OPEN EDUCATIONAL RESOURCES IN THE CONTEXT OF SCHOOL EDUCATION: BARRIERS AND POSSIBLE SOLUTIONS

Thomas Richter
Thomas Kretschmer
Christian M. Stracke
TELIT@University of Duisburg-Essen, Germany
Alan Bruce
Universal Learning Systems, Ireland
Tore Hoel
Oslo and Akershus University College of Applied Sciences, Norway
Elina Megalou
Computer Technology Institute & Press Diophantus, Greece
Ildiko Mazar
EDEN - European Distance and E-Learning Network
Sofoklis Sotirou
Ellinogermaniki Agogi Scholi Panagea Savva, Greece

Abstract

Due to the increasing professional mobility of their parents, pupils often find themselves in new and unfamiliar learning scenarios in foreign contexts and countries. Besides having to leave their familiar environments, these pupils additionally may face language barriers, different curricula, and have to cope with foreign cultures. Printed textbooks, which are the most commonly used educational resources in schools, provide little support for these pupils to manage the new challenges. Teachers are the professionals designated to provide the necessary support. However, they often may not fully appreciate the pupils' individual challenges. Possible solutions could be the provision of alternative learning contents in the pupils' native languages and an international open exchange of knowledge and experiences amongst schoolteachers.

These issues are addressed by the Open Discovery Space platform. In order to empower this platform to provide the best possible support to teachers, we explored barriers to adoption of Open Educational

Practices in the context of school education and asked for manageable solutions. The investigation took place in an action research scenario.

After an introduction of the ODS project, we will present the identified barriers and recommendations for solutions to overcome these, and the mechanisms which we are going to implement in the ODS platform in order to provide the best possible support to the community.

Keywords: Open Discovery Space, Open Educational Resources, School Education, Barriers, Solutions

Introduction

With 52 partners from 21 European countries and a budget of 15.3 Million Euro, Open Discovery Space (http://www.opendiscoveryspace.eu) is the largest e-Learning project ever launched by the European Commission. The Open Discovery Space project (ODS) started in April 2012 and is scheduled to end in March 2015 (3 years). ODS is developing a multi-lingual web portal for the school sector that is designed to support its users (mainly teachers) regarding the accessibility, production, use, and adaptation of Open Educational Resources and to foster open practices regarding the exchange of knowledge and experiences. In the first stage, the ODS-platform, as the central outcome of the project, will be implemented in and affiliated to at least 2000 schools throughout Europe and involve a minimum of 10.000 teachers. However, schools and teachers from all over the world, as well as con-tent, media and network providers, and related projects are kindly invited to join this initiative.

In our pre-studies, we found that the need for Open Educational Resources (OERs) generally is very high. This is in order to enrich educational contents and overcome the disadvantage of overly long production cycles for printed schoolbooks, given that current educational demands quickly change (Richter & Ehlers, 2011). However, teaching scenarios in schools can be extremely different from each other as are the particular challenges that teachers have to overcome when dealing with OERs. One of the most extreme examples identified was an inclusive school where children with special needs were jointly taught with “healthy” children. Each of the children with special learning needs experienced very particular and individually different deficits. Thus, for such a class, the same learning con-tents need to be provided in various different versions in order to meet the pupils’ specific requirements and needs (Perner, 1997).

In order to reach the highly ambitious aims of the ODS platform it is crucial to facilitate common practices regarding the use, reuse, and adaptation of OERs by actually providing helpful solutions for ad-dressing potential barriers (Richter & Ehlers, 2011). In this context, we investigated barriers that could prevent teachers in their particular situations from using, producing, and reusing OERs and deter-mined possible solutions.

We conducted several qualitative studies (Richter & Ehlers, 2011; Andrade et al., 2010; Richter, 2011) in order to learn more about such particular challenges. ln a workshop at the EDEN conference in 2013 in Oslo, we brought stakeholders together in an action-research scenario, asked for their individual challenges and discussed possible solutions that would provide support within their individual educational scenarios. We were able to compose a quite impressive list of basically different issues that will be targeted in the context of the ODS platform and at least partly also need to be targeted by the international OER community.

In the following, we will discuss the found barriers against the production, usage and adaptation of OERs and related solutions, which the experts suggested. Finally, we will explain to which extent and how the ODS platform will address these issues in order to support the school stakeholders' Open Educational Practices (OEPs).

