

ECP 2008 EDU 418006

mEducator

Annual Report 2

01.05.2010 – 30.04.2011

www.meducator.net

Deliverable number/name	<i>D.9.9.</i>
Dissemination level	<i>Public</i>
Delivery date	<i>06 July 2011</i>
Status	<i>Final</i>
Author(s)	<i>Maria Nikolaidou, Panagiotis Bamidis</i>



eContentplus

This project is funded under the eContentplus programme¹,
a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable.

¹ OJ L 79, 24.3.2005, p. 1.



1 Table of content

- 1 TABLE OF CONTENT 2**
- 2 PROJECT OBJECTIVES 3**
- 3 CONSORTIUM 4**
- 4 PROJECT RESULTS/ACHIEVEMENTS..... 6**
- 5 TARGET USERS & THEIR NEEDS 8**
- 6 UNDERLYING CONTENT 9**
- 7 SUMMARY OF ACTIVITIES..... 10**
 - 7.1 MEDUCATOR METADATA DESCRIPTION SCHEME..... 10
 - 7.2 MEDUCATOR 2.0 CONTENT SHARING SOLUTION 10
 - 7.3 MEDUCATOR 3.0 CONTENT SHARING SOLUTION 11
 - 7.4 EVALUATION OF MEDUCATOR CONTENT SHARING SOLUTIONS AND BEST PRACTICE RECOMMENDATIONS
14
 - 7.5 MEDITOR: A MEDUCATOR TOOL TO RE-PURPOSE SERIOUS GAMES 14
 - 7.6 MEDUCATOR CLUSTERING ACTIVITIES..... 15
- 8 IMPACT & SUSTAINABILITY 16**
- 9 FURTHER INFORMATION 17**

2 Project Objectives

Short description of the problem addressed by the project and its objectives.

Summarize briefly how the project contributes to the programme objectives.

Medical educational content is available in individual EU academic institutions, although not widely available or easy to discover and retrieve, due to lack of standardized content sharing mechanisms. Institutions, to support their teaching, often use a variety of web-based Learning (Content) Management Systems (LCMS), as well as, educational standards which are developed and adopted to enable the universal description of educational content. "Mashup" technologies have recently been used to implement efficient brokerage mechanisms for educational content sharing. Web 2.0 applications offer new opportunities for health education since it allows open access to information, sharing of ideas, questions, and opinions etc. Moreover, semantic service-oriented approaches have been developed in previous EU funded projects, based on the commonplace technology of semantic web services in order to implement a federation of LCMSs. A lot of effort has been put in the area of educational content development, description, and sharing, however there was no prominent clear and standards-based solution for the seamless sharing of educational content in medicine and in general. The aim of mEducator is to elaborate on pedagogical, technical, standardization, cultural, social and legal issues and develop a standard-based infrastructure to enable the sharing of state-of-the-art digital medical educational content among medical educators and students in European higher academic institutions. As a Best Practice Network, mEducator will compare the above mentioned contemporary ways of achieving content sharing, the:

1st Solution: mEducator 2.0, based on Web2.0 technologies and mashups in specific

2nd Solution: mEducator 3.0, based on semantic web technologies and linked data in specific.

The mEducator goals and objectives contribute directly to the overall and specific objectives of the eContentplus programme and Action 4.1:

- Implement and extend specifications and standards on a critical mass of medical educational content and provide recommendations for standards adoption and promotion across Europe.
- Implement learning resource discovery and retrieval specifications, standards and commonplace technologies, to facilitate the seamless exchange of existing medical education content over the web, supporting semantic interoperability, and content discovery and retrieval management.
- Support the efficient and seamless sharing and use of formal, specialized, state-of-the-art and pedagogically sound medical educational content across Europe.
- Compare best practice solutions referring to both user generated and professional generated content
- Utilise open educational resources and provides an opportunity to compare practices of standardising Web2.0 content alongside with Medical Research Academic content for educational purposes.
- Experiment with the impact on technology enhanced user interaction and community learning (Web2.0).
- Builds upon previously funded research and experience while involving new member states and quite good geographic coverage and aimed impact.

3 Consortium

Provide a brief description of the consortium members and their roles in the project.

mEducator consortium consists of 14 partners, representatives of 9 EU member countries, which act in close collaboration towards the objectives of the project. Some partners, mainly Medical Schools, act as content providers of educational content for medical education, while others as technology providers who provide state-of-the-art technological solutions or expertise for sharing and repurposing of multi-type content in medical education. There are also partners who act as pedagogic experts and/or users and will play a major role in the project evaluation of the sharing solutions and the specification of recommendations.

