Organic.Edunet

New ways of teaching Organic Agriculture and Agroecology

HANDBOOK FOR SCENARIO IMPLEMENTATION at School level

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Introduction

Organic Agriculture has become increasingly important on the agenda of European countries due to new policies and plans for sustainable development, encompassing social, economical and ecological factors. This will require greater focus on developing and sharing educational material in Organic Agriculture (OA) and Agroecology (AE) among European youth.

Organic.Edunet[1] is an EU-funded project under the eContentPlus Programme that collects digital learning resources on organic agriculture, agroecology and educational approaches, and develops tools to store and describe them in repositories. The project also develops a new Web portal which is linked to the repositories of learning resources.

Aim of this handbook is to present ideas for how to improve teaching in OA/AE at school level. In particular this handbook assists teachers on designing a new learning scenario, adding content to existing learning scenarios as well as searching for learning scenarios with the use of e-learning tools. Specifically, Chapter 1 describes the learning scenario process, and proposes four basic steps for designing a learning scenario. Chapter 2 highlights the importance of digital resources and how these can enhance the teaching and learning process. Chapter 3 describes in detail the process of designing a learning scenario including the adoption of an educational theory and how this can be translated into scenario use. Then, the learning scenario 'An organic garden coming into being' is used as a hands-on example to help teachers to realise the design of their own scenario in actual practice. Chapter4 provides some technical information about how the learning scenarios can be accessed, uploaded as well as described with metadata with the assistance of the e-learning tools developed by the project. Chapter 5 begins by describing how teachers can search for existing scenarios and their learning resources on the Organic.Edunet Web portal and then it presents some short descriptions of additional scenarios for stimulating teachers' curiosity and interest for current and future practices. Finally, Chapter 6 proposes a strategy for enabling the adaptation of existing learning scenarios to a new context.

1 www.organic-edunet.eu

Chapter 1: What is a scenario, and why take it into use?

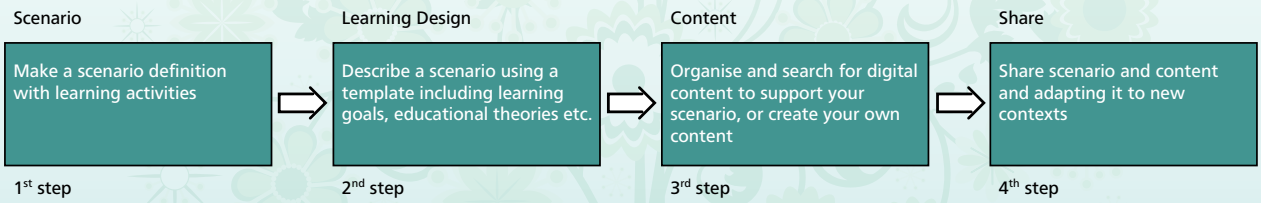
In the context of education for organic agriculture we have developed a very specific set of methods and approaches for learning. That is why an educational scenario, as we understand it, describes educational activities, where the focus and starting point is a real life situation and not a theory. It refers to learning goals within a topic, and more specifically suggests learning activities, use of resources, and may also discuss the role of participating actors.

In a scenario you first learn about water by visiting a river, not by reading a book.

The scenario may be an idea that has already been developed and evaluated and found to be successful or a new idea that is being formed and prepared for implementation. In the context of this handbook, a scenario is a description of a more structured process and set of activities – with guidelines on how to implement the scenario into your own teaching practice.
This handbook strives to emphasize new pedagogical strategies, active learning outside the classroom and show how you can access high quality learning material through the Organic.Edunet Web portal.

Aim of this handbook is to present some of the experiences and suggestions on how to include or improve teaching in OA/AE at school level.

The proposition of a scenario is the first step. In this handbook, a scenario is simply a description of a subject or activity of how to implement OA/AE in school curriculum, educational programme or in specific subjects. New pedagogical strategies and access to high quality learning material through the Organic. Edunet are also considered in this step. Teachers then, describe and adjust their learning scenario using a template provided in annex 1. We consider this as the second step.



At the third step, the teachers are introduced to how to organise, search and enrich their own content, or content that they have identified and consider useful, with metadata.

At the fourth step (explained in detail in chapter 6) scenarios are adapted, taking particular aspects into consideration, for being able to be reused and shared in different contexts.

A scenario is intended to act as catalysts for discussion, reflection and action with a wide audience of teachers, in-service or pre-service, nationally or internationally (Santoro & Allard, 2008; Snoek, 2003) . It is considered beneficial for teachers to use scenario writing as a tool for becoming more reflective professionals themselves. If they gladly share these scenarios they start to feel being part of a learning community of teacher Educators" (Cautreels 2003). Confronting the challenge of teaching to a professional standard requires competences such as communicating one's pedagogical views to colleagues, making one's own learning process explicit to colleagues and students, being oriented towards the stimulation of systematic reflection, evaluating with colleagues new developments in the field of education and in

the area of teacher education (Koster and Dengerink 2001) . Within the more specific context of OA & AE subjects further objectives are identified in the scope of defining educational scenarios:

- Smoothly integrate OA & AE subjects to school curriculum as effectively as possible
- Ensure transferability of the educational scenarios to other organizations by clarifying aims, methods and outcomes
- Consider science subjects as vehicles of integration, however other subjects should not be excluded
- Consider pedagogical approaches from science education for the pedagogical design of scenarios and activities
- Design the educational activities, planned within the scenarios, to meet the individual educational needs of schools
- Pilot and validate educational activities as case studies of actual educational programs (i.e. activities will be implemented in real condition but will be validated systematically)
- Include one or more aspects of the following in their pedagogical design:
    - Problem-based pedagogical approach to learning
    - Inquiry-based pedagogical approach to learning
    - Resource-based pedagogical approach to learning
    - Student-centred approach to learning recognizing students' contribution
    - Support by ICT in school practice will be provided to learning
    - Learning as active process of discovery
    - Learning based on self-motivation
    - Learning motivated by hands-on activities
    - Learning motivated real life problem solving, contemporary issues envisaging
    - Design educational activities along an investigation of available relevant content in appropriate structure, format and language taking into account parameters such as:
    - age
    - prior knowledge
    - organisation structure with easy to manage and describe units
    - information regarding copyright and authorship
    - portable formats and editable versions

Chapter 2: Why use digital resources?

Today's learning environment puts emphasize on a two-way, interactive learning style with a high degree on the student's self-commitment to learning. Modern view of learning is not about a professor giving "correct" information to the student, but about creating an environment where students and teachers together explore a topic, also related to the personal and social context where the learning takes place.

In this context, finding information or knowledge is a much more participatory or shared activity than before, and the use of internet has dramatically increased the students possibilities for finding information, although not always relevant information. The teacher on the other side, has a great opportunity to explore knowledge outside the walls of the institution, in order to improve his/hers teaching practice.

Digital resources are also easy to share! An old fashioned book can't be shared with 30 others at the same time. A digital resource can easily be copied and shared. This opens a new world of possibilities, but also has its dangers in regard to copyright issues and intellectual rights. This handbook gives you ideas on how to use digital resources, but also how to describe them in order for others to make use of the same resources, including user licenses for further use of a resource.

Managing learning resources is a complex process, involving a number of key elements associated with storing, retrieving and re-using resources. Realising these elements requires teachers to collaborate with technical staff. The expertise to manage electronic resources is being combined with the expertise of learning technologies, educational resources and e-learning interoperability standards.

In support of sharing and re-use of e-learning resources within and across institutions, a number of standard-based methods are being implemented. Learning objects are stored in learning repositories which can support the storage, sharing and re-use of learning resources or learning objects. A repository of learning objects may be based in an institution, or regionally or nationally funded and managed. A more recent development is the concept of peer-to-peer repository networks allowing individuals to share resources held on their own hard drive. One major difference between repositories and traditional digital libraries is the idea that creators and users of resources may deposit materials directly into repositories.

Although, the concept of sharing digital resources is very important for enhancing teaching and learning, there has been a parallel awareness of the importance of learning technology interoperability standards and specifications that are designed to facilitate the description, packaging, sequencing and delivery not only of educational content but also of learning activities and learner information. Learning technology interoperability standards help to ensure that resources are portable – allowing users to move resources between proprietary systems while ensuring that resources will remain accessible as systems and platforms change; as well as to tailor resources to meet their own requirements and those of their learners. A wide variety of international bodies and consortia are currently involved in the development of learning technology interoperability standards and specifications. The IMS Global Learning Consortium is the most common in producing common standards and specifications that facilitate interoperability in many areas on online education and training. What would be important though is a partnership between researchers and teachers in order to formulate pedagogically enriched models for re-use of learning objects. Such partnerships are crucial if we are to build a solid framework of how people conceive of digital content.

Chapter 3: Design a scenario

3.1 Educational scenarios expressed through a narrative

An educational scenario is a less formal description of an educational experience which usually includes a reference to the classroom objectives and topics, lists specific learning activities and use of resources, and may also discuss the role of participating actors that is what the teacher and students do during an activity. The scenario may be an idea that has already been developed and evaluated and found to be successful or a new idea that is being formed and prepared for implementation. Reading the one to few paragraphs of an educational scenario should trigger the interest and curiosity of other teachers, or other stakeholders involved in the educational practice, to find out more about how the scenario is implemented, the educational outcomes and maybe motivate the undertaking of a similar project. Presenting a scenario should in general stimulate and develop reflection for current and future practices. In the context of this handbook, the scenario is a first, non formal description, of a more structured process and set of activities that are being defined during the later stages of learning design and content enrichment.

3.2 Scenario specification with definition of learning activities

Having proposed an education scenario with a narrative the teacher turns to planning the learning activities that will take place over the period of the scenario implementation, and will fulfill the learning objectives. We propose, here, a set of templates in order to define a learning scenario with learning activities in the context of a curriculum area. As illustrated in the following figure (Figure 1), a scenario may consist of one or many learning activities. Scenario and activities refer to the same curriculum area. The focus, here, is mainly on the learning activities that the students will carry out (or have already done) in order to achieve specific learning outcome. A learning activity may refer to the amount of activity that is most convenient to describe, whether this is a 'module', a learning session, or a learning activity within a session. If a range of different e-learning tools and techniques are used over the course of a session, or a range of different outcomes are addressed, then it may be easier to break the session down into smaller activity units and describe these separately.