Theoretical Background: Action Research

As the research methodology we chose Action Research for our investigation. Different to the traditional research setting, where the researcher (interviewer) takes a neutral position amongst interview-ees, all actors involved in the Action Research process are equal participants and cooperate in theoretical, practical, and political discourse (Grundy & Kemmis, 1982). According to Zuber-Skerritt (1992), Action Research is research conducted by practitioners for practitioners. Cooperrider & Srivastva (1987) explain that Action Research has the focus on problem solving in existing professional performance and is related to organizational structures. We chose this particular research form, because in traditional interviews participants tend to speak with a clear focus only to the researcher and only answer the explicit questions, which the researcher is able to ask. In action research scenarios, in contrast, the participants exchange knowledge and experiences between each other instead of just reporting to the researcher. In terms of this particular workshop, this scenario was beneficial for both sides, for the research team, as it avoided contextually biased questions and revealed information that might not have been initially included and for the participants direct exchange of experiences which supported them to find solutions for current unresolved issues.

The Study

For the workshop, we initially invited e-Learning experts, policy-makers, and interested practitioners (as beginners) to join as participants. Even though conference participants were primarily involved in higher education, we assumed that their particular challenges might have a lot in common with those schoolteachers would experience. This could prove very

valuable in our school-related project. The relevance of the results for schoolteachers will explicitly be considered in the following discussions.

Study setting

The workshop was conducted in three phases: In the first phase, we introduced some theoretical background issues around OERs, the Open Discovery Space project, and the relevance for the project's success to address and overcome schoolteachers' specific challenges around the production, usage, adaptation and repurposing of OERs. However, during this introduction we did not present any specific examples for such barriers in order to avoid influencing subsequent discussions. In the end of the first phase, we formed three groups according to the participants' levels of expertise regarding their exposure to OERs. "OER-beginners" eventually were joined in one group (6 members). According to our earlier experiences, we assumed that OER-beginners would perceive particular challenges regarding very basic aspects, such as legal and technical issues (e. g. where and how to search for OERs and which supportive software to use for dis-playing, rearranging and presentation of OERs). With those participants who considered themselves more proficient in dealing with OERs or even as OER-experts, we built two further groups each with 5 and 6 members. We expected more proficient participants perceiving particular challenges - like how to design OERs, how to adapt and republish OERs, which quality-related strategies should be fol-lowed, and how to select or even set-up institution-wide OER-policies.

The second phase of the workshop was conducted within the formed groups. The participants of each group were encouraged to contribute to discussions, which were structured in three steps, each with a fixed time limit (10, 15 and 20 minutes). A moderator who controlled the overall schedule and who did not participate in the group-work introduced each of the three steps. In the first step, the participants introduced themselves to the group considering their affiliation, their expectations regarding the workshop, and their particular experiences with OERs. In the second step, the participants were asked to describe their challenges regarding any kind of activities involving OERs. In the third step, the group picked up each of those challenges determined in the second step and jointly discussed on how these could be overcome. Each group was supported and facilitated by one of the co-authors (as an additional group member). During the group-work, the role of the facilitators was threefold: first, they had to keep the discussions running and to ensure that the different steps of the practical phase were taken. Second, the facilitators also were active members of the groups, joining and contributing their own perspectives and opinions to the group discussions and third, the facilitators had to record the outcomes.

In the third phase, each of the facilitators presented the results of the three groups.

The sample

Apart from the three facilitators, the workgroup consisted of 17 participants, who mainly worked in the academic field (13/17). The positions of those who were associated with universities varied between research fellows (2), technical supporters (1), project managers (5), persons with administrative positions (1) head of department (1), and university professors (2). Additionally, one freelancer (project work) and three policy makers from different associations with management positions (director, chair, deputy director) took part. The gender distribution of the participants was 7/10 (m/f). Two of the three participating policy-makers joined the beginners group. The other four participants in the beginners group came from universities and were fully related to technical support and project work.

Study outcomes regarding particular challenges

In each of the following sections, first, the type of challenge and related scenarios are introduced as reported by the participants. Subsequently follows a discussion and solutions are introduced on how to possibly overcome the particular challenge. The schedule of the listed challenges is related to the original list in which the results were presented at the workshop and is not related to their relevance or impact. Particular challenges that repeatedly were mentioned are just listed once.

Language

One of the most challenging aspects in the context of OERs relates to the language of the learning re-source (Richter, 2012). Even though millions of high quality learning resources are available on the Internet for free download, many of these are authored or designed in languages that teachers and learners do not understand or understand imperfectly. Apart from very selective contexts (such as air-plane pilot education and training) there is no general language that serves all or most potential users (Davis, 2005). Kickbush (2001) points out that just one out of ten people understands the English language well enough to navigate through related websites. DePalma et al. (2006) found that 32.6% of Internet-users either never or rarely visit English language websites. Ouane (2002) classifies the languages that are supposed to be commonly known (but actually are not) as ‘elite languages’ (Chumbow. 2002) and having learned such a language as a particular privilege. For the context of Africa, Chumbow (idem) explains that using national languages for educational resources is not just a matter of comprehension but also a political issue as resources in national languages

would lead to a far higher level of education (see also Kickbusch, 2001). Leonardi (2002), further on, argues that a 'simple' translation (in terms of currently available translation tools) into national languages, however, might not entirely solve the problem because too much relevant information that is implicitly coded through the context simply gets lost during the automatic translation process.