Participants & their role in the project

GR Aristotle University of Thessaloniki (AUTH)

Coordinator, Technology provider, Content provider, User/Evaluation, Dissemination



CY University of Cyprus (UCY)

Technology Provider, Content provider, User/Evaluation, Dissemination



GR Democritus University of Thrace (DUTH)

Content provider, Technology provider, User/Evaluation, Dissemination



IR MEDTING Medical Exchange Limited (ex. SITUSI Limited)

Content provider, Technology provider, Dissemination



RO Technical University of Cluj-Napoca (UTCN)

Technology provider, Pedagogical expert



FR Université Nice Sophia Antipolis (UNS)

Content provider, User, Dissemination



BG Medical University Plovdiv (MUPLOVDIV)

Pedagogical expert, Content provider, User



IT Università degli studi di Catania (UNICT)

Pedagogical expert, Content provider, User/Evaluation



FI University of Helsinki (UH)

Pedagogical expert, Evaluation



UK **St George's, University of London (SGUL)**
Pedagogical expert, Standardisation Body, Technology and Content Provider



FR **Succubus Interactive**
Content and Technology Provider



UK **The Open University (OU)**
Technology Provider



The Open University

UK **Coventry University**
Content provider, Technology provider



FR **European Cervical Cancer Association (ECCA)**
User/Evaluation



4 Project Results/Achievements

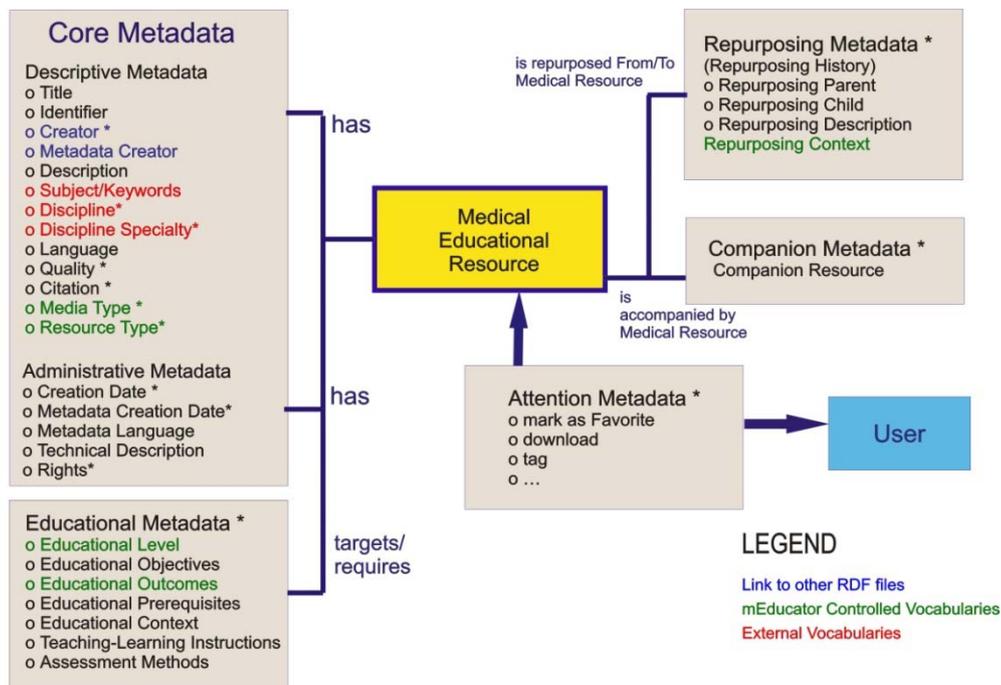
In case of an **annual report**, describe major achievements (e.g. completion of market and user requirements survey, completion of demonstrator design or implementation, initial reactions and feedback from users, first results).

For the **final report**, describe the final services/products implemented: functionality, simplified architecture, innovative features, limitations etc. Include appropriate details of platform. A graphic (screen capture, diagram etc.) may be a good method to illustrate the system. Explain how user requirements are met. If possible, state how interested parties can try out the system.

Metadata description scheme

One of the main achievements of the mEducator project is the creation of the mEducator metadata description scheme or else reference model. Initially the consortium proceeded by setting the ground of the conceptual model. This process included the analysis of Healthcare LOM, the evaluation of other specifications and standards, the elaboration on the repurposing notion along with the respective incorporation of extensions for repurposed content, the refinement of educational aspects and the inclusion of companionship of resources. At a later stage, the consortium have considered the benefits of Linked Data and the Semantic Web which allow reusing and linking to existing knowledge making in this way resources interoperable with other data sets. In order to have a metadata scheme compliant with the principles of Linked Data, the Resource Description Framework (RDF) was identified as the most appropriate framework to be used for the treatment of the metadata model. The Conceptual Model was transformed into an RDF Model which in turn was serialized in XML, in order to be processed by machines. By the end of this second year, the area of attention metadata was also considerably taken into account. The outcome of this work is a metadata description that fits and addresses the requirements and needs for sharing mEducator educational resources.

The conceptual model is presented here:



Best practice guidelines for the scheme are available at:

http://www.meducator.net/?q=content/mEducator_Scheme_bpg

Content sharing solution 1: mEducator2.0²

The implementation of the mEducator technical solution for sharing and repurposing of multi-type educational content in medical education via mashup technologies and Web 2.0 tools for loosely coupled isolated LCMSs has been accomplished during the second year of the mEducator project.