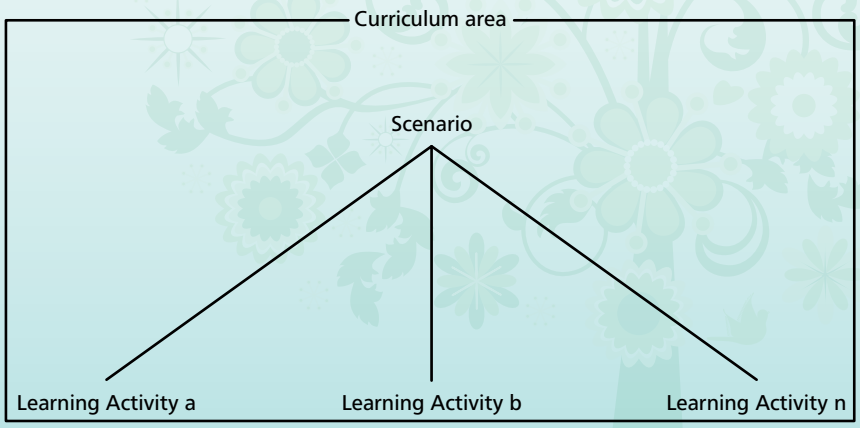


Figure 1. Structure of scenario specification with learning activities within a curriculum area

In the following section, descriptions and examples will be given on how to define a scenario, as those given in the previous section, with the three based templates (shown in the tables bellow).

Template for describing the curriculum area of the scenario

Subject discipline area	
Context / level of study	
Topic domain	
Pre-requisite skills / knowledge	
Pedagogical approach	

Template for describing a scenario

Title of scenario:	
Short description supporting the title:	
Activity or list of related activities:	

Template for describing a learning activity

Learning tasks	
Tools/Resources	
Assessment strategy (Feedback and/or evidence)	
Time allocated	

The proposed templates are based on a simplified version of a JISC template[2] (Beetham and Sharpe 2007) used successfully also in the UNITE IST project to define eLearning scenarios[3]. In these projects, learning activities dealt with combining knowledge from different thematic areas, thinking critically, diagnosing and solving problems, which could be also taken across in the context of OA & AE subjects.

We propose that the process of creating a new learning scenario along with its associated learning activities, described previously, should be created in alignment with a theoretical approach. The following table, based on Conole et al. (2004), presents a way of mapping the main learning theories perspectives with their associated approaches and an indication of their potential application in relation to scenario use. This will assist teachers on creating a new learning scenario that captures a particular theoretical approach as well as describing how this approach is instantiated into actual practice.

2 The JISC template website: http://www.jisc.ac.uk/elp_templates.html
3 http://pedagogy.unite-ist.org/repository/1/userfiles/documents/UNITE_D5.2Handbook-contentDevelopment.pdf

Theories	Approach	Main characteristics	Potential applications in relation to scenario use
Behaviourist	-Behaviourism -Instructional Design -Intelligent tutoring -Didactic -Training needs analysis	-Focuses on behaviour modification via stimulus-response pairs, controlled and adaptive response and observable outcomes -Trial and error learning	-Transfer of didactic approaches online, the scenarios are linked directly to assessment and feedback. -Uploading learning material – no relationship with learning scenario and/or learning activities (content-based approach)
Cognitive	-Reflective practitioner -Learner-centred	-Pedagogical focus is on the processing and transmission of information through communication, explanation, contrast and problem solving -Useful for designing sequences of conceptual material that build on existing information structures	-design of learning scenarios that present facts and teachers' knowledge for understanding basic concepts. -scenarios provide explanations to certain phenomena and encourage opportunities for debates. -activities which include scaffolding mechanisms –where teacher has the main responsibilities for providing guidance.
Cognitive Constructivism	-Active learning -Enquiry-led -Problem-based -Goal-based -Cognitive apprenticeship -Constructivist-based design	-learners build their own mental structures when interacting with an environment -task-orientated, favour hands-on, self-directed activities orientated towards design and discovery	-useful for designing scenarios for self-directed activities. -scenarios may include tasks that guide and inform users through a structured process for embedding and enabling constructivist principles
Social Constructivism	-Dialogic -Argumentation	-Emphasis on interpersonal relationships involving imitation and modelling -Joint construction of knowledge	-potential for new forms of communities of practice or facilities to support and enhance existing communities. -scenarios should offer opportunities for interaction and collaboration between teachers and students.
Experiential	-Experiential learning -Action-based -Problem-based -Enquiry-led	-Experience as foundation for learning -Learning as a transformation of experience into knowledge, skill, attitudes, values and emotions -Problem-based learning is the focus -Theory formation and test in practice.	-scenarios that offer increased opportunities for reflection hence opportunities for problem situation, identification and definition. -scenarios that involve different tasks for students to do that are based on prior knowledge acquired from previous activities.
Activity-based	-Activity-based -Systems thinking	-Focus on the structures of activities as historically constituted entities -bridging the gap between historical state of an activity and the developmental stage of a person with respect to that activity	-designing scenarios in response to both discursive and active feedback. . -scenarios that involve activities that encourage collaborative processes, negotiation of different approaches and co-ordination of actions between groups.

3.3 Organic.Edunet proposed templates

We propose to redefine a learning scenario with attributes that refer to a) the structure of the scenario – simple or composite scenario – b) the curriculum area and c) the learning activities. Depending on the educational objectives and needs a scenario may consist of one (simple scenario) or more activities (composite scenario).

Structure

Example of simple scenario*

Field	What to put here	Example
Title	Provide a working title (maximum 15 words)	A study visit to an organic garden and/or a botanic garden
Short description supporting the title	Describe the scenario with a fe w words so that the reader's understanding of the title is deepened.	Children will be encouraged to take interviews of key figures of the site and also photos and videos. When they will return to the school this information will be analyzed, discussed and considered thoroughly.
Activities	A simple scenario may consist of maximum one activity. In this case the title of the activity coincides in this case with the title of the scenario.	Activity: A study visit to an organic garden and/or a botanic garden

Example of composite scenario*

Field	What to put here	Example
Title	Provide a working title (maximum 15 words)	An organic garden coming into being.
Short description supporting the title	Describe the scenario with a few words so that the reader's understanding of the title is deepened.	Students participating in this scenario will be involved in organic gardening practices and experiences on cultivating plants organically. Teaching and learning activities will include investigations, experimentation and inquiry-based activities, constructions, field trips and open exhibitions. The teaching content will cover areas such as the life of plants and their main functions, growing plants organically from seed-plants, studying the soil and making compost.
Activities	A scenario may consist of a series of learning activities which can be simple scenarios on its own. The activities of a composite scenario can be presented with or without a suggested order.	Activities of the composite scenario "An organic garden coming into being": **Activity 1:** Planning of gardening activities and forming of working groups **Activity 2:** Studying the garden soil and start thinking organically **Activity 3:** A study visit to an organic garden and/or a botanic garden **Activity 4:** Growing seeds in seed-starting pots and trays **Activity 5:** Putting young plants in raised beds **Activity 6:** Nurturing the plants and keeping them healthy **Activity 7:** Constructing greenhouses out of PVC pipes in the garden **Activity 8:** Studying decomposition columns made out of plastic bottles **Activity 9:** Building a compost chamber and compost heaps **Activity 10:** Harvesting the crop and cooking for healthy nutrition (Activities 1, 3 and 7 are explained in detail in the following section)

** The content of the scenario examples (simple and composite) entitled "An Organic Garden Coming into Being" is provided by Mr. Nektarios Tsagliotis (ntsag@edc.uoc.gr), Head of the Laboratory for Primary Science at the 9th Primary School of Rethimno, Crete.*

Curriculum area

For each educational scenario a description that refers to curriculum parameters is suggested. This will help teachers and other stakeholders, who will later take on the task of enhancing content with metadata, to think about how content can be described with metadata

Curriculum area for the scenario: An organic garden coming into being.

Field	What to put here	Example
Subject discipline area	Description of subject	Many curriculum areas can be covered within the thematic framework of an "organic school garden". Science, ecology and environmental education, technology and crafts, mathematics, ICT, as well as language, history, geography and social studies, nutrition and physical education. Many of the designed activities are inter-curricular and integrated within a framework of formal, non-formal and informal educational settings.
Context / level of study	Context and/or level may be used as appropriate. For example: primary education, secondary education, sixth form college	This scenario is prepared for children of the 6th grade of the primary school (11-12 year-olds).. By designing, cultivating, and harvesting organic school gardens, children experience deeper understanding of natural systems and ecosystems and become better stewards of the earth.
Topic domain	A phrase to describe the content of this specific unit of learning, whether a whole module, a learning session, or a single activity within a learning session. Where there is a subject-specific controlled vocabulary for topic areas, or a curriculum list approved by a professional or educational body, use items from this list if possible.	The following topics are to be integrated in the scenario: The life of plants and their main functions, growing plants organically from seed-plants in containers and greenhouses to raised bed organic gardening. Organic treatment of plant diseases collection of vegetables and seasonal fruits and healthy eating habits. Preserving the food with solar dryers etc. Sharing information over the internet and through the "Organic.Edunet" portal.
Pre-requisite skills / knowledge	Skills, not necessarily formally assessed, that learners should have before embarking on this unit of study. For example: Communication Information and communication technologies Improving own learning and performance Solving problems Working with people	Internet basics and research engines skills, producing posters and charts, group work and basic social skills, presentation skills, basic construction skills and handling of simple tools, basic knowledge of English in order to be able to understand simple texts.
Pedagogical approach	Brief description of the general pedagogical approach that will inform practice in the scenario outline in the following section (activities)	As this is a composite scenario many pedagogical approaches will be implemented; problem-based learning in construction, inquiry based learning during basic experiments, situated learning through authentic settings, collaborative learning, resource-based learning

Learning activities

We propose a template with the following categories.

Field	What to put here
Learning objectives/outcomes	These should be stated in terms of one of the four categories: knowledge (facts), understanding (concepts), skills and attitudes/values.
Tools/Resources	Any physical/virtual tool (hardware, software) or resource (e.g. textbook) can be specified here. E-/M-learning resources in particular should be described in some detail.
Assessment strategy (Feedback and/or evidence)	With an emphasis on formative assessment key activities should be selected. Assessment strategies might include peer-commentary, the use of e-portfolios, self generated success criteria, photographic records.
Time allocated	The number of hours dedicated for the delivery of the activity. Reference to preparation time for the students may also be mentioned here.

Here are some of the learning activities from the scenario "An organic garden coming into being"

Activity 1: Planning of gardening activities and forming of working groups

Learning tasks/activities	Brainstorming in the classroom with designs and diagrams on the white board and/or on paper in order to identify children's ideas and preferences about gardening and organic gardening products and options. Students start forming groups and start having ideas of investigation. They discuss their assistance resources from other teachers, parents and/or experts. Groups of volunteers formulate to support the gardening projects.
Learning objectives/ outcome(s)	To identify children's ideas and preferences and put them down in writing. To examine pupils' interests on organic gardening and explore possible expressions of those interests. To establish groups of pupils for further project work and supporting groups of volunteers (teachers, parents, experts etc.).
Tools/Resources	Pen and paper work, spider diagrams, garden designs to briefly identify aspects of the course and the undergoing scenario on organic gardening. Newspaper articles and advertisements of organic products on the clipboard s for reading and further elaboration. Projection of video clips to motivate initial discussions.
Assessment strategy (Feedback and/or evidence)	Informal feedback through classroom discussion and a second, reflective look at the spider diagrams, with possible additions and/or alterations.
Time allocated	A double session (two consequent teaching hours 45' each, a total of 90').