The participants in the ODS workshop did not consider it possible that a single solution could solve the whole problem since there are simply too many aspects and media that need to be addressed. As possible steps along the way to a solution, they proposed the development and provision of freely available and easy-to-use translation tools employing closed captioning to support the translation of spoken texts and dialogue in videos. This would generally foster the OER development in regional languages and facilitate transcript provision in different languages.

Licensing

The question of intellectual property rights in the context of freely available goods has been a critical one in the open movement from the outset. In the meantime, several types of licenses have been developed, including simple solutions such as the Creative Common Licenses. However, many potential users still are uncertain if their activities are fully legal. As a consequence, some potential users generally avoid the situation and do not use OERs. Others entirely ignore the licensing problem because they do not care what happens with their own resources and simply use any learning resources as long as they are available for download. In return, they upload their self-produced learning resources for public reuse without attaching licenses and understand these as fully open learning resources (Richter & Ehlers, 2011).

As possible solutions, participants suggested the initiation of public discussions about open licenses in general: Are open licenses for non-commercial usage really necessary? Since everyone can restrict the access by implementing closed contexts or attach restrictive licenses, a publication in the open context without an attached license could simply be understood as including a general allowance for non-commercial reuse and adoption. Agreed by all participants, this issue needs urgently to be ad-dressed on user- and policy-maker level. For the meantime, an easy to follow and short introduction along with simple examples on how and why to attach open licenses could help to establish better and more correct practices.

Up-To-Date Materials

One of the disadvantages of printed books is the extensive process required to find a consensus, pro-duce and release new and updated versions.

Decision processes for such changes are highly influenced by the respective disciplines, contexts, curricula, and pedagogies (Fan, 2010). This can take a long time. Adding the time required to complete the technical processes for layout, print, and distribution, finalized schoolbooks might already be outdated after having been released. Different to printed schoolbooks, users expect Open Educational Resources to be digital resources easily modified, highly current and up-to-date. This especially applies to the pedagogy employed, contents and the supported media. However, in practice, particularly in the context of open environments, OERs are frequently produced and published on a one-off basis and afterwards discarded and never used again. For sub-sequent users it is difficult or impossible to check before download, if a learning resource actually is up-to-date or if it contains outdated contents.

The participants recommended a mandatory implementation of version numbers and release-dates as a possible solution. Simple tools should support OER updates, and the responsibility for updating should be shared with colleagues. Other educators apart from the original authors should also be able to voluntarily implement updates. A related change and version history could further on support the choice from multiple available versions. In the longer term, institutions should be encouraged to install clear policies for regular updates.

Adaptability (to edit and change)

The particular value of OERs is directly related to the opportunity to re-use material in very diverse educational settings. However, since the original developer produces an OER within and for a particular context, it cannot be expected that the developer's context is similar enough to the new context of the re-purposer and thus, can easily be implemented. Instead, in order to successfully reuse OERs in new contexts, changes may be necessary regarding content presentation, the pedagogy employed, language and format.

The participants expressed changeability as a crucial condition for valuable OERs (see also Dichev & Dicheva, 2012). OERs need to be delivered in a format that allows the implementation of changes to content and presentation style. Thus, OERs should be produced in open and standard formats and the specifics of the original context should be described. A re-uploading of re-purposed/modified OERs should be possible (including a documentation of different versions) so that future users are able to choose the particular resource version that best fits their individual requirements.

Discovery (to identify fitting OERs)

The participants reported that one significant challenge is to find OERs that actually meet the requirements of the targeted learning scenario. There are many OERs around but very few are tagged in a proper way. Thus it is almost impossible to decide if they are appropriate before they are downloaded and manually checked. Resources that could prove valuable even though written in a foreign language e. g., because of a well-designed figure (where included text could be changed if necessary) are particularly difficult to identify and deploy.

In order to overcome this barrier authors of OERs are required to describe their resources before up-loading. Opening the access to already finalized learning resources and investing additional time for extensive tagging are two very different subjects. One must keep in mind that OERs are rarely produced with the purpose to create a publicly available learning resource but become OERs in the moment of allocation. If forcing the original producers of OERs to spend additional time, they might be distracted from the open concept and keep their resources for themselves. In order to ease this tagging process for authors, OER repository owners could provide support by proposing keywords in terms of standard descriptors, which form the basis for a later detection. Repositories could provide such keyword-vocabularies in several languages, so that in whatever language defined keywords are available for the search in multiple languages. However, even tagging an OER with keywords in a sin-gle, widely used language could already help. If a related multilingual keyword-database is not available, a user-based retagging in terms of a later application of metadata in other languages would be a reasonable approach that also would lead to improvement.