The development of the mEducator2.0 content sharing solution was started in May 2010, based on research and definition of requirements which have been taking place since 2009. Technical as well as content providers collaborated for the definition of the use cases to be implemented, the API interfaces have been developed as well as the appropriate scenarios of use. mEducator partners have been contributing in the development of the brokerage mechanism based on “mashup” and the sitemap and the user interface in HTML/CSS. The database is being used as a central repository to store learning objects metadata, user information, etc and is being made accessible remotely through Mashup technologies from individual LCMSs. The evaluation of the solution is in progress and relevant outcomes will provide feedback for further developments and enhancement.

The mEducator2.0 platform is accessible at: www.meducator.net/mEducator2.0

More details on the implementation of the sharing solution are available in Section 7.

Content sharing solution 2: mEducator3.0³

The implementation of the mEducator technical solution for sharing and repurposing of multi-type educational content in medical education via Semantic Web Services technologies for federated LCMSs has also been accomplished.

The development of the mEducator 3.0 content sharing solution was started in May 2010, based on research and definition of requirements which have been taking place since 2009. Technology and content providers have been collaborating closely for the development of the APIs and for the development of the Semantic Web Services brokerage which is concerned with the development of an infrastructure which allows exposing educational services and LCMS in a Linked Data-oriented way (“Linked Services”) to enable the automated discovery/execution of distributed services. Tools and services (API's) have also been developed in order to allow the integration of federated LCMSs. The first prototype of mEducator 3.0 deploys and extends Linked Services technologies for integration of heterogeneous educational data stores and allows storage and enrichment of distributed educational resource metadata in a fully Linked Data-compliant way. The described federated architectural framework may allow for multiple instantiations of the interface. Currently, the content sharing functionality is accessible through a core platform interface, as well as through modules which have been developed for the widely used LCMSs such as Moodle, Drupal and Open Labyrinth (medical education-specific LCMS and repository for virtual patients).

The mEducator3.0 is accessible at: www.meducator.net/mEducator3.0

More details on the implementation of the sharing solution are available in Section 7.

Content Sharing Solutions Evaluation Plan

A core group of mEducator partners has been working since January 2011 in order to detect problems and deficiencies of both solutions. The methodology used was based on a comparison between the initial functional requirements identified, the use cases that have been created and the observation/testing of the solution. An evaluation grid has been developed which embraces binary assessment (functionality present or absent) and quality evaluation (identifying relevance or

² The term **Web 2.0** is associated with web applications that facilitate collaboration on the World Wide Web, including social networking sites, blogs, wikis, video sharing sites, hosted services, web applications, mashups and folksonomies.

³ The term **Web 3.0** is associated with the Semantic Web

deficiencies in the way the functionality was implemented as well as identifying other possible functionalities to enrich the solution).

The evaluation is being performed in 3 distinctive phases:



In the following months the outcomes of the above evaluation will provide feedback to developers for full deployment of the mEducator Solutions.

5 Target Users & their Needs

Provide a summary of your user groups, research on user/customer requirements and the resulting user profiles, and how the project results will respond to these requirements/profiles.

The target user audience of mEducator includes 3 types of users:

- a. Medical educators (clinical/non clinical, in academia)
- b. Medical Students (under- and post-graduates)
- c. Residents & Specialized Doctors (continuing medical education).

Users among the above target groups are being engaged for the evaluation of the developed platforms, as well as for the enrichment of the content to be shared. In parallel, the consortium has been seeking to inform the stakeholders outside the consortium about technical achievements and make the appropriate contacts with standardisation bodies.

Target Users

- Academics (medical educators)
- medical students (under- and post-graduates)
- medical professionals (residents & specialized doctors)

- better awareness of the uses of Learning Content Management Systems
- efficient search and discovery of educational content
- technical and intellectual property rights related issues involved in sharing contents
- ease of use of educational standards
- access to high quality, well described overspecialized, interoperable and applied to different cultures & languages educational content in state-of-the-art topics
- guidelines on how to easily repurpose educational material and access to and use of toolkits & guidelines to create, edit & share and re-purpose educational content
- access to and (transparent/seamless) use of metadata translation tools
- access to demonstrators and easy use of collaboration environments to collaboratively participate in authoring different scenarios of training, repurposing, standardising and uploading material

Technical Stakeholders (e-learning technologists, system developers, metadata experts)

- The consortium has implemented a wiki with best practice guidelines for the medical educational resource description. The wiki is addressed to technical stakeholders and the e-learning or medical education communities and has been made publicly available at http://www.meducator.net/?q=content/mEducator_Scheme_bpg providing examples and best practice recommendations.

Medical Education Community, Professional societies

- Dissemination and hands-on training sessions have been organised with major Medical Education fora in an effort to attract users and engage the involvement of the relevant communities. In parallel, links with other large professional societies have been established in order to initiate medical education collaboration.

