

MEASURING CONSCIOUS USE OF OPEN CONTENT IN COMPETENCE – BASED EDUCATION

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Abstract

The aim of this research is to identify the methods and tools to increase the level of conscious use of Open Educational Resources (OER) and open content (OC) ontologies in competence-based educational settings. The paper discusses the integration of OC ontologies with learning scenarios, suggests the method to identify the level of conscious use of OC in competence-based settings, and defines OpenScout competence-based ontology use culture specific characteristics in multicultural settings. Theoretical conceptual research, as well as empirical research was implemented using OpenScout multicultural community developing and providing OC services for higher education institutions and enterprises.

Introduction

Eternal dispute arising between researchers supporting technology-driven and didactical-setting based solutions continues when open educational resources (OER) and open content (OC) repository design is discussed. Though discussion on the incentive for diversification of OER and OC (didactical scenario or ontology itself) is open, both groups agree that it is important to track the need for OER and OC before researching and designing the models of OER and OC ontologies.

Ontology is defined as a set of open content with which to model a domain of knowledge of discourse (according to Gruber, 2009). OER and OC ontology in this context is classified according to competence level and is searched and used by OpenScout community actors (management educators, students and teachers, companies and organizations, information technology specialists, higher education institutions, and other target groups).

This research addresses the problem arising from miscommunication and different beliefs of diverse groups, representing two opinions, stating that a) technology-based solution designing should be built on expert-driven architecture first and then its applicability tested by the users, and b) user needs and didactical characteristics should be researched, and only then the architecture of technology-based solution should be suggested. At the same time, the importance of user community characteristics is either primary or secondary. Following these arguments and diverse theoretical opinions, this research is focused on the (un)conscious use of OER and OC in educational settings. Moreover, it is contextualized and empirically tested in settings when online educational services

are being designed and both group representatives participate in the process. Even though there is disagreement on the driving force (technology or didactical settings), both groups of researchers also agree that it is important to derive scenarios and integrate them designing OER and OC repositories for higher and enterprise education.

The aim of this research is to identify the methods and tools to increase the level of conscious use of OER and OC ontologies in competence-based educational settings.

The aim of research is reached through the following objectives:

1. To discuss the integration of open content ontologies with learning scenarios.
2. To suggest the method to identify the level of conscious use of open content in competence-based settings.
3. To define OpenScout competence-based ontology use culture specific characteristics.

Theoretical conceptual research, as well as empirical research was implemented using OpenScout multicultural community developing and providing open content services for higher education institutions and enterprises. Qualitative and quantitative research results are presented in the final chapter of the paper.

Integration of OER and OC Ontologies with Learning Scenarios

Different scientists discuss different scenarios for integrating open content (OC) and open educational resources (OER) into curriculum designing. Some authors (Edelson, Gordin, & Pea, 1999) make parallels between problem-based learning and curriculum designing/ improving with OC, explaining the need for integrating the OC inquiry based on teaching and learning needs.

Researchers introduce the learning and teaching scenario as a sequence of problems and solutions, and differently from other forms of e-learning (practicing and drilling) in the sense that learners are moving in game-like situations. The authors' model of scenario-based learning is based on a failure-success approach, rather than on learning activities themselves.

Helic (2007) introduces learning scenarios as scenarios that reflect sophisticated pedagogical approaches such as collaborative writing or project-oriented learning (rather limited to group activities as well). To support different learning activities from such scenarios the technological infrastructure of these systems must be appropriately adjusted and configured. Here eternal dispute arises: who accelerates what? Ontologies accelerate learning scenarios or learning scenarios accelerate ontology models?

As Rius, Sicilia, and García-Barriocanal (2008) introduce the concept of ontologies, they suggest the approach when ontologies contain different type of learning contents, interactions between students and learning systems in collaborative environments (Ikeda, Hoppe, & Mizoguchi, 1995), the learning tasks (Mizoguchi, Sinitsa, & Ikeda, 1996) and the learning objectives and workgroups, and then learning scenarios are aimed at the description of elements that are actively used in a collaborative settings presented by this ontology environment: “This ontology has the aim of describing the interactions and dependences between the agents involved in a collaborative learning scenario” (Rius et al., 2008, p.152).

