

OER Assistant: Finding Learning Materials with Text Analytics

Russell Walker

DeVry University • Long Beach, CA • United States

ABSTRACT

Sharing of Open Educational Resources (OER) can help universities address pressures to improve quality and reduce costs, but OER adoption to date has been limited by poor discoverability of these resources. This poster/demonstration introduces OER Assistant, an interactive web application that uses advanced text analytics provided by IBM's Watson cognitive-computing platform to help educators find OER suitable for use in a course, based on the course description and learning objectives. This tool has so far been in limited use at a single academic location, with positive results. The aim of the poster/demonstration is to gather feedback on the tool from a wider audience, in preparation for making it more broadly available and launching a formal evaluation process.

OER

OER are defined as digital materials for teaching and learning that are freely available online for adaptation, repurposing, and reuse (Geser, 2012). The term covers multiple categories of resources including complete courses, textbooks, videos, tutorials, simulations, exercises, images, diagrams, quizzes, and exams. The OER movement is an extension of the open-source software paradigm and draws on open-ware initiatives pioneered by MIT. Use of OER has been associated with reduced costs to students and institutions as well as improved educational outcomes (Wiley, 2015). MERLOT, one of the best-known public OER databases, currently indexes over 40,000 items spanning 19 different material type categories (MERLOT, 2015).

TEXT ANALYTICS

Text analytics can refer to any automated process for deriving information from unstructured text sources, and includes such applications as summarization, sentiment analysis, explication, investigation, and classification (Gartner Inc., n.d.). Text analytics may be used as a synonym for text mining, or may refer to the application of text mining techniques to a specific problem. Text analytics are increasingly used to extract meaning and identify patterns from unstructured text in law, academic research, finance, medicine, biology, technology, and marketing (Turban, Sharda, & Delen, 2011).

OER DISCOVERY THROUGH TEXT ANALYTICS

Educators seeking OER may not be experts at formulating search queries, and the search tools for OER repository sites are much less sophisticated than Google or other large-scale web search engines (reference). Text analytics can assist with OER discovery by parsing existing text describing course content, such as course descriptions and learning objectives, formulating and executing search queries based on that analysis, and intelligently ranking search results by relevance. Previous work (Walker, 2012a, 2012b) suggests that this approach shows promise, but tests were limited to an older, less capable text-mining tool (Keyword Extraction Algorithm or KEA, an open-source application dating from 1999) and were performed only in a batch-processing mode. This poster/demonstration describes OER Assistant, an improved implementation of the approach using a more advanced text analytics engine (AlchemyAPI, now a part of the IBM Watson cognitive-computing platform) and a web-based interactive user interface.

OER ASSISTANT OVERVIEW

OER Assistant is a web application designed to assist faculty subject matter experts and instructional designers in finding OER suitable for use in a university course, based on existing written material about the course.

For an educator, the process of using OER Assistant is intended to be as simple as possible. The user goes to the OER Assistant site and copy/pastes the text of a course description or learning objective into an input field. The user also selects the general subject area of the course, such as "business" or "humanities." The user is then presented with a list of up to 10 words or short phrases that may characterize the course content. The user can leave all of these selected (the default) or optionally deselect any that appear unsuitable (too broad, too narrow, or otherwise off the mark).

OER Assistant then presents the user with a list of OER materials from multiple repositories that may be related to the course content, ranked in order of their relevance to the course. Each result is linked to its entry in the source repository, so the user can easily investigate each item and choose those most appropriate for his or her needs.

IMPLEMENTATION

OER Assistant is coded in HTML and JavaScript, and runs in most modern web browsers including recent versions of Firefox, Chrome, Internet Explorer, and Safari. It can be hosted on a web server or executed as a locally-installed app on a desktop computer or mobile device. When run as a locally installed app, it still requires network access in order to interface with AlchemyAPI and the various OER repository sites.

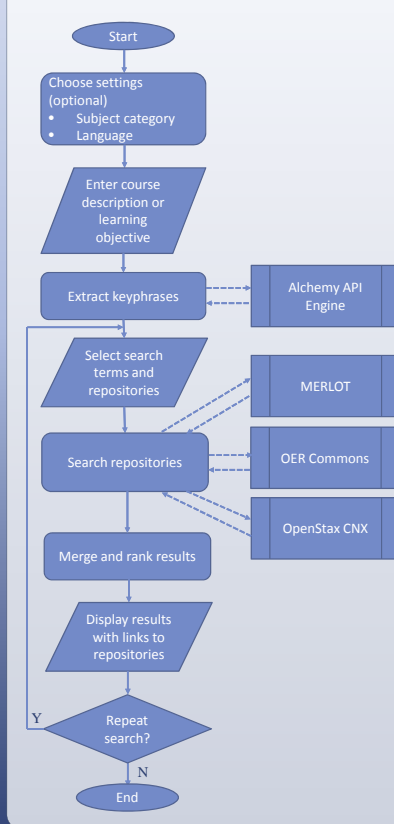
EVALUATION

For about a year, OER Assistant has been used informally by a few faculty members at a single campus of a large US university. During this time the algorithm and implementation have been continually refined, and new features requested by users have been added, such as the ability to view and optionally deselect keyphrases. Professors at this location have found OER Assistant to be a helpful tool for locating supplemental resources for courses in business, computer information systems, network communication, mathematics, and engineering technology.

A broader release of OER Assistant is now planned, accompanied by a more formal evaluation of the tool. A beta version of the tool will be made available to selected users at multiple locations. Users will be asked to rate the tool as to ease of use, quality of results, and overall utility. Users will also be given the opportunity to mark individual results as relevant or not relevant to their needs, allowing standard information-retrieval metrics such as precision to be calculated.

Educators who may be interested in utilizing a beta version of OER Assistant are encouraged to contact the author to be notified of availability. Release is anticipated during the summer of 2016.

PROCESS FLOW



EXAMPLE SESSION

| Suggested OER: | OER Title | Source | Keywords Matched | Score | Rank |
|---------------------|-----------|--------|------------------|-------|------|
| Learning Objectives | OER Title | Source | Keywords Matched | Score | Rank |
| Learning Objectives | OER Title | Source | Keywords Matched | Score | Rank |
| Learning Objectives | OER Title | Source | Keywords Matched | Score | Rank |
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| Learning Objectives | OER Title | Source | Keywords Matched | Score | Rank |

CONCLUSION

The recent availability of powerful new tools for text analytics creates opportunities to reduce barriers to OER adoption. Educators can search for OER using existing text such as course descriptions and learning objectives, removing the need to explicitly formulate keyword searches. OER Assistant is a prototype for exploring and assessing these possibilities. It has shown initial promise during limited use at a single location, and is now being prepared for a wider rollout and more formal evaluation. This poster/demonstration session is to gather additional feedback and gauge interest prior to a beta release. Ultimately, the aim is to make a useful OER discovery tool available to the wider educational technology community, and facilitate greater adoption of OER throughout higher education.

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CONTACT

For more information or to be notified when the beta version of OER Assistant becomes available, please contact:

Russell Walker, PhD
Senior Professor,
College of Business and Management
DeVry University, Long Beach, CA USA
rwalker2@devry.edu • 562.997.5331
@RussWalker58



<http://tinyurl.com/oerasist>