

# Open Educational Resources and Social Software in Global E-learning Settings

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## 1. Introduction

Just like in the Open Source initiative in software development, Open Educational Resources (OER) have become a widely discussed and promising concept for educators. So how can they be used for teachers, trainers and educators to improve their work? This is the key question for this paper.

Open Educational Resources (OER) have become popular in the past decade, in particular when the Massachusetts Institute of Technology (MIT) announced that it would provide all its teaching materials for free to the community. A variety of organizations and individuals have made their learning and teaching materials freely available joining different initiatives such as the Open Courseware Initiative (OCW). Currently, there are millions of learning materials on the web, some structured in repositories and databases, some just hidden on the web as part of personal homepages.

This seems very promising for educators – in principle, it is possible to re-use existing materials for free, it just costs a citation or an email to the original author. But – in contrast to open source software or open knowledge on Wikipedia – the OER initiatives have not yet taken off. Some barriers seem to remain, especially in the educational area.

In the following, we show different initiatives and access points as well as different opportunities – however, we also identify barriers and possible guidelines to overcome those. One possible support mechanism for the stakeholders in E-learning communities is social software. Within this paper, we will elaborate how it can facilitate easier access, adaptation, and sharing of the open resources.

## 2. Open Educational Resources

### 2.1 OER: What does the concept mean?

The UNESCO defines OER as "technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes". (UNESCO, 2002). However, OER are not always altruistic or non-commercial. In principle, OER just mean that they are freely accessible and re-usable in different licensing conditions. We define OER as

"Any digital object which can be freely accessed and used for educational purposes"

This broad definition includes a lot of different objects, such as digital learning objects, software tools like wikis or authoring systems, simulations or animations, electronic textbooks, but also lesson plans or experiences shared. The main aspect is that the object is usable to improve education. The following classification shows parallels to other initiatives:

- **Resources:** Currently, the main research field is how to make learning objects (specific digital objects created for learning purposes) available and re-usable. This includes multimedia documents, simulations but also simple html web resources.
- **Articles, textbooks and digital equivalents:** This class of resources contains typical objects provided by libraries, such as articles, papers, books or journals. When becoming freely available, this class of objects is connected to the concept of Open Access (Björk, 2004, Bailey, 2005).
- **Software tools** are used for different purposes, such as producing / authoring learning resources but also for communication and collaboration. Objects of this class are usually referenced as Open Source or Free Software (Raymond, 1999).
- **Instructional / didactical designs and experiences:** Educators are highly dependent on successfully planning and designing their learning experiences – this class of resources includes access to instructional designs, didactical plans such as lesson plans, case studies or curricula. It also includes one of the most valuable resources: sharing experiences about materials and lessons between colleagues. This class of objects is also called Open Educational Practices.
- **Web assets:** This class of objects regards simple resources (assets) like pictures, links, or short texts which are not usable on their own in a learning context but can be used to support or illustrate a certain topic. In many ways, these are objects found by google or similar search engines.

This list is not intended to be complete, it just tries to distinguish the main concepts and to explain how other “open” concepts are related.

So, how to find those materials, how to include them in the teaching process and how to adapt them to the own context? In the following, we focus on searching and re-using resources and how to use them with different tools.

## ***2.2 Initiatives: Where to find the resources?***

The most intuitive way to find resources nowadays seems to be access through a search engine like google which allows access to web assets, pictures, videos and some scientific articles. However, searching this way might be a long and painful process as most of the results are not usable for educational purposes. There is currently no “google learn”.

Most initiatives provide their materials in so called “Learning Object Repositories (LOR)” which provide access to educational resources. Most of them have stored a variety of information about the materials (“metadata”: data about data). Users can search for specific materials by categories such as subject category, age group or context. This more specific search might lead to more specific results. But: Where to find good resources?

Several communities provide OER for different purposes. The MIT OCW Open Courseware project <sup>1</sup> in the USA and several US universities make their content freely available. In Europe, a variety of universities have formed communities sharing and distributing content. One major initiative is the Open Content initiative OpenLearn by the Open University UK <sup>2</sup>. The ARIADNE initiative provides also access to a variety of resources <sup>3</sup>. Originally designed for Higher Education, the repository contains a variety of resources and tools for developers, teachers and learners.

Other initiatives which mainly provide learning object repositories (LORs) to share OER are Gateway to Educational Material <sup>4</sup>, MERLOT <sup>5</sup>, the JISC Collections <sup>6</sup> or the OER Commons <sup>7</sup>.

