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An Innovative Approach to Bridging Open Access, Collection Development, and Faculty: An Altmetric and CiteScore Case Study at a Large Public University

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Abstract:
This case study examines the outcomes of an altmetric analysis of open access (OA) and non-open access (non-OA) publications from the Rutgers Business School, Rutgers University, Newark and New Brunswick. It explains the magnitude of the 2014–2020 business faculty OA and non-OA publications and their relative scholarly impact and metrics. The continued increase in the volume of OA articles suggests that professors are gradually accepting these article types, and that altmetric and CiteScore journal ranking metrics data may strengthen strategic initiatives for business librarians to assist faculties and university libraries in collective decision-making processes.

Keywords: Open access, cost-per-use, altmetrics, faculty publications, collection development CiteScore

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1. Introduction

The impact of social media and web-based tools has revolutionized how scholarly publications are retrieved through open access (OA) and non-OA publications. These changes in scholarly communication strengthen visibility and data sharing for multidisciplinary researchers (Sugimoto et al., 2017). Scholarly assessment tools such as altmetrics or alternative metrics can show the value and citation count of research publications, and increase their viewership through social media and web-based tools. Altmetrics assess various social platforms, including Twitter, bookmarking sites, and blogs, to measure various facets of scholarly impacts (Zahedi et al., 2014). It is important to understand the variables and measurement of this assessment tool. Crotty states that, "what most of these have in common is that they are measurements of attention, not measurements of quality" (2017, p. 2647). Thus, altmetrics do not measure scholarly publications based on factors such as journal rankings, h-index, or any factor pertaining to the quality of the article itself such as the measures seen in bibliometrics.

Scholarly literature can be published and distributed as an OA or a non-OA article. According to Springer, "open access publications are freely and permanently available online to anyone with an internet connection" (2020, p. 1). By contrast, non-OA articles are part of subscription-based peer-review journals. Studies have shown that authors who have published OA articles may gain a citation advantage compared with others who have not because the publication is freely available. However, the OA citation advantage varies based on the subject matter and research discipline (Norris et al., 2008).

Furthermore, the importance of scholarly visibility is essential for faculty, especially for those who are on the tenured and promotion track (Brown, 2014). Assessing the citation impact of scholarly articles has become the basis of measuring the quality of scholarly output from faculty and researchers for academic institutions (Yang and Li, 2015). Traditionally, bibliometrics has been used to assess scholarly output through variables such as citation analysis, as well as the journal's quality and importance, to identify publications within a

field (Holden et al., 2005; Thananusak and Ansari, 2019). Nonetheless, altmetrics and OA information show that faculty members are hesitant to embrace the following forms of metric tools and scholarly content. For example, a study conducted by Thananusak and Ansari (2019) mentions specifically that, in the field of management, the adoption of altmetrics and OA is minimal. One reason business faculty has been slow in adopting OA is the concern that OA journals may lack quality (Harzing and Adler, 2016).

The connection between altmetrics, OA, and business faculty has not been greatly explored. However, the literature suggests that the benefits of altmetrics are that the tools can track real-time attention from users seeking specific publication, as well as track the attention from non-academic communities (Thananusak and Ansari, 2019). Traditional forms of capturing the impact of scholarly research, such as bibliometrics, tend to rely on the number of citations as its core metric, which has been shown to have limitations because it does not capture usage trends for specific journal articles that were published in a relatively short timeframe (Haustein and Larivière, 2015). An example of this was shown in a study of business-related journals called Organization Studies, in which the authors state

For instance, one of the authors has published an article in Organization Studies in 2017 (Boutinot et al., 2017) that has garnered only one citation, but has the highest altmetric attention score of 477 (ranked 1st out of 581 research articles of this journal) from 60 news outlets, 1 blog post, 4 tweets and 10 reads in Mendeley. Thus, from this vantage point, academics and funders (e.g., the UK REF panel) have begun to use altmetrics to justify the impacts of research on external stakeholders. (Thananusak and Ansari, 2019, pp. 19–20)

Overall, the following studies demonstrate the ability of altmetrics to show research impact from a wide range of variables that can provide real-time results to a broader audience. In this study, the author explains how altmetrics, OA data points, and journal ranking metrics from CiteScore can be used to assess academic journals. This study examines social media platforms, academic

databases, and web base tools such as academic social networks (ASN) platforms and their impact on OA and non-OA scholarly publications through an altmetrics analysis for Rutgers Business School Newark and New Brunswick from 2014 to 2029. The author further examines OA and non-OA trends to determine whether altmetrics reinforce OA. Additionally, this study clarifies the impacts of social media, web-based tools, and journal rankings on business research publications from the Rutgers Business School faculty. Furthermore, it explores how academic librarians can use altmetrics, OA, and journal ranking metrics to benefit university libraries' journal assessment strategies and collective practices during economic downturns and fiscal uncertainly.

