

Aggregating Student Blogs with EduFeedr: Lessons Learned from the First Tryouts

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Abstract. EduFeedr is a specially designed feed reader for following, managing and supporting the learning activities in blog-based courses. This paper describes the technical implementation of EduFeedr and discusses the results of the initial evaluation after using the prototype with real learners. The main challenges were related with limitations of Web content syndication technologies while aggregating blog posts and comments from course blogs. This paper proposes solutions to overcome these limitations.

Keywords: mash-up learning environments, web syndication

1 Introduction

Web 2.0 has opened up a lot of choices for innovative educators. Early adopters have abandoned centralized learning management systems and started to experiment with using blogs, wikis and social networking sites in their courses. However, these new tools have brought up new kind of problems. One of the challenges is related with the increase of the teacher's overhead work while managing, following and supporting student activities, which take place in a distributed learning environment.

This article builds on our previous publication where we presented the conceptual design of EduFeedr [1]. EduFeedr is an educationally enhanced feed reader, designed specifically for courses that take place in a distributed learning environment where all students use their personal blogs and other social software. It is designed so that only teachers have a user account in EduFeedr but anyone can access it for monitoring course activities.

In the second section of the paper we give an overview of some related works. After that we present the technical implementation of EduFeedr and discuss the main lessons that we have learned from pilot-testing a prototype of EduFeedr during an eight week long adult education course in Tallinn University. The pilot test was the second phase of our study, which is based on the methodology of design-based research [2]. The main challenge in this phase was effortless and error-prone aggregation of course-related feeds from various blogging platforms used by learners.

2 Related Works

Two main research fields that have influenced the design of EduFeedr are open education and mash-up personal learning environments. While open education is often associated with open educational resources, there are several other models of openness [3]. One of these is open course model where any interested person may freely enroll to the course [4]. A common format for these open courses is based on blogging assignments. Each week every participant will post in his/her blog a reflection on his/her activities, readings or thoughts. The participants are usually encouraged to comment each other's blog posts and become engaged in collaborative knowledge building.

The initial motivation for designing and developing EduFeedr came in 2008 when one of the authors was a co-facilitator in a course on *Composing free and open online educational resources* [5]. Following the progress of the learners and giving feedback to more than 70 blogs required quite a lot of overhead work from the facilitators. In this and several other courses we have used shared RSS readers (such as Pageflakes) to follow blog posts and comments. Unfortunately this solution doesn't display connections between learners that are important in this type of the course. Fini has studied the use of tools in an open course on *Connectivism and Connective Knowledge* [6]. According to his study Pageflakes was considered the least useful tool.

While we value the openness and personalization of distributed learning environments, we have to agree that some aspects of centralized learning managements systems (LMS's) make it easier for a teacher to manage courses with large number of students. There have been attempts to add blog aggregation to institutional LMS's. One of these is BAM that is integrated with Webfuse LMS [7]. A newer version named BIM¹ is a blog aggregation module for Moodle.

There are some interesting tools for aggregating blogs, but they are not specifically designed for a course setting. ReMashed [8] is aggregating blogs and various web 2.0 services based on user interests. There is also some work on widgets for monitoring the aggregated blog posts. Graz University of Technology is developing an institutional personal learning environment that has various widgets for following blogs, Twitter and other online services [9]. P2PU² has customized Drupal content management system to provide open courses on a centralized platform. Yet, most of these attempts do not add much to the affordances provided by common aggregators like PageFlakes.

Blogs were used as a learning environment already before the Web 2.0 phenomenon [10]. Therefore there is a lot of research about using blogs for learning. In the context of EduFeedr we are specifically interested in managing the course activities. One development in that direction is a LePress plugin developed in Tallinn University, for managing assignment-related workflows between multiple WordPress instances [11]. However, one of the crucial pre-requisites of EduFeedr project was avoidance of any special plugins on the student blogs.

