

The Intergeo Project

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ABSTRACT

Dynamic geometry software allows one to construct geometrical figures where some objects (free points, lines, etc.) may be dragged with the mouse, while some relations, such as perpendicularity, for instance, are defined to hold. Thus, one can observe and deduce properties that may be found at each of the diverse placements of the same construction. In this way each construction is not just one figure but a potentially infinite number of figures. Therefore, interactive geometry software is a powerful tool for teaching mathematics, far beyond a mere technological compass and ruler transposition.

Interactive geometry programmes have been available for more than twenty years. In spite of the large and diverse amount of constructions and teaching materials for interactive geometry available from different sites, very few teachers use interactive geometry in the classroom when teaching mathematics.

Intergeo (<http://i2geo.net>) is an EU-co-funded eContentplus project, with the participation of academic institutions and software developers from six European countries, which gives access to more than 2000 existing resources related to Dynamic Geometry, and it helps users to create new ones. Of special relevance in the project is the creation of an Internet portal Intergeo, in ten languages, which collects all the information related to it, and makes it available to the user. Resources are suitably classified and the portal has a search engine which allows the fast finding of good quality material related to a particular classroom theme. The materials are created using programs such as Cinderella, Cabri, GeoGebra, Geonext, Geoplane/Geospace, TracenPoche, Wiris, and the like. All of the explicitly mentioned programs –some of them are open source, some are commercial-- are members of the Intergeo consortium. The quality of the resources is voluntarily evaluated by the education community. This has a twofold purpose: to provide teachers with information about the resources, so that they can be used in their classrooms with reliability, and to suggest the authors the possible ways to improve the resources.

The aim of the workshop is to present the Intergeo project, comment on its objectives, and to explain the audience how to become active users of the Intergeo web portal, how to submit new resources, how to search for content and how to collaborate in the quality testing of the available resources. Those attending the workshop will be able to practice searching and evaluation of resources with real cases.

Keywords

Interactive geometry, dynamic geometry, teaching resources.

Motivation

Even though there is a considerable number of examples and interesting activities, the use of interactive geometry in the school classrooms is not sufficiently spread out. In fact, many teachers do not know very much about all the possibilities of dynamic geometry programs as teaching and learning tools, or they do not have access to the necessary resources.

The following are probably the three main barriers that prevent the European Union (EU) wide adoption of the existing material:

1. Missing of adequate search facilities.
2. Lack of interoperability of materials created with different interactive geometry software.
3. Missing information about the technical and didactical quality of the resources.

The aim of the Intergeo Project is to make an effective contribution towards the elimination of these barriers.

This article is an invitation for teachers, education researchers, software developers and any other interested person to actively participate in the Intergeo project. We will give practical information about the Intergeo web page (<http://i2geo.net>): how to become a member, how to add material, how to find existing materials, and how to make evaluations of them.

About the project

Intergeo is an acronym for *Interoperable Interactive Geometry for Europe*. Intergeo is a three year project co-founded by the European Community programme **eContentplus**. It started on October 2007, and ends on September 2010, with a funding of 1,427,849 €

The Partners of the Consortium are the following:

University of Education Schwaebisch Gmuend	Germany
University of Montpellier	France
German Research Center for Artificial Intelligence	Germany
Cabrilog SAS	France
University of Bayreuth	Germany
University of Luxembourg	Luxembourg
University of Cantabria	Spain
Eindhoven University of Technology	Netherlands
Maths for More SL	Spain
University of South Bohemia	Czech Republic

with the participation of the following software partners: ActiveMath (<http://www.activemath.org>), Cabri Geometry II, Cabri 3D (<http://www.cabri.com>), Cinderella (<http://cinderella.de>), GeoGebra (<http://www.geogebra.org>), Geonext (<http://www.geonext.de>), Geoplan/Geospace (<http://www.aid-creem.org>), OpenMath

(<http://www.openmath.org>), TracenPoche (<http://tracenpoche.sesamath.net>) and WIRIS (<http://www.wiris.com>), among others.

Objectives of Intergeo

The main objective of the Intergeo Project is to make digital content for mathematics teaching in Europe more accessible, usable and exploitable.

In order to attain this objective, the following tasks are being developed:

- offer content in a searchable and metadata-tagged portal,
- enable users to use their software of choice by specifying a common file format based on open standards,
- test available material in the classroom. All stakeholders, software teams, resource authors, teachers and learners will be involved, in order to promote quality enhancement cycles.