Curriculum Perceptions and Incompatibility

In many countries, curricula define the particular contexts and demands that learning resources for school education need to take into consideration. Closely linked to this, as described in 3.3.5, it is al-most impossible to find out if a resource meets such demands before it has manually been checked, which is very time-consuming.

The participants of the ODS workshop stated that it might be impossible to know the differences be-tween all regional and national curricula. Thus, being able to take a decision regarding the compatibility of a particular learning resource on the basis of the original curriculum appears unlikely. What would be helpful in this context would be the provision of learning pathways, scenarios, and use cases, which map a resource to particular curricula (and learning contexts). From this point it would be much

easier for potential re-purposers to decide if the effort to transfer a particular OER to a new con-text might be a reasonable.

Lack of Institutional Compromise and Institutional Constraints: Time

Even though most institutions appear to expect educators to find and select new and free educational resources on their own, they rarely provide the necessary support. Institutional leaders often seem unaware that the search and selection of appropriate learning resources is quite time consuming. Thus, time constraints often make finding appropriate resources impossible. In the practice, particularly schoolteachers have to invest their private time in order to improve their educational materials. In addition, many institutions and policies are concerned that educational materials not produced in-house will not fit the institutions' requirements. This particular issue is already well known in the literature and called the "not-invented-here syndrome" (e. g., Andrade et al., 2010).

As for time-constraints, it would be very helpful if institutional leaders and policy makers could be in-formed on the benefits but also on particular challenges that are related to finding and re-using OERs. Such information material should explicitly be designed for policy makers and institutional leaders.

Lack of Interdisciplinary Support

A particular strength of Open Educational Resources is the opportunity for specialists from different disciplines to contribute easily to the (further) development of learning resources by jointly using online authoring tools, whether through cooperative writing or interdisciplinary reviews. However, apart from exceptional projects such interdisciplinary productions are rare. Particularly in the context of topics related to more than just a single field, such cooperation could give a boost to the quality of OERs and thus, should be fostered on policy level.

The participants recommended providing special programs, infrastructure and support group departments as well as related policies, to ensure interdisciplinary knowledge transfer and sharing of good practices. It was felt that institutional or policy incentives also could help to improve the current situation.

Quality of Resources

Many issues regarding the quality of e-Learning resources are already targeted by international standards. Among others these include 'Dublin Core' (DCMI, 2012) as well as the 'ISO/IEC 19788-1:2011' (ISO/IEC, 2011), which foster the unified description of educational resources through

standardized metadata. 'Learning Objects Metadata' (IEEE, 2002) deals with descriptions of course content and course requirements. 'IMS Learning Design' (IMS Global Learning Consortium, 2003) supports authors systematically to define didactical aspects of their learning resources. 'ISO/IEC 10796-1:2005' (ISO/IEC JTC1/SC36, 2005) provides a structured process on how Technology Enhanced Learning can systematically be developed. However, producers of OERs often are not professional authors and produce educational resources for themselves that, at first hand, need to fit their individual purposes. They voluntarily make those resources freely available for the community if they decide that the re-sources are good enough. Even though some protagonists think that, regarding formal quality, it should not make any difference if a professional or a "user" produces learning resources, the difference arises from the very different production scenarios. While a professional author generally may plan to sell learning resources to an audience and thus has a personal interest in reaching the highest level of acceptance in the community, the users (teachers, learners, parents) who generate content have a very concrete scenario in mind during the production time and are unlikely to invest more time. From that perspective, the community can just use the resource or leave it. Asking a voluntary user to fully understand and strictly follow common standards, can seem like an unreasonable demand, which eventually could lead users to generally stop sharing their educational resources.

In addition, the common standards neither define when a resource is to be considered appropriate for particular learning scenarios, nor do they distinguish between the different types of educational re-sources. In the latter context, the Creative Commons (CC, 2011) suggests a distinguishing between unstructured (elemental, such as pictures and static documents), partially structured (e. g., grouped by subject area or context), and fully structured resources (e. g. full courses including self-assessments) In terms of successfully applying quality standards in the context of User Generated Content (under-standing teachers as users), user-friendly versions of standards and mechanisms would be required which do not overburden the authors. This would avoid them having to read and comprehend complicated documents before publishing and instead would support them to reach a certain level of quality without having to invest a lot of additional time. As for metadata creation (see also section 3.3.5), OER repositories could provide a predefined list of limited criteria from which users could choose. We think that for acceptance, such a list would need to be reduced to the minimum number of aspects and clearly distinguish between resource types.