The concepts of learning scenarios using ontologies or OER and OC repositories might be very diverse. This research area is still open for didactical and pedagogical models to be investigated. Repositories and ontologies of OC and OER accelerate the use, improvement and distribution of OC by opening Web 2.0 communities (via integration to social network platforms). There is the agreement between ontological approach, opening up from closed to open learning environments and social networks, and then learning and teaching events are necessary to support scenario development and application. This research investigates only one aspect of potential didactical models for the use and exploitation of OER and OC – (un) conscious embedding of OER and OC into learning, discussing all three types of learning: informal, non-formal and formal. As research was initiated in the framework of OpenScout portal, OC competence-based repository and OpenScout community building, empirical research was implemented using OpenScout multicultural community infrastructure and will be presented in following chapters.

Identification of the Level of Conscious Use of OC In Competence-Based Settings

Learning taken as formal, non-formal and informal is merging within the settings of higher education. Teachers face lack of practices for the use of OC in formal learning situations, but non-formal and informal learning affects formal study programs from the point of view of recognition of *learning outcomes*. Learning outcomes are defined on the basis of pre-defined setting of knowledge, skills and attitudes needed for a certain professional activity. Learning outcome recognition is based on the evidence of the knowledge, skills and attitudes, gained irrespectively either within formal, non-formal or informal settings.

Learning and teaching takes place within a set up context at a higher education with derived cultural traditions. Learning and teaching culture consists of certain practices and regulations defined within the institution. Study curriculum designing is another cultural – traditional process set up within these settings. Recognition of study outcomes is implemented on the basis of prescribed and described procedures.

Thus, learning and teaching happens using study curriculum, which comprises scenarios designed by study curriculum authors. Learning happens individually, though the learning process might be organised either individually (individual setting) or in groups (collaborative setting).

Verpoorten, Poumay and Leclercq (2006) suggested classification of learning and teaching activities to:

1. Observation/modelling
2. Reception/transmission
3. Exploration/documentation
4. Self-reflection/co-reflection
5. Debate/moderation
6. Creation/inspiration
7. Experimentation/reactivity
8. Practicing/guidance

These learning and teaching activities are listed from perspective of the learner (1st actor) and the teacher (2nd actor, passive “scenario writer”). Once scenarios are needed to encourage the learning process, all 8 learning and teaching events can be mixed and used to facilitate learning:

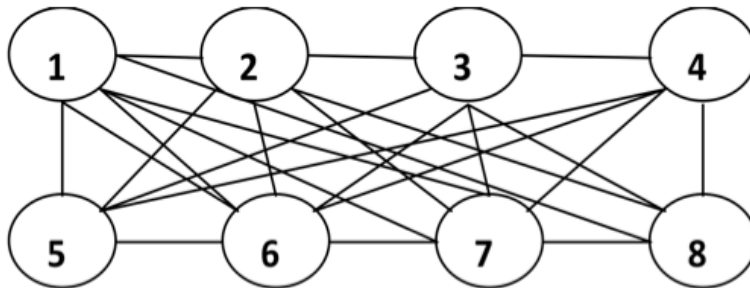


Figure 1. Possible sequences of learning and teaching methods within a learning scenario.

Table 1 illustrates how learning and teaching events might be classified if they happen in two types of learner settings (individually or group settings).

