Improving Open Online Content Development for K-12 Education

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Abstract

The study summarized in this paper explored policies for improving open online content development projects with respect to growing the development community and improving the quantity and quality of materials developed. The study made use of dynamic feedback simulation and interviews with the members of an established content development community that specializes in K-12 instructional materials development.

Open Online Content Development

Open online content development is a collaborative authoring paradigm which has its roots in the free/open source software development movement (Keats 2003). The success of major open source software development projects such as Linux (Torvalds 1999), Apache (Fielding 1999), and Perl (Wall 1999) added credibility to the open online content development paradigm and encouraged the application of the paradigm to content development in other areas.

Open online content development takes place in online communities comprised of voluntary contributors and users. Contribution is mostly open to all with little or no barriers to entry. The information products or content collections developed by the contributors can generally be used freely by anybody that has Internet access. The open online content development paradigm can be used to deliver highly accessible instructional materials to a wide audience of educators and students.

Developing open online content development communities poses certain challenges, such as motivating contributors to participate, attracting users, and building content collections that are rich in both quantity and quality. Furthermore, most of those challenges are interconnected. For example, literature suggests that an important motivating factor for contributors is knowing that a high number of users benefit from their contributions to the content collection (Kollock 1999). Also, the number and talent level of contributors are critical determinants of the quantity and the quality of the content developed. Accordingly, focusing on a single challenge in an open online content community generally does not improve the overall growth and performance of the community.

Policies for Improving Open Online Content Development

The study summarized in this paper explored policies for improving open online content development projects with respect to growing the size of the development community and improving the quantity and quality of materials developed. The study made use of dynamic feedback simulation and interviews with the members of an established content development community that specializes in K-12 instructional materials development.

The first step of the study involved the development of a dynamic feedback simulation model that represents the causal relations among the determinants of success in a typical open online content development community. More specifically, the simulation model was conceptualized as a representation of a hypothetical open source software development community. The model was based on implications derived from three streams of literature: 1) theoretical literature on online communities, 2) theoretical and practical literature on open source software development, and 3) literature on dynamic feedback simulation models of software project management. The simulation model was tested extensively for internal validity (Diker 2003, pp. 249-394).

A series of policy analysis simulations were performed on the model. Policy analysis simulations involve running the model under different values of parameters that can be controlled by the decision and policy makers of the real system that the model represents. The analysis of the policy simulations identified the chief underlying policy problem in open online content development as the tension between building new content and improving the quality of existing content. This problem manifests itself as a barrier to improving both quantity and quality of content simultaneously beyond a certain level (Diker 2003, pp. 366).

Four main policy options for improving the quantity and quality of the content collection without undermining either performance measure were tested on the model: 1) filtering new materials, 2) reviewing and editing existing materials, 3) selecting new inexperienced authors, and 4) coaching existing inexperienced authors. Combinations of these pure policy options were also tested. The two most promising policy options that emerged

were selecting new inexperienced authors, and a combination of coaching and reviewing/editing (Diker 2003, pp. 327-366).

These findings were tested against the mental models and the observations of an actual open online content development community. The specific community studied was a group of teachers and researchers who develop and disseminate instructional materials for introducing system dynamics concepts to K-12 students. The system dynamics K-12 instructional materials development community has gathered around four main organizations or groups: two of these are non-profit organizations propagating systems thinking and system dynamics in K-12 education, and the other two are research and practice groups working on developing instructional materials for introducing system dynamics concepts to K-12 students. Ten leading members of the community were interviewed, and the interview data were analyzed qualitatively (Diker 2003, pp. 395-397).

The analysis of the interviews supported the findings of the model simulations that the fundamental policy problem in the community with respect to content development was the tension between building the quantity and the quality of the content in the collection. Most interviewees stated that they had observed filtering, reviewing/editing, and coaching policies implemented in their community. Three interviewees suggested that they had observed a selecting policy implemented covertly in addition to the other three options. However, more than half of the interviewees argued that an overt selection policy would be detrimental for their specific community. They mentioned the welcoming culture of the community to be main reason why such an overt policy would not be desirable and beneficial. Most interviewees suggested coaching as the most beneficial policy in the long run. Some of these interviewees suggested that a combination of coaching and reviewing/editing would work best (Diker 2003, pp. 412-435).

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