There are also more specific communities based on the purpose or topic:

- Open Training Platform <sup>8</sup> by the UNESCO provides a variety of materials in different topic categories, mainly for developing countries but also on development related topics (such as science education)
- Mace <sup>9</sup> provides contents for architecture and a large community of interested users and contributors.
- OpenScout <sup>10</sup> provides content for management and in particular access to tools to re-use, adapt and improve OER. This initiative is discussed further below.

The main repository for schools in Europe is currently the Learning Resource Exchange (LRE) <sup>11</sup> by European Schoolnet. This initiative supported by European ministries of education provides access to a variety of materials in different forms.

Last but not least, some initiatives connect existing repositories, so more than one repository can be searched to have access to more potentially useful materials – the main initiative here is the GLOBE initiative<sup>12</sup> which includes most of the above mentioned repositories.

As shown in the last section, the amount and variety of educational materials is huge. But still some barriers to successful re-use remain: the not-invented here syndrome, lack of awareness, insecurities about legal aspects and questionable quality of the resources.

So how to successfully search, find, re-use, and share resources?

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<sup>1</sup> <http://ocw.mit.edu/index.htm>

<sup>2</sup> <http://openlearn.open.ac.uk/>

<sup>3</sup> <http://www.ariadne-eu.org/>

<sup>4</sup> <http://www.learningcommons.org/educators/library/gem.php>

<sup>5</sup> <http://www.merlot.org/merlot/index.htm>

<sup>6</sup> <http://www.jisc-collections.ac.uk/>>.

<sup>7</sup> [http://wiki.creativecommons.org/Creative\\_Commons\\_and\\_Open\\_Educational\\_Resources](http://wiki.creativecommons.org/Creative_Commons_and_Open_Educational_Resources)

<sup>8</sup> <http://opentraining.unesco-ci.org/>

<sup>9</sup> <http://portal.mace-project.eu/>

<sup>10</sup> <http://www.openscout.net>

<sup>11</sup> <http://lreforschools.eun.org/>

<sup>12</sup> <http://globe-info.org>

## 2.3 Steps to successful OER re-use

In the following, we show the steps of re-use. The guideline does not mean to be complete and cannot guarantee success – but it can help to identify key aspects of the re-use process.

How to find fitting resources and how to evaluate them? This is the main question of the initial **search phase**.

1. Choose the starting point for your search – in this step, find a good starting repository for your search. We recommend to either use a specific repository for a certain topic (e.g. OpenScout for Management, LRE for school contents) or a federated repository which searches more than one source.
2. Clearly state your requirements and needs: What are the main characteristics of your content besides the topic area – which is the age group, context (school, Higher Education, SME training, etc), instructional context. All these aspects can usually be specified in the search engines and make it more likely to find good results
3. Check the quality of a resource: Has the resource been reviewed by colleagues? Has it been certified or has it achieved good ranking from previous re-users?
4. Ask colleagues and networks: It is promising also to ask experienced colleagues or search forums by fellow teachers as an example. In most cases, you easily find a colleague sharing good ideas and hints.
5. Familiarize yourself with some basic licenses: Most OER use a creative commons license which aims at providing a simple transparent scheme. In most cases, re-use is allowed when informing the author in non-commercial settings. However, the Creative Commons website<sup>13</sup> for OER helps to clarify what your legal situation is and also provides a tool<sup>14</sup> to build licenses for your needs.
6. Search and try: Most repositories provide direct access to resources, so it might be useful just to try out a few resources and see how it fits your context.
7. Make your decision: You cannot use all resources but soon you will find resources and colleagues which are fitting your context.

Having found some good initial resources, there are more steps. In most cases, small adaptations are needed (**adaptation phase**).

1. Small involvement or more? As a first step, a strategic decision is needed – will you only re-use materials or do you see this as a potential for strategic collaboration. Simple re-use just requires downloading the resource and adapting some graphics (just like changing a powerpoint slide design). In some cases, you might find the materials as a good starting point, but you would add concepts and enrich / enhance the contents and share it again with the original author and a community – this can lead to dynamic content enhancements and – even more important – trusted communities.

