Abstract

This paper introduces a European initiative that aims at raising the awareness and education levels of European youth on topics related to Organic Agriculture (OA) and Agroecology (AE), by the development of a multilingual federation of learning repositories with quality educational content. The paper describes the rationale of this initiative, outlines its technical architecture, and describes initial ideas about its future sustainability.

Keywords: Learning repository, federation, agriculture.

Introduction

This paper introduces Organic.Edunet (http://www.organic-edunet.eu), an eContentplus funded initiative that aims to facilitate access, usage and exploitation of digital educational content related to Organic Agriculture (OA) and Agroecology (AE). The project will deploy a multilingual online federation of learning repositories, populated with quality content from various content producers. In addition, it will deploy a multilingual online environment (the Organic.Edunet Web portal) that will facilitate end-users’ search, retrieval, access and use of the content in the learning repositories. The project will study educational scenarios that introduce the use of the Organic.Edunet portal and content to support teaching of topics related to OA and AE in two cases of formal educational systems, i.e., high-schools and agricultural universities. Furthermore, it will evaluate project results in the context of pilot demonstrators in pilot educational institutions, as well as through open validation events where external interested stakeholders will be invited. Organic.Edunet focuses on achieving interoperability between the digital collections of OA and AE content that producers in various EU countries have developed, as well as facilitating publication, access, and use of this content in multilingual learning contexts through a single European reference point. In this way, digital content can be used to educate European Youth about the benefits of OA and AE, and will become easily accessible, usable and exploitable.

Background
Rationale

Consumer demand for food quality and safety, as well as, society's demand for more sustainable development, provide new opportunities for the agricultural sector. Consumers' fears, triggered by food scares and technological developments such as genetic modification and food irradiation, have been translated into serious concern about food safety, increasing demands for quality assurance and more information about production methods. In addition, public awareness of the irreversible damage done to the environment by practices that lead to soil and water pollution, depletion of natural resources, and destruction of delicate ecosystems, has led to calls for a more responsible attitude towards our natural heritage. Against this background, OA has come to the fore as an agricultural approach that can not only produce safer agricultural products but is environmentally sound too. In this light, the European Action Plan for Organic Food and Farming (2004) has identified the need for actions supporting the training and education of all stakeholders related to OA, covering aspects related to production, processing and marketing of OA products and their benefits, plus targeting OA products as the preferred option for both producers and consumers.

The European Commission, through its strategic Action Plan and a number of funded initiatives of the 6th and 7th FPs has aimed at the promotion and further understanding of OA concepts and methods, and the cultivation of a consumer culture that will facilitate the development of the OA products market. In addition, large international organisations such as the United Nations’ Food and Agriculture Organisation (FAO, http://www.fao.org) and the International Federation of Organic Agriculture Movements (IFOAM, http://www.ifoam.org), along to non-profit associations such as the Soil Association in UK (http://www.soilassociation.org), drive their own awareness and education initiatives for the promotion of OA methods and practices around the world. Furthermore, agricultural universities around the world have included OA-related and AE courses in their educational programs, aiming to prepare agricultural professionals that may support and guide farmers through the selection and proper adoption of OA methods.

These developments have led to an increasing production of related educational content in an electronic format. This content aims to support the goals of each initiative, either through promoting OA and educating producers/farmers and consumers about OA benefits, or through the education of agricultural experts about the theory, methods and practices of OA (and AE, in general). On the other hand, these constitute dispersed resources that are individually listed in separate sites, and with no clear plan for their educational exploitation. An initial collection step has been performed by the Bio@gro eContent project No EDC-11293, which included -in a repository of the Bio@gro web portal (http://www.bioagro.gr)- an initial pool of multilingual OA content resources that could support educational purposes. Nevertheless, the systematic collection and categorisation of educational resources related to OA and AE, the development of an integrating online environment that will increase their use and reuse, as well as the study of educational scenarios and exchange of experiences between educational professionals for using this content in the context of formal European educational programs, is an area that remains to be explored. Thus, OA and AE content resources cannot realize the potential of the new World Wide Web technologies as a medium for increasing access and use of their content, and content resources remain unexploited in the context of formal education.

To further promote the familiarization of consumers with the benefits of OA for their health and for the environment, the most dynamic consumer groups have to be properly educated. Young people at all stages of formal education have to be carefully approached through relevant educational programs in the curricula of all kinds of educational institutions, from elementary schools to relevant university departments. But apart from raising the awareness and education level of consumers, agricultural professionals have also to be properly educated. By agricultural professionals we refer to the different types of future agricultural experts (e.g. natural production experts, veterinary experts, agricultural economists, extension officers, etc.) who study in agricultural universities around Europe, and who should be provided with a wide range of information related to OA and AE theories, methods, practices, and economic/environmental impacts. Most European agricultural universities have already included relevant courses in their programs, and university teachers have developed an important amount of content resources, but these are usually collected at an individual level. A great unexploited opportunity therefore exists in appropriately collecting, organising and online offering of quality and multilingual content on
OA and AE that may support current or future educational activities in the formal educational systems of Europe.
Architecture

To achieve its aims, Organic.Edunet utilizes Semantic Web technologies in order to set up a technical infrastructure that will facilitate sharing and reusing of learning resources through a federation of learning repositories. The overall architecture of this technical infrastructure is illustrated in Figure 1. The main elements of the architecture are the following:

- **Learning Repository Management Module**: includes the suite of tools that the Organic.Edunet content providers will use to create a digital collection of learning resources, to describe resources with appropriate metadata, and to publish resources in their own learning repository. Overall, six learning repositories are expected to be set up by the Organic.Edunet content providers (namely the Bio@gro, ENOAT, ECOLOGICA/COMPASS, Intute, School, and Public Resources ones).

