Multichannel Self-Organized Learning and Research in Web 2.0 Environment

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Abstract: This paper explores the functionalities of the start pages and considers their usefulness for deployment as learning and research environments for self-organized learners. The start pages' comparative analysis is done according to created criteria, focused on availability of the authoring, syndicated information, communication, collaboration and networking, research, and evaluation tools. The purpose of this evaluation is to propose a solution of a multichannel environment that can support self-organized learners in their learning process and knowledge construction. The importance of the environments for performing a broad set of activities and for producing rich learning experiences is examined from the point of view of learning design. The prototype of a learning and research multichannel environment is provided in Netvibes and Pageflakes.

Keywords: self-organized learning, web 2.0 technologies, multichannel environment, learning design, start pages

1 Introduction

eLearning is a strategy for learning that employs a wide range of technologies, tools and systems that support knowledge increase and skills improvement at times and terms defined by each learner. It has been the first area to benefit from the Web 2.0 principles (O'Reilly, 2005), which have recently been explored by many educators and researchers due to their possibilities for adoption in the learning process (Hinchcliffe 2006, Woodill 2007, Anderson 2007). The new tools and services such as blogs, microblogs, wikis, podcasts, social bookmarking, start pages, mashups, resource sharing, RSS/Atom syndication and social networks enable and encourage informal conversation, collaborative content generation, and the sharing of information, giving the learners access to a vast array of ideas and representations of knowledge (Rosen 2006, Alexander 2006, Kozlowski, 2007).

The second phase of eLearning based on the Web 2.0 technologies is coined by Downes as eLearning 2.0 (Downes 2005) the features of which

are summarized after analysis of the Web 2.0 principles in Table 1. This analysis allows making main statements about the implications of eLearning 2.0 for supporting self-organized learners: eLearning 2.0 facilitates the active role of the learner in content, applications and services authoring; assists in knowledge and information capturing, sharing and publishing; Supports the performance of self-organized web-based learning activities and personal creativity; forms a bottom-up and less control-oriented learning culture; gives greater leverage of "collective intelligence" to create learning experiences; facilitates easy starting and building of learning environments; facilitates dynamic learning in multichannel environments, with multiple sensory inputs and many different sources of experience.

Table 1. eLearning 1.0 and eLearning 2.0 main features

eLearning 1.0	eLearning 2.0
Learning in a Web medium – the learner transmits and consumes information	Learning in a Web platform – the learner is an author and co-author - content is created, shared, remixed, repurposed, and passed along
LMS, LCMS – require installation, administration, and maintenance	Free hosted eLearning 2.0 systems, start pages, blogs, wikis, Social networks
The course is designed for the main mass of learners	Long tail and snowflakes effects are related to personalization
The main part of LMS and LCMS are not service-oriented	Free and easy access to services – stimulate participation. Network effects - increase in value of a service in which there is some form of interaction with others
Taxonomy – subject indexing by expert, the learning resources are created in top-down, one-way methods	Folksonomy (social bookmarking) - collaborative categorization of learning resources - bottom-up, learner-driven, peer learning, many-to-many methods
Personal home pages – static presentation	Social software – wisdom of crowd - contribution is encouraged
Overload information, static web pages	RSS, mashup allows learner dynamic organization of right learning resources, individual creativity
Software as an artifact, only for usage in the final version	Software as a service, the perpetual beta – activate innovations in learning and the learner can be in the role of a software co-developer
Coordination of the component's system	Loosely coupled systems – flexible, personalized, adaptive learning
All rights reserved	Some rights reserved – remixible, reusable resources
CD, Web-based learning content	Bring web content to portable devices, podcasting
Web-based applications with "thin" client, desktop applications	Web-based applications with rich user interfaces and PC-equivalent

In this paper the possibilities of start pages for supporting self-organized learners through tools, services, and applications is explored. The comparative analysis of fourteen start pages is performed according to a

proposed methodology. The aim of this evaluation is to define a solution for multichannel learning and research environment. The importance of such environments for performing a broad set of activities and for producing rich learning experiences is examined from the point of view of learning design. The gained experience with start pages Netvibes and Pageflakes is provided as one practical example of built learning and research multichannel environments.

2 Used methodology

The comparative analysis of start pages is performed with the goal to select solutions for deployment of learning and research environments for self-organized learners. The methodology comprises: (1) investigation via Internet search engines and using keywords "start pages software" and "learning, education"; to gather blog shared experience, (2) creation of a set of evaluation criteria, (3) experimental practices with the environments and (4) forming the result. The criteria for this review are focused on the availability of the authoring, syndicated information, communication, collaboration and networking, research, and evaluation tools. The point scale is from 0 to 5. The availability of a tool with more functional possibilities is rated at 5, if the tool is missing – 0. The result is formed in two steps: (1) evaluation according to each criterion, (2) count the average value of evaluated weight for all criteria.