<sup>13</sup> [http://wiki.creativecommons.org/Creative\\_Commons\\_and\\_Open\\_Educational\\_Resources](http://wiki.creativecommons.org/Creative_Commons_and_Open_Educational_Resources)

<sup>14</sup> [http://creativecommons.org/choose/?lang=en\\_GB](http://creativecommons.org/choose/?lang=en_GB)

2. Tools: Some materials are simpler to modify (web pages, wiki pages), some need more effort. The selection of good (and free) tools to make changes is essential for a good process. This issue is discussed in the next section.
3. Collaborate: It is always advisable to let the original author and potential colleagues know about your plans. By this, you can clarify the authors' intentions but also initiate a longer cooperation. People who share their materials are in most cases more than willing to discuss and listen to your suggestions.
4. Adapt and try: Making your adaptations, bringing in new ideas, discussing improvements with colleagues. This is the main challenge of this phase. However, you should always try the result before publishing it again.

The last phase is important for a community which depends on the users and the contributions (**share and exchange phase**)

1. Re-publish your results: If you have made changes, you should send your results back to the original author. However, consider whether your work could be interesting to other people in the community. It will generate a dynamic process which might give you even more ideas.
2. Discuss and share: What were the steps when you adapted the materials? Share your open educational practice and your experiences, it will help other colleagues who later help you with their experiences as well.
3. Build your network: It is an illusion that all educators around the world will cooperate and work together. However, it is quite important to build a successful network of colleagues who work in similar areas, who share your ideas and principles for education and who you would simply trust. In those networks, you easily get good recommendations and new ideas.

This is just a very short guideline – more advice on OER usage and good practices can be found in different communities, such as OER Commons <sup>15</sup>, UNESCO Open Training Platform <sup>16</sup>, PBWorks OER infokit <sup>17</sup> or eduwiki <sup>18</sup>.

As a summary, we can recommend to try out OER and other openly accessible resources, objects and assets. It might take some steps to overcome initial fears (Am I doing this good enough? Will I ever be able to use a tool to adapt a resource? Am I doing something wrong in terms of IPR?). But once started and involved a bit in the community, it is much easier to organize innovative, creative, technology-supported learning opportunities.

### 3. Social software and OER

In this part of our paper it will be described what we mean by the term social software and how it is applied in E-learning and in particular in settings that deal with Open Educational Resources (OER). First we clarify what social software consists of and how it has evolved. We will continue

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<sup>15</sup> <http://www.oercommons.org/community>

<sup>16</sup> <http://opentraining.unesco-ci.org/cgi-bin/page.cgi?p=adaptlocalize&d=1>

<sup>17</sup> <https://openeducationalresources.pbworks.com/>

<sup>18</sup> <http://fi.eduwiki.eu/wiki/Etusivu>

the discussion about OER and describe the life cycle and processes in global E-learning settings where social software can be applied to support critical challenges related to global collaboration of stakeholders involved. We will give out examples how these aspects are dealt with in the project OpenScout.

### **3.1 What is social software**

Anyone using the internet and World Wide Web (WWW) in the 21st century has certainly stumbled across the term “social software”. Even as the term is very frequently used, there is still no one-and-only definition for it. One possible way of defining social software is that it enables an interactive way of collaboration, managing content and connecting to online networks with other people. It supports the desire of users to be pulled into groups in order to achieve their personal goals (Wever, Mechant, Veevaete & Hauttekeete 2007). Interpreting this definition we can find that social software is something that is shared, involves many collaborators that are involved in the social interaction where new meanings, contents or discussions are created.

Social software is often referred to web 2.0, social media, groupware, semantic web and of course to single applications – we will give examples of those within this chapter. We would still like to clarify that even though a quite new term, what we understand now as social software has partly been a part of the definition of groupware that has been connected to internet technologies many years before (Koch 2008).

Typical social software technologies include the following types of tools under the umbrella of social software:

- Social networking (Facebook for personal networking <sup>19</sup>, LinkedIn for professional networking <sup>20</sup>, Myspace <sup>21</sup> etc.)
- Blogging (blogger <sup>22</sup> etc.)
- Forums
- Wiki (Wikipedia <sup>23</sup>etc.)
- Collaborative writing (GoogleDocs <sup>24</sup> etc.)
- media sharing (Youtube <sup>25</sup>, Photobucket <sup>26</sup> etc.)
- social bookmarking (delicious <sup>27</sup> etc.)
- etc.

