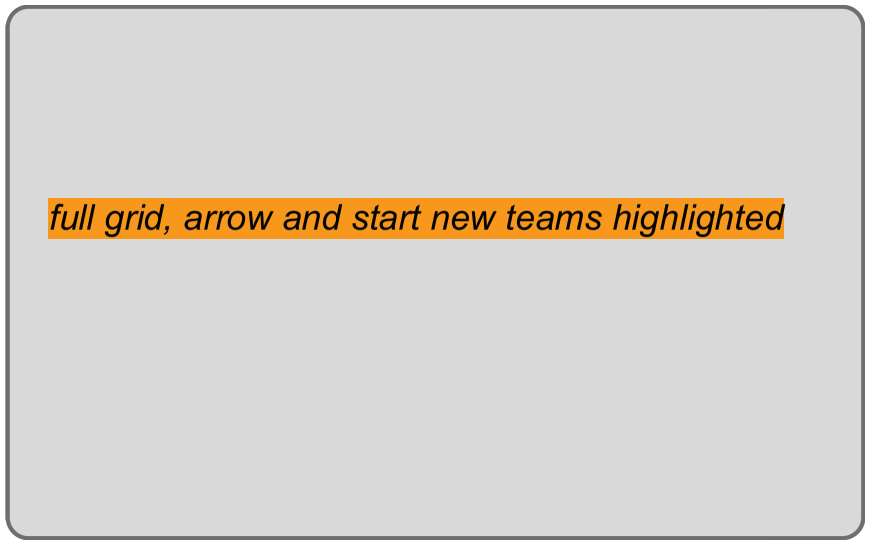


To browse students click on the arrows on the left and right side of the screen.

Part 2: How to form teams



Part 2: How to form teams



Start the team creation wizard by clicking 'Create new teams' or the right arrow.

Enter up to ten topics for team work that the learners can choose from.

TIPS

First present the themes

Before starting team work, it is good to introduce the overall theme to the learners, so they can orientate themselves to the project.

Collect ideas from learners

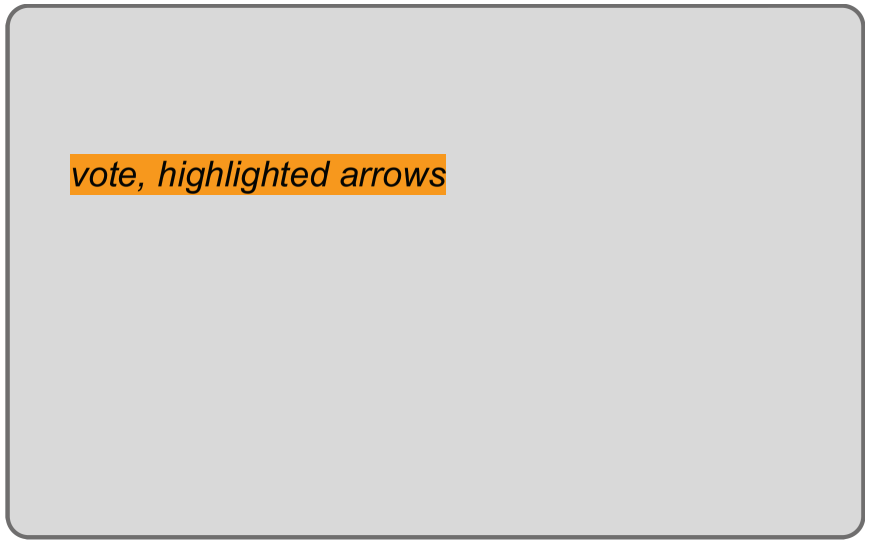
Instead of proposing topics to each team, you may ask the learners to suggest topics they are interested in. Use your judgment to modify their suggestions so they serve the learning goals and curriculum. Collect more topics than the number of teams so that the learners will have a possibility to choose from a wider range.

Change team size

By default, TeamUP forms teams of four learners, which is often the optimal team size. If you want to form smaller or larger teams you can change the team size under 'Options' available in the class view.

Part 2: How to form teams

Ask learners to vote by dragging their profile pictures next to the topics of their choice. Everyone may vote three times, but only once for the same topic



Click the right arrow once voting is complete. Click the left arrow to return to classroom view.