Table 1
Learning Method Classification on the Basis of Individual and Collaborative Learning

Learning method	Individual learning	Collaborative learning
Observation/modeling	X	X
Reception/transmission	X	X
Exploration/documentation	X	X
Self-reflection/co-reflection	X	
Debate/moderation		X
Creation/inspiration	X	X
Experimentation/reactivity	X	X
Practicing/guidance	X	X

In *formal and non-formal learning* settings, a teacher designs learning situations for conscious learning experienced by learners, didactically s/he follows these steps:

1. Identifies the competence/ study outcome in the study program (defined on the level of competence framework)
2. Identifies the skills, knowledge and attitudes to be developed (as the final vision/ evidence) by the learners.
3. Sets up the requirements (evaluation criteria) for the proof of evidence sufficiency (proficiency).
4. Chooses the learning method which would suite, best motivate the learners and their abilities to learn (prior learning, skills, and level of prior knowledge)
 - a. Needs a scenario for learning
 - b. Needs the content for scenario realization
 - c. Needs the tools for content realization.
5. Designs learning activities consistent with the study outcomes/ competences and evidence – based evaluation tools.

Table 2

Didactical Template for Contextualization of OC in the Context of Curriculum Designing

Study Outcomes	A(ttitudes) S(kills) K(nowledge)	Evidence/ Evaluation Criteria	Learning Methods
Study program competence 1	A	X	Topics
	S	Y	Learning scenario
	K	Z	Content (open) Tools
Study program competence 2+n	A	X	Topics
	S	Y	Learning scenario
	K	Z	Content (open) Tools

Learning happening in formal and informal settings would differ in the level of consciousness. The formal learning setting is consciously designed and is targeted at autonomous learners. The informal learning might have an opposite direction: browsing followed by contextualization of OC embedding them among learning results (searching for the place of competence gained among study outcomes or ASK (attitudes, skills and knowledge) needed for professional activities).

Thus the definitions of a random *informal learning scenario* when learning happens accidentally browsing the net, differ. Qualitative research could be the best solution for identification of the sequence of actions (natural way of learning) and contextualization user preferences, trying to define the level of consciousness in application of OC and OER learning results in studies or professional activity. The sequence suggested is the following:

1. Search of OC
2. Use of OC
3. Contextualization of OC in terms of:
 - a. Cognitive decision about its meaningful positioning within a learning activity scenario
 - b. Cognitive attribution of OC and its positioning among learning outcomes
 - i. Identification of evidence piece for describing / forming personal attitudes
 - ii. Identification of evidence piece for describing personal skills

iii. Identification of evidence piece for describing of personal knowledge

However, the preferences are subjective factors and cannot decide the applicability of OC in the context of didactical settings in higher education without its formal settings. ASK should be contextualized in meaningful way in terms of: (a) understanding/ interpretation of information transferred by OC, (b) applicability of OC to demonstrate the evidence of ASK, (c) synthesis with other information, and (4) evaluation, etc.

Thus, the users should evaluate the objective data on the applicability and apperception and interpretation of the OC, as well. The use of OC within online ontologies, its commenting, rating, and tagging might be subjective rather than objective in information settings. Needs of the users in subjective settings decide the usefulness of OC in informal settings. Needs of formal learning and teaching participants are defined and can be measured in the formal settings.

Any effort to increase the level of consciousness in the use of OER and OC should therefore be contextualized and directed by solution-to-the-problem approach. Problem based learning or inquiry – based learning approach used in search for OC in learning and teaching activities (in both, formal and informal settings) should cover the following parameters provided in Table 3.

Table 3

Didactical Template to identify the level of conscious use of OER and OC in Learning

The Problem Addressed by OC	Type of OC	Learner Needs/ Actions	Teacher Needs/ Actions (if teacher participates)
Need for knowledge, information, point of view	video, audio, written form lecture, article, book, guide, presentation, etc.	receiving information, transferring information, cognitive evaluation, information evaluation, constructing meaning	transfer of information, receiving information, testing, provoking , inspiring socio-cognitive conflict
Need for observation and modeling	demo, show, animation, desktop records	modeling, demonstrating, applying, contextualizing	demonstrating, provoking, suggesting
Need for exploration and documentation	all types	constructing personal meaning, synthesizing , evaluating, discussing, contextualizing	provoking Suggesting, moderating, evaluating, inspiring
Need for self-reflection, progress measurement and meta-cognition	Self-assessment, comments, ratings, quality indicators, discussions	self-analysis, self-evaluation, meta-cognition, discussion	moderating, provoking, follow up, positioning, testing
Need for personalization of learning	opinions, discussions, expressed in various forms	responding, synthesizing, evaluating, discussing, constructing personal meaning	provoking, moderating, suggesting
Need for	writing, painting, recording,	publishing, designing,	Inspiring, provoking