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<sup>19</sup> <http://www.facebook.com>

<sup>20</sup> <http://www.linkedin.com>

<sup>21</sup> <http://www.myspace.com>

<sup>22</sup> <http://www.blogger.com>

<sup>23</sup> <http://www.wikipedia.org/>

<sup>24</sup> <https://docs.google.com/>

<sup>25</sup> <http://www.youtube.com/>

<sup>26</sup> <http://photobucket.com/>

<sup>27</sup> <http://www.delicious.com/>

A big part of the classifications include also instant messaging (Windows live messenger<sup>28</sup>, Skype<sup>29</sup> etc.) but there are constant discussions whether tools that provide conversation possibilities that are limited to two persons should be counted as social software.

It is important to understand that social software describes very versatile tools that offer functionalities to perform very different types of actions. For example social networking mainly offers websites for community building, finding interest groups and to link with friends or colleagues. Depending on the website and target audience, social networking sites might offer many other functionalities and tools that are understood as social software, such as blogging opportunity in your own profile, instant messaging, ways for media sharing etc. This gives quite good explanation why sometimes it is hard to classify certain types of social software. But it is also very common that one tool offers just one purpose which could Youtube for video sharing for example. If we take a look at the most commonly classified social software, we can see that it not just offers ways to community building or communication between two or more persons but social software tools offer ways to share media (any types of documents, videos, music, photos or learning materials in general) or your bookmarks, to write documents in a collaborative way (where many people can edit a page simultaneously) or create large databases of shareable knowledge that can be enlarged or edited by anyone (like Wikipedia does).

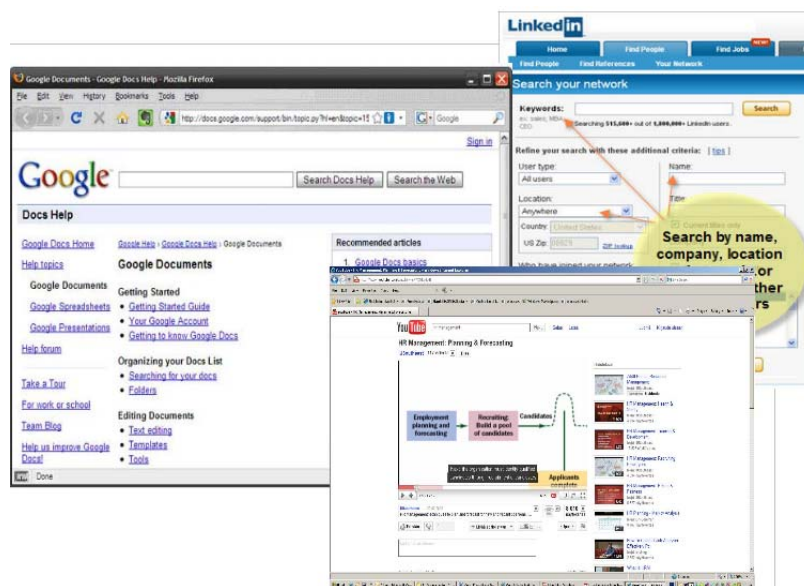


Figure 1: Examples of social software

In chapters 2.3 and 2.4, we will show some examples how these tools can support the users dealing with OER.

<sup>28</sup> <http://explore.live.com/windows-live-messenger?os=other>

<sup>29</sup> <http://www.skype.com>

### 3.2 *The lifecycle of OER*

As we discussed earlier, it is very important to find out where Open Educational Resources can be found, how they should be adapted and shared with the community. The following image describes the basic lifecycle of OER (Pawlowski & Zimmermann, 2007).



Figure 2: OER lifecycle

This Figure presents the phases of OER described in chapter 2 in more detail and will be used to describe how social software can support these steps.

The OER lifecycle starts with the search of materials and ends with the republishing of the content. As we have indicated before, for different stakeholders from various domains, searching of materials could take place in different places. The same is valid for other processes in the OER lifecycle. The process always differs depending on the context but it is important to identify which are the main steps in the lifecycle. After searching and locating the materials, the second step includes the validation of the re-usability of the identified contents in the new context. In this phase, it is elaborated if the material fits the requirement you have (for your course or training session etc). The third step is the actual adaptation phase where the materials are modified by the user with various tools (some include social software for collaborative modifying and also other kinds of technologies for authoring). In the fourth step, the validation of the adapted materials is achieved in a specific environment with possible learners, in a training session etc. The final stage is re-publishing and sharing of experience if the expectations are met with the adapted materials.