2. Literature Review

Altmetrics or alternative metrics is a term coined by Jason Priem in 2010 to describe how to measure scholarly impact using the social web in order to go beyond the traditional methods of assessing research metrics (Dhiman, 2015). Since then, various altmetrics providers have emerged, such as Altmetrics.com, Impactstory, and Plum X, which collect and quantify different events on scholarly publications from various social platforms. The data coverage varies based on the altmetrics provider (Ortega, 2020). In this study, the author only focuses on Plum X as its main source of data, pulled from articles that were indexed in the Scopus database. Plum X is an altmetric product created by Michalek et al. (2012) and was acquired by Elsevier in 2017 (Ortega, 2020). According to Ortega, "Plum X is the aggregator that offers more metrics, including usage metrics (i.e., views and downloads). It covers more than 52.6 million artifacts and is the largest altmetric aggregator (Plum Analytics, 2019)" (2020, p. 3). Ortega (2020) also mentions that Plum X tracks all social activity associated with articles that are indexed in Scopus.

The advantages of altmetrics can be assessed in different ways. One is that it allows scholars to gain greater visibility worldwide (Dhiman, 2015). Another benefit of altmetrics is that it tracks scholarly metrics of a broader scholarly community and relatively quickly through social media platforms such as

Twitter, Facebook, and various blogs. As a result, altmetrics provide real-time metrics, in contrast with other scholarly metrics such as bibliometrics, which only assess research impacts through the number of times a specific article has been cited, with the citation metric captured in selective databases (Dhiman, 2015).

2.1 Altmetrics: Impact on Open Access and Non-Open Access Articles

As time progresses, OA is becoming a relatively established resource in academia. Meanwhile, altmetrics is still fairly unexplored and an underdeveloped field in many cases (Dhiman, 2015). Nonetheless, both resources offer a broad spectrum of benefits for scholars and authors worldwide. It is also observed that non-OA articles are only made available through the traditional access of paywalls, limiting their research impact, as these avenues restrict access of potential readers. An example of this is demonstrated in a study conducted by Mounce (2013) in which the author finds that "In the new reality of online availability of research more and more people are trying to access it. JSTOR, for instance, registers 150 million failed attempts every year to gain access to articles they keep behind the paywall" (p. 15). This can certainly limit the research impact for faculty who rely on scholarly metrics, as well as for readers who do not have access to specific academic databases such as JSTOR.

Further issues may stem from canceling journal subscriptions that higher education institutions must endure because of budget constraints (Alhoori et al., 2015). Additional studies indicate that the traditional journal subscription models that academic libraries implement continue to be unsustainable and negatively impact collection budgets. Tucker et al. (2019) find that journal prices have increased between 6% and 7% annually; as a result, libraries have been unable to keep up with yearly inflation. Library budgets remained stagnant in 2020 according to over 60% of the respondents of a survey called "A

Strategic Library 2020 Library Purchasing Survey" (Bosch et al., 2020). The authors also point to another study called, "Simba Information's Global Scientific and Technical Publishing Report," which shows that library budgets are projected to increase slightly between 1.3% to 1.8% from 2019 to 2023 (Bosch et al., 2020). Dwindling budgets have thus resulted in university libraries shifting toward OA.

An example of this is the University of California System's decision to cancel its $50 million subscription contract with Elsevier in 2019. This decision was based on two factors. According to Tucker et al. (2019), these were "the increasing costs of journal subscriptions in a landscape where library budgets remain flat" and "the effort to shift the journal publishing model away from subscriptions to a sustainable open access model" (p. 1). Other academic institutions have also made similar decisions. For instance, the Massachusetts Institute of Technology (MIT) ended its contract with Elsevier in 2020 and has strengthened its OA initiatives with its "Ad Hoc Task Force on Open Access to MIT's Research" (MIT Libraries, 2020). The following trends show that academic libraries' gradual adoption of OA helps. Altmetrics are a way of measuring faculty research impact and an assessment of Rutgers Business School publishing patterns in OA and non-OA. Thus, the following methodologies were applied throughout this study.

2.2 Altmetrics and Open Access in Business Disciplines

Altmetrics has shown an increase of viewership of OA articles compared with non-OA articles over an extended period. Thus, it is a key variable in the outcome of the OA advantage for article usage and citation impact. The analysis of Yang and Li (2015) shows an assessment of usage, citation, and altmetrics data in evaluating the accumulated page views over time. The results show that OA articles receive greater long-term attention, whereas non-OA articles get short-term attention, and this attention decreases over time (Yang and Li, 2015). The study of Yang and Li (2015) finds that the OA advantage may have come from two variables, namely, altmetrics and the extended viewership resulting

from the accessibility of OA articles compared with the accessibility of non-OA articles, which require readers to subscribe or pay for access.

