Heinen, Richard; Blees, Ingo; Kerres, Michael; Rittberger, Marc

Open educational resources and social bookmarking: Connecting users and editors

Stracke, Christian M. [Hrsg.]; Ehlers, Ulf-Daniel [Hrsg.]; Creelman, Alastair [Hrsg.]; Shamarina-Heidenreich, Tatiana [Hrsg.]: Changing the trajectory: Quality for opening up education. Berlin : Logos 2014, S. 33-40

Christian M. Stracke
Ulf-Daniel Ehlers
Alastair Creelman
Tatiana Shamarina-Heidenreich (Eds.)

Changing the Trajectory:

Quality for Opening up Education

Christian M. Stracke
Ulf-Daniel Ehlers
Alastair Creelman
Tatiana Shamarina-Heidenreich (Eds.)

Changing the Trajectory:

"Quality for Opening up Education"

Official Proceedings of the International EIF / LINQ Conference 2014

Organized by the University of Duisburg-Essen (UDE, Germany) and European Foundation for Quality in e-Learning (EFQUEL, Belgium)

Christian M. Stracke, Ulf-Daniel Ehlers, Alastair Creelman, Tatiana Shamarina-Heidenreich (Eds.)

Changing the Trajectory – Quality for Opening up Education

Official Proceedings of the International EIF / LINQ Conference 2014
held in Crete, Greece, on 7th -9th of May 2014.

Bibliographic information published by the Deutsche Nationalbibliothek:

The German National Library (Deutsche Nationalbibliothek) lists this publication in the German National Bibliography (Deutsche Nationalbibliografie); detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de> .

ISBN: 978-3-8325-3686-2

Cover photo: © Sabine Dertinger, Bonn (Germany)

Published by Logos Verlag Berlin GmbH
Comeniushof
Gubener Str. 47
D-10243 Berlin
Internet: <http://www.logos-verlag.de>

Contact:
Christian M. Stracke
University of Duisburg-Essen
Universitaetsstr. 9
D-45141 Essen (Germany)
christian.stracke@uni-due.de

Information about EIF 2014 online: <http://eif.efquel.org>.

Information about LINQ 2014 online: <http://www.learning-innovations.eu>.

Table of Content

Open educational resources and social bookmarking: Connecting Users and Editors

Richard Heinen[1], Ingo Blees[2], Michael Kerres[1], Marc Rittberger[2]

[1]Duisburg Learning Lab, Universität Duisburg-Essen, Germany
[firstname.lastname]@uni-duisburg-essen.de
[2]Deutsches Institut für Internationale Pädagogische Forschung, Germany
[lastname]@dipf.de

Abstract: Referatories or reference platform can be filled in three ways: By editorial staff, by automatic aggregation or with user generated content. The article presents two cases of reference platforms (Elixier and Edutags) using different ways to aggregate the contents. A comparison of the inventories of both systems makes visible that each system can benefit from the other's metadata. For the example of OER (open educational ressources) it can be shown how automatic aggretation can support manual tagging. As a conclusion a joint system is suggested that combines different aspects of both platforms.

Keywords: metadata**,** social tagging, open educational resources, user generated content, editorial documentation

1 Introduction

In the cooperation project "Edutags" (www.edutags.de) , the Learning Lab of the University Duisburg-Essen an the German Institute for International Educational Research (DIPF) are developing a reference platform for educational resources (Heinen & Blees, 2011). Elixier (www.bildungsserver.de/elixier) is a project carried out by DIPF together with a consortium of German education servers hosted by federal states (Bundesländer).

In certain respect, both projects pursue the same aim: educational resources are selected, evaluated and shared, and the collections are provided to teachers. But there are some significant differences. While Edutags is a social bookmarking service (SBS) offering teachers the possibility to collect and share resources in a user-generated collaborative process (Aigrain, 2012). Elixier is run by editorial staff. Therefore, people with different professional qualifications and intentions are responsible for the aggregation of resources and their description via keywords, abstracts and tags in Edutags and Elixier.

The first question that arises is: can both services (and consequently teachers) benefit from exchanging metadata between both systems? Furthermore: what metadata can be exchanged and how should the metadata be presented to preserve the specific foci of the two services?