Even if these main stages sound very clear, it must be clarified that more support is needed for the teachers and educators to guide them through the steps. Many E-learning related initiatives and European projects are trying to study these practices (and different stages of the model), giving best practices how they should be approached. When these best practices are created and communicated to E-learning communities in a way that they are actually used in practice, we cannot specify a clear timeline for it. It could be foreseen that educators, teachers and students in technologically advanced domains (IT sector, IT departments etc.) apply the best practices for technology recommendations and solutions fastest since they might have lower threshold towards being introduced to new technologies.

In our research we analyze how each of these stages can be supported by using social software. In the next sections we will deal with these issues.

### 3.3 *Social software support for the life cycle*



As we discussed earlier, social software provides tools and ways to communicate / collaborate to very different types of situations. What makes social software easy to approach is the fact that most of the social software technologies are very easy to access and use. Most of the available services for social networking for example are tailored as easy as possible to use which makes it easy to perceive, also for people that are inexperienced with the internet.

We strongly feel that social software could greatly benefit the stakeholders that are dealing with Open Educational Resources and interested to use or modify open materials for their purposes. The selection of technologies, meaning which tools to use when and how should one collaborate in which phase has to be well reasoned and supported as good as possible. The different stages of the OER lifecycle can be used to structure how OER is applied so that it is easier to explain where social software can be best applied.

In the following section, we show how to apply exemplary best practices to the use of social software supporting all stages. The solutions are being developed in the European project OpenScout (see more information [www.openscout.net](http://www.openscout.net)) which develops access to learning materials for management and provides tools and services around OER for different stakeholders.

### **3.3.1 OpenScout perspective**

The goal of OpenScout is to support finding, applying and adapting, re-publishing and sharing of the materials in an open way. The materials are targeted for management education and can be easily applied in the following settings:

- Training settings in management related processes
- As self study materials
- Updating your management related course material with interesting documents found through OpenScout
- Using the contents as they are to be applied within a course
- etc.

The settings where these materials are used can differ based on the needs of the person. OpenScout offers tools for the user to enable modification and combination of the materials straight in the portal. What also makes OpenScout unique in the field of E-learning is the possibility to search and browse through materials that are connected to specific competences. This means that a user is able to find materials not just based on keywords but to find material that fits his/her own skill level and expected learning outcomes.

OpenScout is currently offering the first prototype for E-learning communities and will continue the development of the planned services until 2012 when the portal should be complete. Interested external partners are warmly welcomed to collaborate in the design and dissemination of the results as well as to try out the services. The figure below shows some first impression how OpenScout services are provided.