Research pertaining to altmetrics and OA versus non-OA trends in business disciplines is lacking. However, the studies on this topic have suggested that business faculty members have been slow to adopt altmetrics and OA because of perceptions and judgment of the quality of OA. For example, a study conducted by Thananusak and Ansari (2019) touches on the perception of altmetrics as a new burden when putting together a performance evaluation. Furthermore, Thananusak and Ansari (2019) have suggested that management scholars are slow to adopt OA because of the quality of publications, as well as issues arising from business practices relating to OA concerning academic publishing companies. According to Thananusak and Ansari (2019),

Due to several factors such as unclear funding models and the actions of predatory OA publishers who have attempted to deceive academics to publish in their dubious quality OA journals, we have explained why many management scholars have taken a 'wait-and-see' position to adopting OA. (p. 96)

Additional studies have also mentioned that predatory OA journal practices and publishers may be linked to why scholars and faculty specializing in business management feel that OA is not a legitimate option for publication (Harzing and Adler, 2016). The literature has suggested that faculty in the field of business management has been reluctant to adopt both altmetrics and OA despite its benefits that have a longer-lasting scholarly impact compared with the impact of the benefits of non-OA (Harzing and Adler, 2016).

2.3 Altmetrics in the Field of Collection Development and Librarianship

Studies pertaining to altmetrics and its use in collection development have been marginal. Furthermore, research confirms that altmetrics are being used for collection development practices by librarians (Sutton et al., 2019). A survey study conducted by Sutton et al. (2019) asked library employees with collection

development responsibilities about their familiarity with altmetrics. Surprisingly, the data showed that 33% were moderately familiar, 23% more than moderately familiar, and 5% were experts on altmetrics. Meanwhile, 24% had little familiarity and 13% had never heard of altmetrics (Sutton et al., 2019). The study showed an upward emerging trend for collection development associates and their familiarity with altmetrics. However, the survey pointed out that 76% of collection development associates rarely or never incorporate altmetrics into their work practices (Sutton et al., 2019).

Further research supports that altmetrics tools are not regularly used in collection development practices. In a paper by Sutton et al. (2017), the authors state the following regarding altmetrics tools that are used to assess collections in academic libraries,

Web of Science is the clear leader, followed by Google Scholar and Scopus. Their relatively lower use of sources of altmetrics data from Altmetric.com, ImpactStory, and PlumX supports the finding that among our respondents and in general, altmetrics are not yet being used with much frequency. (p. 141)

The literature certainly demonstrates the value of altmetrics tools such as PlumX, but it appears that associates who work in collection development are not fully aware of the impact and value that altmetrics can have on improving collections.

The need to incorporate altmetrics into academic librarianship has become evident. The following literature has strongly recommended ways to incorporate altmetrics into the professions in a variety of ways. A growing need for the use of altmetrics comes from the importance of scholarly impact and faculty's need for it for tenure purposes. Roemer and Borchardt (2015a) state that academic librarians use altmetrics to assist faculty in preparing for their tenure and promotional process. Roemer and Borchardt (2015a) state that "for example, encouraging faculty to take a look at internal procedures for measuring scholarly impact for things like promotion, merit, tenure, or awards can help these groups consider the role altmetrics can or should play in these procedures" (p. 1). Their

study also shows that altmetrics can be used as a tool for improving practices for the acquisition of journal collections.

Studies have indicated that altmetrics can change the way collections are evaluated and that it can be seen as a new opportunity for librarians to work closely with faculty and department heads on decisions relating to journal acquisitions. A study published by Michalek et al. (2014) stresses the importance of altmetric variables, as these shed light on the research impact and provide transparency for the libraries and faculty they serve. Michalek et al. (2014) state that,

To appreciate impact it is important to understand how the world is interacting with research artifacts across the five categories of metrics. These are 1) Usage, e.g., downloads, 2) Captures, e.g., bookmarks, 3) Mentions, e.g., blogs, 4) Social Media, e.g., tweets, and 5) Citations, e.g., Scopus. By looking at impact information across these categories, you can become a well-versed partner to your faculty and your institution by stepping into the position of understanding and assessing research impact. (p. 81)

The literature continues to show the need for altmetrics in the field of academic librarianship and collection development as the profession continues to evolve around data and metrics that show impact. Overall, it is evident from existing studies that libraries are gradually continuing to use scholarly metrics such as bibliometrics and altmetrics to make data-driven decisions in collection development (Tattersall, 2016).

3. Overview of CiteScore and Journal Rankings in Collection Development

CiteScore is a journal ranking metric platform developed by Elsevier in 2016 (Fernandez-Llimos, 2018). The metrics are calculated to determine the rankings stemming from the journals indexed in Scopus (Fernandez-Llimos, 2018). Although there have not been many studies regarding the usage of CiteScore's metrics and collection development practices, libraries in the past have used

other journal ranking metrics and incorporated them into collection decision-making practices. Studies have indicated that journal rankings and citation analysis can be an insightful resource and an alternative for assessing faculty research behavior (Gao, 2016). Researchers have shown collection development strategies that incorporate a ranked list, which can be used as a tool for identifying the holdings that are available in a collection to better understand the research needs in the targeted subject areas. According to Black (2013), "Ranked lists can be used to indicate how well the collection meets the needs of researchers in particular areas of interest. A comparison of a ranked list with holdings can be used as concrete evidence in those areas" (p. 294). The recommendation from Black (2013) allows academic librarians to provide a critical assessment on the strengths and weaknesses of a specific collection.