Reputational Risk

Linking OERs with the names of institutions in which authors are employed could enhance users' trust in quality of the resources. However, some institutions identify a risk when their employees publish freely available learning resources without further control. Usually, OERs are neither controlled within the institutions, nor do external specialists support an external review process, as it would be the case for journal articles; a risk remains that a published OER reveals having low quality. Thus, instead of proudly presenting their own internal professionalism, creativity, and expertise to the community, institutional leaders fear that self-published OERs could reveal internal issues to the outside or even have a negative impact on institutional reputation.

The workshop participants did not provide suggestions for a solution: The problem is considered very complex, as it is not only relates to the professionalism (discretion) and quality of the resources but al-so to the institutions' internal quality processes and policies. Who else should decide if a learning re-source is correct and valuable if the author is the institution's only expert in a particular field? How should evaluation processes be designed and implemented? Would the time efforts required to con-duct an external review process even contradict one of the basic strengths of online resources (rapid publishing cycles)? This issue eventually needs to be solved on a policy level.

Localization and Varying Stakeholder Interests/Perspectives

This issue is closely related to the adaptability of resources as well as to the sections on languages and curricula. While OERs are produced in and for a particular context, they shall be reused in another. Critical problems not only can occur on cultural/national levels but also on regional or even individual levels. Given that a resource on history is produced in a central Spanish area and shall be reused in the Basque area (which is located in the very north of Spain), different perspectives on historical events could cause major problems even though the nation in which the OER was produced and the one in which it is to be reused are identical. Another example would be a course containing elements related to basic issues on religion, produced in a catholic context and subsequently reused in a protestant context. A last example, this time related to basic political issues: If a learning resource has been produced in one federal state in Germany and shall be reused in another, does it actually meet the curriculum requirements of this particular federal state (In Germany, the federal states are fully self-responsible for their curricula)?

What these examples show is how complicated it might become if all possibly relevant information need to be defined in metadata. Many issues

that are central requirements within a specific scenario may not even be imaginable for people who are not familiar with this particular context. The mass of relevant metadata would increase to an amount, which easily becomes unmanageable particularly for volunteering authors. As solution, rigorous tagging with metadata would be the central demands; this does not fit into the OER production process as priory discussed in section 3.3.9. A compromise be-tween manageability and usefulness still needs to be found. It is unlikely that "the perfectly fitting learning resource" might exist amongst the available OERs, particularly when it comes to quite specific or even unique requirements. Therefore, the expectations regarding the matching ratio of OERs generally need to become more realistic and the central demand for the quality of OERs would become changeability. Eventually, the educators who choose and reuse OERs in another context are responsible to take the last step, which ensures that a learning resource actually meets the individual requirements of a specific learning scenario and its learners.

Appropriateness od Use and Applying OERs

While on the one hand, learning resources need to be appropriate for the educational scenarios where they are to be used, the usage of learning resources needs to be appropriate. But who is responsible if an OER causes any form of damage, just because it has been reused without proper adaptation? Can such damage generally be caused through a learning resource?

The participants indicated that the original author surely is the least person to be held responsible. However, if potential authors are unsure about this issue, e. g., because these deal with very sensible issues, they might decide to not give their self-made resources to the community. In the context of OER repositories, it could be helpful if repository owners provide a declaration that clearly defines the (level of) responsibilities for both authors and re-users. In addition, Best practices from the community should be made available on how to deal with OERs, how to adapt them, and where and what to look for in terms of adaptation requirements.

Sharing Own Resources (Teachers)

Participants reported that they feel unsure about their intellectual property and owner rights. Once an OER is uploaded into a repository, it is being copied and possibly re-uploaded in other contexts (mirrors) and thus, it is easy to loose it out of sight. If other users make changes to a particular resource, who becomes the owner of the resource and whose intellectual property rights are relevant? Who is responsible for a particular resource, once changes have been applied? What happens if a resource has been re-

uploaded after inappropriate changes were conducted but still it is carrying the original author's name and affiliation? How to properly cite once a resource has been changed? Why should someone want to improve other people's work if there is nothing that could be understood as a re-ward?

These questions are related to but not limited to the issue of intellectual property rights. It would be a question of good style, if modified versions of an OER could and would be uploaded as separate documents, including a change history. Repository owners would be responsible to provide supportive mechanisms and relevant information. It generally should not be possible to modify (overwrite) an existing resource but instead, an additional resource in a different version would have to be uploaded. Thus, repository owners should provide an easy to use opportunity and make its usage obligatory for keeping record of the change history regarding both the changes of content (according to the originator's version) and the changing author.

Hesitance of educators (ICT in general and OER in particular) and lack of incentives

Educators tend to keep their self-created resources for themselves instead of sharing them with the community. There might be several reasons of which some already have been introduced and dis-cussed above. However, reasons for the hesitance of educators regarding the upload of educational resources is not limited to the lack of rewards and uncertainty about intellectual property rights. Particularly school teachers but also other professionals often are not proficient enough with authoring systems and ICT in general that they feel capable to share their material with the community. Additionally, why should a teacher share his work results with the community if this generally means to invest even more time?