¹ BIM. <http://davidtjones.wordpress.com/research/bam-blog-aggregation-management/>

² P2PU. <http://p2pu.org/>

3 Technical implementation

EduFeedr is built as a plug-in for Elgg³ social networking engine. We decided to use Elgg because we have previous experience with the platform [12]. Elgg offers us mature and easily extendable framework, perfectly suitable for quick prototyping.

Currently we have implemented the basic features of EduFeedr that include (1) setting up the course, (2) enrolling to the course, (3) aggregating blog posts and comments, and (4) visualizing the progress and social network between the learners. Blog posts and comments are displayed inside EduFeedr, but writing comments takes place in a blog where the post was published. 10 most recent blog posts and comments are displayed on the *Course feed* page (see Fig. 1).

Course feed | Course info | Participants | Assignments | Progress | Social network

Composing free and open online educational resources

The course readings and the assignments in this course will familiarize participants with the main concepts related to open education resources and to the historical and philosophical ideas behind them.

Enrollment for this course ended on March 9, 2008.
In case of questions, please contact [the facilitator](#).

Blog posts

June 11, 2008

[Last Post](#)
11.06.2008 06:18 by Barbara Braun

So this was my course blog for a great course - what is going to happen to it? I was struggling thinking I might take it offline as it is not continued and cyberwaste - well I certainly won't do this now i.e. Hans or Teemu are thinking writing about a paper.

[read more](#)

Comments

May 08, 2008

As I went through the OER course I kept a check on 7 or 8 blogs of other participants but unfortunately (for me) this wasn't one of them! Well, now I have found it and I've really enjoyed reading your thoughts and ideas.

[read more](#)

Fig. 1. Course feed page displays recent blog posts and comments.

In addition to displaying aggregated course data in EduFeedr the system provides data export in several formats. It is possible to download all course blog post and comment feeds in OPML format and use any feed reader for following the course. Participants' contact information can be downloaded in vCard format. Social network data can be downloaded in a format that can be used in ManyEyes⁴ and other visualization services.

We have used several open source components for building EduFeedr. SimplePie⁵ PHP library is used for aggregating feeds. Social network visualization is created using JSViz⁶ JavaScript library. NuSOAP⁷ toolkit for PHP is used instead of default

³ Elgg. <http://elgg.org/>

⁴ ManyEyes. <http://manyeyes.alphaworks.ibm.com/manyeyes/>

⁵ SimplePie. <http://simplepie.org/>

⁶ JSViz. <http://code.google.com/p/jsviz/>

PHP SOAP extension, because it is more convenient to use and allows us to create powerful functionalities with less lines of code (eg. automatically generated WSDL). Unfortunately it seems that this toolkit is not being actively developed any more, so we had to make several modifications in order to get it working with latest PHP version. We considered the possibility of implementing dynamic views such as progress and social network visualizations as Wookie widgets [13] that can be embedded in other systems. However, we decided that in the current phase widgets do not provide added value.

EduFeedr acts as a front-end for displaying course data. As the learners are in command of their learning environment (their blog), they can easily change or delete their blog posts. As the teacher might need to go back to initial versions of blog posts, we have to store the copies centrally. For aggregating and storing course feeds we have developed a separate web service component named EduSuckr. Data for complex views such as social network diagram is aggregated from local storage, thus improving the response time of EduFeedr. Currently each EduFeedr instance requires a dedicated EduSuckr instance, but we are planning to change it in the future so that one EduSuckr web service will serve as a backend for several EduFeedr instances.

Most of the course data is stored in both EduFeedr and EduSuckr MySQL database storages, when data is changed on EduFeedr side it is also updated on the EduSuckr side. That way EduSuckr will have all the needed data at hand when there will be a need to archive the course. EduSuckr is constantly aggregating posts and comments from blogs registered in the system. At the moment it is done hourly using Crontab, a time-based job scheduler in Unix-like computer operating systems.