TIPS

Choosing a topic in the classroom

To choose a topic, learners can either step to the interactive whiteboard one by one, use their response systems, or use their own laptops or smart phones. You can also enter the choices based on what the learners say.

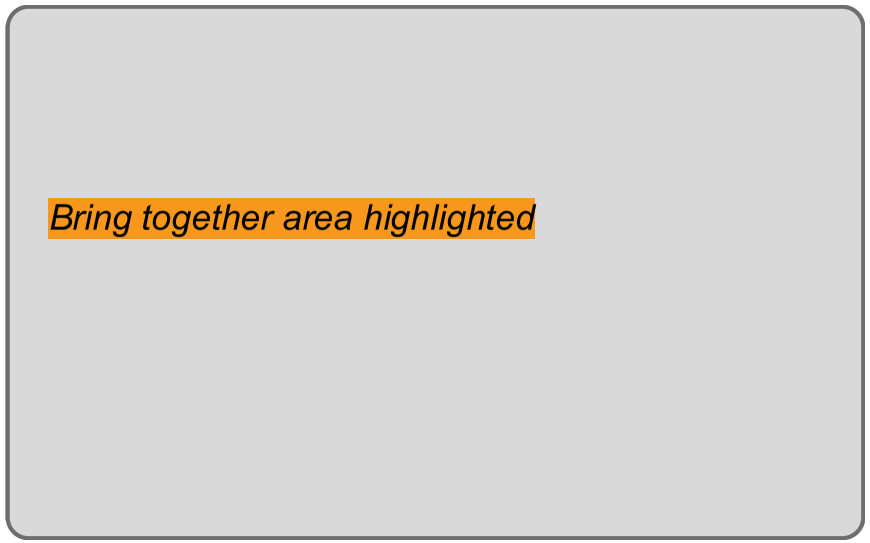
False choice and choosing for absent learners

Anyone accessing TeamUP can distribute the choices of anyone. Absent learners are part of the class, and choices are entered for them by those present to the best of their knowledge. If choosing is abused, it's time for a pedagogically meaningful discussion: "Why did you do that?"

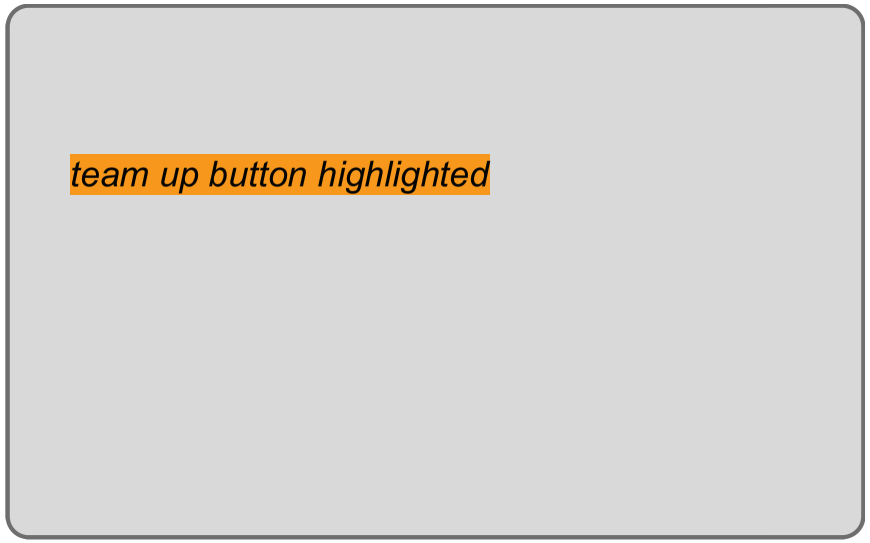
Removing unpopular topics

If one of the topics was not chosen often, the teacher may remove or replace it with another. The learners can then change their choices if needed.

Part 2: How to form teams



If needed, drag up to three mental note to the 'Bring together' area if you want to create homogenous teams.



Create the teams by clicking in 'Team UP!' or the right arrow.

TIPS

Heterogenous teams

TeamUP tries to match each learner to a topic that interested them. In addition, TeamUP uses mental notes to distribute learners into teams that are as heterogeneous as possible. This usually creates teams that are functional and multi-talented.