6 Underlying Content

The quality and quantity of the digital content (and related metadata) contributed to the project, as well as the criteria for its selection, must be clearly identified.

The mEducator consortium has defined content items as the educational material with a registered history of creation, linked with specific educational goals and objectives, as well as, learning outcomes and educational contexts/settings, which are recommended with certain teaching methods and strategies types, while assessed/evaluated by certain means to accomplish the fulfilment of their predefined learning outcomes⁴.

In order to derive best practices for medical educational content repurposing and sharing mEducator partners have identified around 3.000 content items of various types:

- conventional educational content types that are also used in other educational areas, such as lecture notes, books, lecture presentations, exam questions, practicals, scientific papers, graphs, images/videos, algorithms and simulators;
- educational content types unique in medical education, such as teaching files, virtual patients, evidence based medicine forms, objective structured clinical examinations, clinical guidelines, anatomical atlases, electronic traces of images, etc;
- alternative educational content types, either reflecting active learning techniques (extensively used in medical education) and/or stemming from newly introduced web 2.0 technologies, such as problem/case based learning sessions, serious games (2D/3D), web traces, wikis, blogs/discussion forums, etc., including the notion of medical expert instruction in which ever form this may be presented; and
- user generated content, closely related to the above category of active content types, referring to the collection of user interactions with an active learning content item, which by themselves can be later used as an educational item of its own, for example to highlight common mistakes and misconceptions/misconducts, good and bad habits, behaviour trends, etc.

⁴ P.D. Bamidis, E. Kaldoudi, C. Pattichis, "mEducator: A Best Practice Network for Re-purposing and Sharing Medical Educational Multi-Type Content", in the Proceedings of PRO-VE'09: 10th IFIP Working Conference on Virtual Enterprises, Thessaloniki, Greece, 7-9 October 2009 (A Springer Publication), pp. 769-776. Best Paper Award



Currently, content providers are describing their content items with the metadata scheme. Content items are being made available for sharing and repurposing through the two mEducator content sharing solutions.

7 Summary of Activities

Draft a short section for each substantial area of work completed/started, tailored to reader needs rather than revolving around work packages.

The **annual** report should also describe where the project is ‘positioned’ for the next year, describing which are the activities that will be completed and the results that are expected.

7.1 mEducator metadata description scheme

One of the overall objectives of this period was to keep track, maintain and progress on issues initiated regarding the mEducator metadata scheme. Refinements facilitated the development of the Content Sharing Solutions, and also exploited feedback from the initial implementation results. More specifically, the metadata description scheme has been continuously updated and refined by proposing classes/properties in RDFs. The partners have been constantly researching on existing e-learning standards, RDF vocabularies and ontologies so that the mEducator’s metadata scheme is state-of-the-art and compliant with the Linked Data principles. Some FOAF properties replaced mEducator- defined ones, the repurposing and the educational level controlled vocabularies have been described with SKOS, changes in the definitions of some properties have been made, and the representation of the repurposing procedure in RDF has been accomplished. A new working group was established, the Attention Metadata Group (AMG) in order to research and work on the Attention Metadata.

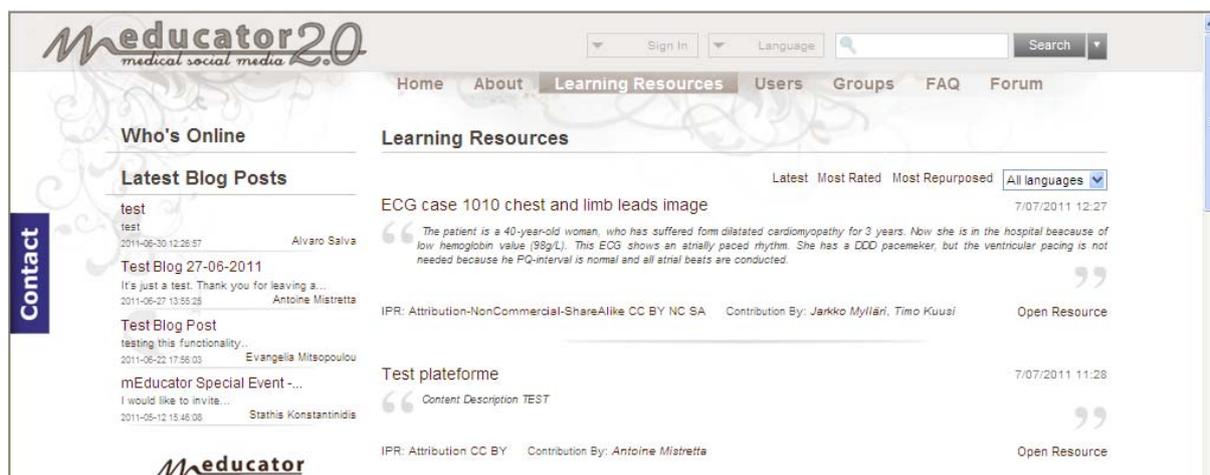
7.2 mEducator 2.0 Content Sharing Solution

The mEducator 2.0 is the first mEducator Content Sharing Solution, which aims at creating a brokerage mechanism based on mashups and other technologies, which allows medical educational content to be shared across websites, or, in our case, individual partners’ LCMSs, by creating a loosely coupled network of LCMSs.