Activity 3: A study visit to an organic garden and/or a botanic garden

Learning tasks/activities	Students will plan an on-site visit to an organic garden and/or a botanic garden. They are encouraged to take interviews of key figures of the site and also photos and videos. When back in School all this information will be analyzed, discussed and considered thoroughly.
Learning objectives/ outcome(s)	To encounter a first-hand experience of an organic garden, confront the difficulties and asses the benefits of such a practice. To take interviews and ask informative questions to obtain project related information. To collect photos and videos and extract information out of the depicting images.
Tools/Resources	Tape recorders, digital photograph cameras and video cameras, notebooks.
Assessment strategy (Feedback and/or evidence)	Start a dynamic, on-going concept map to include acquired information and transform it as the information load increases and new links are formed between concepts and well as cross-links between clusters of concepts in order to enhance meaningful learning. This concept map will develop during the course of the project as additional concepts and/or clusters will be added and modified (suggestion of use : www.lamsinternational.com).
Time allocated	A whole morning session for the on-site study visit(s) and a double session (two consequent teaching hours 45' each, a total of 90') in the School for elaboration of information and further development.

Activity 7: Constructing greenhouses out of PVC pipes in the garden

Learning tasks/activities  	After having elaborated the concept of the greenhouse effect on the models, the construction of one or two greenhouses in the school garden may follow. These greenhouses are to be built with readily available materials like PVC pipes and various joints and greenhouse plastic films. There are several available designs on the internet (cf. URL: < *http://www.pvcplans.com/* >), such as tunnel greenhouses (see side drawing), house-like with Λ roof greenhouses etc. Alternatively, readymade greenhouses either plastic and/or metallic can be bought and assembled. Such greenhouses are available in various sizes from many companies around the world. Plastic ones appear very attractive and safe for children since they use polypropylene synthetic material instead of glass and also come with a built-in ventilation system (e.g. URL: < *http://outstanding-keter.co.il/GreenHouses.asp* >). Many groups of children can work successively with the help of supporters and volunteers until the construction of the project is done and the greenhouses are ready for housing the plants in the school garden.
Learning objectives/ outcome(s)	To experience the construction of an educational greenhouse in the school garden made of common materials. To be able to read designs and plans and follow basic instructions and safety rules in the development of simple and low technology projects. To manipulate safely simple tools and achieve simple construction arrangements. To enhance a sense of ownership of project constructions i.e. greenhouses in order to increase commitment of stewardship in action.
Tools/Resources	Greenhouse designs, available construction materials (PVC tubes, joints, plastic film) and basic tools. A worksheet of the applied construction for dissemination on the "Organic.Edunet" portal and further use by partners.
Assessment strategy (Feedback and/or evidence)	Development of problem solving skills and creative planning as a reflective practice during the construction and on the construction. Feedback from peers and supporters during the construction and through relevant discussions.
Time allocated	Groups of pupils may work on the construction during technology and crafts hours or in the "zone of flexible activities" and/or in the afternoon sessions. Preparation of materials and infrastructure can be taken care of by supporters, local community members and volunteers after school time or during afternoon sessions.

In the context of the 'Organic garden coming into being' scenario each corresponding activity could be designed based on a particular pedagogical approach (described above) in relation to the objectives of the particular learning activity. For example, Activity 1 'Planning of gardening activities and forming working groups' could be realised by adopting a dialogic and/or an argumentation approach based on the social constructivist theory. In particular, the teacher may initiate discussions in order to make explicit students' ideas about gardening and organic gardens while at the same time social interactions are taken into account for the formation of groups. In Activity 3, 'A study visit to an organic garden or a botanic garden', learning may be perceived as the transformation of experience into knowledge, skill, attitudes, values and emotions. Students are also encouraged to plan a visit to an organic garden, take interviews from key figures for experiencing the problems and issues that may arise. This is particularly important for problem situation, identification and definition. Activity 7, 'Constructing a green house out of PVC pipes in the garden' could be perceived as active or goal-based learning where the focus is on the process by which learners build their own mental structures when they build the greenhouse.

Chapter 4: Technical information

There is a wide variety of ICT tools that may be used to support the implementation of the learning activities. Despite this, the range of learning activities that are underpinned by specific pedagogical approaches (i.e. problem and inquiry based scenarios, experiential learning, situated learning) and innovative use of ICT tools is limited, may suggest that teachers are overwhelmed by the plethora of choices and may lack the necessary skills to make informed choices about how to exploit these theories in practice.

Different philosophical traditions had a profound effect on the design of curricula. In relation to technology, curriculum planning has traditionally focused on how best to organise and present content. This makes the role of technology in designing for learning particularly complicated. A technological tool may be treated as a mechanism for delivery, as a resource, as part of pedagogy or of administrative management. The creation of learning communities and virtual learning environments may be regarded as effective strategies to enable knowledge sharing and to encourage learning embedded in authentic activities. In addition, the utilisation of curriculum design models that are inquiry-based, project-orientated or collaborative have become more widespread in order to situate real-life examples within educational contexts.

Recent years have witnessed the emergence of software specifically intended to support teacher to create, share and re-purpose representations of designs for learning. The need to support learning design may be as basic as the need to organise content found from searching and browsing. Such content could be simply organised in folders and shared with other teachers. In the second annex, we propose some additional tools that may help the teacher to design in a diagrammatic form a learning scenario and its associated learning activities (see Annex 2)

4.1 Searching for learning resources

Information-seeking and literacy skills are increasingly important for both student and teacher success. There is a lot of great material on the web - primary sources, specialized directories and databases, statistical information, educational sites on many levels, policy, opinion of all kinds, and so much more. The tools for finding it are steadily improving. Currently, searching techniques are developed to help the learners as well as teachers to find information in the World Wide Web. Nevertheless, the users can be confused with search results due to irrelevant information, misinformation, insufficient information, etc.

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The OrganicEdunet portal

http://portal.organicedunet.eu/

The Organic.Edunet Web portal provides access to a federation of several learning repositories that have multilingual, quality-certified content related to the general topic areas of Organic Agriculture and Agroecology. It aims to serve as a single-point of access for searching, finding, reviewing, and accessing digital educational resources around the topics of interest.

Several organisations have connected their institutional collections with the federation, allowing their content to be searchable through the Organic.Edunet Web portal. In addition, a number of user communities that are creating, sharing, and exchanging educational resources on Organic Agriculture, Agroecology or relevant topics, have been facilitated by the Organic.Edunet software tools and made their content also searchable through this portal.

Today, the Organic.Edunet Web portal provides access to more than 3000 resources, from over 15 institutional collections and 2 user communities.

How to use the Organic.Edunet Web portal

The Organic.Edunet portal harvests resources from a wide range of digital repositories around Europe and the rest of the world. The portal provides five types of search mechanisms:

1. **Text-based search: Search for keywords.**
   This is the traditional search mechanism where you write a keyword and search for resources with this keyword in its title, short description or keyword fields. You may limit down the results by filtering the hits according to Resource Type, Language or Educational Level.
2. **Semantic search: Search for pre-defined concepts.**
   This is a new type of search where you search for pre-defined concepts. Each resource is tagged with one or more concepts, describing the content of the resource. Since these concepts are pre-defined (ontology), you may search for concepts in any of the languages the portal offers. For a more elaborated search, you may define a number of concepts from the ontology, and ask for resources that are related to them.
3. **Browse:**
   This is a simple search mechanism which allows you to browse through the educational resources according to Resource Type, Educational Level or Institutional collection
4. **Concept cloud:**
   A floating cloud presents all the tags given by users of the portal. The concepts most used are displayed with large fonts. Click on your desired concept and get your results.
5. **Search for educational scenarios:**
   The Organic.Edunet consortium and other content providers have also provided educational scenarios – activities or set of activities with additional learning resources. You may look for scenario topics of your interest, and find the scenario description and supporting learning resources for each scenario.

You can read more about the search mechanisms and how to use them on the Organic.Edunet Web portal. You will also find video-clips to describe the use of the portal and search mechanisms.

4.2 Create your own electronic portfolio

Confolio

In order to get an overview of how content is integrated in the Organic.Edunet repositories by a user we will present Confolio, a web-based tool for "uploading", sharing and describing content with metadata. The Confolio tools are freely available to users who would like to join a community of users and contribute with content to one of the repositories.

In short, the Confolio-tool enables you to:

- Upload your own digital resources, such as pdf-files, word-documents, pictures, movies, links etc into a repository.
- Describe the resources with metadata, also giving them licenses for further use.
- Use the Confolio within a network to build up personal folders with content, folders for courses, institutions etc, and share them with others within the network.
- Eventually allowing the Organic.Edunet portal to harvest information from your repository making it possible to search for your content through the search mechanisms of the Organic.Edunet portal.

You can read more about Confolio as a tool, and how to use it on the Organic.Edunet Web portal. Here you will also find an instructional video about the Confolio tool.

4.3 Annotate resources

The need for describing resources (=metadata) and validating this process is at the cornerstone of this Organic.Edunet initiative. Aim of the project is that the content providers (e.g. publishers, librarians, representatives of international organisations) as well as end users (mainly school and university teachers) define this content with a metadata set of terms (vocabulary), that is commonly developed and agreed upon (Application Profile for Organic.Edunet content), and is in compliance with existing standards (IEEE Learning Object Metadata (LOM). The Confolio is also an electronic portfolio system that allows the management of content in the online learning repositories of the Organic.Edunet project, as well as sharing content within a network.

In order to describe and categorize the content in the repositories a semantically rich and multilingual set of metadata is being defined. The Organic.Edunet Metadata consists of mandatory fields such as title, description of resource, language of resource, resource type, and copyright information. There are also recommended fields that contribute to enriching the resources with information on the end user role, the age range, the context, the format and the ontology. In order to facilitate the search mechanism (semantic search) in the Organic.Edunet Web portal, content needs to be annotated manually with terms of the Organic.Edunet concepts (ontology). This is based on existing and enhanced vocabularies related to Organic Agriculture and Agroecology. A very important metadata field is license, where the content provider (author) gives a license for further use of the content. This could be a pre-defined license from Creative Commons, or a self-constructed license.

