JLSC

ISSN 2162-3309 | JLSC is published by the Iowa State University Digital Press | http://jlsc-pub.org

Volume 12, 1 (2024)

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Maistrovskaya, M. (2024). Barriers and Opportunities in the Discoverability and Indexing of Student-Led Academic Journals. *Journal of Librarianship and Scholarly Communication*, 12(1), eP16820. https://doi.org/10.31274/jlsc.16820

This article underwent fully anonymous peer review in accordance with JLSC's peer review policy.

ISSN 2162-3309 10.31274/jlsc.16820

RESEARCH ARTICLE

Barriers and Opportunities in the Discoverability and Indexing of Student-Led Academic Journals

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ABSTRACT

Introduction: Student-led journals are not commonly included in academic indexes and databases. This study explores the barriers that indexing requirements may present for student journals, as well as editors' attitudes toward discoverability strategies and opportunities.
Methods: An environmental scan of select eight indexes looks at potential barriers to inclusion and at indexing rates among Canadian student-led journals ($n = 202$). A survey of Canadian student editors ($n = 47$) and follow-up interviews ($n = 7$) focus on editors' attitudes toward discoverability, indexing challenges, and opportunities.
Results: Only 15% ($n = 30$) of Canadian student journals are indexed in at least one of the seven indexes included in this study, and 74% ($n = 146$) of open-access journals appear in Google Scholar, with Open Journal Systems (OJS) having the highest Google Scholar indexing rate (97%) as a platform. Student editors generally prioritize reaching their audiences via social media, word of mouth, and targeted promotion. For editors who seek indexing, the biggest challenges come from confusing inclusion criteria and processes, lack of knowledge and comfort, and lack of capacity for such projects.
Discussion: Most reviewed indexes have some requirements that may be challenging, but not exclusively to student journals. The main challenge comes from editors' self-perception of not belonging in academic indexes, lack of understanding about the process, and insufficient capacity for discoverability and promotional activities.
Conclusion: The lack of discoverability puts student journals at risk of being invisible to readers and potential authors. Although academic indexing may not be a high priority for student editors, regular outreach and support from libraries and faculty advisors could help editors better use various discoverability opportunities.

Keywords: student journal publishing, student journal indexing, student publishers, student-led publishing

Received: 06/17/2023 Accepted: 04/25/2024

IMPLICATIONS FOR PRACTICE

1. Libraries may provide varying degrees of support to student journals in improving their discoverability and indexing. This study clearly identifies the challenges that student editors might face in this process and the supports they would like to receive.
2. Student editors encounter indexing barriers due to confusing requirements and application processes. The study outcomes are shared in a practical Student Journal Toolkit: Visibility, Discoverability, Impact, Promotion (Public Knowledge Project, n.d.) to help editors navigate various discoverability options and boost their journals' visibility.
3. Google Scholar is the most accessible discoverability channel for student journals, but certain journal publishing platforms such as Open Journal Systems (OJS) outperform generic sites such as WordPress, Squarespace, etc. in indexing. Student editors should consider platform selection as part of their discoverability strategy.
4. The 2022 dataset of Canadian student journals (Maistrovskaya, 2023), with a breakdown of Web platforms used and journals' indexing status, is publicly available and licensed for reuse.

INTRODUCTION

Despite the growing number of student-led academic journals in North America (Ng et al., 2017) and the predominant electronic and open-access nature of their publication, their content is not easily discoverable online.

Traditionally, academic journals seek to be included in indexes, directories, aggregators, and databases that contribute to recognition, reach target audiences, and sometimes provide additional citation and metric tools. Many prominent indexes have specific, often quite strict, inclusion criteria and application processes. To date, there has been no research into whether such criteria may explicitly or implicitly present barriers for student journals.

Additionally, little research has been conducted on student editors' awareness of and interest in such opportunities for improving discoverability (Alamri, 2018). Existing literature mainly focuses on student journals' benefits for writing development, academic success, and early exposure to the academic publishing process (Arsenault et al., 2021). There is little information on indexing rates of student journals, their challenges, and editors' perspectives on discoverability.

This study examines indexes' selection criteria, application processes, and the indexing ratio of student journals, as well as editors' approaches to discoverability, understanding of scholarly

indexing process, and perception of barriers to inclusion. The study outcomes are shared through a practical Student Journal Toolkit: Visibility, Discoverability, Impact, Promotion (Public Knowledge Project, n.d.) aimed at helping student editors enhance the visibility of their journals.