Open educational resources (OER) can be found in both collections. Commonly, a resource is referred to as OER if it is published under a free licence that allows free reuse, remixture and republishing of the material. (Atkins et al., 2007) The Creative Commons licence model (CC) is a model that has frequently been used in recent years, it allows a differentiated declaration of rights for the user (Creative Commons, 2009). At present, the declaration of OER licences in Elixier is fairly scarce. In Edutags, the visibility of OER is far better but still only little more than ten percent of all resources are furnished with a free CC license. Edutags does not solely depend on the users' tagging to identify OER. A crawler can utilize machine-readable licenses (Hagmüller et al., 2013) and indicate this. The Paris declaration asks for services that facilitate "finding, retrieving and sharing of OER" (UNESCO, 2012). This leads to our second question: Can both systems support the awareness for OER by exchanging metadata?

2 Social Tagging

Tagging means that users annotate digital objects with freely chosen keywords (Golder & Huberman, 2006). In many applications tags are used to describe single objects in a platform. In SBS, the objects are links that refer to other websites or documents. A user describes an object by freely chosen tags. In contrast to a hierarchically structured taxonomy, users do not have to classify the object by a given set of terms. As a result a user produces a tag cloud that can be regarded as a representation of a user concept of the subject (Yew et al., 2006).

The social aspect implies that different users start to share their tags and objects. In common SBS, the community of people who share tags and links, i.e. their knowledge, is an informal open community. People can set up open or closed groups and they can build networks. When using a SBS, users can in a first step browse the collection of resources by using the tags used by others. While exploring the tag clouds, they can pick up new tags they regard as helpful. Again the idea of the tag cloud and the meaning of the size of a word (tag) become important because the size indicates the relevance of the tag for the subject area (Sinclair & Cardew Hall, 2008). Using the tag cloud users may rethink and expand their own concept of this area. A SBS therefore is not only a tool that gives users access to even more resources. It also can help build and extend knowledge by

using tags. Users can use tags in two ways: they can describe objects to elaborate their concept of the topic or they use other people's tags to broaden their knowledge (Held et al., 2012). A SBS therefore has to be seen as a learning tool (Bateman et al., 2007; Yew et. al., 2006).

Edutags is a SBS especially for educational purposes. Users can bookmark resources and online documents and describe them with individual tags. They can browse through all resources by using the tags, and they can collaborate in this activity. At present Edutags has more than 2.500 regular users who have collected over 19.000 resources – more than 2.700 are licenced under CC.

3 Documentation by Editorial Staff: the Case of Elixier

Another approach can be found in the collection of materials that are aggregated by editorial staff. In comparison to an open folksonomy, trained members of staff follow a given taxonomy to describe resources. A variety of standards have been created, for example LOM, Dublin Core and LMRI. As these standards are fairly complex, it is not easy to produce appropriate metadata. Still, if one doesn't mind the expense, a collection of very detailed metadata emerges that enables users to create any search query. Information is exchanged in a top-down manner: authors of the metadata are gatekeepers to accessing the described material. Users can only read the information. Elixier is an example of this editorial approach. Since 2007, the educational servers of the German federal states and the national German Eduserver have worked on the specification and implementation of this collection. The cooperation's objective is the mutual provision and usage of shared resources in the respective local contexts. A public documentation of the Elixier data model can be found under http://bildungsserver.de/elixier/elixier.pdf. The metadata attributes are grouped into 10 headings. 30 optional attributes are in usage and there are 14 mandatory. For the purpose of monitoring the quantity and quality of the frequently updated delivery of resources, a chart with suitable indicators is generated at the time of each update. Beyond a quantitative increase, the enhancement of the resource pool's metadata quality is of particular interest. From a user's perspective notably relevant metadata like classification, description, learning levels or media type gain a significantly higher quantifier than the other attributes. In this context, an enhancement of the indicators shows an improvement of editorial efforts.

4 Educational Resources

As described above, both systems are developed to give teachers access to educational resources. But we have to ask what educational resources actually are. Generally speaking, every webpage, every element can be a learning object. In fact, it is only the use of an object in a teaching and learning context that makes it an educational resource (Kerres, 2013). Of course: materials especially produced for learning are educational resources. Still, these materials do not represent all possible educational resources. Regarding referatories that are maintained by editorial staff, the problem emerges that they can only collect explicitly declared educational resources. It is to be asked, whether only descriptions of editorial staff are helpful for teachers (Biffi, 2002; Richter, 2013). Therefore, usage of material by teachers is a necessary criterion for classification. A teacher will be required to describe material properly as an educational resource (Heinen & Kerres, 2014).

5 Comparison of Edutags and Elixier

5.1 Description of Resources

A first comparison of Edutags and Elixier focuses on the entire body of resource inventories. Edutags currently contains (all figures as of 14/01/2014) 19.022 resources, Elixier indexes 50.740 resources. The Intersecting set is only 378 resources. This means that teachers describe different resources than editorial staff. While this does not inform about the use or quality of resources stored in Elixier, a clear indication is given that in preparing and giving lessons, teachers use resources that are not considered by editors working on Elixier. The following overview illustrates the distribution of complementary stocks available.