As users, we can publish content in the Organic.Edunet Web portal as long as it is described according to multilingual, standard-complying, metadata, is of good quality and validated according to given criteria. By users, in the context of the current handbook, we refer mainly to teachers of any educational level. These are expected to be teachers who would like to contribute their content, which they have either found from other resources and considered to be useful in their own teaching practice or have generated themselves. The content that teachers contribute – taking briefly the role of content providers – will then be possible to be retrieved from the Organic.Edunet Web portal. As a community of users, for example the Greek Rural Schools' User Community, they are creating their own learning repository, populating it with content, publishing it online and connecting it to the Organic.Edunet federation of repositories. A

learning repository is a collection of digital content resources or learning objects provided by the content providers, i.e. international organisations, private publishers, organic agriculture teachers or compulsory education teachers.
As individual users we can join one of the existing communities of school or university teachers such as the AGROASIS user Community, the community of Nordic university teachers of Organic Agriculture and the Austrian Schools' User Community, the community of Austrian teachers using the existing portals offered to Austrian schools by the Ministry of Education.
In order to get an overview of how content is integrated in the Organic.Edunet repositories by a user we will present Confolio, a suite of web-based tools for "uploading" and managing content, annotating content with metadata and for reviewing and validating content. The following page will serve as a point of reference to illustrate this overview. It describes three levels of user involvement with content: content search and retrieval, content annotation with metadata, and management of content repositories. In the background of each level a screen shot is inserted. We notice that for content search and retrieval we refer to the Organic.Edunet Web portal while for the other two levels we refer to the Confolio that we will present in this section.

The Confolio suite of tools supports the process of repository formulation, content annotation with metadata and review and validation of content annotation. The Confolio tools are freely available to users who would like to join a community of users and contribute with content to one of the repositories. Using Confolio, Organic.Edunet content providers as well as users, may collect resources, annotate them using metadata conforming to the developed application profile, reviewing and approving resources, and then releasing resources for publication.

The need for assigning metadata to content and validating this process is at the cornerstone of this Organic.Edunet initiative. Aim of the project is that the content providers (e.g. publishers, librarians, representatives of international organisations) as well as end users (mainly school and university teachers) define this content with a metadata set of terms (vocabulary), that is commonly developed and agreed (Application Profile for Organic.Edunet content) and is in compliance with existing standards (IEEE Learning Object Metadata (LOM)). An annotation tool, part of the Confolio tools, prompts the users to assign metadata to learning content, such as files, text and multimedia files, websites, and web addresses. The Confolio is also an electronic portfolio system that allows the management of content in the online learning repositories of the Organic.Edunet project.

In order to describe and categorise the content in the repositories a semantically rich and multilingual set of metadata is being defined. The Organic.Edunet Metadata consists of mandatory fields such as title, description of resource, language of resource, resource type, and copyright information. There are also recommended fields that contribute to enriching the resources with information on the end user role, the age range, the context, the format and the ontology. In order to facilitate the search mechanism (semantic search) in the Organic.Edunet Web portal, content needs to be annotated manually with terms of the Organic.Edunet ontology. This is based on existing and enhanced vocabularies related to Organic Agriculture and Agroecology.

Currently most of the content in the federation is harvested form external resources. These are resources already annotated with metadata which can be automatically (through a specially scripted interface) integrated in the federation. The metadata of the harvested resources can be looked at, modified and extended in Confolio. However, smaller organizations, such as schools and universities, can include their content manualy. In this case we can distinguish two possibilities.

- Annotation only: this is the case when just metadata is used to describe a resource, but no file with additional content is uploaded.
- Upload of a file and annotating with metadata: when a file (e.g. a PDF) with learning content is up-

loaded and provided with descriptive information (metadata).

We will describe here the process of manual input of resources in the federation of the repositories through the Confolio suite of web-based tools. We only give a short presentation, here, while a more elaborated presentation is given in the Confolio documentation.

4.4 Document results of activity

Outcomes of your activities may be uploaded and stored in your electronic portfolio, and if possible (as through the Confolio tool), shared with others as well. Outcomes may be student's presentations, results from excursions, assignments, thesis, pictures, demonstrational guides, movies etc.

Why document results?

From a teacher's point of view, storing of results from your activities over years can give you a good picture of how the students' knowledge, or your teaching field, is developing. This may become a good basis for revising your courses or teaching practice.
If you choose to share the resources with others (students, network, or fully open through the Organic. Edunet portal or other web sites), you participate in a global network of exchanging information, based on modern technology, enabling all people to access information and knowledge.

4.5 Share your resources

This chapter will explain how you can share your resources for a specific scenario; an already existing scenario or a new one which you have developed yourself. The sharing takes place by using the Confolio tool, describing the resources with metadata. Over time, scenarios may be supported with a high number of resources from a wide range of countries and institutions, and in a wide range of languages.

Make new scenarios or contribute to existing ones

In chapter five you will find 8 scenarios with descriptions, provided by institutions in the Organic.Edunet federation. You have however the opportunity to create your own scenario (based on this handbook) with related learning resources, or to contribute with learning resources to already existing scenarios. In order to do this, you need to have access to Confolio (as affiliated partner of the Organic.Edunet federation, see 4.1 and 4.2.1).

a) Contribute with learning resources to an existing scenario

- Upload the resource in Confolio
- Fill in "Scenario" in a keyword metadata-field (and choose "English" as "Language")
- Fill in the scenario title (eg: Reflection sessions) in a keyword metadata-filed (and choose "English" as "Language")
- Optional: If you want to visualize that the content is from your institution, you may fill in "scenario title + (institution)" in the keyword metadata-field (eg: "Organic Farming (EA))

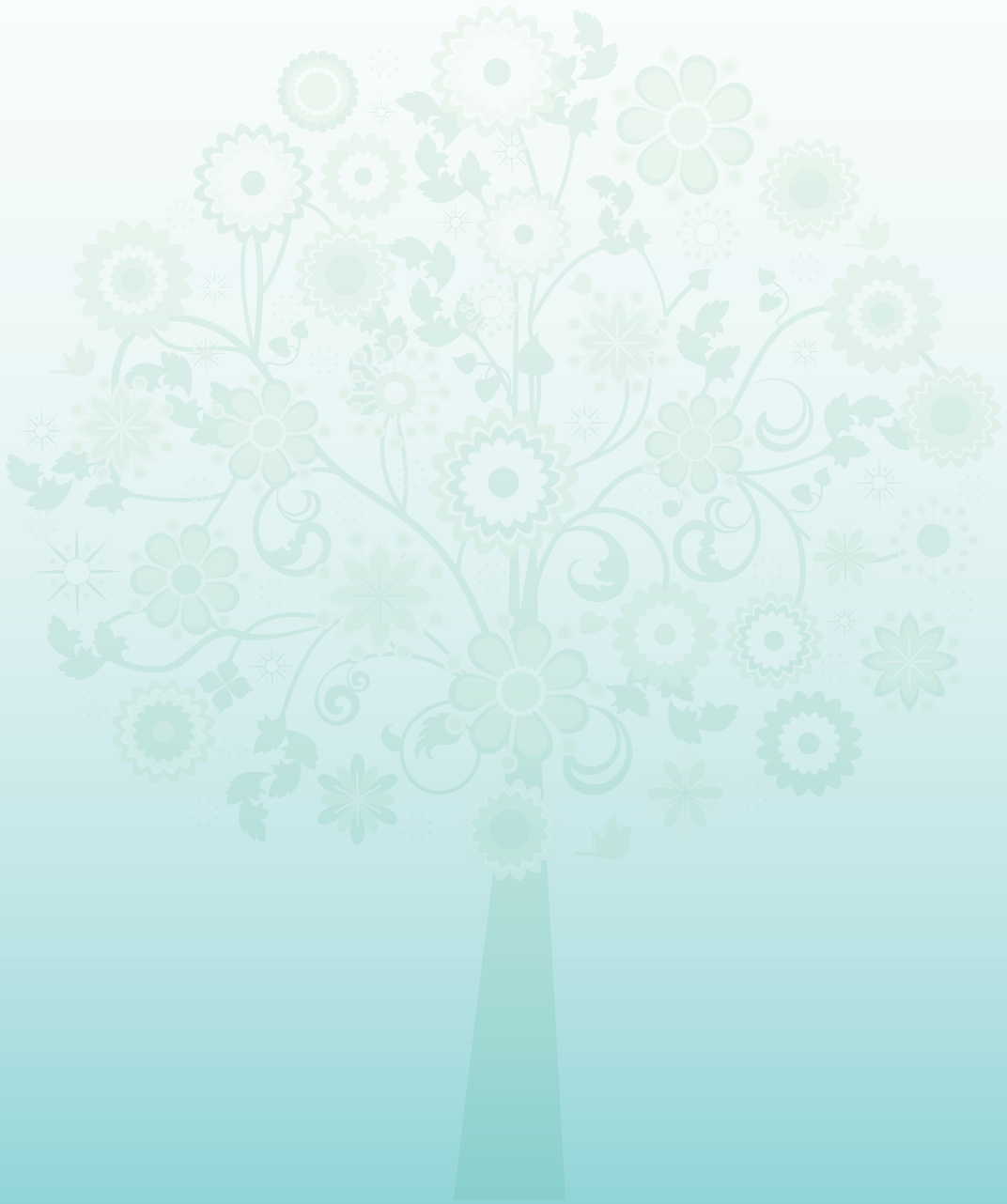
Explanation: The search mechanism called "Search for educational scenarios" is retrieving resources only annotated with "Scenario" in the keyword metadata-field. By adding a new keyword with the scenario title you link the resource to other resources designed for the same scenario.

b) Create new scenario with additional learning resources

- Upload the resources in Confolio

- Fill in “Scenario” in a keyword metadata-field (and choose “English” as “Language”) for each resource
- Fill in the scenario title+ institution (eg: Organic Farming (EA)) in a keyword metadata-filed (and choose “English” as “Language”)
- The scenario description document must be titled: “Scenario description + topic + (institution)” (eg: “Scenario description Organic Farming (EA)).

Explanation: The search mechanism called “Search for educational scenarios” is retrieving resources only annotated with “Scenario” in the keyword metadata-field. By adding a scenario title and your institutional name in the keyword end users may find your resources. They have the opportunity to search for “Exact phrase”, and this functionality makes it possible for end users to find your resources only.



Chapter 5: Short descriptions of existing scenarios

The Organic.Edunet federation has developed 6 scenarios at school level, which are briefly presented in this chapter. Adopting the narrative style is done in different ways. Some adopt a more formal description than others. Some are more specific with regards to activities. As already mentioned it is important to trigger interest and curiosity as well as stimulate reflection for current and future practices. It is believed that these elements, interest, curiosity and reflection will be instantiated throughout the implementation of the scenario.

The scenarios have more or less a basis in a specific context (course, country), but our hope and main idea behind the scenarios, are that they can awake interest in using the existing scenarios (although developing them to fit your own learning context), or be inspirational examples for designing new scenarios.

In the menu-point "Educational scenarios" on the Organic.Edunet Web portal (http://portal.organicedunet.eu) you may search for scenarios and their resources in different ways:

1. Find the handbooks for scenario implementation at school level and university level
2. Search for the existing scenarios (Scenario description documents) provided by the consortium and others
3. Search for existing scenarios provided by the consortium, both on school level and university level. This search provides you with both scenario descriptions and the additional resources attached to each scenario
4. Search for additional scenarios and their resources by keyword search

Eg: You want to search for scenario resources on "Organic Farming". Type "organic" in the keyword field and see if there are any resources designed for scenarios on the topic "organic farming"

5.2. Existing scenarios with short description

A short description of the six scenarios provided by the Organic.Edunet federation is presented below. If you want to have a more detailed description of the scenarios, included learning resources attached to them, please search for them on the Organic.Edunet Web portal (by following the instructions in chapter 5.1) Your search will result in a list of resources, one of them called "Scenario description <scenario title>" which is the main document describing the scenario.

