Innovative Open Data Education and Training Based on PBL and Learning Analytics

ODEdu
OPEN DATA EDUCATION

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ODEdu project resulted in 16 tangible exploitable results that are divided in: **Knowledge Assets** which refer to any type of knowledge produced in the project context and **Educational Assets** which are all the project results that can be used in educational and training activities. Next, the knowledge and educational assets as well as their web location are presented in detail.

Knowledge Assets

Open Data knowledge and skills inventory. This is an identification of the knowledge and skills that university students and employees of private and public organizations need to acquire in order to publish and re-use. The result can be found in the publicly available deliverable D1.1 "Stakeholders needs regarding Open Data".

Repository on Open Data technologies. This is an overview of tools and technologies available on the web for the support of each of the phases in the Open Data (OD) publishing and re-using cycle. The result can be found in the project website at: http://odedu-project.eu/open-data-technologies/.

Repository on learning analytics. This result includes a list of learning analytics technologies and their descriptions. The repository aims to provide knowledge on learning analytics tools to any interested stakeholders that want to apply learning analytics in their education and training settings. The result can be found in the project website at: http://odedu-project.eu/learning-analytics-technologies/.

Data driven Problem Based Learning (PBL) model. This is a methodology developed to facilitate design of open data educational/ training activities. The methodology was built based on the information gathered through literature review on PBL, data collected on the existing Open Data training activities of the partners, and the international Open Data educational activities.

The model consists of four layers that are to be considered when creating learning activities:

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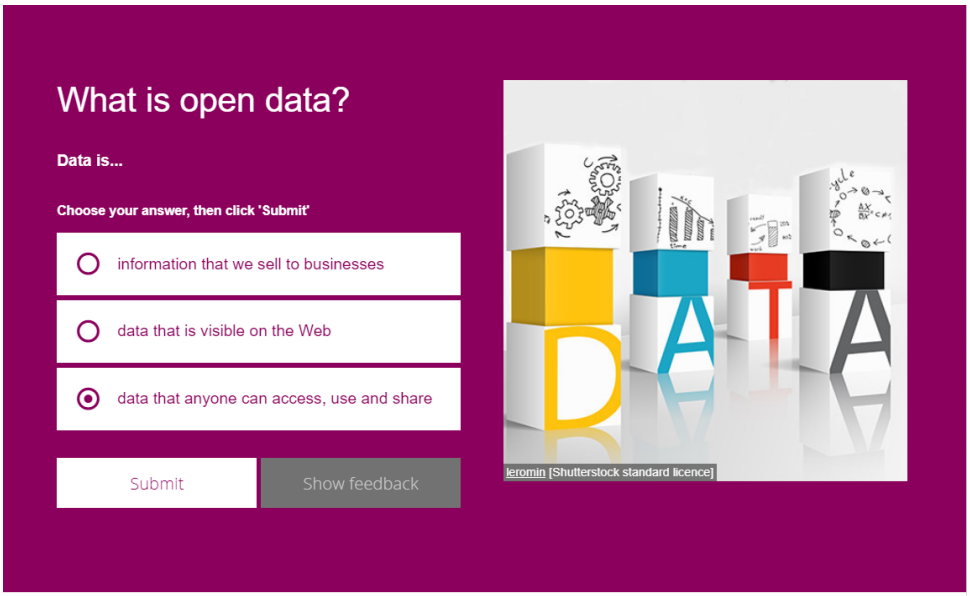
Erasmus+ is the EU's programme to support education, training, youth and sport. With a budget of €14.7 billion for 2014-2020, it provides opportunities for over 4 million participants to study, train, gain experience, and volunteer abroad. It also offers €1.68 billion for activities with partner countries.

More information about the Erasmus+Programme could be found at: https://ec.europa.eu/programmes/erasmus-plus



- combining content, technology and pedagogy using the technological pedagogical content knowledge
- maintaining an alignment between learning principles of PBL and other components using the model for problem and project based alignment
- applying the 10 principles of instructional design quality
- developing competencies necessary to design PBL-based learning activities by getting familiar with different PBL designs

The result can be found in the publicly available deliverable D2.1 "Data-driven PBL model".

Open Data PBL Design Pathway. This is a visual, structured model created to support the OD educators in implementing PBL principles, and to help them develop their learning design skills and competences. The model is to be used as a guide for educators in structuring the design process of the OD teaching/training activities. The OD-PBL Design Pathway is divided into five main steps: understand, review, design, teach and reflect. Each of them includes a description of guidelines for course design. The result can be found in the publicly available deliverable D2.2 "Open Data learning processes and analytics".

Pilots Reports. The reports elaborate on the preparatory work carried out for the implementation of the university and VET (Vocational Education and Training) pilots. In particular, the reports provide analytical descriptions of the curriculum covered, the process, including information such as the methodology followed, the learning methods and materials used, the duration of the pilots, practical applications, engagement learning methods etc. Moreover, the reports provide information about how the pilots were built upon the pedagogic principles and summarises the results and feedback received during and the delivery of the pilot. The result can be found in the publicly available deliverables D4.1 "University pilots report" and D4.2 "VET pilots report".