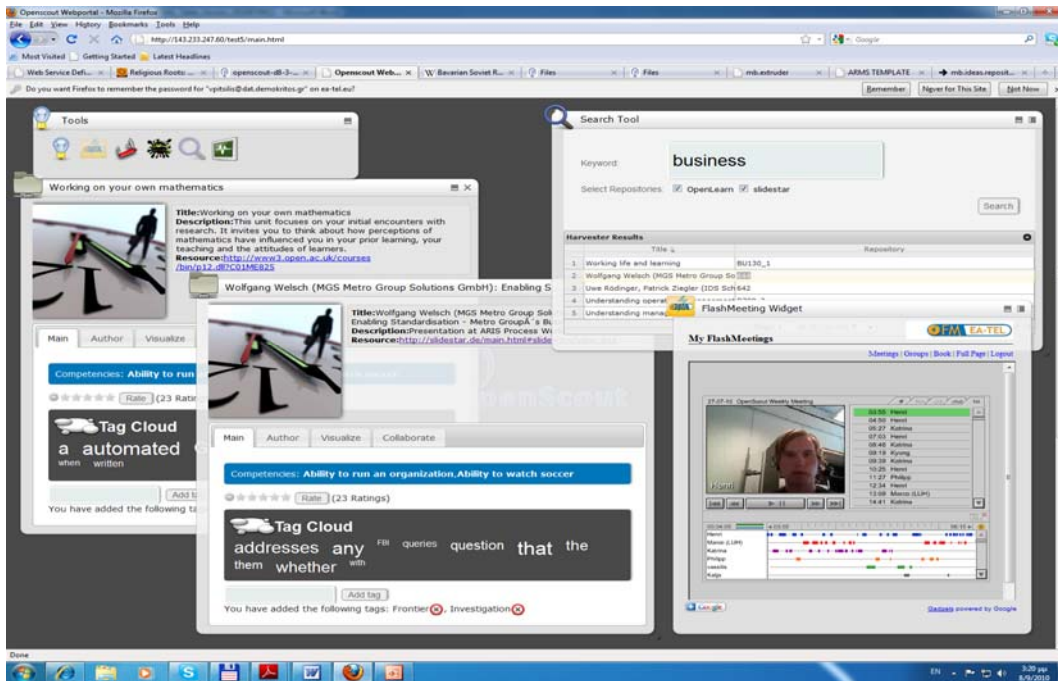


Figure 3: OpenScout first prototype

Current development plans in OpenScout consider how to support the users of OpenScout to adapt their obtained learning materials for their own context by using social software as well as authoring tools available. Something that is currently not supported properly by other OER initiatives is the possibility for the user to be guided through all of these previously mentioned OER life cycle steps within one portal. As many initiatives provide means for searching for materials, guided processes how to modify the materials for your own requirements is currently not available. We feel that in an evolving landscape of E-learning where new innovations are created and best practice emerges, the efforts to communicate and sum up all the most promising aspects to the end users – teachers and students - have to be very clearly structured and presented. The adaptation process of OER is one of the most critical one's since the actual re-use and re-publishing of modified materials, and the sharing of these experiences make it easier for more people to try out open materials and open services around them. This creates awareness and trust and builds communities.

OpenScout's vision is to build a single access point to all the services created within and brought to the project by partner organizations. This means that the OpenScout portal<sup>30</sup> offers all the tools and communication possibilities through this one portal. With a large content base of connected open repositories and with the previously mentioned search facilities (with competence based search/browsing), the basis for the portal is set. OpenScout will make use of social software by community building (social networking functionality) and experience sharing possibilities (messaging facilities offering forums, instant messaging and commenting etc.). In addition we will offer ways to collaboratively edit materials and being tightly connected to the interest groups within the portal.

<sup>30</sup> www.openscout.net

As we have indicated within the last chapters, finding ways to support the whole life cycle of OER and especially “how to apply and adapt the contents for the requirements of the user” is crucial. OpenScout aims to identify common or most typical usage patterns how open contents are modified and applied to new settings. This will be done by studying literature related to OER and questionnaires and interviews with teachers and educators that have vast experience in course creation and teaching. After identifying similarities in the adaptation practices, this could be for example that materials were translated and the contents of the material were double-checked and cultural and context specific parts were changed to fit the curricula or country specific examples. See below an example how materials for students from different country might look like (Blanchard et al. 2005).



**Figure 4: Material prepared for different learners**

When we have identified these aspects, we will cut the common practices to small pieces, study emerging best practices from OER initiatives and literature how each part should be prepared in a “good way”, study how social software can offer support for each of the phase in terms of communication, finding suitable persons to discuss / collaborate and of course by offering tools that can be applied to actually modify these contents. This is planned to be achieved within one portal. Example could be:

“University teacher from Finland is recommended within LinkedIn to try OpenScout for finding management material. This fits perfectly since he has a course starting in three months about HR management. As OpenScout is promoting and offering services through LinkedIn (user can also decide to add an OpenScout tool for LinkedIn to search materials straight in his own profile there) and other popular social networking sites, the teacher found more information of the project easily in LinkedIn already. He enters OpenScout portal and runs a search on HR management finding interesting materials. He sees that as registered user he could be connected to interest groups within OpenScout’s social network, could rate and comment

material and be suggested for personalized recommendations about possible users with same interests, contents that fit his interests and also personalized adaptation recommendations for materials. He registers and fills his profile information with his interests and preferences.

Within the interest group page, other users have already written their experience with OER, suggested some materials that they have found interesting and shared links to re-used materials they have just uploaded to OpenScout (messages appear in a dedicated forum and on the front page of the group with Facebook-type of status updates). As the experiences from colleagues around the world (with ratings and comments) raise awareness of these open resources, the threshold to try these materials gets lower. This was one example how OpenScout uses social software to attract people and make it easier to search and access OER **(phase one of the OER lifecycle)**.

As the teacher is now browsing through some possible materials that he could see using for his course, he is provided with comments, ratings and also cultural information for each material he finds. The comments (experiences) are again provided by other users and shown in a simple discussion board. Each material has a culture-link where users have marked how the material has been applied and describe if this specific material is targeted for a specific domain or culture. This will support the teacher to validate the suitability of the material for his context **(phase two of the OER lifecycle)**.