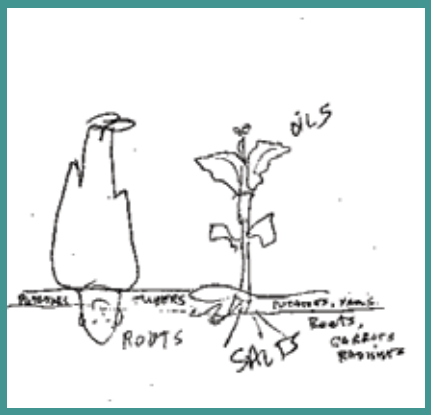
An organic garden coming into being

Do you remember the first time you planted lentil seeds on a bed of cotton? How about the first time you tasted a fresh homegrown tomato? Children like to play in the mud, hide in the bushes, and catch bugs. Grown ups like to pride themselves about their perfect grass and roses. Gardens are in general well received by everybody. Thanks to our school's administration initiative since the end of last school year we have access to a space in the surround ing area of our school where we can start an organic garden. Two of us teachers got excited and are looking forward to get involved in the project. The corners of our garden will become living spaces for students to learn, discover, and use their imagination. Gardening can be extremely effective and fun for teaching many different subjects, including history, art, science, math, geography, geology. The space that we are given is small but has many possibilities to become a brilliant organic garden. We, including our students, have already big plans, ideas and a lot of enthusiasm. We have arranged with our students to visit a nearby organic vineyard. We heard and read about the producer in the papers and we are looking forward to meet him. Meanwhile, we are discussing about the design of the garden, the choice of plants and the appropriate location for planting them. Making our own compost is another important project to discuss. As the winter is coming closer we also plan to construct a greenhouse. If our harvesting season is successful we will give away our organic products during our school annual bazaar just before the end of the school year.

Educational level: Primary and secondary
Topic: Organic garden
Scenario provider: EA (Kostas Tassis) Email: (tassis@ea.gr)
Search keyword: Organic garden (EA)

Visit to an organic vineyard and winery

Enthusiasm is contagious and we were lucky to meet Mr Georgas, an enthusiastic wine producer in Spata, near Athens. Spata is part of Mesogaia, situated in Attika's eastern plain, which has for generations been a principal wine source for Athenians. It is surrounded by mountains and has a good climate, appropriate for viticulture.



Mr Georgas attracted the students' attention by comparing the vine plant to a living organism that has its head, the route system, in the soil and its body and sensors above the soil, the leaf and branches. The more nutrients and creatures exist near the routes, the happier the plants are. Vines sense the environment and climate conditions through their leaves. Students were gradually introduced to the nature of vines and the physiology of the plant.

To understand organic viticulture students were exposed to a direct comparison of the conventional and organic vineyards.
Through dialogue and questions the students draw conclusions regarding the presence and usefulness of flowers, and others small plants, which in a conventional vineyards would be considered pests and harmful weeds. It became evident to them that in the organic vineyards the weeds, the flowers, and other little plants, protect the vine plant by creating a complete ecosystem, keeping the life of the plant balanced, and nurturing its soil with rich ingredients. The presence of certain insects that are attracted by specific weeds and flowers repel other insects and organism that would otherwise harm the vine.
Mr Georgras drew his students attention to a very illustrative comparison of conventional (to the left) and organic (to the right) soil, as he took and compare a handful of soil from the two vineyards. He asked the students what soil they would use for the pots at home. Most of the students pointed to the conventional soil. The difference (or even misconception) was clarified by reference to the richness of the soil, the presence of live organism, and recycled matter. The visit ended at the winery, where the students were shown how wine is produced, bottled and packaged.

Educational level:	**Primary and Secondary**
Topic:	**vine production**
Scenario provider:	**EA (Kostas Tassis)**
Email:	**tassis@ea.gr**
Search keyword:	**Organic vineyard (EA)**

Comparing Organic and conventional farming

("Alles Bio - oda was ?")
The scenario starts with excursions to farmers in the surrounding of the school: students are divided in 2 groups: one group visits an "Organic Farmer", the other group goes to a "Conventional Farmer". During these excursions students are informed about the different methods of farming.

In the next step students purchase products of different origin, taste them and perform simple chemical tests to compare differences in price, taste and ingredients. They are taught to perform simple tests in the laboratory of the chemical department.

After these activities students interview people on the street in order to find out about people's knowledge and opinions about "organic food". Students use the Learning Management System "Moodle" as means of communication cooperation between students in groups and teachers.

During the next activity each group has the possibility to cook different meals, using conventionally produced or organically grown products. Students learn the basics of nutritional science and domestic economy in their follow-up activities: selecting recipes, cooking meals and finally tasting the different dishes.

In a next step students produce a small booklet about the entire project thus learning the basics of how to publish the results of a project. They make themselves familiar with various computer programmes and learn the basic principles of good layout.

In the final phase of the project students present their work on the internet and distribute their brochure for a voluntary donation to locals at the market place in Schwechat and visitors of the end of the school year ceremony.

Educational level:	Primary and secondary
Topic:	Organic and conventional comparison
Scenario provider:	BG/BRG Schwechat (Angelica Janseen)
Email:	angelika.janssen@tele2.at
Search keyword:	Comparing organic farming(BG/BRG Schwechat)

Compost – in the cycle of nature

The topic of composting shall serve as an example to make pupils familiar with natural cycles. From knowledge to action the programme aims at raising awareness for waste separation, recycling in general and the use of compost in organic farming and its importance for organic farming in particular.

Students will set up a heap in the school garden, take care of it (watering, shifting) and document the development processes (temperature development, humidity content, mass decomposition, determination of reducing agents) the compost container can be constructed by the pupils themselves (handicrafts) or the purchase can be organised. A survey among acquaintances whether composting of green cut and organic waste is considered to be useful constitutes another aspect of this instruction scenario. This project can be concluded by a visit of a compositing plant, preferably on an organic farm.

Educational level: Primary and secondary
Topic: Compost
Scenario provider: BMLFUW, (Christian Wagner)
Email: Christiane.WAGNER-ALT@lebensministerium.at
Search keyword: Compost (BMLFUW)

From the seed to delight

Delight in the cycle of nature – bread has been considered to be the most important basic foodstuff for millenniums and should serve here as an example and as a model to illustrate the modern food chain for human beings.
Organising an excursion – maybe at two or three different dates in order to be able to observe the stages of growth on the field – or children, who live in the countryside take pictures for the other pupils. Asking elderly people to tell stories about bread baking in former times – what do the grandparents tell about the topic of bread from their childhood, what do the parents tell? Where was the bread bought? etc. (inviting persons to school to tell about this topic). Translating Latin stories on the topic of bread. Including examples from plant growing in mathematics instruction (e.g. how many grains develop from one grain in x years); visiting an organic farmer, baking bread together as a sensual experience in the community.

Educational level:	**Primary and Secondary**
Topic:	**Growing food**
Scenario provider:	**BMLFUW (Christian Wagner)**
E-mail:	**Christiane.WAGNER-ALT@lebensministerium.at**
Search keyword:	**Food chain (BMLFUW)**

Pollution/ Visiting nearby river

Learning activities in the scenario:

- Lesson about pollution topic at school
- Visiting nearby river
- Filling worksheets with exercises about the pollution
- Searching information about the pollution and making conclusions
- Using Organic.Edunet website and other places to collect information about the topic
- Writing a story/essay or making posters with the group about the topic
- Sharing information with the others
- Exhibition at school

The scenario starts with introducing the topic by the teacher.
After that pupils will visit a nearby river. They will use worksheets with exercises. During the visit there will also be a discussion about the topic. Pupils will search for answers to the questions prepared by the teacher and they will work in pairs. After these activities pupils have to make a summary/essay about the topic and give it to the teacher. Pupils share information with others through Internet or make exhibition at school.

Educational level:	Primary and secondary
Topic:	Pollution of water
Scenario provider:	MIKSIKE (Kristiina Rattasepp)
E-mail:	Kristiina@miksike.ee
Search keyword:	River pollution (MIKSIKE)

Organic food from farm

Learning activities in the scenario:

- "Organic food" – introducing the topic
- Collecting information about the topic / individual and pair work
- Visiting farm / tasks and exercises / group work
- Conclusions and group work
- Organic food day at school / making pictures and introducing the topic to the others



The scenario starts with introducing the topic by the teacher in class.
After that pupils will have a visit to nearby farm. They have worksheets with exercises with them. During the visit there is also a discussion going on about the topic.
Pupils have to search answers to the questions prepared by the teacher and they work in pairs. Pupils have different type of exercises, for example tests etc.
After these activities pupils have to make a summary/essay/picture/poster about the topic and give it to the teacher. During this activity they also use OrganicEdunet portal and collect more information about the topic. They have to make themselves familiar with OrganicEdunet project site and other sites, from where it was possible to search information. Pupils share information with others through Internet or make exhibition at school.

The content of OrganicEdunet is planned to be used in order to get information about following topics:
In the final phase students will make a poster/pictures and crosswords which give an overview about all important facts and conclusions about the topic.
The topic fits to the curriculum of nature study of the 3rd-6th class and to the curriculum of Information Technology.
Learning session is designed as a project based learning session (includes work in pairs, individual work etc).

The content of OrganicEdunet is planned to be used in order to get information about following topics:

- Meaning of organic food:

Difference between organic and un organic food:

- Organic farm:
- Organic food examples:
- Visiting farm:

Educational level:	Primary and secondary
Topic:	Organic Food
Scenario provider:	MIKSIKE (Kristiina Rattasepp)
E-mail:	Kristiina@miksike.ee
Search keyword:	Organic Food (MIKSIKE)

Chapter 6: Enabling the adaptation of existing learning scenarios to a new context

To enable the adaptation of existing learning scenarios to a new context, a metadata approach, based on Pawlowski and Richter (2007) is adopted for providing the basis for re-using, comparing and adapting learning scenarios. Although sharing learning materials is considered as a valuable process for teaching and learning, it is equally important to share learning scenarios for inhibiting effective pedagogical practice. The adaptation process consists of five phases:

- Search: users search for interesting learning objects through the Confolio tool
- Validate re-usability: Comparison of the intended context and the new context
- Re-use/adapt: Retrieving and changing the learning scenario for the purpose of reusing learning scenarios in a new context (for example from secondary to tertiary education).
- Validate solution: testing how the new/changed learning scenario fits the needs of the new context.
- Re-publish: the new learning scenarios are shared with other users in the Confolio tool.