Technical providers have been contributing for the development of the brokerage mechanism based on “mashup” and the mEducator Platform. The platform architecture which has been developed for mEducator 2.0 has taken into account the input of all partners in previous meetings. Usability and accessibility guidelines have been created, following a study over the main characteristics of the target users of the application, which have been adapted to the technical specifications and specific requirements of the solution. Technical providers have developed the sitemap and the user interface in HTML/CSS. The first version of the database has also been developed and has been enhanced considering valuable contribution from the mEducator Technical Reference Group in order to meet the project and tasks expectations. The database is being used as a central repository to store learning objects metadata, user information, etc and is being made accessible remotely through Mashup technologies from individual LCMSs.

mEducator partners acting as content providers implemented the mashup of mEducator 2.0 in their LCMS and have provided feedback to MEDTING for the appropriate improvements/adjustments. Initial pilot content testings have been performed to allow the implementation of the relevant functionalities for repurposing, in both platform and mashup.

mEducator users across multiple institutions will utilise the mashups for uploading, creating, and editing content metadata, as well as for the search and retrieval of content. Alternatively, for users without access to a specific LCMS, an independent platform has been created applies web 2.0 techniques and facilitates user collaboration, allows the creation of social networks for medical education, knowledge exchange and second opinion.



The mEducator2.0 platform is accessible at: www.meducator.net/mEducator2.0

7.3 mEducator 3.0 Content Sharing Solution

The mEducator 3.0 is the second mEducator Content Sharing Solution, which aims at allowing for sharing and repurposing of multi-type educational content in medical education via Semantic Web Services technologies for federated LCMSs.

The overall architecture of mEducator 3.0 includes three layers, composed of (Web) data and service layer, Data and service integration layer and Application and presentation layer .

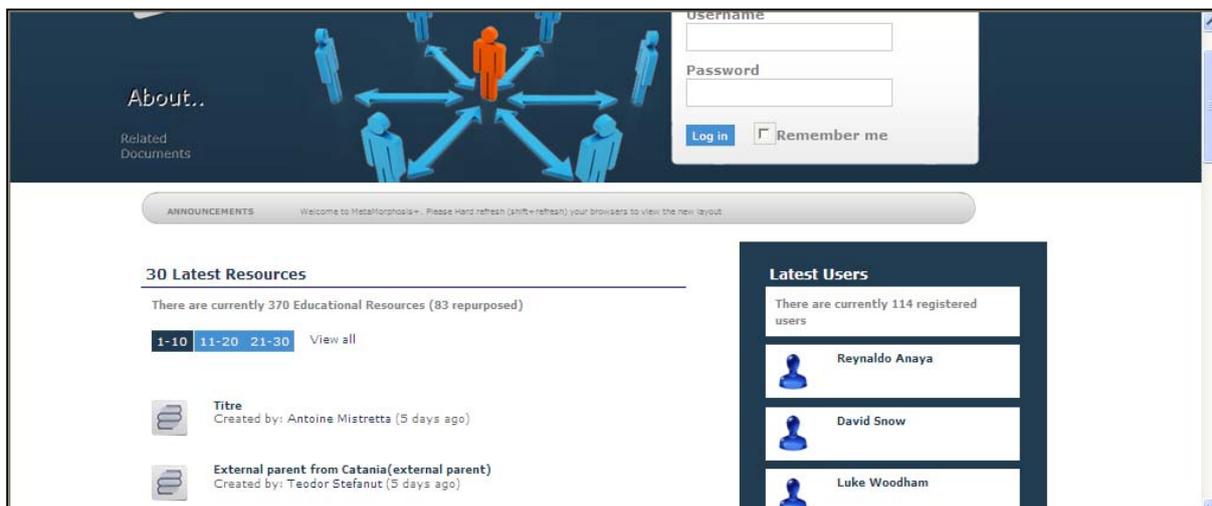
- A. The (Web) data and service layer consists of available Learning Resource metadata (LRM), Web services and data sources such as the Linked Data cloud.
- B. The data and service integration layer is based on the Linked Services approach facilitated by iServe and SmartLink, Linked Data based service annotation repositories, the APIs to broker services and an RDF LRM repository. The iServe/SmartLink repositories store two different kinds of service annotations separately, namely functional and non-functional service annotations. This layer offers a set of APIs which allows 3rd parties to perform distributed searches across multiple

Web-wide repositories and store and retrieve semantically enriched educational resource metadata from the educational Linked Data resource store.

