Crowdsourcing Journal Rankings in Educational Technology and Distance Learning

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Abstract: Much emphasis has been and continues to be placed on measures of quality and prestige of scholarly publishing outlets. Educational technology and distance learning researchers worldwide are under perennial pressure to publish in journals that perform favorably according to these measures. This paper describes a work-in-progress project whose objective is to trial the use of a novel approach based on “crowdsourcing” as an alternative method for producing rankings of scholarly journals. The approach involves gathering and aggregating the collective opinions of a large number of individuals on the World Wide Web. The project seeks to provide “proof of concept” of the approach and to elicit participants’ views and perceptions of the crowdsourced rankings in comparison to traditional journal rankings and quality measures.

Introduction

Over the last decade, we have witnessed a seismic shift in the way information is created and shared, particularly on the Internet. Increasingly, scholarly information and knowledge are no longer tightly controlled and regulated by an elite few, as with the advent of the “Web 2.0” (O’Reilly, 2005) movement the power to contribute ideas and content now rests in the hands of “the people formerly known as the audience” (Rosen, 2006, para. 1). In contrast to the “Web 1.0” model in which content was largely “read only,” Web 2.0 affords “read-and-write” capabilities to users and members of the general public, making them both producers and consumers (“prosumers”—Toffler, 1980) capable of actively shaping and influencing the evolutionary trajectory of web-based information as part of an open “architecture of participation” (O’Reilly, 2005). These changes have had a profound impact in academia, where traditional concepts of authority and ownership are being challenged (Hilton, 2006), and this is being mirrored in the scholarly publishing industry against the backdrop of a publishing landscape in which the demand for open-access and participatory mechanisms (e.g., post-publication peer review, use of social media) is steadily rising. At the same time, we are seeing a trend towards the use of “big data” (MIKE2.0, n.d.; Kusnetzky, 2010; White, 2012) both generally and within academia, in particular with the rise of academic analytics (Campbell, DeBlois, & Oblinger, 2007; Conole, Gašević, Long, & Siemens, 2011; Dawson, Haythornthwaite, Buckingham Shum, Gašević, & Ferguson, 2012; Goldstein, 2005; Long & Siemens, 2011).

Outside of academia, crowdsourcing (Doan, Ramakrishnan, & Halevy, 2011; Brabham, 2008; Greengard, 2011; Howe, 2006, 2008) is a technique that is beginning to gain popularity not only for the generation of large data sets that capitalize on the “wisdom of crowds” (Surowiecki, 2004), but also to enable the harnessing of the collective intelligence of large numbers of people in the processing of these data sets. One area in which mainstream websites are benefitting heavily from crowdsourcing techniques is in the solicitation and analysis of user evaluations or reviews. In addition to allowing users to enter qualitative feedback in the form of open-ended comments, social media and other sites now regularly incorporate features letting them indicate, at the click of a button, whether they “like” or “dislike” something (be it a commercial product or service, an organization, a web-based object/resource such as a video clip, another user’s comments, etc.), or to assign to it a score or other rating. These quantitative data can be analyzed through simple, automated statistical procedures or, given their scale, “mined” to reveal more complex patterns not discoverable through standard methods. An important feature of this approach to data collection and analysis is that it “has the scale, speed, and quantification of a survey while still allowing for new information [and the most popular or prevalent themes and ideas] to ‘bubble up’ from respondents as happens in interviews, participant observation, and focus groups” (All Our Ideas, 2012, para. 1). This appears to be one aspect of the Web’s new affordances that has been relatively underused and underexplored in academia, despite the
proliferative uptake of blogs, wikis, RSS, podcasting, social sharing, and social networking sites that has occurred as part of a move towards Web 2.0-based learning and teaching (see Lee & McLoughlin, 2011).

The project described in this paper seeks to embrace the Web 2.0 philosophy and ethos, appropriating, in particular, the evaluative capabilities of Web 2.0, to explore whether and how the wisdom of crowds on the Internet can be leveraged to produce crowdsourced rankings of scholarly journals to complement traditional rankings and quality measures. In line with Web 2.0 principles, the rankings will be updated continuously as users participate in the online voting process, and they will be openly and freely viewable by the public at any time.