In addition, the project involves contact persons from the governments and school administration of several countries, as well as curriculum experts. This has a double purpose: to get reliable information about the use of interactive geometry software in each country, and to convey to the educational administrators the convenience of the use of digital content.

Using the platform

The web address of the platform is: <http://i2geo.net>.

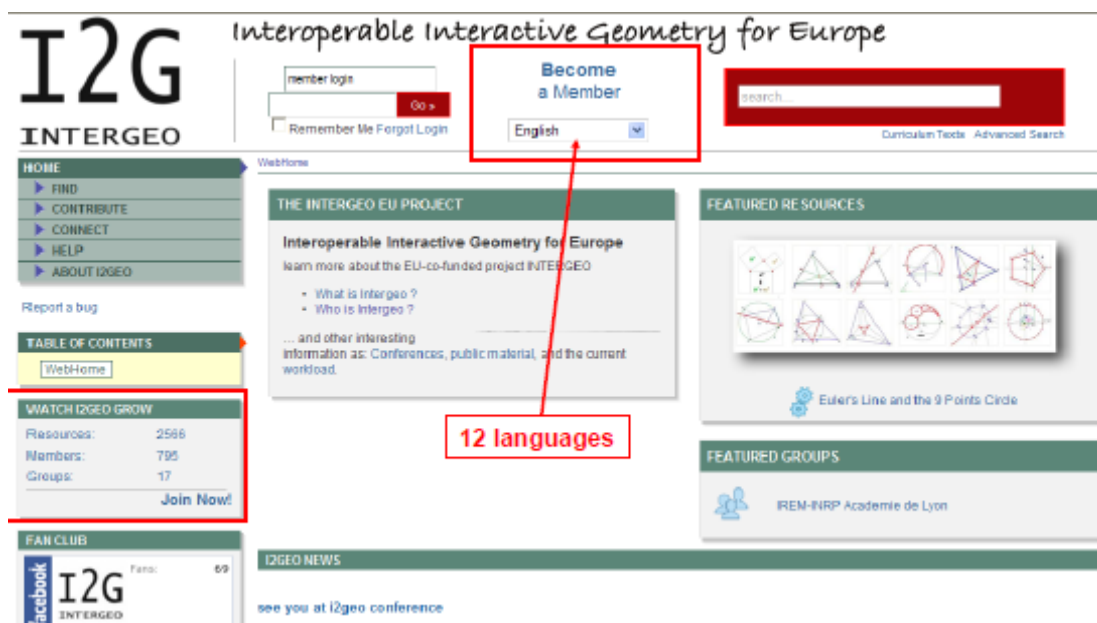
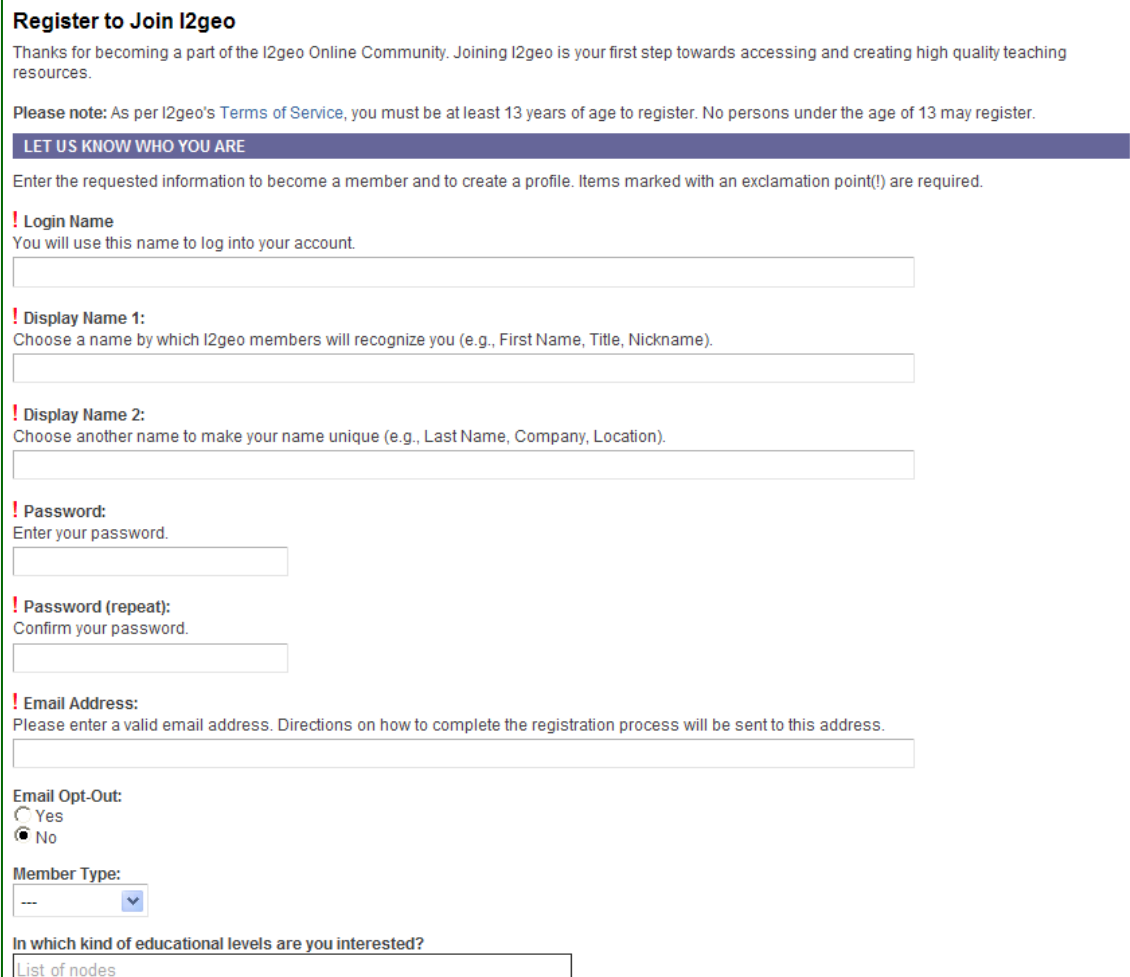