EduSuckr is using InnoDB storage engine and makes use of relations by means of foreign keys. This allows us to only add every blog once, even if the owner is participating using same blog in more than one course. It also saves us the effort of aggregating information twice from the same blog. General architecture of the system is presented on Fig. 2.

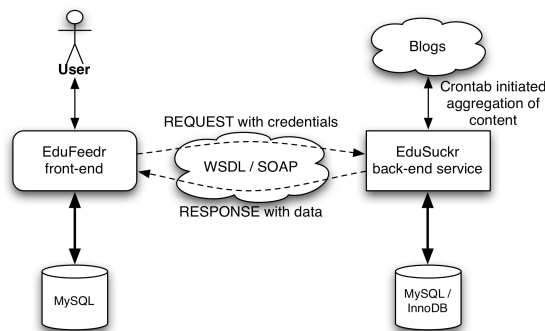


Fig. 2. General architecture of the system.

Currently the intersystem communication involves adding, updating and removing courses, adding and removing participants, adding and removing assignments, hiding and restoring posts and comments (if some of these are not related to the course),

⁷ NuSOAP - SOAP Toolkit for PHP. <http://sourceforge.net/projects/nusoap/>

getting information about course progress table and linking connections, getting course posts and comments.

4 Results of the first tryout

The first tryout of EduFeedr took place in an online professional development course with 13 adult learners. This eight-week course focused on academic referencing, citing and managing the references. Most of the participants were teachers and learning technology specialists from vocational schools and colleges. All enrolled learners were informed about the use of blog-based learning environment on this course, half of them did not have any previous experiences in using blogs for learning purposes. The aim of this pilot test was to carry out a formative evaluation exercise with EduFeedr prototype, in order to improve the presentation, visualization and linking of data. Our research methodology was inspired by the approach called design-based research [2]. We were involved in the study in a triple role: as designers/developers of the software, as facilitators of the pilot course and also as researchers. Instead of well-defined research questions and data collection from the learners using questionnaires, we treat our software prototype as a hypothesis [14] and try to analyze our own experiences while using it in a real-life situation.

Only ourselves as facilitators used EduFeedr on this course, because the system was under constant development and we did not want to risk with causing frustration to learners with our first prototype, which still had some unsolved scalability and interaction design issues. 11 students opted to use Blogger as their personal learning environment and 2 students used WordPress.com. Course blog that was used by 2 facilitators was also hosted at WordPress.com. In addition to that we tested EduFeedr with imported data from 4 previous courses, which also were conducted using blog-based personal learning environments. The testing indicated that RSS and Atom technologies have several bottlenecks, which limit the aggregation of course activities taking place in blogs. The following sections provide a summary of our findings.

Lesson 1: Locating the Comments Feed. Our initial requirement was that EduFeedr would aggregate blog posts and comments from any blogging platform that outputs feeds in RSS or Atom format. Unfortunately there is no standard way to detect the location of comments feed. We have hardcoded the comments feed location for widely used blogging services such as Blogger, WordPress.com and EduBlogs.org. Independent WordPress installations can be detected from the meta tag. We see two solutions to support rarely used blogging engines: (1) student can specify the comments feed URL (possibly also posts feed URL) during the enrollment process, or (2) teacher can specify the feed URL.

Lesson 2: Linking Student Posts with the Assignments. The second complicated issue is linking student posts with the assignments in course blog. This information is needed for displaying the progress diagram. We discussed the possible solutions in a previous publication and suggested that students could link to the original assignment in the course blog [1]. In last course we asked students to include links to the assignments in their blog posts. However, within our pilot course only 10 blog posts from 91 included link to the assignment. In the current implementation we decided to

use different colors for posts that contain a link to the assignment and posts that are posted during the assignment period.

Typically students do their assignments in the order given by the teacher. It means that we are able to connect the posts and the assignment with a high accuracy even when the students are late. EduFeedr could ask the teacher to confirm if the blog post was a response for certain assignment.