Evaluation reports of educational activities & Recommendations. The evaluation reports include quantitative and qualitative information from the students' feedback as well as lessons learnt from all the trials carried out during the ODEdu project. The reports also include conclusions as recommendations for future efforts by external stakeholders on Open Data PBL-based education. The result can be found in the publicly available deliverables D5.1 "University pilots evaluation report" and D5.2 "VET pilots evaluation report".

Educational Assets

Open Data PBL model course for university. This result proposes a PBL course entitled Open Data for Research and Innovation that can be delivered as a full or part of a University module. The complete course model for the university will see students capable of obtaining European Qualification Framework (EQF) level 7 knowledge and skills that will enable them to demonstrate specialised problem-solving skills required in research and/or innovation to develop solutions to open ended problems. The result can be found in D3.1 "Open Data university course".

Open Data PBL VET model course for private and public sector employees. This result presents a VET course model for private and public sector employees. It is an EQF level 4 course and its objective is to introduce professionals in the public and private sectors to the essentials of working with open data. The course follows PBL principles and includes a series of problems that trainees have to work with. The result can be found in the publicly available deliverable D3.2 "Open Data VET course for private and public employees".

Educational material on Open Data. This result concerns the individual units of learning that make up the ODEdu course catalogue. This list only covers those units developed directly as part of the ODEdu project and not those that were reused under license from other projects. In particular, the educational material is comprised of the following units:

- The data spectrum
- Open data and open standards
- When to open up data
- Why open research data?
- Annotating and describing data
- How to enrich data
- Starting a business with open data
- Growing a business with open data
- Overcoming barriers for established businesses
- Pitching an open data business
- Working with big data
- RDF: Three is the magic number
- Linked open data and RDF
- Having a REST with API design
- Choosing and designing schemas
- Schemas, linked open data and RDF

- Is the semantic web the future of the web?

The result can be found in the ODedu educational and training platform and it is licensed under CC BY-SA 4.0: Creative Commons Attribution-Share Alike 4.0 International License.

Educational material on Open and Linked Data in Greek. The educational material includes content, exercises, examples and datasets in the Greek language that cover various topics from the Open and Linked Data categories of the Open Data curriculum skeleton. The result can be found in the ODedu educational and training platform and it is licensed under CC BY-SA 4.0: Creative Commons Attribution-Share Alike 4.0 International License.

Educational material developed on Open and Linked Data in Dutch. This result provides a simple but comprehensive introduction to open data: the rationale behind it, formats, syntax, applications and even linked open data. It also includes problem-solving exercises with typical Flemish datasets. The result can be found in the ODedu educational and training platform and it is licensed under CC BY-SA 4.0: Creative Commons Attribution-Share Alike 4.0 International License.

Educational material on Machine Learning Basics. The material consists of the following sections:

- Material on machine learning: the essentials
- Unsupervised and supervised learning.
- Building a model, doing predictions, evaluating the model
- Building clusters and anomaly detection

The result can be found in the ODedu educational and training platform and it is licensed under Creative Commons CC.0: No Rights Reserved.

ODEdu Moodle course template. The Moodle course template includes a structured course with sections of units of learning on Open and Linked Data. Each unit of learning includes educational material in Greek as slides and links to external resources as well as various activities that support the problem-based delivery of the course (e.g. forum, wiki, quiz, feedback etc.).The result can be found in the ODedu educational and training platform and it is licensed under CC BY-SA 4.0: Creative Commons Attribution-Share Alike 4.0 International License.

Open Data Portal Sources. This result is a list of the data sources used in the ODEdu trials for experimentation with existing datasets. The result can be found in the ODedu website at: http://odedu-project.eu/open-data-portal-sources/.

ODEdu Educational and Training Platform. The education and training platform is the delivery mechanism for the courses designed within the ODEdu project. As such, the platform is able to handle courses designed in the PBL model, in multiple localisations. The platform supports these courses by providing course creators with a variety of different course formats and activities, and the flexibility to structure their courses in any configuration they require. A wide variety of plugins are available for supporting the different steps of the PBL process and allowing students to engage and participate actively by solving problems within the course. Additionally, a wide variety of Learning Analytics (LA) are recorded to allow course designers to maximise the effectiveness of their courses, as well as to provide sufficient data for the evaluation of the project as a whole. The result can be found in the ODedu educational and training platform.

ODEdu WEBSITE

For further information, you can visit the ODEdu website at: http://odedu-project.eu.

All project deliverables are available in the ODEdu website.

ODEdu EDUCATIONAL PLATFORM

You can access the ODEdu educational and training platform at: http://platform.odedu-project.eu/

CONSORTIUM

University of Macedonia, Greece

Open Data Institute , Great Britain

Aalborg University, Denmark

AcrossLimits, Malta

Association of Information Technology Companies of Northern Greece, Greece

ProXML, Belgium

Linked Organisation of Local Authority ICT Societies, Belgium

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