LITERATURE REVIEW

Student journal publishing is on the rise, with a nearly 10-fold increase in North American science, technology, engineering, and mathematics (STEM) journals from 1995 to 2015 (Ng et al., 2017). In Canada, an informal list of student-run journals put together by the University of Alberta Library in 2017 shows 206 titles (Hamilton et al., 2017).

Research and practitioner publications regarding student journal publishing focus predominantly on the pedagogical benefits of student-led journals, including early exposure to and mentorship in the publishing process for authors, learning the ins and outs of the editorial workflow management for editors, and providing constructive feedback for reviewers (Arsenault et al., 2021; Pavithran et al., 2022). Improved employability, increased interest in pursuing a career in research, and early exposure to the open-access publishing model are also quoted among the benefits of student-led publishing (Davis-Kahl, 2012; Stone et al., 2016; Weiner & Watkinson, 2014).

Only a few, mostly subject-specific, publications look at indexing of student journals in various indexes and databases (Alamri, 2018; Ng et al., 2017; Verma et al., 2011). Student editors often face challenges in juggling their working, academic, and editorial duties, which include recruiting volunteer editors and reviewers and establishing their journal's presence: "Another challenge we face is a lack of recognition for our journals, whose visibility can be poor. Only a couple student journals are indexed on PubMed. There is no database for showcasing student research." (Thawani et al., 2013, p. 2).

On the other hand, faculty raise the question of how the impact of student-led journals should be evaluated and "whether or not student articles should be measured by the same standards as other journal articles" (Waye & Simpson, 2016, p. 5). Some also raise concerns regarding their quality and rigor and suggest that "if the research is good enough, it should be published in a 'real' journal" (Gilbert, 2004, p. 23).

Considering the lack of existing research on indexing barriers for student journals and conflicting views on their place in academic indexing, this study was designed to look at both indexing requirements and student editors' perceptions of discoverability opportunities.

METHODS

The study employs a combination of quantitative and qualitative methods described later in this paper. The human ethics protocol for the survey and interviews was approved by the University of Toronto Research Ethics Board in October 2022.

Environmental scan of index policies

Eight prominent academic indexes were selected for the study, comprising commercial and non-commercial, subscription-based and open, global and local Canadian, and multidisciplinary and subject-specific indexes. The list includes a combination of directories, databases, aggregators, indexes, and a search engine, collectively referred to as "the indexes" in this study for the sake of brevity.

- Directory of Open Access Journals (DOAJ)
- Scopus
- Web of Science (WoS)
- Medline
- Érudit
- ProQuest
- HeinOnline
- Google Scholar (GS)

An environmental scan of these indexes' inclusion criteria and application processes conducted in the fall of 2022 facilitated the comparison of their requirements and identification of potentially challenging inclusion criteria.

Interviews with index representatives

The aforementioned indexes, with the exception of GS, were contacted with an invitation to a brief informal interview regarding their criteria pertaining to student journals and their general attitude toward student journal inclusion. Three index representatives accepted the invitation. Interview questions are shared in Appendix A.

Compiling a list of Canadian student journals

A list of Canadian student journals was compiled in the fall of 2022 for querying the indexes to check for inclusion and to create a contact list for survey and interview invitations. The inclusion criteria were as follows:

- Published in Canada, defined as affiliated or cross affiliated with a Canadian institution(s) or having an editorial board consisting mostly of Canadian editors;
- Currently publishing, defined as at least three articles published in 2021 or 2022;
- Publishing online or online and print. Print-only journals were excluded;
- Operated by undergraduate or graduate students, with faculty advisory participation accepted. Journals run by faculty or student editorial teams with faculty as Editor in Chief were excluded;
- All subject areas, disciplines, platforms, and languages of publication were included;
- Newspapers, newsletters, blogs, and magazine-style periodicals were excluded.

The list was compiled from known lists and directories (Council on Undergraduate Research, n.d.; Hamilton et al., 2017; Hensley & Johnson, 2018) and supplemented by checking Canadian academic library hosting programs through Google searches and International Standard Serial Number (ISSN) portal verification.

Querying the journals against the indexes/databases

Seven of the indexes were queried against the compiled list of student journal titles and/or ISSNs as follows:

- A bulk ISSN search via the front-end search interface (ProQuest, Érudit, Medline, WoS);
- An open application programming interface (API) query (DOAJ, Scopus) using a script by Heinrichs (2023);
- A cross-check against the master journal list (HeinOnline).