**Brief Literature Review**

Perhaps the best-known and most commonly used measure of a journal’s quality and prestige is the impact factor (Garfield, 1955, 1994, 2005), which is based on the number of citations received by recent articles published in a journal. Other popular methods of quantifying a journal’s importance and influence that are also based on citation analysis are the Google PageRank algorithm (including variants—see Bollen, Rodriguez, & Van de Sompel, 2006; Kodrzycki & Yu, 2006; Liebowitz & Palmer, 1984; Palacios-Huerta & Volij, 2004) and the Eigenfactor (Bergstrom, 2007; University of Washington, 2012). Additionally, in a number of countries and disciplines, lists of journal rankings or ratings have been developed by scholarly societies, government research agencies, and individual universities, based on a range of criteria. While such lists exist largely to assist scholars in making informed decisions about the journals they should target and to which to submit their work, there have been moves at some universities and within certain jurisdictions to make use of these lists for staff evaluation and performance appraisal purposes instead of or in conjunction with bibliometric indicators and peer review (Pontille & Torny, 2010). In some cases, the ratings or rankings of journals in which researchers publish have a bearing on the level of research funding allocated to their institutions and organizations (see Auranen & Nieminen, 2010), and are therefore taken into direct account when they apply for promotion and tenure.

It has not been uncommon for attempts to introduce journal rankings into policy at an institutional or national level to be met with strong resistance, often to a point where the respective attempts have been substantially slowed or have had to be abandoned altogether (most notably as seen in the cases of the UK’s Research Excellence Framework [REF]—see Fearn, 2010—and Australia’s Excellence in Research for Australia [ERA] initiative—see Atkinson, 2011; Australian Research Council, 2011). It is arguable that the contention and controversy surrounding the introduction and use of journal rankings (see Pontille & Torny, 2010) and the opposition with which they have been faced (Rowbotham, 2011) may be due in part to the level of subjectivity involved in determining if one journal is superior to or “better” than another, and the myriad criteria that need to be taken into consideration. While every effort can be made to achieve a democratic outcome by actively involving stakeholders through expert surveys (see, for example, Serenko & Dohan, 2011), calls for written submissions, one-on-one interviews, and/or face-to-face roundtables/focus groups, trying to effectively reconcile and incorporate the views and opinions held by all relevant groups is no trivial task.

The main goal of the present study is to explore if subjecting scholarly journals to a simple, open, and transparent voting process involving very large numbers of individuals on the World Wide Web can be a feasible and effective way of producing rankings to complement the traditional rankings developed by “authoritative” entities such as research database publishers and government agencies. It is hoped that the massive numbers of voters and votes involved will be sufficient to counter or negate the effects of personal and institutional bias inherent in the process, so as to deliver a fair and equitable means of accommodating the diverse and likely often conflicting or competing priorities and perspectives that are present. A secondary goal of the project is to attempt to understand the criteria that scholars use to judge the quality of a journal as well as the factors that influence their choices of journals to read/use as sources of information and to target as potential publication avenues for their own research.

**The JournalRankings Website**

An initial prototype or “beta” version of a web-based system for producing crowdsourced rankings of scholarly journals has been developed by the author using open-source software code from the All Our Ideas project ([http://www.allourideas.org/](http://www.allourideas.org/)) led by Matthew Salganik and Karen Levy of the Department of Sociology at Princeton University (see Salganik & Levy, 2012). Visitors to the JournalRankings website select one of the available subject areas (categories) on the site in order to participate in the voting process for journals within that category. Initially,
the site will only contain two categories: “educational technology,” and “open, flexible, and distance education.” When voting, users are presented with the names of journals within the relevant category in a pairwise fashion (i.e., two at a time) and asked to indicate which journal in each pair they believe is the “better” journal. They can cast as many or as few votes as they wish (but do not have control over the pairs with which they are presented), and they can also submit for potential inclusion in the category the titles of additional journals with which they are familiar (see Figure 1). They can “skip” any given pair by clicking on the button labeled “I can’t decide,” in which case they are prompted to select a reason for their inability to make a choice (Figure 2).

![Figure 1: JournalRankings voting screen showing the pairwise voting process](image)

![Figure 2: Options selectable by the user as reasons for being unable to decide between two journals](image)

The voting process, including nomination of additional titles, is anonymous and does not require users to register in order to take part. Users can also, at any time, view the latest results of the voting process for a subject category in the form of a list of all of the journals within that category, ordered by their current scores (see Figure 3; the score of a journal is the estimated probability that it will be chosen in preference over another randomly chosen journal—a score of 100 means the journal is predicted to “win” every time and a score of 0 means it is predicted to “lose” every time). On the Results page, users can additionally opt to view various visualizations of the data, including: word clouds showing the relative frequencies of words in journal titles (possibly weighted by score—see Figure 4 for an example of a word cloud); a world map showing the geographical locations from which votes have originated; and a range of different column charts and line graphs showing, for example, a comparison of scores received by journals suggested by users versus those originally listed, as well as numbers of unique user sessions, votes, and user-suggested journal names over time.