inspiration to create something	publishing, sharing, co-editing content, blogging, photo, drawing, material presentation tools, interactive boards	creating	
Need for experimentation	re-publishing, re-using content	adapting, using, editing, constructing, re-using, re-publishing	suggesting, inspiring, testing
Need for practicing	programs, drilling tools, for writing, drawing, recording audio and video tools	developing speaking, writing, applying, evaluating, and other skills	providing guidance and feedback

After searching, using and re-using of OC (either learner-initiative or teacher-initiative based), the users should provide evidence on contextualization of OC or OER.

Table 4

Indicators of Cognitive Recognition of the Three Levels of Consciousness

Levels of Cognitive Recognition of Consciousness	Indicators
1. Cognitive decision about its meaningful positioning within a learning activity scenario (activity level)	<ul style="list-style-type: none"> - Needs fulfilled - Facilitated search of OC and OER - Facilitate use and re-use of OC and OER - Efficiency of search and application - User feedback
2. Cognitive attribution of OC and its positioning among learning outcomes (study program level)	<ul style="list-style-type: none"> - Identification of evidence for developed personal attitudes
Or	<ul style="list-style-type: none"> - Identification of evidence of developed personal skills
3. Definition of purposeful use/ application to future needs/ career plans (personal career level)	<ul style="list-style-type: none"> - Identification of evidence of development of personal knowledge

The conceptual research on the use of OC and OER in formal, non-formal and informal settings should further be developed. OC development, use and re-use should be researched in terms of attitudes, skills and knowledge that learners and teachers have towards OC and OER. The use and development of OC and OER will also be affected by individual and institutional practices, as well as evaluation and recognition of the value of OC and OER. Given the credit to OpenScout portal and services development, it must be mentioned that community building and bridging education and enterprise services is highly facilitated with the advent of OC and OER. By all means, competence-based search is another key factor increasing the level of consciousness in the use and re-use of OER and OC in learning.

OpenScout Competence-Based Ontology Services for Management Education

OpenScout aims at providing education services online that enable users to easily find, access, use and exchange OC and OER for management education and training. OpenScout enables competence-based search of OER and OC, improving access to both, professionally produced and user-generated learning resources. The services unlock existing high quality content repositories (EFMD, INSEAD, OUUK, etc.) and harvest them within OpenScout infrastructure, where users can search, download, recommend or share OC. OpenScout supports the paradigm shift in organisational thinking towards the provision and use of OER. It involves large user communities (including students, teachers, instructional designers, companies, enterprises, and content providers).

OpenScout, as an ontology, embraces competence-based search of OC and OER, re-use policy with demo version and didactical scenarios for users, user community services, tool library for re-use, re-mix and editing of OER and OC, and finally, large community of generations of managers working on OC to be embedded in educational and industry settings. As an ontology, OpenScout significantly contributes to accelerating the use of OER and reduces barriers for the exploitation of OC in general. The project already created new opportunities to increase access and use of OC, by creating the largest federated collection of management content over European OC repositories, and deliver more than 20.000 hours of management content. By these results, OpenScout makes a critical mass of skill-tagged management education content available to end users within their individual learning environment. Search of content is based on competence approach and multilingual portal at [http:// learn.openscout.net](http://learn.openscout.net).

Having developed the portal with multilingual support services, competence-based search, OC community, tool library for use communities, the didactical approach was still mulling the question – why and how do users in education institutions and companies use OC and OER? What are (if any) culture specific issues for the use of OER and OC? How should didactical recommendations be developed to search, use and re-use OC and OER in different settings? How conscious is the use of OC and OER among higher education institutions? Vytautas Magnus university researchers addressed these issues in didactical research on the use of OER and OC.

