A Platform for Social Microlearning

Bernhard Göschlberger

Research Studios Austria FG, Linz, Austria
Johannes Kepler University, Linz, Austria
bernhard.goeschlberger@researchstudio.at

Abstract. In the 21st century the web has evolved from a producer-consumer oriented information source to a prosumer centric social web filled with user generated content. To overcome potential loss of quality assurance on the producer side successful social web solutions came up with methods to ensure content quality using wisdom of the crowd. Although the success of this revolution is undisputed a vast majority of e-learning systems are still producer-consumer oriented and therefore impede engagement potential. We propose to use interaction patterns of successful social web solutions to create a platform that motivates students to create and share learning activities. As we will argue, microlearning activities are especially well suited for such a platform. We also demonstrate how to design such a system open and interoperable by using xAPI and a flexible authentication concept.

Keywords: microlearning, social learning, crowd sourcing, question posing, xAPI

1 Introduction

The evolution of the Internet towards a space of more democratic information exchange has ultimately led to its society-changing success. Whilst called Web 2.0 earlier the term *social web* is nowadays used more often, as it better reflects the social nature of the process of creating and sharing information resources. Accordingly the term *social software* has been coined for software that enables groups to form and self-organize in a bottom-up manner (cf. [1, 2]).

As of today social network sites (SNS) are the predominant form of social software on the web. Two success factors for SNS are the simplicity and immediate graspability of its content artifacts. Twitter – considering itself as a micro-blogging service – became more popular than other blogging services as it restricted tweets to 140 characters. Hence, the cognitive load per tweet for both creators and consumers is reduced. This lowers the barrier to initiate social interaction by sharing on the one side and enables the consumers to quickly decide whether content is relevant to them on the other side.

In this paper we present a prototype for social microlearning that tries to incorporate successful strategies and common features of social software.

2 Background

Microlearning focuses on short-term and informal learning activities using small, but self-explanatory learning resources that are available via Internet [3, 4]. Microlearning implementations oftentimes use learning activities similar to flashcards (e.g. Mobler Cards [5, 6], KnowledgePulse [7]). Flashcards are generally associated with behaviorist learning style and lower-level cognitive functions. In Bloom's revised taxonomy [8] the act of learning a flashcard (in drill mode) represents an act of remembering. To promote understanding – a higher-level learning objective – the aforementioned microlearning implementations enhanced the traditional flashcards enriching them with explanation, insight and/or feedback. Moreover, they implemented a variety of features aimed at engaging students in higher order cognitive tasks such as reflection, self-regulation, content evaluation and content creation. In order to evaluate or create learning content a learner already needs a good understanding of the subject. Baumgartner [9] proposes the model of a competence spiral. In a first step learners have to absorb basic knowledge about a topic or subject (Learning I), before being able to actively acquire knowledge about that topic in a self-determined manner (Learning II) and finally being able to construct knowledge in a third step (Learning III). With the learner proceeding to more advanced concepts this process is repeated on a higher level (Learning I+). Baumgartner remarks relations between Learning I and behaviorism, Learning II and cognitivism, and Learning III and constructivism.

A key challenge for microlearning systems is to motivate students to progress through these phases as each phase implies different requirements for the system. Learning I requires the software to provide strict guidance and reduce complexity by limiting the degree of freedom. In Learning II phase the learner takes control over his learning process. Guidance is reduced to recommendation. Learning III phase includes the construction of new knowledge. Therefore the system needs to support students to contribute, evaluate and discuss. The prototype presented in the following section is a first step towards a system addressing students' needs throughout the three phases.

3 Social Microlearning Platform

To validate the pedagogical model and evaluate best practices in design and usability for social microlearning we decided to prototypically implement a platform for our experiments. The developed platform prototype aims to provide a social space for microlearning activities. Based on analysis of features and strategies of social software in literature (cf. [1, 10, 11]) we decided on an initial feature set for our prototype. Learners can (1) create and share, (2) evaluate, rate, comment and improve, (3) tag and collect, and (4) interact with and solve learning activities.

Before these capabilities are explained in depth, a few remarks about the implementation details are provided. The prototype frontend is developed using AngularJS, Bootstrap 3 and Material Design, providing a mobile first, responsive user interface. It

uses a Spring Data REST Backend that uses MongoDB for persistency. All user interactions listed above are logged to a learning record store (LRS) using xAPI. Fine grained user interactions such as mouse clicks are logged directly by the frontend and persistent user interactions such as content creation are logged by the backend. Amongst other options, Shibboleth is used for authentication to facilitate experiments in the tertiary sector.

Create and share. Through a simple interface users can create and share micro learning content. Shared content is presented as an inverse chronological stream in the main view. The system does not separate the processes of creating and sharing. Therefore it is not possible to use the system as a private content repository. The prototype currently supports only multiple-choice cards (single-select and multi-select). However, it is designed to support a great variety of micro learning content types in the future. Creating and sharing learning content aligns with the highest level in Bloom's revised taxonomy.

Evaluate, Rate, Comment and Improve. Existing content items can be rated using a simple up/down-vote mechanism commonly used in social software. To enable students to express their thoughts on particular items each item has a comment section. These comments themselves can also be rated by up/down-vote. This approach has been proven very effective and is well accepted on e.g. stackoverflow.com, an online social Q&A system. Authors can edit and improve their content items based on these inputs. A last-edited-remark denotes that an item has been edited. Previous versions remain available as a version history to all users by clicking the last-edited remark. These activities align with the second and third highest level in Bloom's revised taxonomy.

Tag and Collect. To organize existing learning content relevant to them, students can tag items. Tags can be chosen arbitrary. The user interface supports the student by offering tags previously used by the student on any content item or by other students on the respective content item as autocompletions. The user can browse through his tags in the myTags-view and through the collection of items annotated with the tag by clicking a tag. Tagging and collecting is an act of curation and aligns with fourth and fifth level in Bloom's revised taxonomy.

Interact and Solve. Students can interact with the provided micro-content. In the case of multiple-choice questions this means that they can check and uncheck options. Once they chose an answer they can submit and resolve. This can be repeated any number of times. Interacting and solving simple micro-content items, such as multiple-choice questions is initially a task of remembering and therefore on the lowest level of Bloom's revised taxonomy. However, it triggers any higher order activities described above in students that have passed through the Learning I phase already.

4 Future Work

Currently the prototype is used to validate the pedagogical model. It does not yet filter the shared content. To use it beyond isolated experimental settings restricted to certain topics, it is however necessary to identify communities and filter content based on those community structures. For students in Learning I phase additional guidance needs to be provided. Therefore it will be necessary to extract and use information provided by more advanced learners and/or historical data (traces) of other learners. Moreover it is planned to implement user statistics to foster reflection and self-regulation.

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