Bringing together for strategic teaming

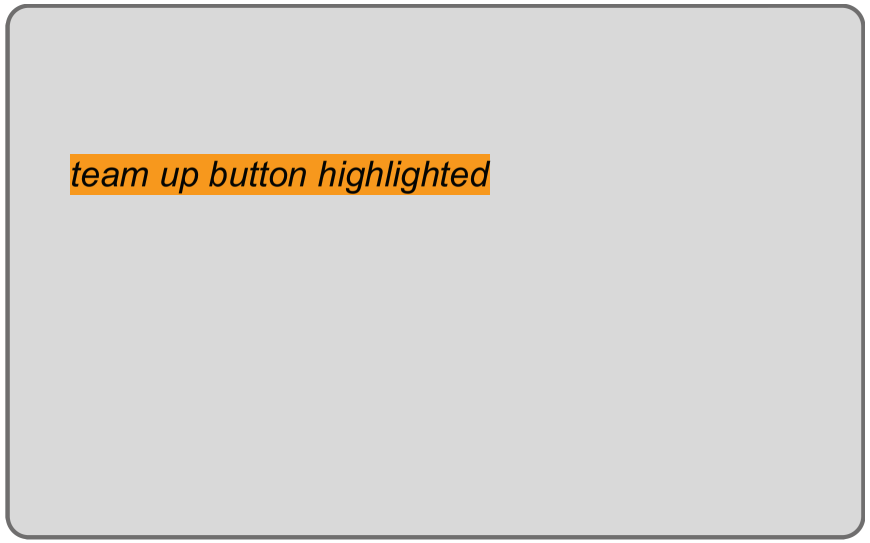
Without additional selection, Team up uses the choices of the learners to bring teams together. However, sometimes it may be necessary to create teams that are homogeneous in particular aspects, for example gender based teams, or teams that share similar skills. To do that, you may choose up to three aspects that represent aspects that should be of high concentration in a team.

Manually adjusting team

Once the teams are formed, you may move individual learners from one team to another. To create entirely different team formations, you can click the left arrow and 'Team UP!' again.

Part 2: How to form teams

If needed, you can move learners from one team to another by dragging them.



To switch between classroom view and team view click on the icons at the top of the screen.

TIPS

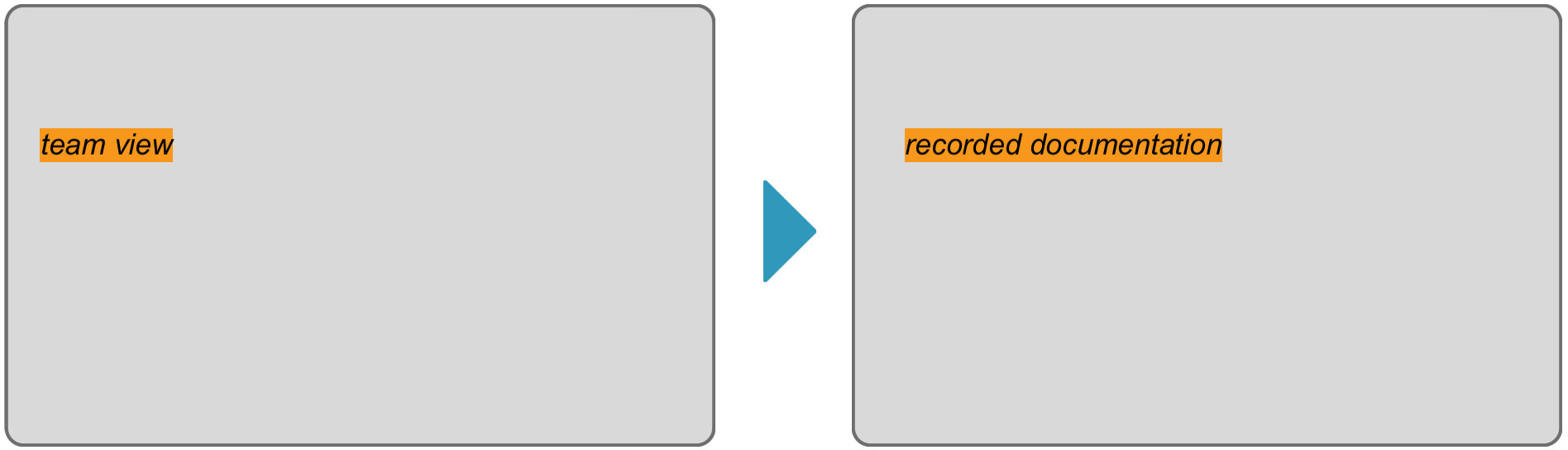
Continuing team work with the same arrangement

The TeamUp tool will store and display the team setups to allow quick continuation of the work at the next lesson.