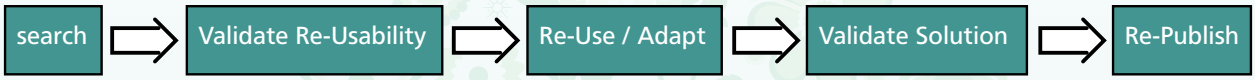


Figure 32. The adaptation process

There are some contextual factors that influence a learning scenario. These contextual influences are defined as context blocks. Each context block includes various context metadata and related attributes that can be described in a form of a data structure in order to be used during the adaptation process. The context blocks along with their related metadata are presented below.

Context Block	Description	Sample context elements
Culture	influence learning scenarios because they are directly influenced by curricula, predominating paradigms and teaching methods (applied to regions and countries)	-Language (country) -Learning styles (country) -Teaching style -Methods for criticism (country) -Required support (country) -…
Rights	influence teaching and learning scenarios, rights and rights on contents because of particular laws within countries and regions (applied on countries/regions)	-accreditation needs -content related age-constraints -controlled historical views -information constraints -gender specific constraints -…
Roles	influence learning scenarios in terms of the participants' role: Learners, Authors and Tutors	-level of needed support (learner) -general learner history (learner) -known learning styles (learner) -interacting habits (learner) -known teaching styles (teacher) -special expertise (author) -cultural background (author) -…
…	…	…

A practical approach to adapting learning scenarios

The adaptation process has been applied in practice during the summer school in Rethymnon, Crete, Greece. A small group of eight school teachers have been engaged in a series of training activities for creating, adapting and sharing their own scenarios. Teachers were instructed to adapt/extend the "Organic Garden Coming into Being" scenario already described in this handbook. To this line, teachers were prompted to use the handbook as a scaffold for designing and adapting their own scenarios based on the provided templates.

To facilitate the adaptation process, the Pawlowski and Richter approach described above has been simplified in a series of adaptation steps as follows:

1. Study the original scenario idea (i.e. Organic Garden Coming into Being)
2. Select particular activities for adaptation
3. Adapt learning activities for a particular context (e.g. to different regions, different schools, different visits (i.e. museum, farm, garden)) and collect digital content (from Organic.Edunet portal; Google,; YouTube; your own pictures, videos, diagrams etc)
4. Re- Publish

Teachers were informed that they need to adapt/extend already structured activities described in the handbook. Despite this, in order to allow flexibility and personalisation, teachers were allowed to create their own learning activities that were not limited to the specified ones. The specified activities were:

- Activity 1: Planning of gardening activities and forming of working groups
- Activity 3: A study visit to an organic garden and/or a botanic garden
- Activity 4: Growing seeds in seed-starting pots and trays.

For the purpose of instantiating the adaptation process, we provide two examples which demonstrate how teachers have adapted/extended their scenarios based on the pre-structured scenario "An Organic Garden Coming into Being." Before the adaptation process commenced, an initial discussion took place for explaining the process and allowing teachers to think of a scenario suitable to their own teaching and learning environment. Then, the teachers were prompted to read the handbook so as to: (a) Understand the process of creating lesson plans in general (b) be able to design their own learning scenarios in particular and (c) use it as a scaffolding tool for adapting pre-structured learning scenarios for their own educational environment.

Example 1

Study the original scenario idea: The teacher was prompted to study the handbook as a whole and in particular the "Organic Coming into being" scenario description, and then to extensively reflect on the scenario description templates described above for creating the adapted scenario. Specifically, it was suggested to the teacher to read through the "curriculum area", the "scenario" and the "learning activity" templates and to think of how a new learning scenario could be developed based on specific contextual issues.

Select particular activities for adaptation: The teacher selected the pre-structured activities and tried to make some primary thoughts on how these activities can be described in different teaching and learning contexts. However, the teacher proposed some more activities which felt that would make the scenario more holistic and adaptive to the new context but also to students' needs.

Adapt learning activities and collect content for a particular context: The teacher initiated the adaptation process by filling in the "Curriculum area" template. The fields related to the: subject discipline area,

context/level of study, topic domain, prerequisite skills and knowledge and pedagogical approach were completed as appropriate to describe the new context in which the activity would be implemented. The teacher decided to adapt the pre-structured learning activities for using plants as an alternative to fossil fuels (see Table 6.1).

Curriculum area	
Field	Biology – Chemistry
Subject discipline area	Science – Biology and Chemistry
Context / level of study	1. Plants – Using plants as an alternative to fossil fuels. 2. Grades: 9 (advanced) – 10 (14 – 16)
Topic domain	organic crop development – genetic crop development soil degredation improving air-quality
Pre-requisite skills / knowledge	testing Ph levels in soils testing air quality sustainable farming – watering, soil nutrient research investigation and presentation
Pedagogical approach	collaborative – Inquiry – Systems (underpinned by problem solving)

Table 6.1: Completing the "Curriculum Area" template to describe the new context.

Then, the teacher attempted to give a general title to the adapted scenario along with a short description to support the title. After this, the teacher listed the adapted learning activities that would be extensively described at a later stage of the adaptation process (see Table 6.2).

Scenario	
Field	Biology – Chemistry
Title	Garden Cars: growing plants to power cars
Short description supporting the title	Air pollution is a serious problem in many large cities. One of the major causes of that pollution is exhaust gases form cars. Alternatives to petroleum have been developed and are currently being trialled and implemented. Fuels form corps such as sunflower, soya-beans and sugar-cane have been trialled and found to have some degree of effectiveness.. students will investigate both biological and chemical concerns in establishing the potential for large scale implementation of this type of fuel
Activity or list of activities	1. Researching the crops 2. Bio farm and/or bio production plant visit 3. Growing the crop 4. making the fuel 5. Testing the product

Table 6.2: Scenario description and list of activities

After completing these incremental phases, the actual learning activity adaptation took place. The teacher adapted the aforementioned learning activities by providing concrete, adaptive and reflexive new activities that would be used in a personalized manner. These activities were instantiated and formalized by completing the "learning activity" template. In particular, the teacher appropriately described: the learning tasks, the learning objectives and outcomes, the tools/resources used, the assessment strategy and the time allocated for the adapted activities 1, 3 and 4 (see Table 6.3, Table 6.4 and Table 6.5). Clearly the tables show how the teacher used the pre-defined learning activities to modify and extend new activities in different educational contexts. Teaching and learning strategies as well as the overall pedagogical processes have been adapted according to teachers' beliefs, intentions and actions.

Learning activity 1	
Field	Biology-Chemistry
Learning tasks 	Show you-tube video on car exhaust emissions http://www.youtube.com/watch?v=awW14Ms73Pc&feature=related Brainstorm what effects do these emissions have on the air we breathe Divide class into groups- Set groups' different websites to search. Results in a power point pres: Hypothesis question: Bio-fuels can replace petroleum to power cars effectively. What type of plants could be used so that a fuel for cars could be produced. What plants have been the most successful? Why were they successful? Is any country using plant fuel for cars? Negotiate with the class which two plants they could grow to compare the results.
Learning objectives/outcome(s)	Students will have an understanding about the effect of the automobile on air quality Students will be able to distinguish between the type of plants that can be produced for fuels Students will have an understanding about countries that are promoting ecological solutions to petroleum
Tools/Resources	green resources http://www.thebioenergysite.com/news/vars/country/at The bio-energy site for sustainable energy http://www.youtube.com/watch?v=awW14Ms73Pc&feature=related you tube video on car emissions
Assessment strategy (Feedback and/or evidence)	Student powerpoints on bio-fuel plant research
Time allocated	3 x 60-minute lessons

Table 6.3: Describing learning activity 1

Learning activity 2	
Field	Biology-Chemistry
Learning Tasks 	Students consider the factors involved in growing the crops chosen, a list of research questions is developed for students to find answers to on their visit. Students visit a bio farm and/or a bio plant to discuss what is involved. Students pool their answers to clarify them, and ensure that they have enough information to proceed to the next step.
Learning objectives/outcome(s)	1. Students will understand some of the factors involved in the selection of bio-fuel crops 2. Students will understand some of the economic advantages for the bio-fuel industry
Tools/Resources	http://www.biodiesel.at/ bio fuel farm and processing http://www.greeningschools.org/resources/view_cat_teacher.cfm?id=134 green resources
Assessment strategy (Feedback and/or evidence)	development of a strategic plan for implementation of research
Time allocated	one day + 1x 60 minute lesson

Table 6.4: Describing learning activity 2

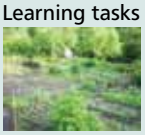
Learning activity 3	
Field	Biology-Chemistry
Learning tasks 	In groups Students develop a plan to make the garden beds, sow the seeds, maintain the crops and harvest the crops. Students to gain one expert's advice in developing their plan. Students then vote on the plans after evaluating the pluses and minuses of each plan. Students then draw up the work schedule with teacher's assistance. Students will prepare garden and plant seeds and look after crops
Learning objectives/outcome(s)	1. Students will be able to identify a nutrient rich soil 2. Students will maintain nutrient quality in soils 3. Students will be able to grow two crops organically 4. Students will be able to develop and maintain a sustainable crop development on a small scale
Tools/Resources	http://www.buzzle.com/articles/growing-sunflowers-tips-and-advice.html Growing sunflowers organically http://www.greeningschools.org/resources/view_cat_teacher.cfm?id=134 green resources http://www.gardenguides.com/90697-grow-soy-beans-georgia.html growing soybeans
Assessment strategy (Feedback and/or evidence)	Development of task strategy and schedule
Time allocated	14 x weeks

Table 6.5: Describing learning activity 3

Re-Publish: When the procedure competed, the teacher published the new scenario along with associated content to the Organic.Edunet portal.

Example 2

Study the original scenario idea: As in example 1, the teacher read through the "Organic Garden Coming into Being" scenario and then tried to conceptualise a new scenario that would be implemented in a different context. The handbook was used as an example for understanding the different scenario stages and for giving an insight on how to adapt an existing learning scenario for re-using it in another educational domain. At this stage, the teacher decided which aspects of the scenario may adapt/change and which other aspects may re-use to the new scenario.

Select particular activities for adaptation: In contrast to example 1, this teacher extended the proposed activities (i.e. activity 1, 3 and 4) to more inclusive ones that would efficiently and effectively represent a more articulated scenario. This means that the teacher felt that in order for different activities to be adapted some more elaborated activities would be described, while some others could be re-used, for designing a contextualised learning scenario.

Adapt learning activities and collect content for a particular context: Similarly to example 1, this teacher changed the predefined learning activities to meet the needs of a different educational context. Although the teacher perceived that the pre-defined learning activities would be sufficient to cover the needs of the training activity, it was perceived that more relevant activities were needed to describe and represent a fully adaptive learning scenario. To this line, the teacher started by completing the "Curriculum Area" template for specifying the context of the activity. The activity was about encouraging pupils to learn about a Mediterranean plant and the differences of exploiting it during the past and during the future (see Table 6.6).