Figure 1. Intergeo platform.

On the left hand side you will see up to date information on the number of resources, members and groups. At the moment the figure 1 was made, there were 2566 resources.

You can choose one of twelve different languages for the web page. In order to become a member, you must fill a very simple form (see figure 2). If you are not a member, you can use many of the tools of the platform, but to have a more active participation it is convenient to be a member.



Register to Join I2geo

Thanks for becoming a part of the I2geo Online Community. Joining I2geo is your first step towards accessing and creating high quality teaching resources.

Please note: As per I2geo's [Terms of Service](#), you must be at least 13 years of age to register. No persons under the age of 13 may register.

LET US KNOW WHO YOU ARE

Enter the requested information to become a member and to create a profile. Items marked with an exclamation point(!) are required.

! Login Name
You will use this name to log into your account.

! Display Name 1:
Choose a name by which I2geo members will recognize you (e.g., First Name, Title, Nickname).

! Display Name 2:
Choose another name to make your name unique (e.g., Last Name, Company, Location).

! Password:
Enter your password.

! Password (repeat):
Confirm your password.

! Email Address:
Please enter a valid email address. Directions on how to complete the registration process will be sent to this address.

Email Opt-Out:
☐ Yes
☒ No

Member Type:

In which kind of educational levels are you interested?

Figure 2. Registration form.

On the left hand side of the Intergeo web page you will find links to three brief videos explaining how to create a simple GeoGebra resource, how to write a review, and how to find a resource.

Finding resources

In Intergeo, a resource may take different forms: it may be a link to a web page containing interactive geometry material, a single dynamic geometry construction, a document, a set of files compressed in an archive, etc. There are different criteria one may use to search for particular resources in the platform.

On the top left of the home page there is a menu with the following items:

> FIND
> CONTRIBUTE
> CONNECT
> HELP
> ABOUT I2GEO

Choosing FIND, one gets a drop down menu with different options (see figure 3): Featured Resources, Recent Resources, Search through Curriculum Texts, Browse Resources by Subject, or Reviewed Resources.