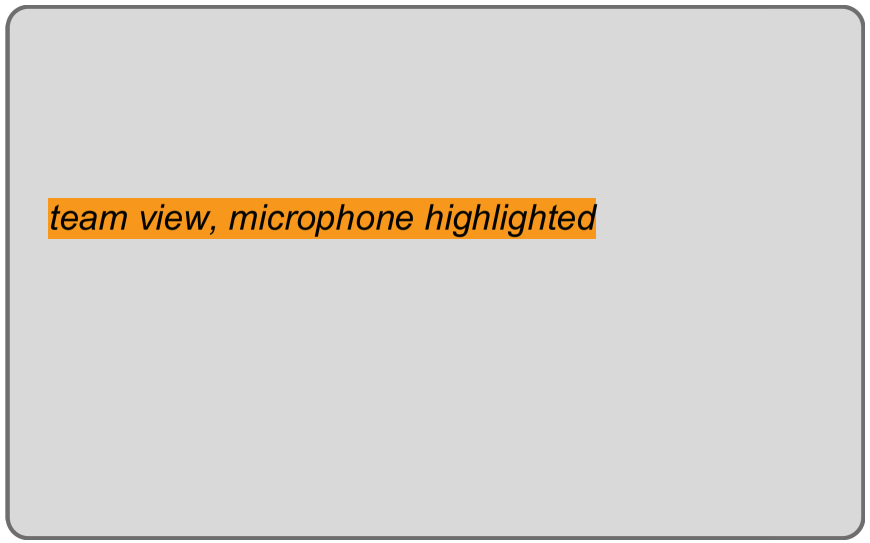
Marking learners absent

In the team view and the class view, hovering above a learner's image shows their names and a small 'x'. Clicking on the 'x' marks a learner absent.

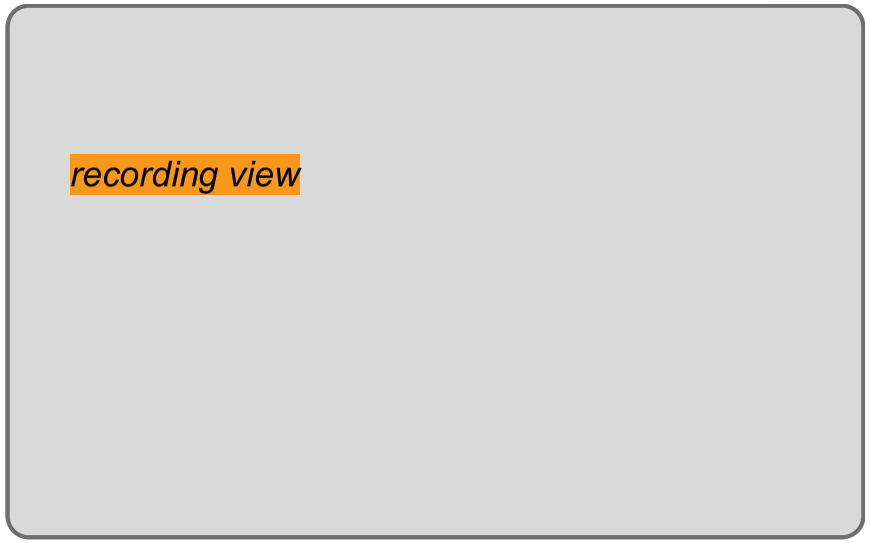
Part 3: How to record newsflashes



Part 3: How to record newsflashes



Learners can click on the microphone icon of their team to record newsflashes of their work or to listen to previously recorded newsflashes.



Click on the record button to start recording a newsflash.