Curriculum area	
Field	Agriculture – environment – politics
Subject discipline area	History, geography, art, environmental study, language, math
Context / level of study	1. First to sixth grade
Topic domain	Carob, the healthy Mediterranean alternative…
Pre-requisite skills / knowledge	Previous environmental projects about cretan plants and trees
Pedagogical approach	Activity – based

Table 6.6: Completing the Curriculum Area to describe the new context

The teacher then, provided salient descriptions about the scenario per se, a short description for supporting the title and a list of activities that comprised the scenario (see Table 6.7).

Scenario	
Field	Environmental study, Science, History, Agricultural education
	Carob, the healthy mediterranean alternative…
Short description supporting the title	Children will be encouraged to learn about the carob, its characteristics and uses and the way that older people were using it in the previous years and how we can use it nowadays for a healthier life. The main purpose is to discover the healthy way to live using carob. We intend to make our students work together, cooperate with older people, use their knowledge, share this knowledge and learn from them. We also intend to try and use carob in our life and make its products with the help of older people, parents and the small society of our village and the surrounding area. Basically we would like to make our students develop an agricultural way of living by respecting the past and crating the future for their own children.
Activity or list of activities	Activity 1: Students will be gathered in small groups of four for five members. Each group will have to take an activity of collecting information about the carob, its uses and characteristics. Each team will make a list of questions for the interviews and their research. Activity 2: After the presentations we will make a spider diagram form the gathered information. Activity 3: Visiting a factory about carob's products. Visiting the museum of Natural History. Visiting other areas of that plant and make the comparison with their own place. Activity 4: Calling older people, watching, learning and participating in their making the products of the carob (honey, liquer, powder, pie, chocolate etc.)

Table 6.7: Scenario description and list of activities

After highlighting the learning activities needed to complete the scenario, the teacher adapted the pre-structured learning activities by describing the three distinct activities. It is worth noting that although we provided the description of only three activities, the teachers felt that in order for the scenario to be fully adapted and extended, further activities were developed and streamlined accordingly. With the aim to bring the insights of the adaptation process, and to extend the repertoire of tools and strategies in educational practice, the description of the learning activities offers to teachers a way to apply existing scenarios to their own concerns and incorporates a variety of contexts including face-to-face, self-directed and blended modes. The three adapted activities were described in terms of particular learning tasks, learning objectives, tools/resources, assessment strategy and time allocated. Learning activities 1, 2 and 3 show an inclusive hierarchical order specifying and making explicit all formal processes in which students will be engaged in. Important in this process is the description of learning tasks and its alignment with learning outcomes and assessment strategy as well as the way it captures context and the different ways to ensure that the language used can be understood by other teachers who wish to re-use the learning scenario (see Table 6.8, Table 6.9 and Table 6.10)

Learning activity 1	
Field	Environmental Education
Learning tasks 	Students will be gathered in small groups of four or five members. Each group will have to take an activity of collecting information about the carob, its uses and characteristics. Each team will make a list of questions for the interviews and their research. The first and second team will be collecting information and finding pictures from the internet. The third and fourth team will be collecting information and finding pictures from the library. The fifth and sixth team will be collecting information through interviewing older people and taking photos from the carob trees and fruits in their area. All the teams will be presenting their information in the classroom.
Learning objectives/outcome(s)	The students will be able to: • understand the origins of the carob • distinguish the different kinds of the carob tree • be aware of the products that are being produced by the carob • use scientific tools in order to contact scientific experiments for weighting other products by the assistance of the carob (the old traditional way).
Tools/Resources	• Blogs • Youtube • Concept maps • Weblinks • Digital recorder • Interview guide • E-mail • Videocamera
Assessment strategy (Feedback and/or evidence)	Formal feedback through tests (multiple choices) and essays will be created by the students themselves and at the end they will evaluate their peers work.
Time allocated	A three hour session (One hour for announcing the objectives and forming the groups and allocating their tasks. Second hour searching the internet to find information. Third hour announcing the information they have found and making the spider diagram.

Table 6.8: Describing learning activity 1

Learning activity 2	
Field	Environmental Education
Learning tasks 	Visiting the carob's areas of their village. Collecting carobs and noticing them.
Learning objectives/outcome(s)	The students will be able to: • observe the growing of the carobs • observe the leaves of the carobs • observe the location of the carobs • collect the fruits and leaves and observe them in the classroom • taste the fruits
Tools/Resources	• videocamera • microscopes • magnifying glass • pencil and paper (to do some calculations, comparisons etc...)
Assessment strategy (Feedback and/or evidence)	They will be provided with informal feedback about how they did their observations and then it will be an in-class discussion for further reflecting and coming to an agreement.
Time allocated	One teaching day.

Table 6.9: Describing learning activity 2

Learning activity 3	
Field	Environmental Education
Learning tasks 	Calling an expert to inform the children about the scientific meaning of the carob. Calling older people, watching, learning and participating in their making the products of the carob (honey, liqueur, powder, pie, chocolate etc.).
Learning objectives/outcome(s)	The students will be able to: • Understand the importance of the carob from a scientific perspective. • Cooperate with older people for learning about how they harvested the carob. • Produce collaboratively products that are associated from the carob.
Tools/Resources	• ingredients (for producing the products) • digital recorder • videocamera • leaflets for giving to the older people for explaining the purpose of the project
Assessment strategy (Feedback and/or evidence)	• Informal discussions for giving feedback about the scientific procedure. • Formative tests.
Time allocated	A double hour session, one for the expert to explain the scientific meanings and one for the collaboration with the older people.

Table 6.10: Describing learning activity 3

Re-Publish: When the procedure competed, the teacher published the new scenario along with associated content to the Organic.Edunet portal.

The previous examples showed how a learning scenario can be re-used in a different context. The scenario 'An organic garden coming into being' was used for the contextualisation process. By considering these examples on how to adapt, change or extend, a learning scenario, it is possible to comtextualise a learning scenario taking a variety of aspects into consideration such as the adaptation of specific activities; whilst other activities remain for re-use, technologies' uses for supporting these activities, and the effective design and delivering of activities to ensure that adaptation in a new context is driven by pedagogy.

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Annex 1: Scenario template for schools

Curriculum Area

Field	
Subject discipline area	
Context / level of study	
Topic domain	
Pre-requisite skills / knowledge	
Pedagogical approach	

Scenario

Field	
Title	
Short description supporting the title	
Activity or list of activities	

Learning activities

Field	
Learning tasks	
Learning objectives/outcome(s)	
Tools/Resources	
Assessment strategy (Feedback and/or evidence)	
Time allocated	

Annex 2: Organising learning objects and learning activities in a semantic diagram

In this annex we propose the use of a resource processing tool for better organising and associating retrieved learning objects with learning activities

In learning scenarios where information is stored electronically on servers all over the world, learners have to search, localize, represent and make efficient use of the information, as well as relate the information to their personal knowledge, objectives and planned activities. This section aims to demonstrate that localising and representing the relations between learning objects helps the teacher-participant to acquire strategies for effective interaction with learning resources. Then, introducing these resources in the classroom is more straightforward. The organic garden is, here, the learning context where rich digital resources will enhance and promote the learning experience. School activities that are actively related to the structure and development of the garden can be effectively promoted through rich digital content that can be retrieved through web search, identified in relevant content repositories, reused, or created from scratch.

Figure 2. Content organised around the school organic garden on http://www.ea.gr/ep/organic/content.

The implementation of the organic school garden scenario draws on existing content and motivates teachers and students to reuse and adapt it to existing needs or create new. On this website http://www.ea.gr/ep/organic/content/ the content is being organised and constantly updated according to 6 main themes: Before planting, Planting, Visits, Greenhouses, Composting, Plant Care, and Harvesting and promoting products (Figure 2).

The aim of this organisation of content is to enable the learner to consider what resources are available, to show relationships among resources, activities and future tasks, to visualise content as separate and independent learning objects, or grouped into larger collections of content that could be transformed

into traditional course structures. The content is structured into maps and interlinked websites with the CompendiumLD tool, an open, and resource processing tool. It supports teachers and learning designers to create diagram maps, incorporate content and web addresses, show the relations between resources and activities[4]. It is being developed as a tool to support lecturers, teachers and others involved in education to help them articulate their ideas and map out the design or learning sequence. While in this section we see the exported output of Compendium LD that can be published on the web in a form of inter-linked websites the process of creating such maps with CompendiumLD or other resource processing tools is considered very important. Overall the objective is to instil effective interaction with learning resources and help the participants to cope with the complexity of knowledge and information resources.

For every of the 6 themes there exist content that is already uploaded in the Organic.Edunet Confolio, while further content is suggested for uploading: a) informational resources that could be added to the Confolio and b) resources generated at school sites, during scenario implementation, which could be added to the Confolio (Figure 3). Going through the content you can witness moments from Ellinogermaniki Agogi and the 9th Rethymnon primary school where the "organic school garden" scenario has been already implemented.

Before the stage of enriching the resources and learning objects with metadata, a mind mapping methodology is employed as a visual-spatial strategy for generating, organizing, and visualizing structures of ideas, thoughts, and concepts, as well as a managing tool for storing and accessing information.