3 Start Pages Analysis

According to (Leyden & Jacki2 2006), the autonomous or self-organized learner is being able to "learn how to learn" and possesses a disposition to do so. Such a learner can analyze his/her own learning strategies and outcomes as well as support the learning of others.
For the self-organized learning and research to occur, a framework, learning tools and techniques are needed to assist the learners to identifying, reflecting on and improving their skills as self-organized learners (West-Burnham & Coates 2005, Koper 2005).
The big challenge is how to implement such learning environments which support and facilitate learning process and knowledge construction. One solution proposed in this paper is based on the technical and functional possibilities of start pages. The fourteen start pages are explored and analyzed according to the proposed methodology. Their main characteristics and formed ratings are presented in Table 2.

Table 2. Start pages technical and functional possibilities

Start Page	Characteristics	Rate
24eyes www.24eyes.com	*Authoring*: arrange RSS feeds; *Information*: RSS feeds; *Collaboration and Networking*: share tags, invite friends to dashboard; *Communications*: email tab to friend; *Personalization*: create and arrange RSS dashboard, look and feel	**2,7**
Eskobo www.eskobo.com/default.aspx	*Authoring*: web note ; *Information*: RSS feeds, site addresses; *Research*: search the web; *Personalization*: look and feel	**1,4**
ItsAStart www.itsastart.com	*Authoring*: sticky notes; *Information*: RSS feeds, del.icio.us bookmarks; *Research*: Google search; *Personalization*: look and feel	**1,7**
Favoor http://www.favoor.com	*Authoring*: notes, save links; *Information*: RSS feeds, bookmark import ; *Research*: Google search; *Collaboration*: share links; *Personalization*: look and feel	**1,7**
MyGetGo http://mygetgo.com/index.html	*Authoring*: microblog, notepad; *Information*: RSS feeds, link sites, YouTube videos, bookmarks; *Research*: multiple search; *Collaboration and Networking*: Flickr photos, store and share files; *Personalization*: add modules and widgets, change themes	**3,6**
Personalized Google homepage www.google.com/ig	*Authoring*: via gadgets, notes; *Information*: RSS feeds, YouTube videos, del.icio.us bookmarks, podcast; *Research*: Google search; *Collaboration and Networking*: Flickr photos, share panels and widgets; *Communications*: email; *Personalization*: create or add existing gadgets	**4**
Goowy www.goowy.com	*Authoring*: sticky notes, calendar, file storage; *Information*: RSS feeds, bookmarks; *Research*: search; *Collaboration and Networking:* send invitation via email; *Communications*: email, AIM, ICQ; *Personalization*: look and feel	**2,7**
Jimdo www.jimdo.com	*Authoring*: simple site creation tools, text creation; *Information*: RSS feeds, add links, YouTube videos; *Research*: search engine; *Collaboration and Networking*: guest book, add links to social networks and virtual spaces; *Communications*: email; *Personalization*: add widgets, look and feel templates	**4**
Netvibes www.netvibes.com	*Authoring*: to-do list, notes, calendar, web storage; *Information*: RSS feeds, YouTube videos, del.icio.us bookmarks, podcast; *Research*: multiple searches; *Collaboration and Networking*: Flickr photos, Facebook, Meebo, feeds and modules can be shared with others individually or via the Netvibes Ecosystem; *Communications*: email, Skype; *Personalization*: add user-created widgets	**4,2**
Pageflakes www.pageflakes.com	*Authoring*: to-do list, notes, calendar; *Information*: RSS feeds, YouTube videos, del.icio.us bookmarks; *Research*: web search; *Collaboration and Networking*: share pages, invite friends, collaborate on project, Flickr photos, Facebook, Twitter; *Communications*: email; *Personalization*: add user-created modules	**4,2**
Protopage http://protopage.com	*Authoring*: to-do list, sticky note, blog, comment box, calendar; *Information*: RSS feeds, YouTube videos, bookmarks, images, podcasts; *Research*: web search; *Collaboration and Networking*: share tabs, *Personalization*: add widget, look and feel	**4,2**
Microsoft Personal Start Page www.start.com	*Information*: RSS feeds; *Research*: web search; *Collaboration*: share tabs; *Personalization*: add tabs, look and feel	**3,6**

SuprGlu www.suprglu.com	*Authoring*: add service to existing blog site; *Information*: RSS feeds, bookmarks; *Collaboration and Networking*: add service to existing networks; *Personalization*: look and feel	*3*
SurfNinja www.surfninja.com	*Authoring*: wiki, blog; *Information*: RSS feeds, YouTube videos, del.icio.us bookmarks, podcast; *Research*: multiple searches; *Collaboration and Networking*: Flickr photos, Facebook, other; *Communications*: forum, Skype; *Personalization*: add widgets	*4*