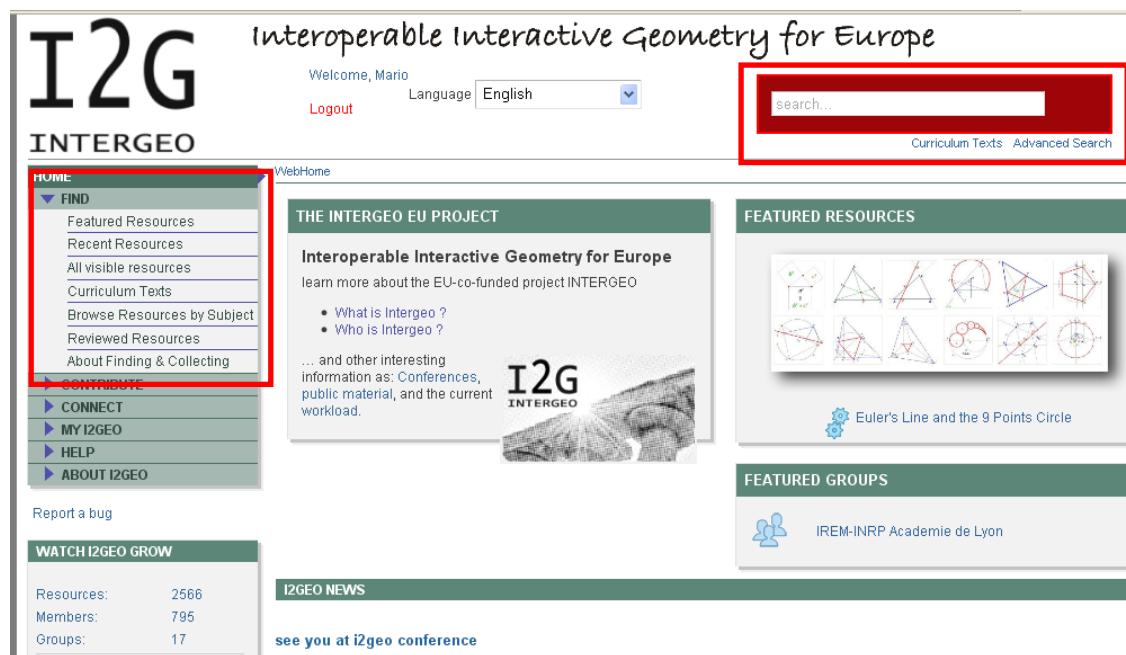


Figure 3. Searching for resources.

Another way to find resources is using the keyword search box on the top right of the home page. Typing one or more keywords, one gets, in a couple of seconds, a list of resources related to the keywords.

In addition, the platform contains the Mathematics Curriculum Contents of some European countries. Each of those curricula has, in highlighted form, the subjects that are linked to specific materials in the repository.

The outcome of a search procedure will have a form similar to the one in figure 4. Each item in the list contains the following information on the resource:

- Title.
- File type: HTML, zip, pdf, Cabri2 construction, GeoGebra construction, etc.
- Authors and contributor.
- Date of last update.
- Review rating: 1 to 4 stars.
- Type of resource: Animation/Simulation, Experiment/Lab, Curriculum-Tutorial, etc.