	Edutags	Elixier
Mathematics	311	2683
Physics	163	1813
Chemistry	230	2080
Biology	350	3974
German	239	6403
Geography	53	680
History	105	3438

Tab 1: Complementary stocks in Edutags and Elixier

First of all, it is clear that categorisation by subject is less relevant for teachers' tagging a resource. Even though Elixier contains "only" 2.5 as many resources as Edutags, categorization by subject differs tenfold. In a second step, it would be interesting to investigate the resources that can be found in both systems. Categorisation by teaching subject is first of all relevant for teachers. Therefore, tags in Edutags are analysed to find out whether they correspond to a subject categorisation of resources in the intersecting set and if possible, whether the categorisation is identical. The analysis reveals that of the 378 intersecting resources, 153 bear a tag that can be allocated to any of the subject categories in Elixier. A combination of keywords would therefore improve the quality of descriptions in Edutags. In the case of 134 resources, allocation to a subject is identical in Edutags and Elixier. Regarding the other 19 resources, teachers have categorised materials in a way that indicates the resources seem relevant for other subjects, too. In these cases, the sets of metadata are complementary and the teachers tagging indicates, that the actual use in a classroom might differ from the publisher's or editors' intentions.

intersecting resources	**378**
no subject assignment	225
identical subject	134
different subject	19

tags in intersection	**2220**
Elixier only	1332
Edutags only	219
both systems	669

Tab 2. – Subject tags and comparison of tags in intersecting set

Below, we present an in-depth comparison of tags and indexing: In total, resources in the intersecting set show 888 different tags in Edutags. In Elixier, they are described by 2001 keywords. 669 terms can be found in both systems. The number of correspondences can serve as an indicator of quality regarding the descriptive data assigned by the two different groups (teachers respectively editors). On the one hand, the number of different terms results from the systematics path: while teachers will occasionally use only one term to describe a resource, the systematic pathway will always encompass a series of superordinate terms. In the intersecting set, Elixier contains 1332 terms that do not exist in Edutags. The same set accounts for 219 tags that can be found in Edutags only. This shows that users apply other criteria for categorisation than editors. However, it is also evident that meshing metadata from both systems would in each case lead to an enrichment. Adding the systematic path of Elixier to resources in Edutags can make it easier to locate a resource. Vice versa the tags created by teachers would add new facets to the description in Elixier.

For indexing in Edutags, a procedure needs to be provided that enables automatic tagging by subject to offer users added value in terms of better "findability". To import user tags into Elixier an API will be set up. In summary, it can be stated that regarding question 1, a benefit is expected for both systems.

5.2 Open Educational Resources (OER)

In a second step, we want to investigate in what way OER are present in Elixier and Edutags. A frequently used approach to making educators aware of OER is to publish collections of OER (Blees & Heinen, 2013). Edutags is based on another approach: To foster awareness of OER, it seems helpful to present OER together with other learning resources and put some effort into rendering OER resources visible. In Edutags, OER are distinctly tagged with an instance of CC-licence and the tag "Creative Commons". A logo of the licence is displayed with the bookmark. For this purpose, a crawler is integrated into Edutags; it visits the websites that are linked by the bookmarks and searches for a machine readable CC-licence. The CC-licence model consists of three layers: the legal text, the Logo and the machine readable licence (Creative Commons, 2009). This is a small piece of html code embedded in the website. If the crawler finds this snippet, it adds the licence to the bookmark. We can find 2718 resources in Edutags that are tagged as OER. 2.280 of these resources are only tagged as OER by the crawler. That means: In 2.280 cases the user was not aware of tagging an OER or this information wasn't important to the user. The benefit of the crawler is that it raises the user's awareness of the OER-quality of a bookmark and forwards this information to other users. This crawler is another example of how automatic tagging adds value to the user's tagging.

Comparing the complete collections with respect to the representation of OER, a significantly different picture is revealed than in the above comparison. In Edutags as mentioned we find 2718 OERs, in Elixier only 227 resources are described as OER. Two reasons can be assumed for this observation: The resources in Elixier are not published under a free licence – at least not under a CC-licence. The editorial staff did not care about the CC-licence.

In the case of OER, it seems more viable to use the crawler also to scan resources in Elixier. If the number of OER remains small, the result could be used to a) reconsider the criteria applied by the editorial staff for selection of a resource and b) to make publishers aware of the lack of free licences.