Detailed analysis leads to the following findings: (1) start pages are not specially designed for educational purposes, but they possess flexible functions for configuring the existing components in a learning environment. They can be extended with new created components and it allows connections to other external tools and services. (2) Start pages could be used for supporting and facilitating the self-organized learners in terms of two aspects: (a) learning – learn to exploit the Learning 2.0 advantages such as personal creativity and social interactivity in different situations and in different context. Learn to work with Web 2.0 technologies as aggregate tools and services and create new components; (b) research – exploring the wealth and accessibility of functionality allows the assembling off complex prototypes of a learning environment in a small amount of time. More of the start pages propose tools for data gathering, analysis and visualization. (3) Start pages are suitable for building multichannel learning environments, where learning and knowledge capturing can be provided and mechanisms for coordinating and delivering a wide range of information resources and educational experiences can easily be used. One model for designing the multichannel environment in a start page application is shown in Figure 1.
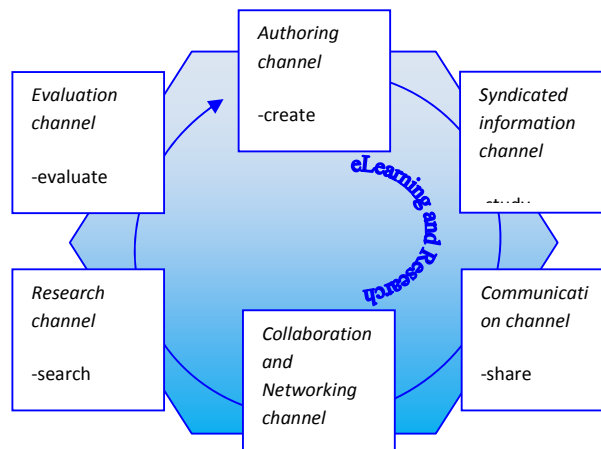

Fig.1. A Model of Multichannel Environment

(4) As mentioned before, the start pages are not typical learning products, but in this paper are treat as learning environments. So, one way for better analyzing their features is comparison with IEEE LTSA (Learning Technology Systems Architecture) component architecture (IEEE 2001). IEEE LTSA presents 4 Processes (learner entity, evaluation, coach, and delivery process) - active system components that transform their inputs into outputs, 2 Stores (learner records and learning resources) - inactive system components used as repositories, 13 Flows (behavioral observations, assessment information, learner information (three times), query, catalog info, locator (twice), learning content, multimedia, interaction context, and learning preferences) - flows that starts, stops, or changes processing. The start page's limitations are commented below. In the start pages the evaluation process is limited –data gathering, tracking and evaluation of learner activities is not possible. Only the test thought widget or html components can be arranged. The role of a coach is limited to a consultant. The coach could be another learner or a group of learners. There are no Learner Records: information, such as learning activity performance and preferences are not stored. The following flows are missing: interaction context, assessment, learner info, and catalog info. Despite these limitations the start pages could be used for supporting self-organized learners in their knowledge capturing.

(5) The start pages Netvibes, Pageflakes and Protopage show the rich possibilities for self-organized learning environments with characteristics for authoring: create a list of activities, use a simple text editor, access to blog and wiki; syndicating information of rich media sources; researching via search engines and using additional widgets, for example polls; collaboration and networking: sharing of information and knowledge, connecting to social networks; personalization of feel and look as well as using widgets, for example for quizzes and surveys. Other start pages can be used for different learning purposes, for example: 24eyses– working with RSS feeds or lists of RSS feeds; Jimdo for site creation and arrangement; SurfNinja: proposes visual arranging of icons and access to favorite websites.

4 Design of Self-Organized Learning in Start Pages

The Web 2.0 technologies have several implications for learning design and its elements: roles, activities, environments and scenarios (Koper & Tattersall 2005). The learners play a wide range of roles: they can be authors, contributors, distributors, searchers, moderators, reviewers, editors, researchers, or evaluators. The role of educators has changed from controlling and managing learning to be consultants and advisers. With so

much Web 2.0 artifacts being produced, the learners need guidance on selecting the right learning resources, the right technology, tools and services which are appropriate for their needs. Also, the educators can support the development of the skills required to become a self-organized learner. Self-organized learning can occur in the Web 2.0 platform combining a wide range of applications, tools, services and devices. The learners create, examine, syndicate and search for microcontent objects which encapsulate knowledge created in a collaborative way through social interactions using Web 2.0 tools. The importance for scenarios of self-organized learning is integration of the multichannel environment with simple play and short time acts, where learners perform a wide range of activities and educators support learning resources identification, developing of the skills of self-organized learners, arrangement of technologically rich and social oriented environment. The Learning design conceptual model for self-organized learning is presented in Figure 2.