Culture Specific Characteristics of the Use of OER and OC Among OpenScout Community

Cultural differences are important characteristic of users. On the one hand, user diversity is based on the differences between the various user groups, and on the other hand, specific cultural identity causes different expectations and behaviour in the learning environment. In order to better understand the influence of the cultural differences on OpenScout communities and how these differences can be addressed, research was set up in the form of observations during the pilots,

qualitative interviews and online questionnaires among OpenScout community members.

Cultural differences were addressed initially by a qualitative interview with teachers and students from Lithuanian higher education institutions organised by Vytautas Magnus University. Numerous teachers and students who participated in long-term OpenScout pilots were asked to indicate what culture-specific issues influence the use of OC and OER. The following criteria for culture specific issues were identified:

1. OER culture within institutions,
2. User ICT and OER skills and knowledge,
3. Existing OER practices (developing, using, re-using, adapting, etc.),
4. Online community building and participation practices (common practice, little practice, no practice),
5. User training (needed, not-needed),
6. Involvement in social networking in formal studies (high level, medium level, low level),
7. Need for OER in national language (high need, medium need, no need),
8. Awareness of quality procedures in OER, and
9. Awareness of cultural issues (like copyright, other) on OER.

After the criteria were set up, qualitative research was implemented interviewing 8 OpenScout experts from Finland, Lithuania, Spain, United Kingdom, Germany, Slovenia and Greece. In parallel to the qualitative research, an online questionnaire was created in order to gain a better understanding of user organisational domains, personal preferences and background. The questionnaire was answered by 46 respondents from various countries. The results of both, interview and the survey, have been summarized, compared and are presented below.

1. OER culture within institutions.

Qualitative research showed that mostly, the culture of OER is not a common knowledge or rather limited among organisations in the Baltics, Spain, and Greece. In other countries (e.g., Belgium, Slovenia, Finland, Germany and the UK, and especially in corporate training) OC is a known but not yet well-established initiative especially in industry. Quantitative research results showed that there is a lack of policy and guidelines (51 %) within the organisations in which the respondents work. More than a half of the respondents indicated that there is no common understanding in their culture of what OC is.

2. User ICT and OER skills and knowledge.

In the Baltics, Spain and Greece, users lack knowledge about how OER can be used in the process of formal, non-formal or informal learning. ICT skills are still lacking among individuals and companies. There is high usage of

different systems (e.g., Moodle or CLIX) and ICT tools in higher education institutions and corporate organisations. The experts from Slovenia, the UK, Finland and Germany indicated that OER are used, but users are not interested in creating and adapting them. Quantitative research showed that the respondents don't know how to use or adapt OER for learning and still need help on using the different tools and services for OC. Of respondents, 36 % stated that there is incompatibility of already existing systems with OER and OC repositories or they lack knowledge on integration of both.

3. Existing OER practices.

The majority of teachers and students in management education in Lithuania, and Spain are inclined to use and introduce new OER repositories but they prefer using the ones they are familiar with. In Lithuania, Spain, Greece, Belgium, Slovenia and the UK, sharing is not a common practice, possibly due to the lack of relevant space for sharing. Users are not aware of existing OER practices on re-purposing and adapting. Development and usage of digital learning resources is promoted and financed by the Slovene Ministry of education. The experts from Finland and Germany indicated that OER are re-used but not necessarily modified, adapted and shared. OER in terms of audio or video contributions are occasionally shared. Quantitative research respondents have indicated that not only do they lack time (Mean 3.58 out of maximum 5) to incorporate OC in their work, but also that there is a lack of good practices (Mean 3,66 out of maximum 5) regarding OC in their own countries. Possible explanation could be the teachers' reluctance to discuss the quality of curriculum and course contents with their peers in the same institution. This indicator was agreed on by more than half of the respondents.