TIPS

Explaining newsflashes to learners

Newsflashes are one minute long voice recordings that tell others how the team is progressing. When starting a project, you are recommended to instruct learners to post daily newsflashes of their teamwork, and to inform them that the newsflashes are shared with other teams and with you. It is also good to mention that you will be able to give more productive additional support based on the newsflashes.

60 second recording time

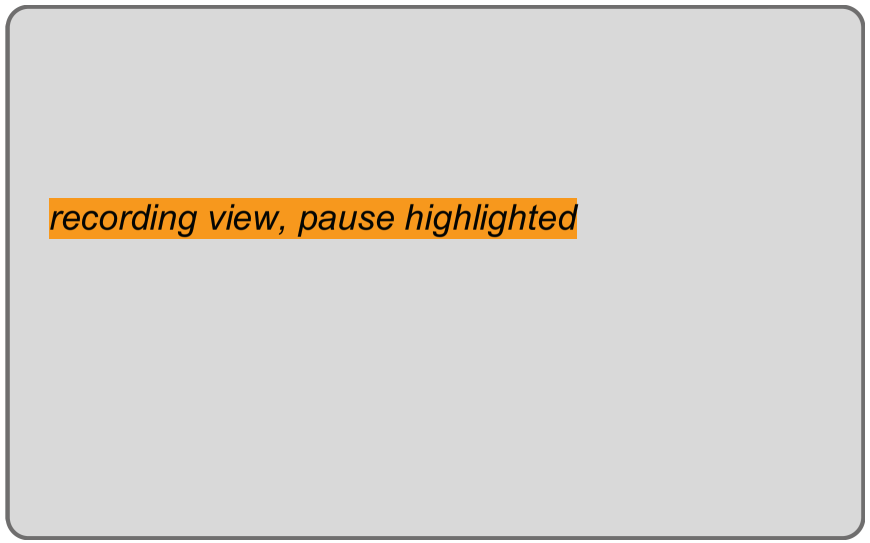
The recording time of a newsflash is limited to 60 seconds. Learners need to carefully think about how they can say everything in that time. The time limit ensures that the teacher can check each team's status quickly.

Three questions answered

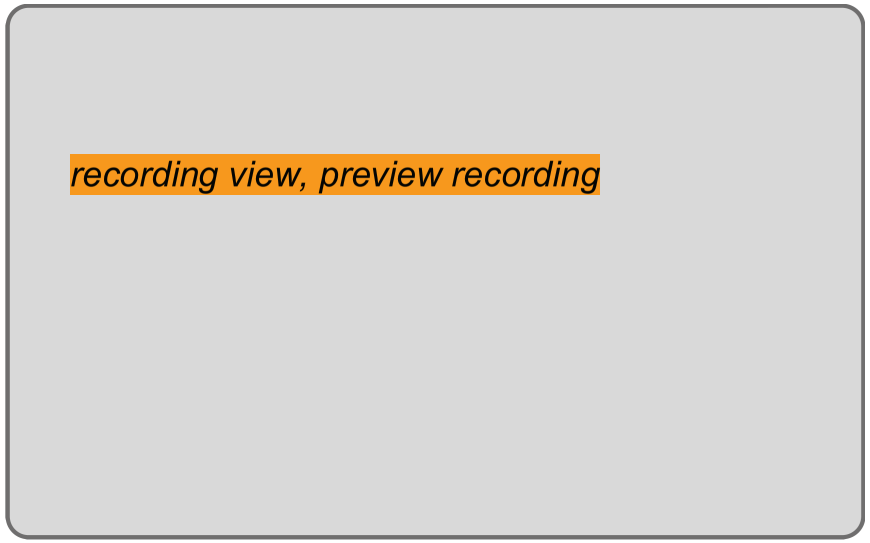
Each newsflash should answer three questions, each in 20 seconds:

1. What we did after the previous newsflash
2. What we will do next
3. Any problems we've encountered or foresee

Part 3: How to record newsflashes



Click pause to interrupt a recording.



After recording, the newsflash can be previewed by clicking play.

TIPS

Pause, prepare, resume

A recording may be paused, prepared and resumed. After the 60 seconds are up, the recording can be previewed, re-recorded or saved.