Further studies have shown the benefits of gathering journal and citation data to assess the quality of publications through citation metrics, such as the journal impact factor, to support business faculty with their research. According to Martindale (2020), "as the primary goal of this study was to measure the usefulness of the library's journal holdings, reassuringly, the evidence gathered indicates that the journal collection strongly supports the information needs of the business faculty" (p. 331). Based on the literature, the findings show that more academic librarians and libraries are exploring metrics, such as journal rankings, to strengthen assessment and research support services for faculty members

4. Background and Inclusion Process

This section provides a background of how OA journals are added to academic databases, which is the result of the inclusion process. The inclusion criteria and standards for academic databases vary. The purpose of the Scopus inclusion process is to ensure that high-quality OA journals are included, and it is meant to eliminate low quality and predatory OA journals (Solomon, 2013). A paper by Kähler (2010) states that, in 2008, Scopus began developing an inclusion process to increase global research output, specifically in China and Brazil. The

same study conducted by Kähler (2020) shows that, in 2009, Scopus implemented a scorecard called STEP, which evaluated the quality of journals. STEP consisted of 16 measurements and five main categories (Kähler, 2010). According to the Scopus Content Policy and Selection guidelines, the categories are 1) journal policy, 2) content, 3) journal standing, 4) publishing regularity, and 5) online availability (Scopus, 2021). It is important to note that both OA and non-OA journals have the same minimum journal requirements for the section criteria. This stringent process is conducted by the Scopus Content Selection and Advisory Board (CSAB), which assesses the quality of the content. According to Elsevier (2021), "Every year, approximately 3,500 new titles are suggested for inclusion in Scopus, but only 33% of those titles meet the technical criteria. And of those roughly 1,200 titles, only 50% are accepted after CSAB review" (p. 1). Overall, Scopus's inclusion process ensures the quality of the content to prevent predatory journals.

Using data collected from Scopus and Plum X, this study analyzes and provides further recommendations on the following: 1) an altmetric analysis between OA and non-OA of Rutgers Business School Faculty publications, 2) an exploration of CiteScope journal ranking metrics to identify the quality OA output from Rutgers Business School faculty, and 3) the creation of a theoretical framework using Altmetrics, CiteScore, and OA data as a way to strengthen traditional collection decision-making practices.

5. Data and Methods

The case author selected Rutgers University Business School (RBS) Newark and New Brunswick faculty publications for this case study. A list of PlumX Metrics for 666 publications was exported from the Scopus database based on articles written by Rutgers Business School faculty published from 2014–2020. The metrics are organized by the following categories: Twitter: tweets; Facebook: shares, likes, and comments; Mendeley: captures, readers; and

EBSCO: full-text views to measure and determine the output between OA vs. Non-OA.

Regarding the OA classifications, "Gold Open" is defined as articles that are completely published in OA; "Hybrid" denotes an option that allows authors the choice of publishing OA in a specific journal; "Bronze" permits publishers to provide provisional or permanent access; and "Green" gives publishers the right to make the manuscript available in an open repository (Scopus.com, 2020). Lastly, "Closed OA" is defined by Piwowar et al. (2018) as "All other articles, including those shared only on an ASN Academic Social Networks or in Sci-Hub" (p. 5). ASN are social platforms, such as ResearchGate and Academia.edu, used by researchers to post their manuscripts (Piwowar et al., 2018). Meanwhile, Sci-Hub is defined by Piwowar et al. (2018) as an "illegal pirate site" (p. 4). Greshake (2017) thoroughly defines Sci-Hub as follows:

According to founder Alexandra Elbakyan, the website uses donated library credentials of contributors to circumvent publishers' paywalls and thus downloads large parts of their collections. This clear violation of copyright not only led to a lawsuit by Elsevier against Elbakyan [14], but also to her being called "the Robin Hood of Science," with both sparking further interest in Sci-Hub. (p. 3)

The following OA classifications were determined by importing the DOI of 65 OA articles into the Simple Query Tool by Unpaywall.org. Unpaywall.org has specific features that allow users to check the classifications of specific OA publications based on DOI. Furthermore, Unpaywall is integrated in popular databases such as Web of Science and Scopus (Dhakal 2019). Thus, Unpaywall allows a seamless process in identifying each classification for all OA articles.