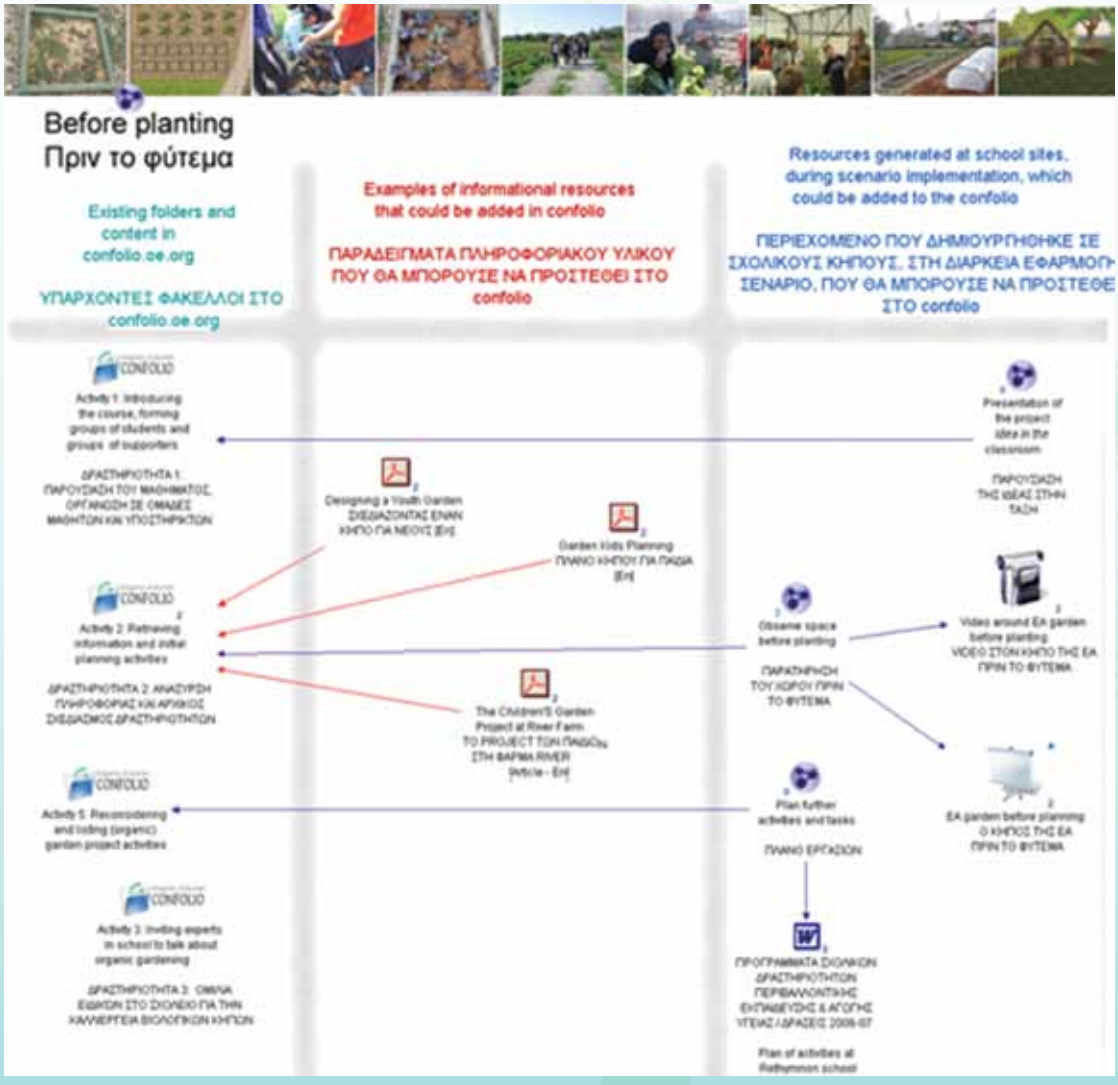
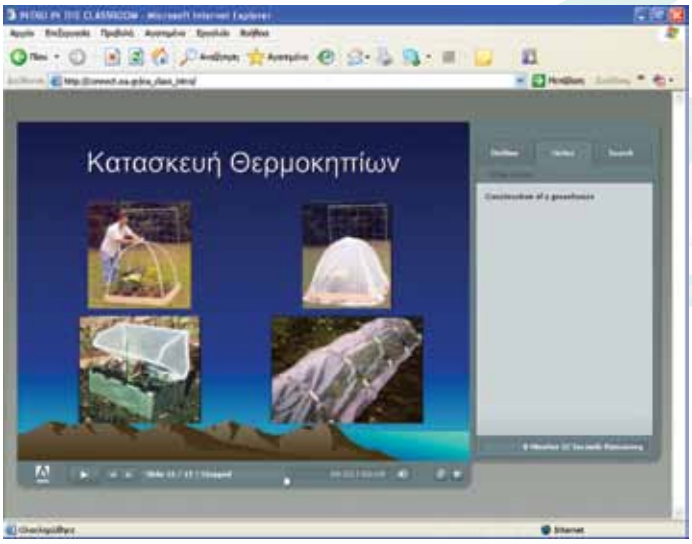


Figure 3. For every of the 6 themes there exist content that is already uploaded in the Organic Edunet Confolio, while further content is suggested for uploading

4 Compendium LD: Learning design software : http://kn.open.ac.uk/public/workspace.cfm?wpid=8690



Every node and icon of the map opens another map or lead to content, for example a PDF file, a power point presentation. By clicking on a map icon a new map is invoked. For example the user can access a whole map on how to present the project in the classroom (Figure 5) and to access the presentation the teacher has used in order to discuss in the classroom possible activities that the whole classroom can plan together (Figure 4).

Figure 4. A slide on constructing greenhouses as part of the activities to plan in the organic school garden

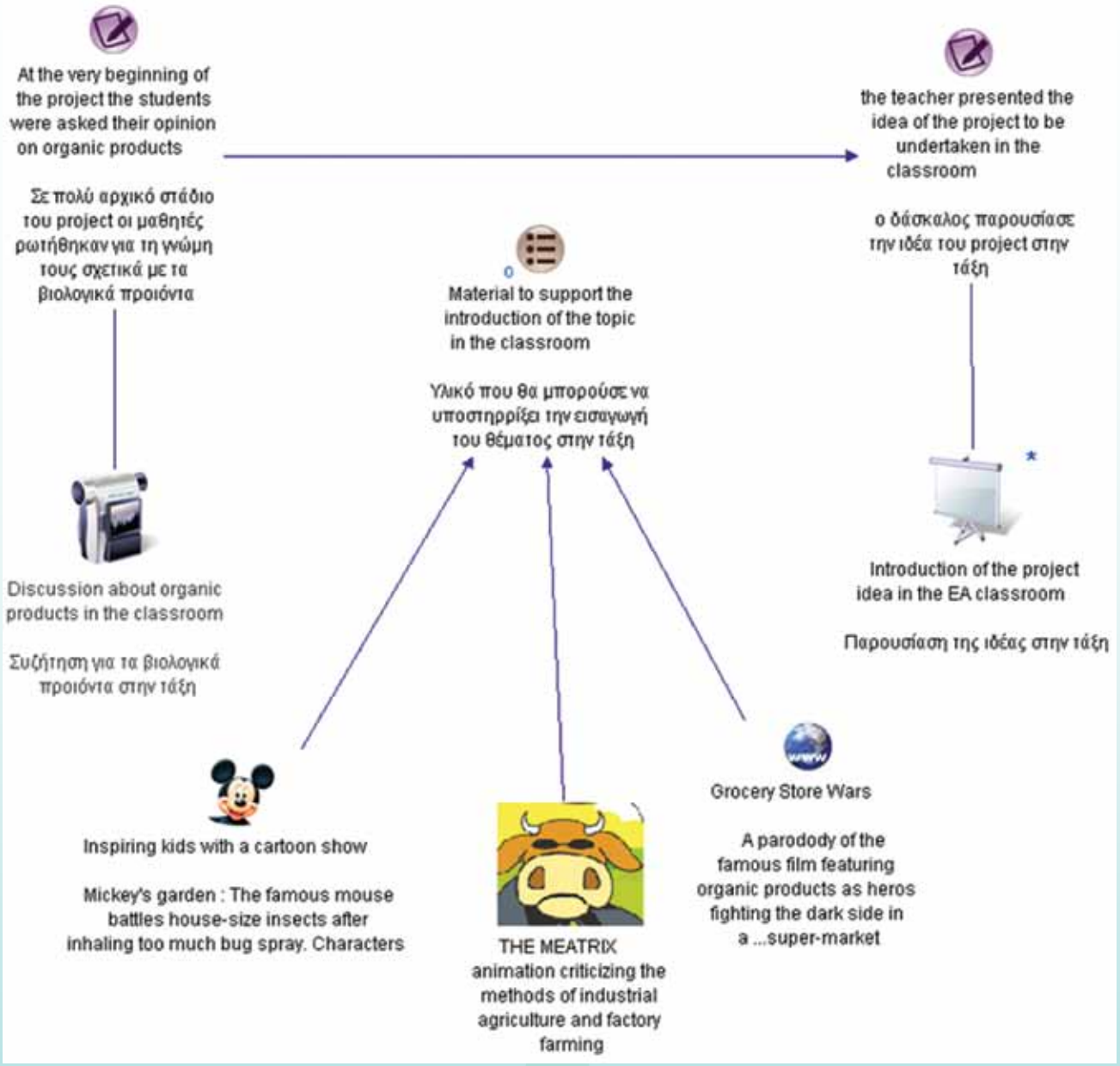


Figure 5 . A detailed map of resources on how to introduce the project of organic school garden in the classroom

Teachers who will employ Compendium LD or any other resource processing tool should reflect upon the following questions:

- How do I organise the retrieved or created resources I use in my teaching?
- What is my main concern and difficulty in doing so?

Annex 3: Further websites which you can search for content

- kidsgardening.org

http://www.kidsgardening.org

The website, maintained by the American National Gardening Association (NGA), includes rich content that is specialised for young learners and schools. The philosophy of the website is to use gardening as a vehicle for encouraging students and young people in general to make good food choices, augment classroom activities with experiential learning, build a love of nature and stimulate social interaction and cultural exchange. The content can be searched with keywords, through categories such as "Classroom Stories", "Teaching Strategies", "Activities", "All about Plants". Activities can be also searched with keywords and categories. See for example:

- Classroom Project Ideas for exploring gardening, plant growth, and nature: http://www.kidsgardening.org/growingideas/projects/library.html
- Teaching Children about Fruit Varieties: http://www.kidsgardening.com/Dig/digdetail.taf?Type=Art&id=21
- Harvest Celebration Activities, including a list of children's books: http://www.kidsgardening.com/themes/harvest.asp

The site is also presenting and registering schools that have gardening activities worldwide.

- Growing schools

http://www.growingschools.org.uk/

The website has been designed by British education and environmental institutions to support teachers in using the "outdoor classroom" as a resource across the curriculum for pupils of all ages. Resources can be searched by category, key stage and discipline. The following links from within the site are worth visited

- Growingschools.org Resources

http://www.growingschools.org.uk/Resources/

This section of the growing schools website holds a wide variety of resources related to the outdoor classroom that introduce in an interesting and innovative ways the outdoor learning into lessons.

Get Your Hands Dirty

http://www.growingschools.org.uk/Resources/Resource.aspx?id=298

Resource that helps teachers consider the issues involved in growing plants, or caring for animal, in schools. This free resource gives ideas, practical advice, educational reasons, and case studies to help teachers and students grow plants or keep animals in your school grounds, see for example "Growing in a small area of land", "Gardening without land ", and "Simple horticultural activities & small animal care".

UK-based projects related to school gardening

Science and Plants for Schools (SAPS), works with teachers to promote plant science and molecular biology as key curriculum areas. It also support educators in the delivery of plant science and molecular biology education in schools and colleges.

http://www-saps.plantsci.cam.ac.uk/about_whatis.htm

The Garden Organic for Schools project is a nationwide campaign which helps children grow vegetables at school, and learn more about their food. By setting up small gardens in or near the school grounds, children can learn about how food is produced and its link with the countryside.

http://www.gardenorganic.org.uk/schools_organic_network/quest.htm

The Campaign for School Gardening, with the support of TV gardeners a community gardening initiative, focused on getting parents to help their child's primary school to build and develop a garden. Includes resources to help you get started in setting up and using a garden in your school.
http://apps.rhs.org.uk/schoolgardening/default.aspa