How Open Content Servers Can Be Made Beneficial for Learning and Education

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Abstract - ***The development of Open Educational Resources (OER) is necessary for the classroom of tomorrow. Especially in Central Europe the copyright law does not allow the use of not-licensed content located in the Internet for educational purposes. Therefore different projects and initiatives started to provide Internet platforms with free educational resources or links to such resources. For educators as well as learners searching for open content on several platforms can be very exhausting. In this publication we present a first prototype for mobile devices that allow users to find open educational resources in minutes. In the discussion, benefits and handicaps of the approach are pointed out. The research work shows that the application supports the daily life of teachers and learners.***

Index Terms: ***Open educational resources, Open education, Mobile application, iOS, Android***

1. INTRODUCTION

UNESCO announced its initiative "Free Educational Resources" in 2002. The UNESCO International Institute for Educational Planning (IIEP) defined the term "Open Educational Resources (OER)" as the „wish to develop together a universal educational resource available for the whole of humanity, to be referred to henceforth as Open Educational Resources" [1]. The core of this issue is the main idea to make education and any content needed for educating people free available. One milestone for OER was the start of the "MIT OpenCourseWare" of the Massachusetts Institute of Technology (MIT) in 2002. Though MIT did it mainly for marketing purposes it is nowadays a very well-known and huge repository for lecture recording, videos, and additional content. Two further publications – a questionnaire about OER of the OECD in 2007 as well as a first draft about the OER-movement by the William and Flora Hewlett Foundation [2] helped to gather further attention. First OER projects which were co-financed by the European commission, started in the same year (OLCOS, Bazaar). Nowadays, there are many initiatives and projects dealing with OER; some of them are listed:

- MIT OpenCourseWare: Since 2002 the MIT offers free online courses and got a number of awards for its trend-setting initiative. In 2008 there have already been more than 1,900 courses from 33 different disciplines online [3].
- OpenLearn: The Open University UK also started a project, called OpenLearn founded by the William and Flora Hewlett Foundation. Due to the fact that in the meantime also Web 2.0 technologies became important they were integrated into the project following the idea that OER content can be enhanced by learner´s active participation [4].
- Wikieducator: At wikieducator.org a Media Wiki serves as one of the biggest OER-platforms worldwide. The main idea is to provide resources about technology-enhanced learning and how to find and use Open Educational Resources.
- ZUM-Wiki: The ZUM-Wiki is the largest OER-wiki in German speaking countries aiming to offer open educational resources for schools. The repository for teachers is of mainly secondary level.

Of course this is only a short selection of many more different platforms in the World Wide Web [5]. With other words, the biggest advantage, which is to have no restrictions in offering OER, is also its worst disadvantage – it is hard to find appropriate material for teachers within a suitable short time span.

In this publication we deal with the way of how to put all these repositories together, so that teachers, lecturers, and educators can find appropriate OER content for their daily work. First of all the reason for using OER is pointed out, afterwards we describe a prototype in detail. In the discussion we focus on the constraints as well as the possibilities of our approach.

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2. FROM COPYRIGHT TO OPEN EDUCATIONAL RESOURCES

In Central Europe a strict copyright law supports the rights of artists, musicians, and authors. Thus it seems of high importance to protect the rights of creative working people. This makes it nearly impossible to use such content for educational purposes. This is even the case when its educational usage is intended. But let us give a short example: If a university lecturer produces content for a lecture and provides it (online and digital) to the students to assist their learning processes, students are not allowed (!) to copy any of the content into their learning personal notations and share it with anyone per se. Each single student has to ask whether this is allowed or not. Of course, any other changes or even sending such content per e-mail to colleagues is simply not allowed. It can be summarized that learning content provided by an author can be only used in a kind of read-only way otherwise the copyright is being violated and the violator can be sued (which happens quite often). Reality is different: we have in that sense every day lots of incorrect copyright behavior that misleads teachers and students to hide their content from each other.

Open educational resources are exactly the opposite of this development and therefore a solution to overcome these problems. They are not only freely available, but also free to use. Each single resource is delivered with a license that allows the usage by teachers as well as by learners in a defined way. “Open” means that [6]

- It is available for free,
- It is useable for free (can be changed, remixed, …),
- It is possible to use and modify the material with free available software (e.g. OpenOffice), and
- It supports open teaching and learning processes.
- Beside the copyright law Geser [7] pointed out further several benefits of using Open Educational Resources in education (p. 21):
- OER offer a broader range of subjects and topics to choose from and allow for more flexibility in choosing material for teaching and learning.
- OER leverages the educational value of resources through providing teachers personal feedback, lessons learned and suggestions for improvements.
- OER provide learning communities, such as groups of teachers and learners, with easy-to-use tools to set up collaborative learning environments
- OER promote user-centered approaches in education and lifelong learning. Users are not only consumer of educational content, but create own materials, develop e-portfolios and share study results and experiences with peers.