This study's final step for data collection was to gather the 2020 CiteScore journal ranking through Scopus. The title of the journals came from the above-mentioned 65 OA articles, and the names of the journals were individually added to the Scopus search interface to put together the following variables: 1) Cite rank and 2) In category. An example of the process is outlined as follows—Title: Business Ethics Quarterly; CiteScore rank 2020: 34/218; and In category:

General business, management, and accounting. The output showed that 32 out of the 65 OA articles that were published in targeted journals made the 2020 CiteScore rankings. This study also examined the journal ranking metrics from CiteScore Rank-Scopus to determine 1) how many OA articles came from top-tier and mid-tier journals and 2) the subject areas that OA journals were classified in. The frequency of publishing OA in high-impact journals by Rutgers business faculty was also assessed.

The examination of specific journal ranking metric trends and OA impact included the following: 1) an assessment of OA and non-OA articles from 2014–2020, 2) an assessment of faculty publishing output based on rank and OA and Non-OA status, 3) an analysis of altmetrics to determine the impact of OA and non-OA practices, and 4) an exploration of journal ranking metrics to assess OA publishing trends in top-tier and mid-tier academic journals and better understand Rutgers Business School OA publishing output in prestigious academic journals

6. Results

6.1 Open Access vs. Non-open Access

A total of 65 articles were OA, whereas 601 articles were non-OA. The author provides a breakdown of OA and non-OA based on output and distribution percentages for all years. Figure 1 shows a steady output of 11 OA publications for three years in a row during 2016–2018, which accounted for 51% of OA between those years, but a sharp decline in OA with 5 (8%) in 2019, with the highest level of publishing output in 2015 with 113 (19%) non-OA articles, declining to 75 (12%) in 2016. The figure also shows non-OA increases in publishing output within 2016–2018. Nonetheless, it is difficult to speculate what caused the decline in 2015 (3%), 2019 (8%), and the gradual increases from 2016–2018 (40%) without understanding the behaviors in publishing for Rutgers University Business School faculty. The literature shows that business faculty members are not in favor of publishing OA, because of the quality of

specific journals (Harzing and Adler 2016). However, the figure shows the highest output of OA articles at 18 (28%) in 2020, and in the same year, the lowest output of non-OA at 57 (9%). Overall, it is clear based on the data shows that there been a gradual increase in the adoption of OA over a six-year span.

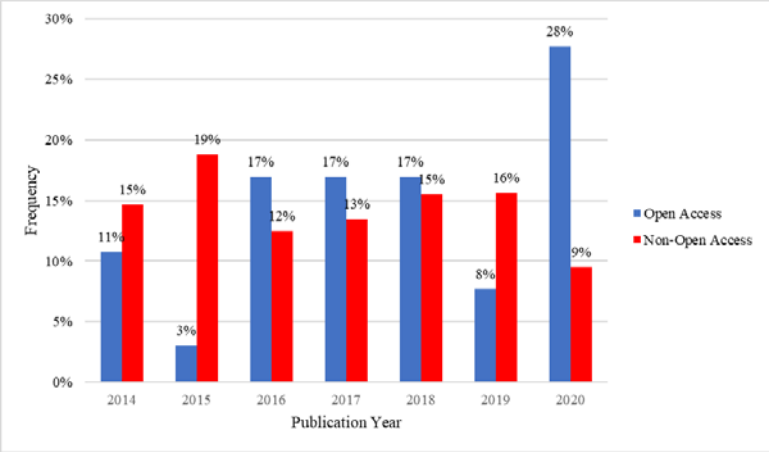

Figure 1. Distribution analysis on open access vs. non-open access publications, 2014–2020

6.2 Distribution Analysis of Open Access Based on Type and Year

The importance of this study lies in showing the distribution of OA by type and over time for the period 2014–2020. The following classification determines the level of accessibility of articles written by Rutgers Business School faculty over time. Figure 2A shows that Bronze OA was at 40%, while Figure 2B shows a consistent trend of Bronze OA in 2014–2020, with the peak in 2016, at 12.31%. A paper by Brock (2018) describes Bronze OA as follows: "These articles are available on websites hosted by their publisher—either immediately or following an embargo—but are not formally licensed for reuse" (p. 1). An interesting trend in another study (Piwowar et al., 2018) showing a similar comparison across different disciplines indicates that Bronze OA is considered a favorable option. Figure 2A shows Gold OA—which allows articles to be completely accessible—at 26%, and Figure 2B shows its peak in 2017, at 7.7%. Moreover, Figure 2A shows Green OA—which allows publishers the option of

placing the article in a repository—at 15%, and Figure 2B shows its first result in 2018, at 1.54%. However, in 2020, Green OA, at 13.85%, is shown as producing the most output out of all the OA classifications (Figure 2B). Figure 2A shows the percentage of Closed OA at 11%; these articles are usually found in Academic Social Networks and Sci-Hub (Piwowar et al., 2018). Figure 2B shows the peak of Closed OA in 2018, at 4.62%. Figure 2A shows Hybrid OA with the least frequency, at 8%, and Figure 2B shows its first output in 2017, at 6.15 %. Hybrid OA gives authors the OA option usually associated with a fee based on the publishing company.