While the participants of the workshop did not propose a solution on how to motivate educators, we think that generally establishing and promoting the concept of sharing by presenting Open Educational Practices would already help to overcome this kind of "phlegm". OER repositories should be easy to be used, offer support for all levels of ICT-proficiency, provide instructions on how to successfully complete all steps of publication, and demonstrate that it actually is rewarding to share educational re-sources by presenting best practices and reports on experiences as examples.

Limitations of the study

This study surely is not representative for all educators, institutional leaders, and policy-makers. This qualitative study was conducted to get a better understanding of the spectrum of barriers set against the establishment of Open Educational Practices and OERs and to gain impressions on how to

over-come such barriers. The results neither are complete. Once again, we realized that there are very general barriers, which often have to do with uncertainty, basing on a lack of information and experience. Further barriers are related to issues that are already well known but where the community has no easy solution to present. However, the largest part of barriers, which we found in the workshop seemed being related to very individual scenarios.

We generalized such very individual barriers in order to make them more applicable, transferable, understandable, and particularly discussable for others. An example would be the report of a participant who explained that in his institution, it is expected that OERs are used in order to save money, but on the other hand, the institution does not provide the necessary IT infrastructure, nor supports educators with free time or rewards them in any way. This process of generalization started within the workshop: In the context of the group discussions we presented such reports to the other group members, dis-cussed if such issues could also be applied to their particular scenarios, and how to put the individual experiences into a more general context. For this paper, we additionally clustered barriers as some were listed more than a single time (from each group) or related to similar issues.

Relevance of found barriers for the school sector

In this workshop we did not explicitly invite schoolteachers as participants, even though our focal interest is related to the school sector. The conference was not limited to schoolteachers. Thus, it is relevant to check to which extent the barriers actually are relevant for the school sector. There are barriers, which appear less threatening for the school context, such as the “non-invented-here syndrome” or obligations against the production of OERs because of a possible loss of reputation. Those barriers seem to be much more relevant in the academic sector, where publications and authorship are general criteria for evaluation of an institution’s or researcher’s “quality”.

Subsuming the results, we eventually found barriers that were related to an insufficient information flow, to the usability of OERs in scenarios different to the originator’s setting, to lacking professional-ism regarding the use of ICT, and we found legal issues that caused uncertainty amongst the participants. Some of the issues were already well known, others actually were completely new for us, such as the fear to lose ones institution’s reputation if OERs are found to be inappropriate or even incomplete or inaccurate.

The Open Discovery Space Platform

In order to reach the highest level of acceptance and support through the international community, the freely accessible Open Discovery Space

(Sotiriou et al., 2013) platform provides mechanisms to over-come most of the barriers identified in our workshop. In the following, we will introduce and discuss some of the key features of the Open Discovery Space platform.

The Open Discovery Space platform contains two generally different parts. The first part is a multilingual and central access point to learning resources and educational materials and the second part is a community platform that supports multiple community scenarios.

In terms of the functionality as a centralized access point, 1.500.000 OERs from various European repositories are being linked and searchable as a first starting point. For the search, we implemented a particular vocabulary, which is available in a multitude of (European) languages. Thus, it is possible to look for a particular type of resource by keywords in one language even if the resource itself is written in another one. The vocabulary also supports users who like to upload new OERs or changed versions of existing OERs and need to select and apply relevant metadata.

We provide lots of information material and guidelines, related to quality, licensing and other legal is-sues, to the production, adaptation, and modification of OERs, and on how to use OERs in diverse learning scenarios. For the latter case, we particularly provide support for course planning by giving access to a steadily growing number of best practices, lesson plans (over 5000), educational path-ways (338), and pedagogical scenarios (373). The numbers in brackets are the numbers of resources, which already are available or known to be available at the end of the project's runtime. Further path-ways and scenarios are to be generated during the last year of the project's runtime. Additionally, we provide the ODS toolbox, which is a collection of freely available tools that can be used for the design of lectures, such as lesson plan templates, Universal Design for Learning guidelines, user guides, guidelines for setting up inter-school collaboration projects, guidelines particularly designed for institutional leaders and policy makers, and a library of tools that can be helpful for creating, adapting (re-purposing), modifying and (re-)publishing of OERs.

The ODS Platform will provide opportunities for users to comment available OERs that can be accessed through the platform. While the learning resources which are accessible through the ODS plat-form are not physically stored (mirrored) within the platform but keep staying within our partners' repositories connected with ODS, the comments actually are. In this context, teachers can report about the scenarios in which the particular resources were used, how valuable the resources actually proved for that setting and provide recommendations on changes. They also can upload modified resources in connection with related scenarios.