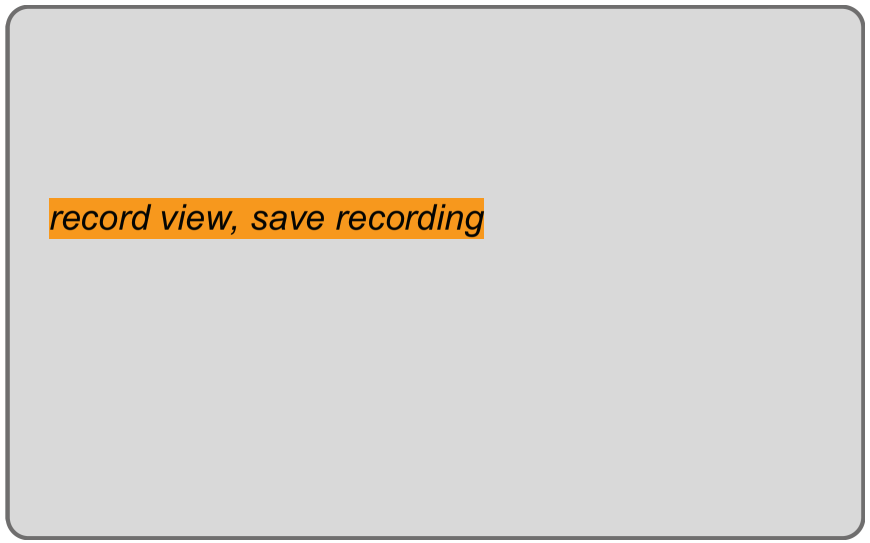
Time needed for doing newsflashes

Teams may need up to 30 minutes to create their first newsflash. Once the learners have practiced documenting their progress, each recording can be created in 2-10 minutes.

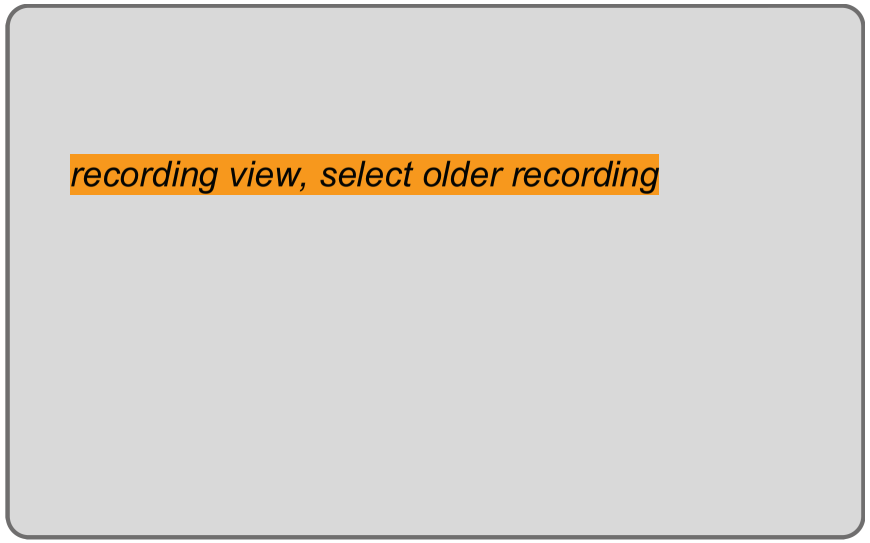
Pictures of teams

The web cam is used to take a picture in the beginning of the recording. The teams may just stand in front of the camera, or can show something relevant for the recording.

Part 3: How to record newsflashes



To save the newsflash, click 'Save'. To start over and record a new newsflash, click record.



To listen to previously recorded newsflashes, select one of them and click play.

TIPS

Following what other teams are doing

The whole class has access to the newsflashes. Learners can check the work progress of other teams, intervene, and share ideas.

Benefits of recording newsflashes

- Learners learn how to summarize and communicate their work and work in progress.
- Learners learn to plan ahead.
- Learners can quickly resume work, as they have a reminder of what they last did.
- Newsflashes can be used to reflect on learning outcomes and future learning goals.
- Limited recording time reduces the time teachers have to spend on following the progress of each team.