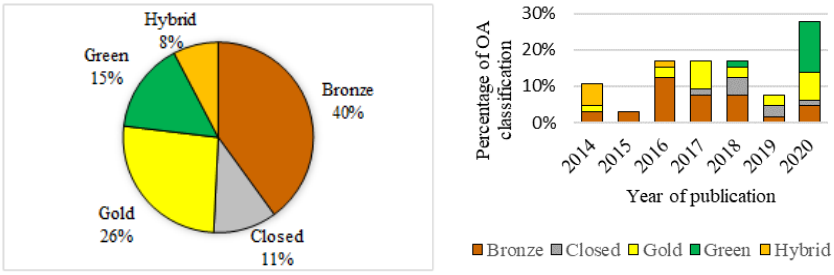

Figure 2. A. Percentage of Open Access by Type; B. Open Access Type Based on Yearly Trends

6.3 Altmetric Analysis of Rutgers Business School by Open Access vs. Non-Open Access

In this section, Figure 3 clarifies where the scholarly content is retrieved and examines the altmetrics of OA and non-OA output based on four categories: 1) Twitter, 2) Mendeley, 3) Facebook, and 4) EBSCO.

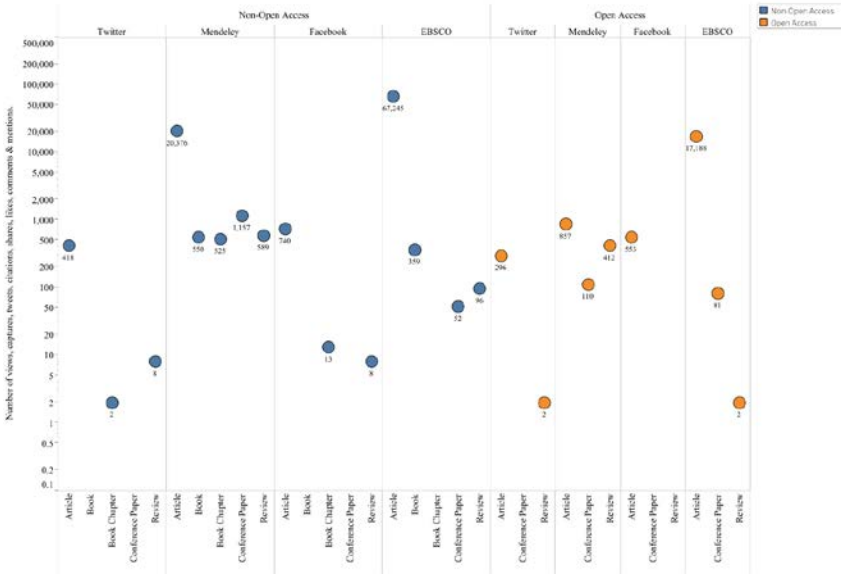

Figure 3. OA vs. non-OA altmetric analysis of Rutgers business school faculty

EBSCO altmetric output was ranked #1 in both OA and non-OA classifications, with the total output of OA articles at 17,188, conference papers at 81, and reviews at 2. Meanwhile, the total output of non-OA EBSCO was 67,245 articles, 359 books, 96 reviews, and 52 conference papers. Mendeley ranked #2 in OA with 857 articles, 412 reviews, and 110 conference papers. Mendeley produced the following non-OA results: 20,376 articles, 1,157 conference papers, 589 reviews, 550 books, and 525 book chapters. By contrast, Facebook ranked third in OA for only one classification, 553 articles, but expanded its reach in non-OA with 740 articles, 13 book chapters, and 8 reviews. The two metrics at the bottom for OA and-OA were Twitter with 296 articles and 2 reviews for OA; and 418 articles, 8 reviews, and 2 book chapters for non-OA. The reason behind EBSCO Host yielding the strongest results in both categories could stem from the coverage relating to business research. Mendeley had high outputs in both OA and non-OA categories. The data collected for Mendeley were based on the number of captured readers. These results from Mendeley

may stem from the crowdsourcing community feature that allows researchers to seamlessly share information and scholarly content (Simperl 2015). Overall, both EBSCO and Mendeley are directly tied to academic literature, explaining the outputs shown in Figure 3. By contrast, Facebook and Twitter seem to lag slightly behind, owing to a lack of integration between social media platforms, research publications, and academia, compared with resources that were designed for academic researchers such as EBSCO and Mendeley.

6.4 CiteScore 2020 Rankings of Academic Journals with the Most Open Access Articles

This section discusses the quality of OA articles from top-tier journals. Studies have indicated that business faculty at academic institutions are reluctant to adopt OA material due to the quality of research published in OA (Harzing and Adler, 2016). This study specifically provides insights and assessments on Rutgers business faculty's behavior in OA publishing in mid to top-tier journals.