Now, as he knows that the material would be suitable with small changes, he clicks to be supported through the material adaptation process. The user can see illustrations of most common adaptation processes – these are very simple like “translation to other language” or “translation and changing cultural and context specific examples”. The recommendations include also more comprehensive processes if the user requires that contents are packaged and cut down to small modules to be delivered to the students with a specific learning management system (Moodle etc.). The user can tailor the flexible process to fit he’s own requirements and is suggested with best practices for each stage. The teacher selects “translation and cultural adaptation” since the materials he found were in English and he needs Finnish material for the course. First he is asked which types of documents he wants to modify (if it is a word document, pdf or a course package etc.), he also clicks the output format (this is important if it is required that he transforms the material to a specific format used in his department). He doesn’t have to change formats since he wants just to keep the files as word documents as the originals. Now he is suggested with suitable tools to modify the documents. He wants to work on the documents with his colleague who is also teaching the same course and chooses to try collaborative writing (GoogleDocs) with automatic translation support. The two tools open as small windows in the portal and a next step is shown with best practices how to adapt material. In GoogleDocs window the teacher can upload the original document as a template and invite his colleague to work on it. The other tool with automatic translation support can be used to copy/paste the English text to it and translate it automatically to Finnish. As the quality of the translation isn’t good enough, the teacher can manually in GoogleDocs write the Finnish translations (that weren’t suitable) and copy/paste the sentences that were good enough

with automatic translation. The two teachers can also use chatting tools or the discussion boards offered by OpenScout to discuss the adaptation process.

Now as they have translated the contents, OpenScout gives best practices how the cultural and context specific information should be dealt with. This includes changing examples to consider Finnish traditions, changing symbols, icons, pictures, time and other culturally sensitive factors to fit the course and the students. This included examples how the complex and differing process of adaptation can be supported by collaboration possibilities of social software (**phase three in the OER lifecycle**).

For the **fourth step of the OER lifecycle**, the guided adaptation process suggests how the user can validate if the modified contents are fitting for his purpose. This is a checklist type of suggestion where we give hints from available best practices, which are the aspects the teacher should take in to account to make sure the material is suitable. For example "is the material written in a style understandable for the students, is the material in a format that it is easily accessible by the students etc. In the **final phase of re-publishing**, OpenScout would suggest to upload the modified materials for other users to find. This is done in a simple form where the connection to the original document(s), licensing issues and adding of metadata (title, author, language etc.) about the material are clearly guided by OpenScout. Finally recommendation is made to share experience of the process and of the material in OpenScout or external social networks. This enables widespread of best practices and easier access to suitable learning materials for all who are interested in open materials."

These examples show possibilities and new support mechanisms for OER initiatives as well as ways providing individual guidance for individuals with unique needs.

## 4. Conclusions and future trends

In this paper, state of the art and opportunities related to OER are identified and some of the upcoming tasks within OpenScout project were shared.

OER offer a number of possibilities such as easily adjusting and using materials that are already used in real life practices and are shared with open licenses that allow easy re-use and modification. As a new field, many challenges still remain. Some of them include lack of trust and awareness towards the materials, and distribution of open materials and services within the web which makes it hard for individuals to understand "where to find what". Within the OER initiatives, these problems have been identified and ways to fill the gap between a single user and open resources are approached constantly. One possible solution that we have identified and studied is support from social software. These tools with various functionalities can support all stages of OER from search and identification of materials, through re-use and adaptation to re-publishing and sharing of experiences.

As a conclusion for the paper, it is important to take a look in the future and predict where OER initiatives are heading and what challenges occur. As we have indicated, OER initiatives are struggling with similar challenges regarding awareness of their results and towards OER in

general. We could say that these initiatives have started to build a unified front by sharing results and also many of their services created. This means that the fruits of creation work are not staying within one project or initiative but they are shared with similar ones. This has started to happen on a large scale which makes it easier for a single user interested in OER. Additionally we can see that the services and tools created in the OER initiatives are building more sophisticated and mature. The benefits for using them are reasoned from end users points of view (which are teachers and students).

Still, even bigger efforts are needed to disseminate these results to E-learning communities that the open resources would be brought to daily use in education. It is important to study how trust of these resources can be more effectively facilitated for all stakeholders in education.

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