EUROPEAN EDUCATIONAL RESEARCH ASSOCIATION

Analysing Learning Interactions in Digital Learning Ecosystems based on Learning Activity Streams

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Conference: ECER 2013

Network: 06. Open Learning: Media, Environments and Cultures

Format: Paper

Session Information

06 SES 04, New Approaches to Learning Analytics

Paper Session

Time: 2013-09-11
09:00-10:30

Room: D-406

Chair: Anna Chronaki

Contribution

Learning interactions have been regarded in the context of Technology-Enhanced Learning as an important unit of analysis and they have been studied by the community of educational researchers from various perspectives (Anderson 2003a; 2003; Garisson 2005) Most of the research is based on the data collected through learner-reported surveys (Miyazoe Anderson 2010; Garison R.D (2005), educational data mining techniques (Zaiane 2002;Tang and McCalla 2005), qualitative text analysis (Muirhead 2000) or social network analysis (Dowson et al 2011). We argue that each of the approaches alone is neither sufficient nor relevant for researchers aiming at conducting large-scale learning analytics in Digital Learning Ecosystems (DLE). We see DLE as the third-generation virtual learning environment, replacing traditional Learning Management Systems. While in LMS (e.g. Moodle) all learning interactions take place within a single closed Web information system and the data is stored in one centralised database, the situation changes radically in DLE. DLE consists of a large and distributed set of dynamically evolving online tools and services, which are selected and used by different groups of learners and facilitators. We have built a prototype of DLE called Dippler (Laanpere et al 2012), it consists of three interconnected components: a central learning flow management service, institutional course management environment and a personal blog-based e-portfolio for each learner. Learners can integrate external social media tools, services and content to their e-portfolios through simple technologies such as RSS-feeds, embedding, linking and widgets.

In order to add learning analytics functionalities to DLE like Dippler, there are two necessary steps to be taken: (1) harvesting, storing and monitoring interaction-related data with rich semantics and (2) identifying methods and tools for analyzing and visualizing the data.

Harvesting, storing and monitoring the data on learning interactions poses challenges due to the very nature of DLE concept – it's a

distributed learning environment where different social tools are selected, used, added and removed from the learner side. Four types of learning interactions take place in such settings: learner-teacher, learner-learner, learner-content and content-content (e.g. aggregators). The current version of Dippler documents these interactions in the form of Activity Stream, which is based on the Activity Base Schema (activitystrea.ms). Dippler's Activity Stream displays the main types of interactions in the form of a proposition, containing the Actor (a user), the Action (a verb from restricted vocabulary), the Object (a target of the Activity) and timestamp. As most of the Objects and Activities are linked to the domain-related categories (keywords organized in tree structure), it opens the potential for a different kind of learning analytics not currently supported in the traditional LMS. In order to analyze learning interactions in Dippler from the perspective of learning theories (e.g. Communities of Inquiry)(Garison et al 2000, 2001), we need to expand the current Activity Schema of Dippler to contain semantics from Anderson's model of Communities of Inquiry.

Method

The methodology of this study is inspired by the tradition of design-based research. We are going to carry out three iterations of participatory design activities, in order to identify the conceptual model of learning interactions in DLE such as Dippler. The third iteration involves also the validation trial of the extended Activity Stream and related prototypes of Learning Analytics tools to be added to Dippler. The expanded Activity Bases Schema will map the possible interactions and configure the initial terminology to contain the learning context. Retrieved data will be analyzed based on Anderson's Communities of Inquiry framework, focusing on three types of presence – cognitive, social and teacher presence.

Expected Outcomes

As a result of our study, we provide a validated conceptual model of learning interactions in the context of distributed Digital Learning Ecosystems, together with extended Learning Activity Schema and innovative Learning Analytics instruments based on this schema.

References

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