Publication Title	Cite Score Rank 2020-Scopus	% of OA Articles	Discipline
Journal of International Business Studies	5/440	3	Strategy and Management
Statistical Science	8/378	1	General Mathematics
Psychonomic Bulletin & Review	10/306	1	Arts and Humanities (miscellaneous)
Journal of Open Innovation: Technology, Market, and Complexity	17/243	1	General Economics, Econometrics, and Finance
Industry and Innovation	21/218	1	General Business, Management, and Accounting
Discrete Applied Mathematics	23/85	4	Discrete, Mathematics, and Combinatorics
South Asian Journal of Business Studies	27/1037	1	Cultural Studies-Business
Annals of Operations Research	28/166	3	Management Science and Operations Research
Journal of Economic Geography	32/704	1	Geography, Planning, and Development
Discrete Mathematics	33/73	4	Discrete, Mathematics, and Combinatorics
Business Ethics Quarterly	34/218	1	General Business, Management, and Accounting
Electronic Journal of Combinatorics *	42/85	1	Discrete, Mathematics, and Combinatorics

Frontiers in Psychology *	54/203	1	General Psychology
Cancer Medicine *	54/288	1	Radiology, Nuclear Medicine, and Imaging
Probability in the Engineering and Informational Sciences	67/152	1	Statistics and Probability
Competitiveness Review	68/218	1	General Business. Management, and Accounting
Statistics, Optimization and Information Computing	71/152	1	Statistics, Probability, and Uncertainty
Management International Review	77/399	1	Business and International Management
Enterprise and Society	82/101	1	Business, Management, and Accounting (miscellaneous)
Algorithmica	87/226	1	General Computer Science
Journal of Global Optimization	108/548	1	Applied Mathematics
Frontiers in Medicine *	110 /793	1	General Medicine
Journal of Systems Science and Systems Engineering	121 /260	1	Control and Systems Engineering
International Journal of Security and its Applications	140 /202	1	General Computer Science
International Journal of Environmental Research and Public Health *	179 /526	1	Public Health, Environmental and Occupational Health
Operations Research Letters	181/336	1	Industrial and Manufacturing and Engineering
Politics and Governance	187/1269	1	Sociology and Political Science
Journal of Physics: Conference Series *	191/233	1	General Physics and Astronomy
Business: Theory and Practice *	205/440	1	Strategy and Management
Annals of Occupational and Environmental Medicine *	240/526	1	Public Health, Environmental and Occupational Health

Table 1 shows the CiteScore rankings of academic journals with the most OA articles. Table 1 shows a total of 11 OA articles published in the top 25 journals according to Cite Score Rank-Scopus, 13 OA articles published in journals that ranked between 27 and 54, 6 OA articles published in journals with ranking metrics from 67 to 87, and 10 OA articles published in lower-tier journals ranking from 108 to 240. In comparison, 35 out of the 65 OA articles included in this study did not come from CiteScore-ranked journals. The academic journals that had the most OA articles were Discrete Mathematics and Discrete Applied Mathematics, tied at four articles, followed by the Journal of International Business Studies at three, and Annals of Operations Research at

three. A part of the differences stem from business and non-business journals' CiteScore rankings. The CiteScore rankings are vastly different depending on the discipline, resulting in some confusion in OA output centered on business faculty. It is important to note that this section examines Rutgers business faculty OA output trends based on the CiteScore rankings regardless of journal discipline. Another key point is that here, altmetric variables, such as book chapters and conference proceedings, are excluded. Nonetheless, the trend in Table 1 reveals that OA articles are becoming more accessible in the mid to upper-tier journals, considering that a total of 40 OA articles were in CiteScore-ranked journals, while 25 OA articles were excluded. Interestingly, it shows that 8 out of the 30 journals that are CiteScore-ranked are OA journals. This may indicate that the RBS faculty is embracing OA at a faster rate than the author anticipated

7. Discussion

The findings show that certain faculty members at RBS, New Brunswick and Newark, have published in an OA journal, suggesting that more RBS faculty members may have done the same. Studies have shown that OA metrics have not been greatly explored when trying to find collection development methods; however, some reports have shown interest in including OA in collection management practices. According to Antelman (2017), "while OA journals and OA collections were noted as data points of interest, article-level OA was not listed as a data point used in collection assessment by any library in the 2015 ARL SPEC Kit" (p. 412). Further studies have shown that the implementation of OA and other types of data points has not been explored or incorporated into the CPU ratio or in additional journal assessment practices within collection development.