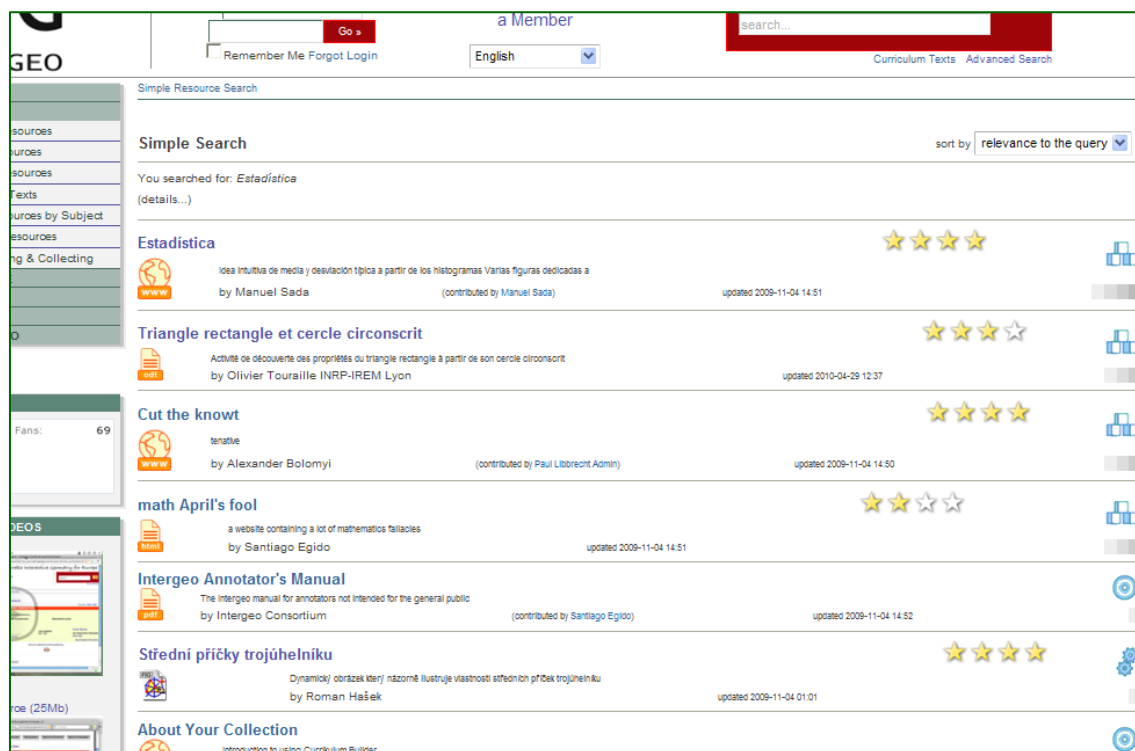


Figure 4. Searching with the keyword “Estadística”.

Once we click on the title of a particular resource, a box will open containing three “cards”: Content, Information and Comments & Reviews (see figure 5). Under Content comes an abbreviated description of the resource and a link for downloading or opening the resource. Under Information one finds a structured presentation of the basic relevant information on the resource. The last card contains a summary of the reviews and comments about the resource, with the option to see each review in detail.

Going back to the drop down FIND menu, if you choose to Browse Resources by Subject, you will be able to choose one of ten main fields in mathematics (see figure 6). For example, more than 200 resources are classified as Calculus, and more than 1200 are classified as Geometry resources!

Contributions are welcome

The active participation of users is a key aspect of the Intergeo project. One of the project work packages is devoted to the creation and consolidation of Communities of Practice. Local user meetings were organized in different regions, with the participation of teachers, researchers and interactive geometry material creators. The purpose of these meetings is to divulgate the project, and to encourage the participants to place resources in the portal, and to use and evaluate the existing materials. One may contribute with its own materials or with those created by someone else.

Triangle rectangle et cercle circonscrit



Contributed By: Olivier Touraille INRP-IREM
Lyon



(one review on 2010-03-20)

Content

Information

Comments (0) & Reviews (1)

Revision History

BASIC INFORMATION

Title:

Triangle rectangle et cercle circonscrit

Description:

Activité de découverte des propriétés du triangle rectangle à partir de son cercle circonscrit

Trained Topics and Competencies

- circumcircle
- right angled triangle
- Perpendicular bisector
- use the definition of the perpendicular bisector of a segment
- die charakteristische Eigenschaft einer Mittelsenkrechten kennen
- Thales-Circle-Theorem

Educational Levels

- Quatrième de Collège

Instructional Component Type:



Activity: Experiment/Lab

Key Words:

Language:English

RIGHTS & ACCESS INFORMATION

Access Privileges:Protected: Available to anyone but only you (or your group members) can edit this copy

Hidden from Search:No

Rights Holder:Olivier Touraille INRP-IREM Lyon

License Deed:i2geo License (Creative Commons Attributions 3.0)

Figure 5. Content / Information / Reviews.

INTERGEO

☐ Remember Me ☐ Forgot Login

Engli

HOME

▼ FIND

Featured Resources

Recent Resources

All visible resources

Curriculum Texts

Browse Resources by Subject

Reviewed Resources

About Finding & Collecting

► CONTRIBUTE

► CONNECT

► HELP

► ABOUT I2GEO

[Report a bug](#)

FAN CLUB

Subjects

Browse Resources By Subject

- Algebra and Number Theory (65)
- Applied Mathematics (110)
- Calculus (210)
- Differential and Difference Equations (0)
- Discrete Mathematics (0)
- Geometry (1257)
- Logic and foundations (21)
- Numbers and Computation (331)
- Statistics and Probability (32)
- Analysis (107)

Figure 6. Browse resources by subject.