Lesson 3: Linking Comments with the Participants. The social network visualization creates a link between the participants if one has linked or commented another participants' blog post. Major blogging platforms ask for the name, e-mail and URL when a person is submitting a comment. We decided that comments will be linked with students by the URL that is provided in the comment metadata.

In the testing it came out that these URL's pointed to student blog only in rare occasions. All together, the participants wrote exactly 100 comments to the blog posts. The URL's in the comment metadata pointed to the following locations: user profile in Blogger (57 times), website specified in WordPress user profile (18 times), OpenID URL (7 times), student blog in the course (3 times). No URL was submitted with 15 comments. As we can see, users are typically logged in to the blogging service when submitting a comment. In that case the blogging platform will not ask for their website URL when they submit a comment. This shows that EduFeedr must use multiple methods to connect comments with course participants.

Lesson 4: Only Recent Items are Stored in the Syndication Feeds. Blog posts and comments are aggregated from Atom feeds. Atom was chosen because this is the default syndication feed in Blogger and supported also by WordPress. By default Blogger Atom feeds contain 25 most recent posts and comments. In WordPress only 10 most recent items are contained in the syndication feeds by default. It means that in a longer course not all posts and comments will remain available in the syndication feeds. Also, syndication feeds will be updated with new items when people continue to use their blogs for other purposes after the course. In Blogger it is possible to query for more items in the syndication feed. For WordPress there is no workaround, but the users may increase the number of items stored in the syndication feeds.

One solution for this problem is aggregating data into local storage. For this purpose we had to create a separate web service called EduSuckr. Unfortunately EduFeedr is not able to create complete archives and visualizations from previous courses, because there is no way to retrieve posts that are not in the WordPress feeds anymore.

Teacher can specify a period when posts are aggregated from the feeds and stored locally. This way it is possible to avoid unrelated posts that are published after the course. Also, teacher can hide posts and comments that are not related with the course.

5 Discussion and Conclusions

We have designed EduFeedr to fit into a larger ecosystem of tools that are used in the open education. We are planning to provide EduFeedr as a centralized service where any educator could set up an aggregated course with open enrollment. This

centralized service could also act as a catalogue of open courses. Currently the information about ongoing open courses is scattered in various wikis and initiatives (Wikiversity⁸, P2PU, etc).

EduFeedr is targeted for educators who teach open courses in a distributed learning environment. We understand that less tech savvy educators may prefer a more centralized learning environment. Also there are sensitive topics that can be discussed better in closed online discussion rooms. As EduFeedr is developed on Elgg platform there is a future possibility to reuse the EduFeedr components to display course activities that take place on a centralized Elgg system. These courses could be also visible only for the participants. However, this would be a different product.

EduFeedr is currently a work-in-progress. We have implemented the basic features that enable aggregating, displaying and visualizing the communication that takes place in a network of blogs. More work is needed on the user interface design and performance issues. The source code of EduFeedr is available in the development site⁹. The public beta site was launched in September 2010 at <http://www.edufedr.net>.

In autumn term 2010 the beta version of EduFeedr will be tested in several open courses in the Estonian Wikiversity. In addition to these courses we are planning to organize think aloud usability tests with a small group of users. We are going to continue the development of new features after fixing the found defects and analyzing the user feedback from the first courses.

Some ideas for future developments include (1) aggregating recent content from various Web 2.0 services that are used in courses (Twitter, Delicious, SlideShare, etc.), (2) providing visualization widgets that could be embedded in external web sites and (3) archiving the course posts and comments.

This paper summarized some of the issues that we have tackled in the development and testing of EduFeedr. Plain RSS/Atom feeds have certain constraints that limit their use in distributed learning environments. Adding educational semantics to syndication feed formats is a topic that needs further research.

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⁸ Wikiversity. <http://www.wikiversity.org>

⁹ EduFeedr development site. <http://www.edufedr.org/>

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