As the second core-functionality of the ODS platform, a community platform has been implemented. It is designed to support the open exchange

of experiences and know-how between the different stakeholders from the school sector and thus, to establish an opportunity for the development of an open educational culture. The community platform needs to be understood as a communication hub for any level, as local, regional, national and international communities can be implemented. Several national communities have already been implemented where teachers, institutional leaders, policy makers, and all other school-related stakeholders can communicate with each other in their native languages. By enabling and encouraging the information exchange between all kinds of stakeholders, we expect that also interdisciplinary cooperation is being fostered. Additionally, the vivid discussions of peers shall encourage those users who usually would not contribute own resources.

In order to overcome barriers that are related to legal issues, policies, and curricula, the ODS project closely cooperates with several national ministries, standardization bodies, and other international community hubs.

Conclusion

The open education movement forms a quickly growing, worldwide community. It offers opportunities that were unimaginable 20 years ago, such as providing fully adaptable educational materials to learners and educators who are not privileged in terms of living in the developed world and having the financial resources to afford any kind of education or for individual requirements of children with special needs. However, we should not limit our understanding of the open education movement to a beneficiary institution. The open education movement offers a situation of giving and taking and benefits for everyone. With Open Educational Resources and Open Educational Practices, we have the chance to learn from other colleagues, we do not need to re-invent the wheel by developing courses that already exist for several scenarios. We have the chance to enrich our lectures by adopting materials, which we could not produce ourselves, because we do not have access to the necessary information or technology. And, of course, we have the chance to share experiences with other educators, realize that we are not alone with our problems and get quick support by colleagues, who experienced similar challenges before and who already found solutions that at least worked within their educational settings.

There still are unsolved problems, such as legal and quality issues. Little support and incentives are provided to teachers through institutions and governments. Also, we need to be aware that according to the millions of different individual learning scenarios, the chance is quite low that we will find a single educational resource that perfectly meets our particular requirements. When reusing OERs, we always need to keep in mind that we do not choose and buy professional contents produced for our particular

needs, but see what other educators have done in their particular scenarios and participate – for free. We have a chance to reuse their learning materials in the case that they roughly fit into our own educational scenario, as a whole as well as in parts. And we have a chance to modify resources in order to make them appropriate. A lot of potential for improvement and work remain in order to make OERs more attractive and accessible for everyone.

The Open Discovery Space platform directly supports the open movement and the concept of Open Educational Practices. By directly involving policy makers from governments and institutions, providing a centralized and multilingual access point to many different OER repositories, intelligent search algorithms and unified tagging, offering a lot of support for producers, users and re-users of OERs, and establishing a social platform for the exchange of experiences and knowledge, the Open Discovery Space platform has the potential to become the world's hub for the open education movement.

Because of its funding through the European Commission, the Open Discovery Space platform focus-es on the European context. It is limited to the school sector but for the future, other educational sec-tors can and will be attached so that a seamless support for open education will be possible. In order to expand to a truly worldwide community level, we would like to invite every stakeholder of the school sector, worldwide, to join our community and profit from the Open Discovery Space platform but also, to make contributions in order to give something back to the community. For this purpose, we need your support, as educators, as schools, as institutions and associations, as media partners, as publishers, network partners, researchers, policy makers and repository owners. Such contributions are not necessarily related to an anonymous community of foreign teachers but could directly support learners who study abroad due whatever reasons. Often, when parents take a job in foreign countries, their children need to cope with the consequences within their education. Teachers who do not know the learners' original context are unable to provide proper support. A vivid exchange of information with teachers in their origin context and learning resources in the native languages of the pupils as supplementary information source could actually make the difference between success or failure.

As a very first step, you are invited to register yourself and/or your institution at http://portal.opendiscoveryspace.eu. If you further on are interested in a direct cooperation with our team, be it in terms of adding repositories and/or learning resources or supporting the translation process (in non-European languages) for the platform and the search vocabularies, you are heartily welcome. In these cases, please contact the project's coordinator.

Disclaimer

The Open Discovery Space project is partially funded by the European Union CIP PSP Grant Agreement no. 297229.

References:

Andrade, A.; Caine, A.; Carneiro, R.; Conole, G.; Ehlers, U.D.; Holmberg, C.; Kairamo, A.-K.; Koskinen, T.; Kretschmer, T.; Moe-Pryce, N.; Mundin, P.; Nozes, J.; Reinhardt, R.; Richter, T.; Silva, G. (2010). *Beyond OER – Shifting Focus to Open Educational Practices: OPAL Report 2011*. Due-Publico, Essen. Retrieved from http://nbn-resolving.de/urn/resolver.pl?urn=urn:nbn:de:hbz:464-20110208-115314-6

CC (2011). *Different types of OERs meet different needs*. Creative Commons. Retrieved from http://wiki.creativecommons.org/Free_to_Learn_Guide/Different_Types_of_OER_Meet_Different_Needs

Chumbow, B.S. (2002). The language question and national development in Africa. In:Mkandawire, T. (Ed.), *African intellectuals: Rethinking politics, language, gender and development*. Zed books, London, New York, pp. 165-192.

