

# E-LEARNING 2.0: METHODOLOGY, TECHNOLOGY AND SOLUTIONS

Pavel Drášil, Tomáš Pitner

**Abstract:** The paper deals with current trends in e-learning known as E-learning 2.0. The trends are characterized by new methodological approaches such as connectivism in the context of present web technologies and tools – Web 2.0. The E-learning 2.0 tools should be able to integrate legacy learning- and other resources in order to create personalized learning environment called *learning landscape*. L2 Platform represents a prototype solution reflecting the requirements of E-learning 2.0.

**Keywords:** Web 2.0, E-learning 2.0, REST, Adaptive XML Inclusions.

## 1 E-LEARNING 2.0

The shift to Web 2.0 has its counterparts in both e-learning technology and methodology. Downes [1] denotes this trend as E-learning 2.0. E-learning 2.0 strongly aims on collaborative nature of learning, about transition from traditional view of e-learning as a technologically driven way to transfer the pre-existing knowledge to the recipients – students.

One of the core methodologies behind E-learning 2.0 is *connectivism*, concentrating on making connections (i.e. links) among learning resources and people. E-learning 2.0 brings also strong focus on content syndication, its reuse/re-purposing, adaptation, and personalization.

Experiments and prototype implementations of an E-learning 2.0 platform such as Elgg [9] have recently emerged. They introduced the concept of a *learning landscape*. According to Dave Tosh [9], the learning landscape is a hybrid of weblogging, ePortfolios and social networking. It can serve as a stand-alone learning space or can be integrated with a traditional LMS like Moodle.

## 2 AN E-LEARNING 2.0 PLATFORM

### 2.1 L2 Platform

Current solutions, such as Elgg, are not ideal in terms of easy content creation, integration of various external resources like RSS feeds, blogs, web pages and others. Thus, we focused on developing a prototype platform providing all necessary E-learning 2.0 services/resources. Our research resulted in a new E-learning 2.0 platform called L2 [2].

L2 provides all standard functionality required from a learning landscape. It enables creation of learner communities, sharing of knowledge and experience with blogs, link (bookmark) databases. Typically, resources are tagged, instead of being assigned to a (fixed) taxonomy.

In contrast to the recent E-learning 2.0 platforms (learning landscape implementations), L2 strictly follows the rules defined by Roy Fielding in his *REST architectural style* proposal [3]. It builds on the *Restlet API* by Noelios Consulting [4], and is freely available on Sourceforge. The Figure 1 shows a typical E-learning 2.0 resource in the L2 design – a wiki page enabling very fast content creation in the learning landscape.

## Wiki Page L2 Platform

Author: Tomáš Pitner [tomphttp://localhost:8182/l2/user/tomp](http://localhost:8182/l2/user/tomp) | Variant: N0

Type id: docbook-book-wiki

## L2 Platform

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### Chapter 1. E-learning 2.0

### Chapter 2. Introducing the L2 Platform

Our research resulted in the development of a new E-learning 2.0 orientation to:

- ◆ REST architectural style, as defined by Fielding.
- ◆ Adaptive XML Inclusions (AXI) enabling to adapt and integrate
- ◆ Lightweight P2P Personalization allowing to personalize (edit, an

Quickly navigate to [Texts](#) [Users](#) [Tags](#) [Blog](#) [Wiki](#) [Profile](#) [URLs](#)