Since those early days of the OER movement, different publications pointed out why OER is highly relevant also for Higher Education [8] [9] [10] [11]. For example, the necessity of an own OER strategy is carried out by Schaffert [12] and executed for the first time at Graz University of Technology [13].

3. PROTOTYPE

As described before, Open Educational Resources are a prerequisite for teachers and learners of tomorrow and it is still hard to find appropriate resources for special teaching or learning behaviors. Most resources are parked on Wikis using the software Media Wiki, without any national or international strategy, as well as using no Meta standards. Therefore it is nearly impossible – Wikipedia seems to be the only exception – to find these platforms on the World Wide Web or their content without any knowledge about their existence.

3.1 Creative Commons License

In the United States of America it is possible to provide any content as so-called “Public Domain”, which can be used by anyone for anything. The copyright law in Central Europe did now allow defining any content as public domain. The author of any content owns the copyright for at least 70 years after his/her death per law. Therefore it is absolutely necessary that authors define how their content can be used. In general, there are numerous different license models, but especially in the field of OER the so-called Creative Commons licenses (CC) are common and widely used. The CC model benefits from the fact that there is a standardized, easy understandable description about how content can be used. Such content is signed with the “CC”-symbol; additionally to the “CC”-symbol the following symbols and options can be added and combined:

- BY: In the case of re-use of the content, the author has to be named.
- ND (“no derivation”). It is not allowed to change the provided content in any case.
- NC (“not commercial”): It is not allowed to use the content for commercial purposes (for example if students have to pay for a single course).
- SA (“share alike”): In case there is any change to the content it must be republished under the same conditions, which means the same license.

For example, the world best-known encyclopedia Wikipedia is using the CC license CC-BY-SA-3.0 (as shown in Fig. 1).

Fig 1 Creative Common License CC-BY-SA

3.2 Technical solution

As described, it must be taken into account that there are a number of servers holding different Wiki-systems for Open Educational Resources. Due to the fact that more or less all those servers are using today's most favored system Media Wiki, the idea came up to send one search request for a particular search query to all the servers in parallel. With other words it should be possible to search in different systems in real time. Furthermore, such a search is often done when travelling and therefore an application for mobile phones should be developed. The prototypes are realized as two mobile applications for the two most spread mobile operating systems – iOS and Android.

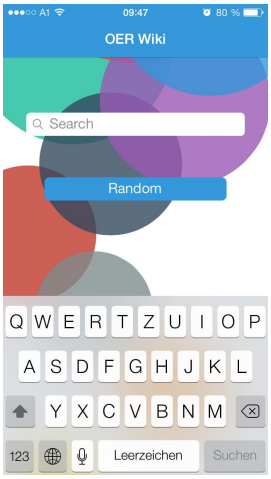

Fig. 2 Main Screen

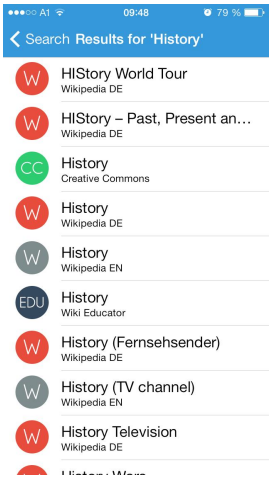

Fig. 3 Search results

Due to the requirement that one search query is sent to different Media Wiki instances the offered Application Programming Interface (API) of those Wikis is used. According to the official documentation of the API [14] it is possible to send an http-request to the Media Wiki that allows searching for data, extract data, change data, login or logout, and even more on the corresponding system. In our particular case just three requests are necessary:

- Open Search: The corresponding Wiki system gets a search request and gives back an answer string with a maximum of 10 related articles
- Parse: If the user decides to read one of the related articles in detail, the app asks for the whole article.
- Random: This is a fun mode of the application – when users click on random functionality they get randomized articles from the platform.

3.3 The Mobile Application - How it works

The prototype has been developed for two different mobile operating systems:

- iOS: One application was programmed using Objective C and Apple's developer environment Xcode. The final app is running on iPhones as well as on iPads.
- Android: The second application was programmed using Java and Android's Software Development Kit (SDK). The final app is running on all Android-based mobile devices with Android 2.3 or higher on board.

