Collaborative Filtering Applications in Distance Education

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Introduction

This presentation analyzes several modes through which individuals can construct a personal identity, establish voice, and develop critical thinking skills in distance education settings. Collaborative filtering and recommender systems are being used within organizations and in public contexts for knowledge rating as well as the facilitation of interactions among individuals. With many of these systems, individuals can establish and maintain a "reputation" based on the quality of their participation. Weblogs (in which individuals critique various web materials in a "journal" format) provide yet another means through which individuals can establish a distinct perspective while exchanging critical insights with others.

Collaborative filtering and recommender systems as well as weblogs have all been utilized in community and business contexts for various purposes. The presentation addresses how these and related systems can be adapted for distance teaching and learning contexts to provide new forms of interaction and to extend participants' capabilities for writing and discussion. There are many Internet-based applications of these systems that are not supported by universities but are available for anyone to utilize--thus giving individuals the opportunity to continue their educations indefinitely in "collabversity" settings. According to Figallo and Rhine (2000), the incentives for participation in such systems include public recognition, visibility and the "community-exchange" factor: "if a user posts information of value to his or her fellow users, it's more likely that some of them will post information of value to him or her" (page 39). Collabversities such as Slashdot.com and Plastic.com (described below) are thus extending the channels through which individuals can obtain intellectual and social interaction in a topic-focused, moderated setting outside the boundaries of the university.

Collaborative Filtering and Collabversities

Collaborative filtering and recommender systems apply many of the strategies of expert matchmakers in matching willing participants and in providing individuals with links to Internet materials that best serve their needs and interests. Many of these systems also allow individuals to create and maintain reputations based on how their contributions are evaluated either by fellow participants or by editors, thus constructing "virtual individuals" that reflect the levels and quality of their participation (Oravec, 1996). In my presentation, I will describe a number of these systems and compare their features, relating the systems to distance education contexts.
Various collaborative filtering and recommender systems differ in their basic structures, but have some common threads: through the collection and analysis of information about individuals and their preferences, sets of individuals with comparable or compatible characteristics are matched (if only in their virtual forms) and recommendations or opinions are shared. For example, in one variety of collaborative filtering (the kind used in MovieLens, described in Carlson, 2000), individuals are given recommendations based on the opinions or other expressions of the group members to which their profiles are the closest match. The assumption of this system is that individuals would probably like the movies, books, ideas, or other items that their virtual cohorts would like. Demonstrations of MovieLens and an assortment of other systems are available on-line for free for students and educators to explore and discuss. Also available on-line are a number of collabversity forums that incorporate some collaborative filtering strategies, such as Slashdot.com and Plastic.com. At the University of Wisconsin at Whitewater, students utilized Plastic.com as an introduction to Internet design issues as well as a vehicle for on-line community participation. Plastic.com has a mechanism that incorporates "reputation" establishment and maintenance: moderators rate the contributions of participants, and participants with high ratings can become moderators. Readers can filter out contributions by individuals with ratings below a certain threshold (of their choice). In other reputation establishment schemes, reputations are set through popularity rankings (how many people access one's contributions) or other compiled evaluations. These systems can have a variety of uses in distance education contexts. In society at large, reputation establishment and maintenance play large roles in professional realms (Whitmeyer, 2000), so these systems can provide salient lessons to participants. These systems can serve as forms of academic evaluation (although this can be problematic, as discussed in a future section). In large classroom settings, collaborative filtering and recommender systems can help to match students with compatible perspectives; a system is already in experimental development that matches educators with other educators worldwide who have similar research interests. Here is a description of WebCenter: "All actions on entities performed by users of the WebCenter are recorded in a database. This data is used by a collaborative filtering system in the Recommendation Center to recommend entities of possible interest. The system calculates its recommendations by comparing the user’s history of use of the WebCenter with the histories of all other users. The system selects a group of other users who have a similar history of use. They have read and ranked highly many of the same publications, searched for resources in the same categories or using the same set of search arguments, read some of the same messages, etc. This list of people is returned to the user as people with whom they may want to begin conversations to discover productive shared interests" (Cambridge, 1999). Ideally, individuals will be able to use WebCenter to connect with others-- and perhaps discover more about themselves and their own interests in the process. These systems can be integrated into various discussion forums, providing means through which students can connect with each other and obtain Internet materials of high quality with minimal assistance by instructors. Becoming acquainted with collaborative filtering and collabversities can thus aid students in becoming independent, lifelong learners.
Weblogs in Critical Thinking Approaches

Since its emergence as a popular form of exposition in the late 1990s, the weblog has become an increasingly recognized genre on the Internet. Although some are composed by teams or are institutionally sponsored, weblogs have primarily served as modes of personal expression, providing a vehicle for individuals to contribute commentary on Internet material, react to current events, or provide personal reflections (Oravec, forthcoming). Weblogs are intrinsically time-bound, following the diary or journal format that is familiar in many writing instruction contexts. Some weblogs specialize in certain topics, such as distance education (Online, 2001), though others discuss and critique vast ranges of Internet resources. Online diaries (web-based streams of personal reflections) have emerged as a similar genre, one less closely tied to the critique of Internet materials but that still often involves linkages to particular web sources.