6 Conclusion

In general reference platforms may be filled with content in three ways: (1) **Editorial Maintenance:** An editorial team looks for materials on the Internet and posts references to these materials, usually furnishing them with keywords. This corresponds roughly to the practice adopted by Elixier. (2) **Automatic Aggregation**: Crawlers analyse the contents and attempt to classify them automatically. (3) **User-generated Collection**: The users themselves enter references to valuable educational materials, assess these and provide keywords.

At present Elixier uses option 1 wheras Edutags relies on option 2 and 3. As could be shown an integration of all three options would provide better search results. In future an integration of Elixier and Edutags will give the best of both systems to the user. This does not entail that the combination of both systems is meant to be a monolithic referatory (Blees & Heinen, 2013). Despite exerting some gravitational force it seems to be important to keep the system permeable to build and foster an open ecosystem (Kerres & Heinen, 2014).

7 References

Aigrain, P. (2012*). Sharing: Culture and the Economy in the Internet Age.* Amsterdam: University Press.

Atkins, D. E., Brown, J. S., & Hammond, A. L. (2007). *A review of the open educational resources (OER) movement: Achievements, challenges, and new opportunities*. Creative Commons. Retrieved February 10, 2014, from http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf.

Bateman, S., Brooks, C., McCalla, G., & Brusilovsky, P. (2007). Applying collaborative tagging to e-learning. In C. Williamson, M. E. Zurko, P. Patel-Schneider, & P. Shenoy (Eds.), *WWW'07: Proceedings of the 16th international conference on World Wide Web.* Alberta, Canada: ACM Press

Biffi, C. (2002): Evaluation von Bildungssoftware im Spannungsfeld von Objektivität und praktischer Anwendung. *Medienpädagogik - Zeitschrift für Theorie und Praxis der Medienbildung*. Retrieved February 7, 2014, from http://genderkompetenz.ch/dotnetscripts/MAPortrait_Data/53526/5/biffi_Lernsoftware_Me dienp%C3%A4d.pdf

Blees, I. & Heinen, R. (2013). Edutags als Referatory und" Suchmaschine" für Open Educational Resources. *Zeitschrift für Hochschulentwicklung*, 8(4), 26-36. Retrieved February 10, 2014, from http://www.zfhe.at/index.php/zfhe/article/view/576/568

Creative Commons (2009). Retrieved February 7, 2014, from http://creativecommons.org/licenses/.

Golder, S.A. & Huberman, B.A. (2006). Usage patterns of collaborative tagging systems. *Journal of information science*, 32(2), 198-208.

Hagmüller, P., Klopf, M., & Richter, R. (2013). *Open Government Data.*

Heinen, R. & Blees, I. (2011). Social Bookmarking als Werkzeug für die Kooperation von Lehrkräften. In J. Griesbaum, T. Mandl & C. Womser-Hacker, (Eds.), *Information und Wissen: global, sozial und frei?* Boizenburg : Hülsbusch (2011) , 111-122.

Held, C., Kimmerle, J., & Cress, U. (2012). Learning by foraging: The impact of individual knowledge and social tags on web navigation processes. *Computers in Human Behavior*, 28(1), 34-40.

Kerres, M. (2013): *Mediendidaktik: Konzeption und Entwicklung mediengestützter Lernangebote*. München: Oldenbourg.

Kerres, M. & Heinen, R. (2014). Open educational resources and informational ecosystems: Edutags as a connector for open learning. *MedienPädagogik. Zeitschrift für Theorie und Praxis der Medienbildung*, (Special Issue: Educational Media Ecologies (Ed. by N. Friesen, Th. Hug & D.M. Meister)

Richter, Thomas (2013). The Appropriateness of Open Educational Resources. In C.M. Stracke (Ed.), *Learning Innovations and Quality: „The Future of Digital Resources" – Proceedings of the European and international Conference LINQ 2013*, Berlin : Logos, 52-59.

Sinclair, J. & Cardew-Hall, M. (2008). The folksonomy tag cloud: when is it useful? *Journal of Information Science*, 34(1), 15-29.

UNESCO (2012): *Paris OER Declaration*. Retrieved February 10, 2014, from http://www.unesco.de/oer-faq.html

Yew, J., Gibson, F. P., & Teasley, S. D. (2006). Learning by tagging: The role of social tagging in group knowledge formation. *MERLOT Journal of Online Learning and Teaching*, 2. Retrieved February 10, 2014, from http://jolt.merlot.org/vol2no4/yew.pdf