Cooperrider, D.L.; Srivastva, S. (1987). Appreciative inquiry in organizational life. In: Woodman, R., & Pasmore, W. (Eds.), *Research in Organizational Change Development*, Vol. 1, JAI Press, Greenwich.

Davis, M. (2005). Cultural Viability of Global English in Creating Universal Meaning in Technologically Mediated Communication. Electronic Journal of Communication, 15(1&2).

DCMI Dublin Core Metadata Initiative (2012). Dublin Core Metadata Terms. Retrieved from http://dublincore.org/documents/dcmi-terms/

Dichev, C.; Dicheva, D. (2012). Open Educational Resources in Computer Science Teaching. In: Proceedings of the ACM SIGSE 2012, Raleigh, NC, pp. 619-624.

Fan, L. (2010). *Principles and Processes for Publishing Textbooks and Alignment with Standards: A Case in Singapore*. In: Proceedings of the APEC Conference on Replicating Exemplary Practices in Mathematics Education, Koh Samui, Thailand. Retrieved from http://hrd.apec.org/images/c/c7/6.18.pdf

Grundy, S.; Kemmis, S. (1982). Educational action research in Australia. In: Kemmis, S. (Ed.), *The Action Research Reader*, Deakin University Press, Victoria.

IEEE: Learning Technology Standards Committee (2002). Draft Standard for Learning Object Metadata v. 1484.12.1. Institute of Electrical and Electronics Engineers, NY, USA. Retrieved from http://ltsc.ieee.org/wg12/files/LOM_1484_12_1_v1_Final_Draft.pdf

IMS Global Learning Consortium (2003). IMS Learning Design Best Practice and Implementation Guide Version 1.0, Final Specification. IMS Global Learning Consortium, Inc., Lake Mary, USA. Retrieved from http://www.imsglobal.org/learningdesign/ldv1p0/imsld_bestv1p0.html

ISO/IEC JTC1/SC36 (2005): ISO/IEC 19796-1:2005 (E), Information Technology - Learning, Education, and Training - Quality Management, Assurance and Metrics - Part 1: General Approach.

ISO/IEC (2011). ISO/IEC 19788-1:2011, Information technology - Learning, education and training — Metadata for learning resources - Part 1: Framework. ISO/IEC 2011, Switzerland.

Kickbusch, I.S. (2001). *Health literacy: addressing the health and education divide*. Health Promotion International, 16(3), pp. 289-297.

Leonardi, P. (2002). Cultural variability and web interface design: Communicating US Hispanic cultural values on the Internet. In: Sudweeks, F.H.; Ess, C. (Eds.), *Proceedings of CATaC'02: Cultural Attitudes towards Technology and Communication*, Montréal, Canada. pp. 297-316.

Ouane, A. (2002). *Towards a multilingual culture of education*. UNESCO Institute for Education, Hamburg.

Perner, D. (1997). Supporting the classroom teachers in New Brunswick. In: OECD (Ed.), *OECD Proceedings: Implementing Inclusive Education*, Paris, France, pp. 75-80.

Richter, T. (2011). Adaptability as a Special Demand on Open Educational Resources: The Cultural Context of e-Learning. European Journal of Open, Distance and E-Learning, 2/2011.

Richter, T.; Ehlers, U.D. (2011). *Barriers and Motivators for Using Open Educational Resources in Schools*. eLearning Papers, No. 23, 03/2011.

Richter, T. (2012). *Educational Resources for E-Learning in Urban Life-Long Learning*. In: Yangpu Society Construction and Lifelong Education Promotion Committee Office (Eds.), Proceedings of the Forum on Construction of Urban Lifelong Education and Learning Community, Shanghai, pp. 59-80.

Sotiriou, S.A.; Athanasiades, N.; Ramfos, A.; Stracke, C.M.; Richter, T.; Pirkkalainen, H.; Pawlowski, J.M.; Klements, K.; Stergioulas, L.; Manouselis, N.; Moumoutzis, N. (2013). Open Discovery Space. In: Paulsen, M.F.; Szücs, A. (Eds.), The Joy of Learning: Enhancing Learning Experience, Improving Learning Quality. Oslo – Norway, Proceed-ings of the 22nd EDEN 2013 Annual Conference, Oslo, Norway, European Distance and E-Learning Network, Buda-pest, Hungary, pp. 495-503.

Zuber-Skerritt, O. (1992). *Action Research in Higher Education*. Kogan Page, London.