- **Learning Resource Exchange Module**: concerns the connection of the Organic.Edunet federation with other federations of learning repositories, using open standards and specifications for the exchange of search queries and the harvesting of metadata. Organic.Edunet is expected to be connected with two external federations; the Learning Resource Exchange (LRE) of the European Schoolnet (http://lre.eun.org) and the ARIADNE Foundation (http://www.ariadne-eu.org/).

- **Semantic Services Module**: it is the core of the Semantic Web technologies’ application in the architecture, and supports the semantically-enabled services that the Organic.Edunet Web portal will offer, by reasoning upon a number of integrated ontologies.

- **Web Portal Module**: refers to the end-user visible parts of the whole infrastructure, allowing users to search, locate, retrieve and access learning resources on OA and AE throughout the whole Organic.Edunet federation.

![Figure 1: Overall architecture of the Organic.Edunet federation](image-url)
Future Sustainability

The sustainability scenarios envisaged for Organic.Edunet are mainly two. The first one concerns the provision of the Organic.Edunet Web portal as an open-access service for European educational institutions. This focuses on the continuation of offering the multilingual search, retrieval, and recommendation services for the content in the federated repositories. Targeted users will be the user communities already addressed by the project (high-school students and teachers, as well as agricultural university students and teachers). More specifically, the Organic.Edunet portal is expected to be freely used by all European schools and agricultural universities, in order to help potential users search and locate content resources of interest. The maintenance and operation of the Web portal can be funded by a Special Interest Group (SIG) such as the European Network of Organic Agriculture Teachers (ENOAT, http://www.umb.no/7187) or by an individual educational network such as the Baltic Forestry, Veterinary, and Agricultural University network (BOVA, www.bova-university.org) or the Nordic Forestry, Veterinary, and Agricultural University network (NOVA, www.nova-university.org/).

The second sustainability scenario considered is the one of providing the Organic.Edunet suite of learning repository tools as a free service to content providers of OA and AE resources. The targeted users are all types of content producers aimed by the project (OA teachers, international organisations, private publishers), who will freely use the tools in order to create their own learning repository, populate it with content, publish it online and connect it to the Organic.Edunet federation. Further extensibility or update of this suite of tools is expected to be carried out either on a voluntary/research base (by the technical partners of the project) or on demand by some content producer that wishes to have a customised product for his needs.

Nevertheless, the availability of the content itself after the end of EU funding may depend on each individual repository. The repositories of the project are expected to belong in two categories: repositories with freely offered content (such as the ones offered by educational institutions), and repositories with content that requires payment to access and use (such as the ones offered by private publishing houses). Then, the following sustainability scenarios can be envisaged:

- The targeted users of repositories with free content (mainly user groups in educational institutions), will be formulating virtual communities around their learning repositories (e.g. the community of the ENOAT repository, where all participating teachers may contribute and share their content). Such a type of repository is expected to be self-sustainable, with no further development and no direct revenues. E.g. Intute that wishes to remain a public repository with free content for UK educational institutions.

- The targeted users of repositories with content that requires payment (all users/consumers potentially interested in OA and AE content) will have to use content in private repositories. Private content publishers may define their own business model, according to the revenue scheme they wish to apply (e.g. access to the content through a subscription scheme, or per use). Each content publisher may explore his own sustainability scenario. E.g. the ECOLOGICA repository, which aims to launch a spin-off company that will make profit by charging its educational content and services.

In addition, mixed sustainability scenarios can be considered based on public-private partnerships. For instance, the organisations involved in Organic.Edunet (and any additional interested/affiliated partners) will consider the formulation of a SIG that will manage, operate and further develop the Organic.Edunet service. The participating repositories will then offer content only to the members of the SIG, who will be subscribed to the service. The operation and further development of Organic.Edunet will be based on the contributions of participating institutions. In this way, interested educational organisations (e.g. the libraries of European agricultural universities belonging to the BOVA & NOVA networks) may subscribe to the use of Organic.Edunet, in order to provide to their members free access to the repositories’ content. A relevant example is the subscription of university libraries to the Hellenic Academic Libraries (HEAL-Link, http://www.heal-link.gr) network for accessing digital libraries of research papers.
Conclusions

Due to the current climate and environmental conditions, Organic Agriculture (OA) and Agroecology (AE) topics have come to the fore as important educational elements for rural youth and professionals. Thus, ways to introduce them into the formal educational settings of both schools and universities are considered as a primary goal. To this end, this paper introduced a European initiative that aims to raise the awareness and education levels of young people on topics related to OA and AE, by the development of a multilingual federation of learning repositories with quality educational content.

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References