The journal assessment in Table 2 broadens the scope to include additional items: 1) Cite Scopus Rank-Scopus, 2) OA classification, 3) RBS altmetrics data from Twitter: tweets; Facebook: shares, likes and comments; EBSCO: full-text

views; and Mendeley: captures. This theoretical approach provides additional insights based on faculty publishing trends and usage data of mid- to high-cost journals. The data variables allow academic librarians to assess the journal's quality, the determination of the OA classification, and the journal's popularity based on social web tools from the altmetrics data, along with the traditional assessment metrics of use, fee, and CPU data. One highlight of our findings (shown in Table 2) is that Business: Theory and Practice is considered an OA journal. Furthermore, Business: Theory and Practice shows substantial viewership in the academic platforms, with a total of 1,185 EBSCO Host full-text views and 97 Mendeley captures, but it did not yield results in Facebook or Twitter. There was no usage or CPU data for Business: Theory and Practice because it is an OA journal; therefore, such metrics are unnecessary, as the journal is free. Overall, the journal assessment model in Table 2 provides a clear picture of faculty publishing and research trends based on the added sections of altmetrics and journal rankings. Most importantly, it provides a cost-effective model by identifying OA journals that are overlooked by traditional journal assessment methods.

Journal Title	2021 Usage	2021 Fee	CPU 2020	Cite Score Rank-Scopus	Open Access Classifications	Twitter: Tweets	Facebook: Shares, Likes, and Comments	EBSCO HOST-Full-text views	Altmetrics: Mendeley: Captures
Business Ethics Quarterly	125	$516	$4.13	4/606	Bronze	0	0	15,339	70
Psychonomic Bulletin & Review	221	$594	$2.69	7/295	Bronze	273	477	0	29
Industry and Innovation	57	$2,267	$39.77	16/221	Bronze	5	0	0	128
Journal of Economic Geography	32	$1,249	$39.03	33/679	Closed	2	42	2	18
Business: Theory and Practice	$0	$0	$0.00	204/427	Gold	0	0	1,185	97

Table 2. Assessing Business Journal Manuscripts by Usage, Journals, Cost-Per-Use, Citescore Rank-Scopus, Open Access Classifications, and Altmetrics Data

8. Conclusions

This study has shown that Rutgers business faculty members are slowly adopting OA. Nonetheless, the rate of adoption of non-OA continues to outpace that of OA, as expected from top-tier business schools and universities. The

altmetric analysis revealed that most of the views, captures, downloads, and attention for both OA and non-OA are coming from academic platforms such as EBSCO and Mendeley. Although Twitter and Facebook metrics were slightly below in some areas, it has been proven that social media tools can improve visibility for research at a faster rate than traditional research metrics such as bibliometrics (Breuer et al., 2020).

This study recommends that altmetrics, OA, and journal rankings through the CiteScore rank be included in the decision-making processes for journal cancellations to strengthen traditional collection development standards. The aspects of 1) CiteScore rank; 2) OA classification; and 3) altmetric variables (namely, Twitter: tweets; Facebook: shares, likes, and comments; EBSCO: full-text views; and Mendeley: captures) will allow academic librarians to assess business journal collections effectively based on metrics from the faculty and business school they serve. Further recommendations include having open discussions with researchers and the faculty regarding the dynamics of altmetrics to better understand the altmetric tools and explore opportunities in this area (Roemer and Borchardt, 2015b).

In addition, the theoretical approach of this study broadens the scope for collaboration among business librarians, faculty members, and the department heads of business schools in assessing the research needs and academic journal collections, as well as in identifying cost-effective strategies about journal cancellations due to budget cuts.

A limitation of this study is that it is limited to one business school located in two campuses; thus, the outcomes may vary by region and the size of the academic institution. Moreover, this study could not determine the reasons behind the adoption of OA based on the faculty members' status and could not determine the intent or reasons to adopt OA without surveying faculty. The author also used only four altmetric variables; hence, these few variables may not show the full impact of altmetrics on the selected business journals. Other studies (e.g., Priem, 2014) have shown that altmetrics are vulnerable to

manipulation. Priem (2014) expresses the following apprehension, "A second concern is an ease with which altmetrics counts can be manipulated. Again, this is a legitimate concern—but we should not imagine that extant metrics are free from it, either" (p. 224). Overall, it is important that librarians and faculty members understand the weakness that altmetrics can be manipulated to a certain extent.

This study's framework for the business journal assessment—which includes altmetrics, OA, and journal rankings through CiteScore—is a specific theoretical concept and has not been applied to collection development or journal assessment strategies, based on the author's findings. Further studies and practical use by university libraries must be undertaken to validate these additions to the traditional journal assessment framework.

Overall, this study has shown a fluctuating trend of open access; however, the results show the highest increase for OA in 2020. The need to strengthen collection development practices is apparent, especially journal cancellation methods in a time of fiscal uncertainty for colleges, universities, and academic libraries. Furthermore, there is a need to explore additional metrics when assessing journal or material cancellations in academic libraries. The theoretical framework presented in this study provides a broader scope on how to make a journal or other material cancellations based on actual metrics from faculty publishing, CiteScore, and usage data. Most importantly, it has shown the value of OA and altmetrics, and has provided business librarians strategic ways to work in conjunction with business faculty, business school department heads, and collection development personnel on collective decision-making processes.

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