The weblog format provides the opportunity for individuals ("bloggers") to create and share annotated records of their critical reflections on the Internet over time. Distance education instructors and other educators who are looking for ways to stimulate critical thinking can employ weblogs in student exercises and encourage students to read and comment on each other's weblogs. The process of weblog construction can foster the development of a distinct, discriminating voice in the context of Internet materials related to a particular subject. In contrast to computer conferencing, bloggers maintain their own unique thread of discourse; however, bloggers generally reference and react to each others' reflections, thus allowing for some forms of interaction. This juxtaposition between parallel development of weblog material and co-production of interblog discourse can enable students to expand their repertoire of critical thinking skills. Educators can also encourage students to read and critique weblogs that are constructed by individuals outside of their specific classroom contexts. Thousands of weblogs are being maintained across the globe, and "metalogs" are available that can link students with weblogs on relevant topics.

Facilitating Multi-modal Interaction in Distance Education Contexts

Distance education via the Internet provides the opportunity for introducing new modes of interaction into learning contexts. However, many distance teaching and learning initiatives have utilized only a few vehicles of interaction—including threaded discussion groups, e-mail exchanges, simulations, etc.—rather than exploring a wider range of on-line modes. The applications emphasized in this presentation (collaborative filtering and weblogs) present forms of interaction that allow for kinds of group intellectual exchange (as threaded discussions do). However, they also emphasize the importance of individual contribution in powerful and creative ways. These applications are especially useful in stimulating critical thinking and encouraging the development of individual perspectives. They also raise important questions about the emotional and ethical dimensions of distance education, as well as evaluation issues.
In many collaborative filtering and weblog contexts, a few individuals tend to excel-- that is, have reputational ratings that are extraordinarily high or produce weblogs that are far more popular than others. Distance education instructors will have to deal with these issues of difference in student outcomes, difference that will be open and obvious to everyone involved (unlike many other forms of student evaluation). Students are often reticent to evaluate the quality of each other's ideas; however, such evaluations are an essential aspect of collaborative filtering and weblog development. Also, the students who excel in critiquing each other and evaluating web materials may not be the same as those who excel at other, more familiar forms of intellectual endeavor (such as multiple choice exams and other structured evaluation exercises), which can provide disquiet.

In recent years, classroom interaction standards (in both on-line and face-to-face contexts) have generally emphasized acceptance of others' intellectual products, rather than encouraged open evaluation and criticism. Distance education students may come from cultural settings in which openly expressed forms of intellectual critique are strongly discouraged, which also increases the complexity of these issues. Educators who utilize collaborative filtering and weblogs in classroom contexts should advise their students about the basic shifts in educational and cultural perspective that the systems can engender; they should also watch for emotional problems that may emerge, as well as disputes about the fairness of student-conducted evaluations. Issues involving emotion are often neglected in instructional systems design, in part because they may be seen to "interfere with the achievement of important cognitive or motivational objectives" (Astleitner & Leutner, 2000). However, emotional issues may indeed be critical to the success of these non-traditional, multi-modal ventures.

Some Conclusions and Reflections

Both weblogs and collaborative filtering have the potential for giving distance educators and students some new, specialized tools for various kinds of intellectual explorations. As the range of distinct modes of on-line interaction grows, educators should share with each other their experiences: what kinds of discussion topics work best with what modes of interaction? How does one deal with the emotional aspects related to large differences in academic performance? These applications are emerging in many workplace and on-line community settings (and in "collabversity" contexts), so students' acquaintance with them can provide important benefits. Distance educators who are flexible in their ability to facilitate various modes of interaction-- tailoring each on-line presentation to fit content and participant considerations-- can aid students in their development of critical thinking skills and overall quests for knowledge.

References


**Biographical Sketch**

**Jo Ann Oravec** is an Associate Professor in the College of Business and Economics, University of Wisconsin-Whitewater. She has an M.B.A., M.A., M.S. and Ph.D. from UW-Madison. She taught at Baruch College of CUNY and in the School of Business and Computer Sciences Department (artificial intelligence area) at UW-Madison. She was chair of the Privacy Council of the State of Wisconsin, the nation’s first state-level council dealing with information technology and privacy. She wrote *Virtual Individuals, Virtual Groups: Human Dimensions of Groupware and Computer Networking* (Cambridge University Press, 1996) and two other academic books, as well as over thirty peer-reviewed articles and special issues.

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