An “administrator” view of the results provides the following additional visualizations:

- Density of votes for the subject category;
- Number of ratings of journals by time of addition;
- Number of appearances per journal by addition date;
- World map of bounces\(^1\);
- World map of locations from which journal suggestions originate;
- Number of votes per session;

\(^1\) A “bounce” is defined as an instance where the user views a subject category once and then leaves the site.
- Number of skips per session;
- Number of votes vs. number of skips per session;
- Number of skips per day;
- Journal score vs. total votes.

![JournalRankings results screen]

**Figure 3:** JournalRankings results screen

![Example of a word cloud. Words that appear more frequently than others and/or that appear in the titles of journals with higher scores are rendered in a larger font within the cloud]

**Figure 4:** Example of a word cloud. Words that appear more frequently than others and/or that appear in the titles of journals with higher scores are rendered in a larger font within the cloud.

Furthermore, the administrator view allows the researcher to download comma-separated value (CSV) files containing a list of all of the journals in the category (both original/seed and user-suggested), a list of all of the votes cast in the category, and a list of all of the non-vote actions performed in the category (e.g., skips and suggestions of new journals).

**Data Collection and Analysis**

*Data Collected by the JournalRankings Website*

The JournalRankings website records details of all activities/actions performed on the site. In addition, the Internet Protocol (IP) address of each visitor to the site is “geolocated” using a publicly available database. His/her approximate location, as inferred from the IP address, together with a cryptographic hash of the IP address, is stored in a database on the JournalRankings server along with the activity data. The IP address itself is not stored in the database, and although each IP address has a unique corresponding hash, it cannot be derived from the hash. There are also plans to use third-party analytics services such as Google Analytics ([http://www.google.com/analytics](http://www.google.com/analytics)) to track traffic on the JournalRankings website.
Online Survey

An online survey has been developed that is intended to be completed by individuals who have visited and used the JournalRankings website. The survey asks respondents questions pertaining to the following areas:

1. Background information about themselves and their areas of academic expertise;
2. Their experience of participating in the voting process for scholarly journals in one or more specific subject categories on the JournalRankings website, and of using the JournalRankings website overall; and
3. Their views and perceptions regarding traditional and crowdsourced journal ranking systems.

While participating in the journal voting procedure, after having cast a certain number of votes users will be given the option to access and complete the survey by way of a message displayed at the bottom of the screen, as shown in Figure 5.

![Figure 5: JournalRankings voting screen with message inviting the user to click on a link to participate in the survey](image.png)

Data Analysis

Analysis of the data collected on the JournalRankings website will be primarily descriptive in order to present a picture of users’ voting behaviors and the ways in which they are using the site. In addition to the journal rankings themselves and the built-in visualizations available within each subject category (as outlined above), the system will be able to generate the following site-wide statistics (across all categories):

- Number of all votes (across all subject categories) over time;
- Number of all user-suggested journals (across all subject categories) over time;
- Number of all unique users using the site per day;
- Number of all user sessions per day.

Moreover, data mining and other advanced analytics techniques will be drawn upon to discover underlying relationships and patterns in ways that capitalize on the vast amount of data that will hopefully be available.

The survey responses will be analyzed both in their own right as well as in conjunction with the data collected on the JournalRankings website, with cryptographic hashes of the users’ IP addresses facilitating the matching of each survey response with the corresponding participant’s voting and usage information on the JournalRankings site. Both descriptive and inferential statistics will be employed to examine and report on the quantitative data within and across subject categories, while the qualitative data from the open-ended survey items will be analyzed inductively, using a grounded approach, to achieve progressive abstraction of themes from the raw data (Strauss & Corbin, 2008).

The results of the data analysis will be used both to help refine and improve the JournalRankings website as well as to provide insight into the value in and feasibility of more widespread use of the crowdsourcing approach for evaluating and ranking scholarly journals. Also, the journal rankings within each subject category and the descriptive statistics and associated data visualizations within and across categories on the site will be valuable in of themselves. The analysis of the survey responses will yield an understanding of how scholars go about evaluating journals and deciding which ones to use as information sources and/or dissemination venues for their research.
Conclusion and Future Plans

This paper has outlined the author’s plans for a project aimed at trialing the use of a crowdsourcing approach as an alternative method for producing rankings of scholarly journals. The first phase of the project focuses solely on journals in the areas of educational technology and open, flexible, and distance learning. Preliminary data and results from the first phase will be presented at the conference, and an open call will be issued to invite attendees to participate and contribute to the JournalRankings website. In the second phase of the project, the JournalRankings website will be refined and expanded to include more subject areas/categories, in light of the findings, observations, and lessons learned from the first phase. The second phase will also see the development of a set of recommendations pertaining to crowdsourced journal rankings and their use.

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References