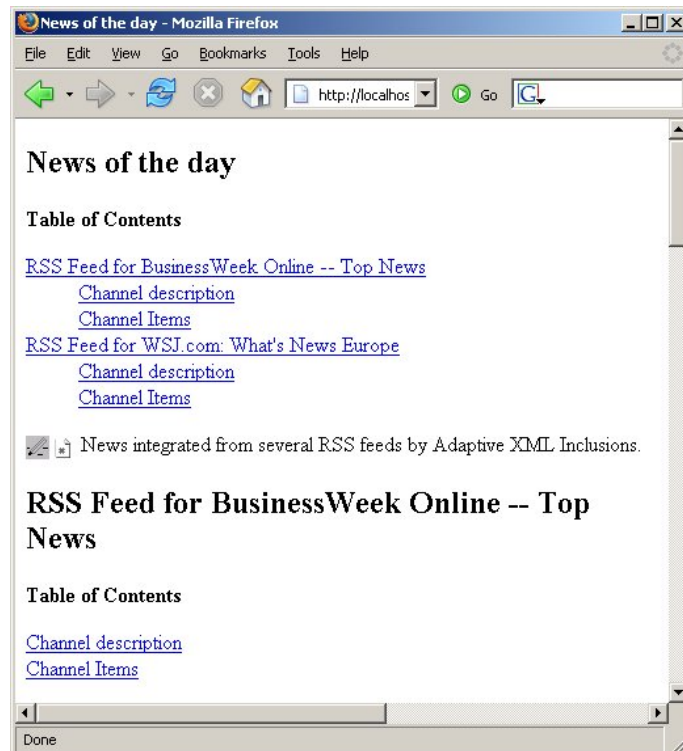
**Fig. 1** L2 Platform with a wiki page, navigation to other resources is placed at bottom

## 2.2 Resources, Content Creation, Adaptation and Integration

Primarily, everything stored and managed by L2 is a *resource* – it can be a blog entry, wiki page, link database or basic user data. A resource is uniformly addressed by a URL – so each resource has a globally unique identifier and is accessible via the Internet. It is available in various forms – *representations*. An XML form is a typical resource representation but the system may provide also plain text, image/multimedia formats and other representations of the same resource if it is relevant.

Secondly, L2 uses a mechanism called *Adaptive XML Inclusions* [7]. It allows seamless reusing/repurposing and integration of various contents in different contexts. This feature is crucial when building a personal learning landscape – one can integrate virtually any XML-represented resource, such as blog entries, tag descriptions, and learning content in various web formats like XHTML, or so-called microformats [10] fragments, i.e. pieces of “embedded” markup with specialized semantics. Adaptive Inclusions also follow the concept of *Active Documents*, introduced in [5].

The Figure 2 illustrates the repurposing of RSS feeds that represent typical Web 2.0 resources with a great potential for e-learning.



**Fig. 2** Content integration from RSS feeds

### 2.3 Personalization


Thirdly, further typical e-learning requirement is personalization. The E-learning 2.0 approach to personalization is more oriented to the social networking principles. L2 implements a very lightweight – but typically Web 2.0 – way of personalization called *Lightweight XML Peer-to-peer Personalization* [6].


Any L2 resource can be personalized with very simple user model required. All common personalization axes are covered by a single mechanism. The Figure 3 shows personalization via annotations. By clicking on the annotation icon, one can enter comment, remarks, make corrections, or even hide content that is not of interest.

## Chapter 1. Extensions

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 The DocBook XSL Stylesheets distribution include implement with standard XSLT only:

- ◆  embed callouts in verbatim environments (pr

**Fig. 3** The resource can be personalized after clicking on the icons

L2 also enables personalization by content filtering using either predefined or custom filters that can be written easily.

The personalization in L2 is constructed as *peer-to-peer* and builds on *social networking* following exactly the same philosophy as the Web 2.0 itself. One user (typically the course tutor of the group or a student – colleague – in the same group) adds an annotation, corrects an error in the text or hides some content that is not interesting or important for him/her. As other students *trust the tutor and/or a more experienced colleague(s)*, they may wish to see the annotations, remarks, and other changes made by the trusted peers. This is possible with L2 – the user just tunes his/her profile in order to *combine personalization actions* made by any number of other users.

### 3 CONCLUSION AND FUTURE WORK

L2 has been tested in a laboratory environment and has proven as a viable E-learning 2.0 platform. The next priority is to deploy L2 in a *larger-scale learner community*, test the *robustness*, collect the *feedback*, and try to create a distributed, long-term running *network of personal and/or centralized installations* of L2.

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