- C. The application and representation layer uses the APIs provided by the data & services integration layer to interact with underlying data & services and provide interface to end-users. The described (federated) architectural framework may allow for multiple instantiations of the interface, such as the:
 - a. Metamorphosis+: the Metamorphosis environment developed in the early phase of the project as a testbed for the metadata description scheme and content sharing mechanisms, was used as one possible user interface to the general architecture of mEducator 3.0, showcasing the suitability of the Linked Services/Linked Data-based approach
 - b. Moodle module: the Moodle module has been developed to allow resources to be created, uploaded, described, shared and searched. It exploits SPARQL queries using a D2R server with the associated RDF responses complying with mEducator’s RDF schema. The D2R server is a tool for publishing relational databases on the Semantic Web. It enables RDF and HTML browsers to navigate the content of the database, and allows applications to query the database using the SPARQL query language.
 - c. Drupal module: The Drupal module has been developed to allow resources to be created, uploaded, described, shared and searched. It exploits SPARQL queries using Drupal SPARQL endpoint functionality. Multiple endpoints (included internal and external) could be added in SPARQL registry and queried.
 - d. Open labyrinth module: The Open labyrinth module has been developed to allow specific resources (virtual patients, OSCE) to be described, shared and searched. It exploits SPARQL queries using a D2R server with the associated RDF responses complying with mEducator’s RDF schema.

The mEducator 3.0 platform is accessible at: www.meducator.net/mEducator3.0

Screenshots of the interfaces of mEducator 3.0:



Learning package Add a file | Add a weblink

Basic details [Title to be changed]

Enable multiple items

Title*

Identifier*

IPRType* [Can I Apply an IPR license to my resource?](#)
[Help me select a Creative Common license](#)

If the resource is protected by any other IPR licence please state which one

Quality

Language

Metadata Language

Tasks Index Dashboard Content Structure Appearance People Modules Configuration SPARQL settings Reports Help 0 / 1 Dennis Search Log out

Meducator Multi-type Content Repurposing and Sharing in Medical Education My account Log out

Home Users

Home » some new metadata description

Edit Resource some new metadata description

View Edit

Title*

Status

Sets the privacy of the learning resource.

Main identifier
 This property is used to identify the resource by means of one of the next options.

URL Identifier

IPR Licenses
 IPR Licenses

This property is used to describe the type of IPR License that is granted for legally using this medical learning resource. It can be either one of the Creative Commons Licenses, or a different one.

Quality
 This property is used to identify that this resource has a specific quality stamp.

[Show row weights](#)

Quality	Order

OpenLabyrinth
 OpenLabyrinth is an open source educational pathway authoring and delivery system.

preview
 editor
 - global
 - nodes
 - node grid
 - options
 - links
 - counters
 - counter grid
 - questions
 - files
 - users
 - avatars
 - elements
 - clusters
 - feedback
 - session
 - visual editor

v2.5.1

add Labyrinth ""

title

description

contributors [add]

registered Labyrinth authors:

keywords

Labyrinth type

Labyrinth skin

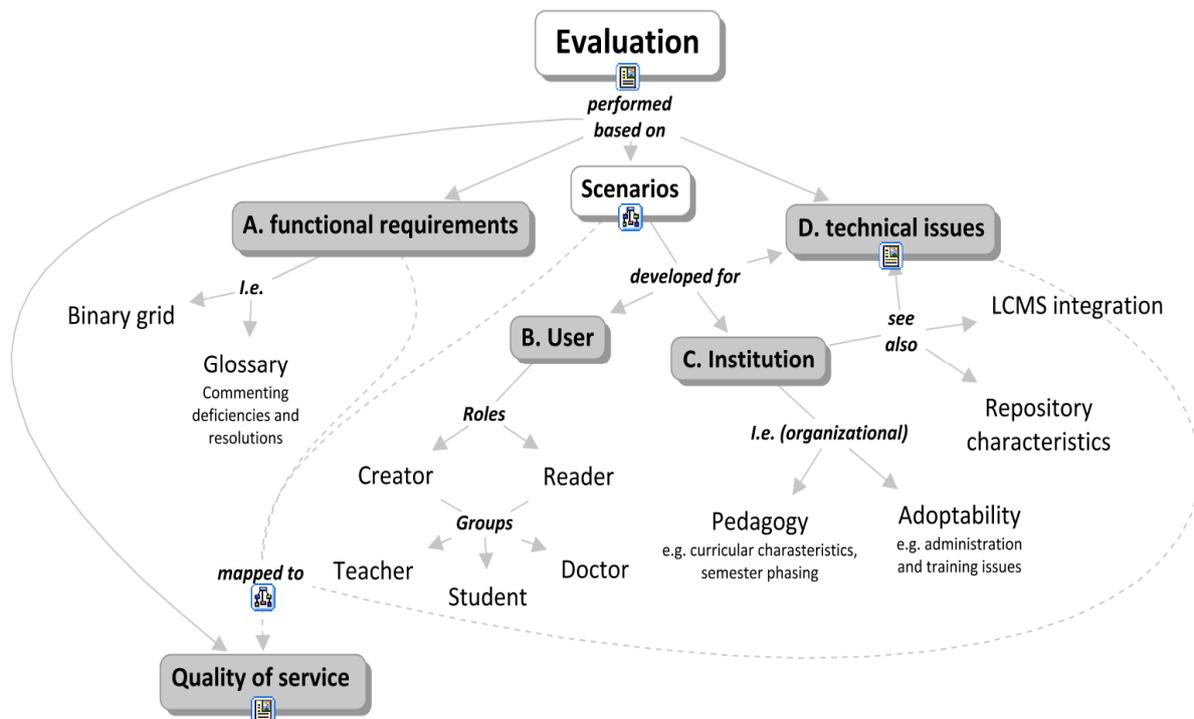
timing off : timing on

timing

7.4 Evaluation of mEducator Content Sharing Solutions and Best practice Recommendations

mEducator partners have begun the evaluation of the 2 sharing solutions in order to detect problems and deficiencies. The methodology used is based on a comparison between the initial functional requirements identified, the use cases that have been created and the observation/testing of the solution. The outcomes of technical evaluation will provide feedback to the developers for further enhancement of the two sharing platforms.

The following step is the evaluation of the two solutions aiming for their critical comparison and assessment. The evaluation has already been planned and designed and is demonstrated at the following graph. The consortium will derive recommendations on best practices to content description metadata procedure as well as to content repurposing.



7.5 mEditor: a mEducator tool to re-purpose Serious Games

Some of the mEducator content items involve educational resources in the form of serious medical games.

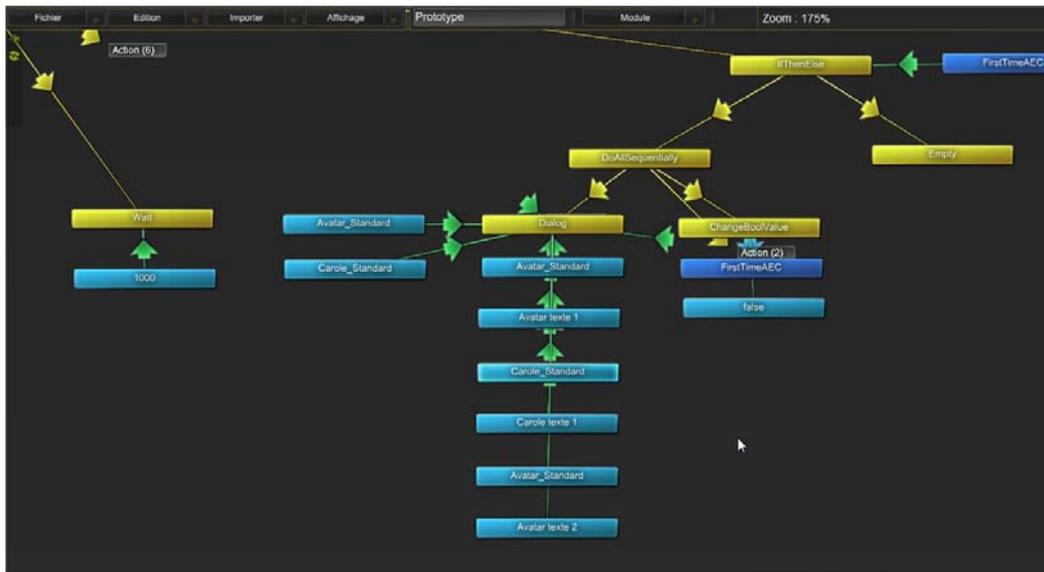
One of the activities of mEducator during the second year was the work on the repurposing of serious games. The work conducted in the first year of the project involved development work for generating specific scenario wrappers aiming to produce reusable content via content wrappers, scenario editors and web-based tools .

Games' scenaria are usually hard to repurpose because one needs to edit the source code, provided he has access to it. mEducator serious games providers have developed a tool which was named mEditor, allowing access to the repurposable parts of a serious game. With this tool, the scenario becomes an XML file, and by proposing a visual representation of the scenario in the form of a graph

(node and links), authors are able to navigate through it. This tool is technology agnostic, i.e. it can be bound to any technology, be it a game engine, or any other kind of application.

The main benefits in using the mEditor tool are the following:

- Serious Games are becoming content which can be repurposed
- Games can be played in another engine that share the same features
- There has been a significant decrease in serious games production time (testing phase)



7.6 mEducator Clustering Activities

The consortium has organized clustering meetings and events with related projects or relevant associations. The main goal was to collaborate with various teams and establish associations which would benefit the project and allow:

- a. the enrichment of available educational material and benefit from repurposing procedures
- b. the collaboration with communities of learning technologies as well as standardization bodies and working with state-of-the-art solutions and tools to allow repurposing and sharing of educational material
- c. the engagement of users groups to take part in the evaluation process of mEducator solutions.