Before programming was started so-called paper mock-ups were carried out aiming to guarantee a sufficient user experience and that both applications are using the same program logic as well as look and feel. The following description of the main functionality of the applications is the same for both apps; the screenshots are taken from the iOS version.

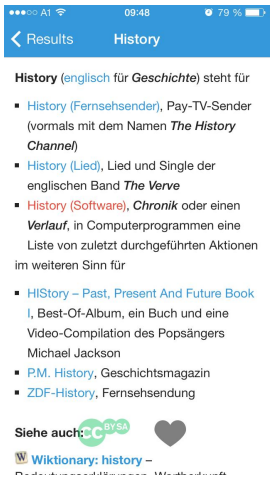

Fig. 4 Article

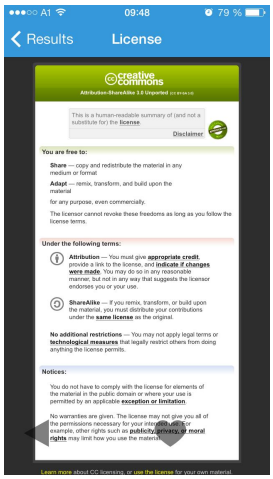

Fig. 5 License Screen

Fig. 2 shows the start screen – it's simply a search field with the intent that the users provide a keyword they are looking for. After tapping on the search button, numerous search queries are sent to the wiki APIs defined in the preferences (there are 12 different Wiki systems predefined). Fig. 3 lists the search results in a table view, which article has been found in which Wiki system. In our example there are different results in the Wikipedia (English and German version), the Wiki Educator and in the Creative Commons system. If any article of the list of results is chosen, Fig. 4 is appearing. This screen shows the detailed article as well as the according license at the bottom of the page. In our particular case the license is a creative common license,

CC-BY-SA. If users taps on the license icon they will get the appropriate licenses description (if available) as shown in Fig. 5. All copyright issues are listed and point out the way this content can be used in education.

Finally Fig. 6 shows the left preference side bar, which can be accessed by a swipe gesture. There the user can choose the random modus, save bookmarks, a general description about the CC licenses, a short “about” window, and the possibility to share the article via e-mail or social media. The last item “Wiki” gives the users the possibility to add numerous Media Wiki systems on their own or to delete existing ones.

The screenshots for the Android version are exactly the same.

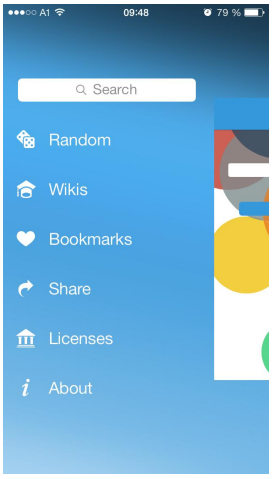

Fig. 6 Preference Bar

4. Discussion

In this section we discuss important issues of the prototype. After launching the apps in the appropriate online stores it was tested with several users of different backgrounds – educators as well as students. The following outcomes are worth to be mentioned:

- The apps are an easy and fast way to search for OER-content. The users had no problems in using the app and found very fast appropriate OER content.
- According to some users, the app will support their daily life, due to the fact that they can search for the same keyword in many different wiki systems in parallel. Furthermore, they suggested us to predefine some more systems.
- Some users mentioned that the app is not for beginners, due to the fact that the licenses are shown as symbols. If a user never saw these symbols before he/she will not be able to understand it intuitively.
- The app can be extended to any other Media Wiki system just by providing the URL. Other platforms are not supported.
- Some users complained about that there is no desktop version for Windows or other operating systems.
- One problem of the applications is that not every found article had a license. From a technical point of view this occurs when the Wiki system in general provides no licenses or when the license is not defined in the meta data of the article.

In this research project we described a first prototype that should help educators as well as learners finding content for their daily work with an open license. Bearing in mind the evaluation process, we were able to bring different open content servers together.

5. Conclusion

Due to the fact that during the evaluation process some teachers complained about the necessary pre-knowledge about licenses in general, in the meantime a further application has been programmed. That second app (currently only available for iOS-devices) called OER-Remix Game gives lecturers as well as learners the ability to exercise their knowledge about OER and licensing. The app itself is defined as a game to encourage learning in a playful manner.

Further research work has to address the integration of further platforms beside Media Wikis. From a technical point of view this is not a trivial approach, due to the fact that some platforms did not offer any API or a complete different one. Nevertheless, this is one of the core future tasks in assisting world educators with appropriate open content.

Finally it can be pointed out that we have to bear in mind two main tasks for servers providing open content. First of all, each single content should be offered together with a license, defined in the meta data. Second each open content server should provide an API which allow to search and find OER.

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