The platform offers four ways for adding a resource (see figure 7):

- Upload a file from your computer.
- Add a link to a great web resource you know.
- Create a lesson plan using a template.
- Create a resource from “scratch”.

About Contributing

First of all, be assured that your personal data *will not* be shared with anybody unless you voluntary make the choice to let others see them. You will not receive spam because of your participation in I2geo. So, in order to contribute, [Become a member!](#)



[Tutorial: Contributing Basics](#)

CONTRIBUTING ON I2GEO

- Publish your best resources for the world to see and use, not only your own creations but as well collections of interesting resources put together, organizing is valuable!
» [Add a Resource](#)

HOW TO CONTRIBUTE

Go to: [My Contributions](#) | [My Collections](#)

Add Your Best Curriculum

If you have teaching and learning resources that you'd like to share with the global education community, add them into the I2geo repository.

- » [Add a Resource](#)
- » [View Featured Resources](#)

Create a Resource

No wiki knowledge required! It's easy to create instructional materials on I2geo: use a form to enter and format your content.

- » [Make a Resource from "Scratch"](#)
- » [Make a Lesson Plan from a Template](#)



Figure 7. Adding resources.

If you decide to create a lesson plan using a template, you can choose one of these templates:

- I2geo Standard Lesson Plan
- Nortel LearniT Lesson Plan
- ACE Lesson Plan
- Cloud Institute Lesson Plan
- WebQuest

If you prefer to create a resource from “scratch”, there are two options:

- **Wiki Resource:** No special skills required -- simple "what you see is what you get" format makes creating content easy!
- **HTML Resource:** Use for pasting in existing HTML or formatted text from MS Word.

Share your views about the resources

Another way of making a valuable contribution to the project is to use or review resources, and then write a short evaluation of its quality. In order to do this, first choose a resource. From the Comments & Reviews card, click on Add a Review and you will be taken to a questionnaire, with nine statements, where you can choose one of four levels of agreement (see figure 8).

Radio buttons: more on the left side to say that I don't agree, more on the right side to say that I agree

▶ ○ ○ ○ ○	I found easily the resource, the audience, competencies and themes are adequate
▶ ○ ○ ○ ○	The files are technically sound and easy to open
▶ ○ ○ ○ ○	The content is mathematically sound and usable in the classroom
▶ ○ ○ ○ ○	Translation of the mathematical activity into interactive geometry is coherent
▶ ○ ○ ○ ○	In this resource, Interactive Geometry adds value to the learning experience
▶ ○ ○ ○ ○	This activity helps me teach mathematics
▶ ○ ○ ○ ○	I know how to set my class for this activity
▶ ○ ○ ○ ○	I found easily a way to use this activity in my curriculum progression
▶ ○ ○ ○ ○	The resource is user friendly and adaptable

Figure 8. Short questionnaire.

You can choose to answer only the statements which you find relevant to the chosen resource.

If you would like to be more specific in any of the statements, you may unfold it in a few substatements (for an example, see figure 9).

▼ ○ ○ ○ ○	Translation of the mathematical activity into interactive geometry is coherent
○ ○ ○ ○	The math and the figures are related
○ ○ ○ ○	The figure is behaving consistently within the activity
○ ○ ○ ○	The figure shows no ill effect
○ ○ ○ ○	The numerical values (angles, lengths) are consistent
○ ○ ○ ○	Functionalities and specific behaviors like sliders, keyboard interaction or macros are well described
Comments:	
<input type="text"/>	

Figure 9. More specific statements.

This questionnaire has been carefully designed, with the objective of addressing all the important aspects of a good dynamic geometry resource, from the mathematical, didactical and technical points of view. For a more detailed analysis of quality evaluation in Intergeo, see the contribution by Laborde and Soury-Lavergne in these proceedings.

Final remarks

As stated in the first introductory section, the aim of this article is to invite all members of the education community to visit the Intergeo platform, see its main features, join as a member, use the resources, and give their opinions about those resources that captured their attention.

We tried to give an overview of the platform, and some directions on how to use it. If necessary, additional help can be found in the platform.

We would like to thank those members of the partner institutions for their valuable work in the project, and all the members who are contributing with useful materials, comments and evaluations.