4. Online community building and participation practices.

Teachers and students in higher education, as well as specifically in management education, in all the countries participating, except Finland and Germany, appear reluctant to share, collaborate and discuss the use of their content in formal education. This is not a tradition, neither within the same institution, nor among several higher education institutions. Users in these countries are not aware of online community building and participation practices. It is easy to foster the sharing and collaboration within the same institution if the culture of OER is introduced. However, online communities are constantly growing, with more people taking active part in online discussions and exchanges. Experts from Finland and Germany have indicated that there is an increased awareness and openness towards OER. This can be also deduced by the increasing numbers of open access repositories and initiatives, which support community building. Therefore, people are generally inclined to use and introduce new OER repositories. According to quantitative research results, the challenges for collaborative working on social tools are the unwillingness to share information, the language issues, values, beliefs and the lack of collaboration incentive.

5. User training.

All experts have confirmed that user training is needed. Depending on the user role, and the level of ease with ICT and e-learning, some training may be required. For some target groups, training is very necessary, especially for adaptation processes. Quantitative research results demonstrated that more than half of the users need support from top management and IT practice tools and services for OC (52 %). The need of training for teachers and students for helping them to be open appears in one of the open questions in the questionnaire.

6. Involvement in social networking in formal studies.

Teachers in higher education in the Baltic States, as well as in Spain, the UK, Belgium and Slovenia, are not particularly involved in social networking and online communities. The most popular type of participation in online community is mainly based on rating and commenting. The most popular use of OER is revising and re-using OER for formal studies. Librarians play a major role in offering new resources to students and teachers in higher education. Greece, Finland and Germany indicate characteristics of high level of involvement in social networking among all institutions. Quantitative research results showed that more than half (61%) of the respondents use social networking sites (e.g., LinkedIn, Facebook, etc.) often or very often, and 57% contribute to online communities (e.g., forums, Wikipedia, etc.).

7. Need for OER in national language.

The availability of OER in the native language could make learning available to a larger user audience, as indicated by the Lithuanian, Spanish, German, Greek and Finnish experts. The Slovenian, Belgian and UK (by all means) experts indicate that there is no need for native language application in OER. The survey showed that almost half of the respondents would appreciate OER (46 %) in their native language.

8. Awareness of quality procedures in OER.

Users need special training on quality issues in all consortium countries. The most popular type of participation is mainly based on rating and commenting. Mainly the OER quality is an individual responsibility. Quality procedures exist for creation of digital learning resources, e.g., digital textbooks, being OER or with other licences. No culture-specific issues were identified. More than half (67%) of the respondents in the survey confirmed that they occasionally rate or comment about OER and tag them. The respondents also indicate that it is hard to judge the quality of the material.

9. Awareness of cultural issues on OER.

Only responses from Lithuania, Spain, Slovenia, the UK, Finland and Germany were received. All responses show that there is a lack of knowledge and practice among teachers and students on re-publishing of content, due to the lack of knowledge and practices on copyright issues and technical

possibilities. Different countries are highly exposed to international influences. Nevertheless, there is a great need to embed those cultural issues, as the broad community of users does not know some parts. Quantitative research demonstrated reluctance of the respondents to share their own material on the Internet is indicated in one of the open questions. The main problem is the lack of motivation to share open materials when others are not sharing. Another problem is the fear that others can use the resource. For half of the respondents the IPR (Intellectual Property Rights) issues remain unclear.

Conclusions

1. OER and OC ontologies mutually accelerate innovative learning scenarios, which should be created and suggested for practitioners in order to develop qualitative and sustainable open educational practices among higher education institutions and enterprises.
2. Competence-based services and settings increase probability of conscious use of OER and OC. Didactical templates can facilitate conscious use of OER and OC on learning activity, study curriculum and personal career development levels. Conscious use of OER and OC will facilitate the use and development of open educational practices.
3. Research embedded in OpenScout community using competence-based services proved the need for culture -specific approach introducing conscious and effective use of OER and OC. User characteristics and prior ASK are very important factors in open and quality education for all.

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