Projects currently in the process of being associated with mEducator are:

- Porsche project. Pathways for Open Resource Sharing through Convergence in Healthcare Education (PORSCHÉ), (<http://www.medev.ac.uk/ourwork/oer/PORSCHÉ>)
- Mededworld – AAMC MedEdWorld, Association for Medical Education in Europe (<http://www.mededworld.org/>)
- MedEdPORTAL (www.aamc.org/mededportal)
- The Tempus CRH-BME project – Curricula Reformation and Harmonisation in the field of Biomedical Engineering (<http://www.crhbme.upatras.gr>)
- The Virtual Physiological Human Network of Excellence – NoE
- The Ricordo Project – Interoperable Anatomy and Physiology, (<http://www.ricordo.eu>)
- iSeek - Empowering Individuals with the Knowledge to Act by Dynamically Targeting, Discovering, and Organizing Information, Powered by Vantage Labs, www.iSeek.com
- IMIA Social Media SIG, International Medical Informatics Association Social Media Working Group (SMWG) (<http://imiasocialmedia.wordpress.com>)

- The CISMeF project: Catalog and Index of French-language Health Internet resources. A quality-controlled subject gateway. <http://www.chu-rouen.fr/cismef/>
- HON, Health On the Net Foundation, (<http://www.hon.ch>)
- The InterSTIS project <http://www.interstis.org/>
- United Health Groups (<http://www.unitedhealthgroup.com>)
- The TransMed programme – Translational Medicine (<http://www.helsinki.fi/transmed>)
- UROFilm (The Papageorgiou Hospital Urology Clinic’s educational film project, Greece)
- The Educational activities and internal projects of the Dental Association of Northern Greece

and numerous other projects and initiatives.

8 Impact & Sustainability

This section should highlight the European dimension of the project and why and how it has an impact on the target market (*e.g. due to the critical mass of content aggregated, the improved accessibility of the content*), including information on market prospects (*provide a summary of your market research, giving an overview of the market situation, future trends in your target markets.*)

As regards the **final** report, describe measures taken to ensure sustainability of the project results (*provide a summary of your business model, expected revenues, expected costs to maintain the service, break-even point, etc.*).

A description of possible future activities that derive from the completion of the project should be included, incorporating information on when the services/products are going to be available on the market, whether, when and how future additional services/products are going to become available and on other events/actions that might be of interest to the reader.

The abundance of medical educational content available in individual EU member countries cannot be used effectively simply because discovery and retrieval are hampered by a lack of standardized terminology and content sharing mechanisms. This need is addressed by mEducator, by building standards and reference mechanisms so that medical educational content can be shared more effectively by EU higher educational institutions. To this end, it is envisaged that mEducator will improve the quality of medical education by allowing the best educational materials to be shared across EU, while eliminating the costs currently incurred through duplication of these materials in multiple institutions. In fact, a number of established repositories of medical education content are already showing interest in adopting the best practice guidelines and schemes produced by the mEducator project.

In order to derive best practices for medical educational content re-use and sharing, mEducator needs a critical mass of medical educational content types (rather than items), representing various educational approaches (e.g. conventional teaching, active learning, e-learning and blended learning, etc), various audiences, various languages and various cultures. Content in mEducator covers and represents the whole range of medical educational contents, including traditional instructional learning resources (e.g. notes, books, scientific papers, exams, lectures, images, videos, practicals), as well as, resources related to active learning approaches (e.g. problem/case based learning material), or related to novel experiential teaching and studying techniques (e.g. serious medical games), as well as resources unique in the medical domain (e.g. virtual patients, simulation algorithms, evidence based medicine forms, objective standard clinical examination forms, medical annotation tools, anatomy web traces) and content items related to new web 2.0 technologies (e.g. medical wikis, podcasts, blogs).

Finally, it has to be mentioned, that all effort spent so far, as well as any future developments in mEducator envisage to ensure that achievements are sustainable. To this end, mEducator has already started developing a simple licensing model for new content providers (simple users, as well as associated partners) to join in the project network in order to exceed the goals of the project and to broaden the network of the partners. Actions are undertaken so as to achieve the creation of a self

sustainable service for the managed provision of the network at a European level (but not limited to that). A full sustainability and maintenance plan is currently under development to accommodate the above needs and facilitate future extensions and developments of the mEducator products and outcomes.

9 Further Information

If relevant, list here whatever else you deem necessary/appropriate for the understanding of the work you have done, the results you have achieved and/or the objectives you have reached.

In the immediate future, the mEducator consortium will engage with project activities towards:

- the finalisation of the mEducator metadata schema and its subsequent standardisation, together with numerous accompanying/associated tools and environments that will allow a user to effortlessly describe, license and re-purpose their material independently of its form and origin
- the creation and expansion of a social network of collaborating resource providers
- the finalisation of the development of two mechanisms (technical solutions) for interlinking the resource repositories and LCMSs in a transparent to the user way, as well as, their full evaluation and exploitation.
- the production of guidelines on how to achieve best practices in all the involved tasks and aims of the project.