5 Prototype of Multichannel Learning and Research Environment

The model in Figure 2 is used for the implementation of learning and research environments in Netvibes and Pageflakes. The environments are arranged using embedded start pages components as well as components for customer html code and widgets.

The authoring channel is realized through the following components: to-do list, note, calendar and html component for links to tools, proposed by: www.box.net – store and share documents, http://www.zoho.com/ - create documents, http://www.slideshare.net/ - share presentation, http://animoto.com/ - create and share videos, http://pbwiki.com/ - share information, http://bubbl.us – concept mapping, http://secondlife.com/ - virtual space, http://www.inetword.com/ - social html editor.

The syndication and information channel consists of: embedded component for social bookmarking Del.icio.us, and html component with links to RSS readers – http://www.bloglines.com/, http://www.newsgator.com/, http://technorati.com/. The communication channel includes components for Gmail, Yahoo mail, Hotmail. Networking channel proposes access to Facebook, Ning social networks. Research channel contains components for search – pictures/audio/video/podcast, Google search, Babylon translator, poll/survey, analysis and visualization. The evaluation channel includes link to http://www.polldaddy.com/ - polls/survey.
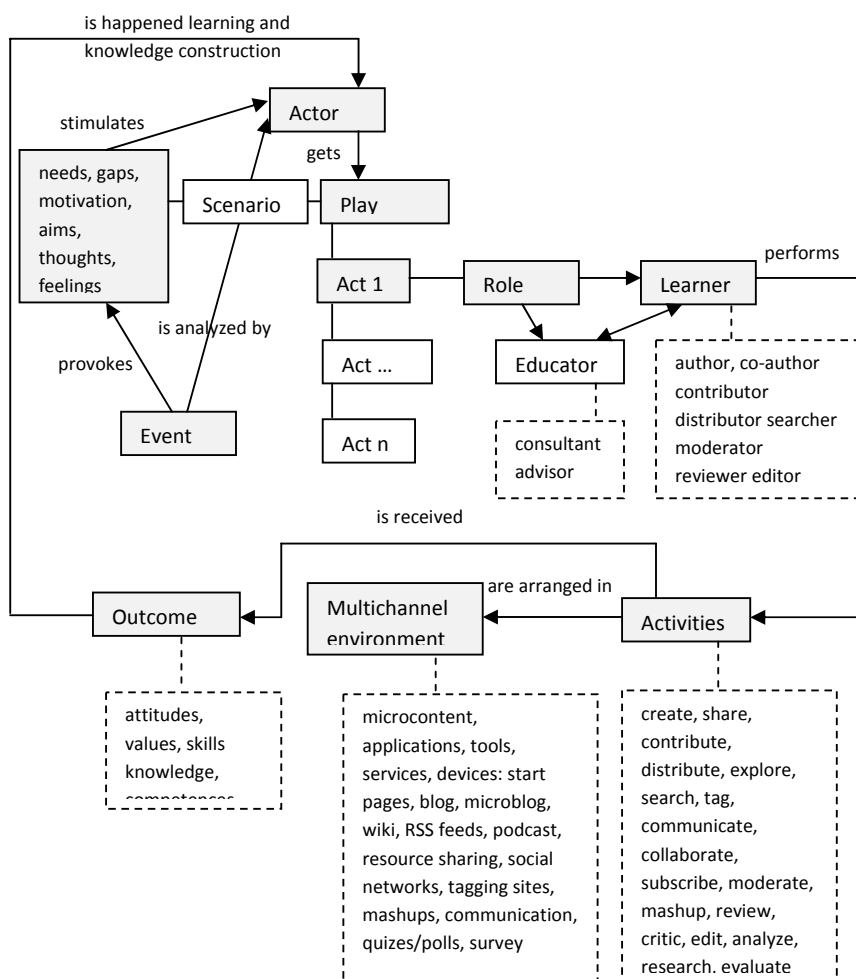
Fig. 2 Self-Organized Learning Design

6   Conclusion

Fourteen start pages are examined with the main point of view being how they can be better used for defining the self-organized learning and research environments. The analysis shows that start pages are suitable for easy and fast unfolding of learning and knowledge construction environment. To describe the complexity and richness of current technological solutions, a model of multichannel learning environment is developed, consisting of authoring channel, syndicated information

channel, communication channel, collaboration and networking channel, research channel, and evaluation channel. Self-organized learner has to cope with two main tasks – (1) study technology and functionality of a start page and (2) design environment and learning. The role of the educator is to consult the learner in a pedagogical and technological aspect.

Web 2.0 technologies also impact on defining new learning design approaches by extending and transforming current practices, while keeping learners and the social dimensions of learning at the forefront. The model of self-organized learning is proposed, which presents the new roles of learners, new learning activities, performed in a technologically rich multichannel environment with a social orientation.

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