A different approach was used with GS because it does not rely on journal-level records or ISSNs. Checking was done by a combination of journal title search as "source" and an article title search of a sample of two to four articles published since 2019. Search results were categorized as follows:

- Substantial: A significant number of post-2019 articles appear in GS from the journal's website;
- Limited: Occasional post-2019 articles appear in GS from the journal's website, or only citation-level results, or records show incomplete or incorrect metadata;
- None: No content since 2019 appears in GS from the journal's website;

- Not available (N/A): GS was not queried for journals that do not publish content on their own websites, even when the content may appear in GS from other sources such as subscription databases. This effectively excluded non-open-access journals from GS querying.

Additionally, journal publishing platforms used by the student journals were recorded to facilitate between-platform comparison of GS indexing results.

The 2022 dataset of Canadian student journals and their indexing status was published in the Borealis repository in February 2023, with a subsequent version 2 update in April 2023 (Maistrovskaya, 2023).

Survey of student journal editors

Canadian student editors were invited to fill out a survey about their publishing practices and their views on discoverability that ran between February 20 and March 19, 2023. Inclusion criteria for survey participants were the same as for the aforementioned Canadian student journal list, and survey invitations were distributed via direct publicly available contact emails, Canadian student editor listservs, and Canadian hosting library contacts.

Survey responses were collected via Redcap software and analyzed using Microsoft Excel. Following the validation against inclusion criteria and the removal of duplicates, 47 responses were included in the final analysis. Survey questions are shared in Appendix B.

Follow-up interviews with student journal editors

Survey participants had an option to sign up for brief, informal follow-up interviews. Out of 25 sign-ups, seven interviews were conducted between March 28 and April 7, 2023, with editors representing graduate and undergraduate journals, different disciplines, geographical areas, and indexing statuses. Editor interview questions are shared in Appendix C.

Limitations

The study has certain methodological and logistical limitations that should be acknowledged:

- Determining whether a journal is operated by students or by faculty/department publishing student work was challenging because this information is not always

explicitly stated on journal websites. Journals that could not be clearly established as student-led were excluded;

- Differentiating between graduate and undergraduate student-led journals was also challenging, and the analysis of this facet was based only on the self-reported survey results ($n = 47$), not the full dataset ($n = 202$);
- Some indexing requirements and application processes changed during the course of the study, which may limit the longevity of this study's conclusions;
- Owing to linguistic limitations, the editor survey and interviews were only made available in English, which may have limited the participation of French-language journals;
- Only three index representatives agreed to be interviewed, limiting the conclusions that can be drawn regarding indexing requirements and attitudes toward student journals from all of the indexes.

RESULTS

Index policies: environmental scan and index representative interviews

Most indexes do not have student journal-specific restrictions, with the exception of Érudit, which, in general, does not accept student journals. DOAJ is the only index with an explicit requirement for student journals, stating that "If a journal is run by a student body, there must be an advisory board for the journal where at least two members have a PhD or equivalent qualification" (Directory of Open Access Journals, n.d.).

Although neither Medline nor PubMed outline student journal-specific criteria, when reached for comment, the National Library of Medicine (NLM) pointed to their 2004 guideline, stating that "NLM very selectively collects alumni and student publications from a range of US institutions, seeking to represent not only the publications of prominent medical schools but also those of culturally and geographically diverse institutions" (National Library of Medicine, 2004)

The following indexing requirements were identified as potentially challenging for student-run journals and used to inform editor survey and interview questions:

1. Peer review: It may be challenging for student editors to establish and coordinate a rigorous review process and recruit and train reviewers, particularly if a journal did not start out as peer-reviewed;

2. Prior citedness in the index: Scopus requires applying journals' articles to have been cited by other articles already indexed in Scopus (Elsevier, n.d.), which may be harder for student journals to achieve and out of their control. WoS has a similar requirement for advancing from the initial Emerging Sources Citation Index (ECSI) inclusion to their more selective databases (Clarivate, n.d.);
3. English metadata: Most of the indexes, including Scopus, WoS, and Medline, accept multilingual publications but require a title and abstract in English. This presents a barrier for French-only student journals published in Québec, Canada;
4. Regularity of publication: Indexes that expect metadata and/or content delivery, such as WoS, Scopus, and Medline, consider regularity of publication as an important factor. In our interview, the WoS representative confirmed that there is little flexibility with late delivery or missed issues. Similarly, Medline would de-index a journal that does not adhere to its stated schedule over a 2-year period (National Library of Medicine, n.d.);
5. Long-term preservation: Medline requires that journals be archived in one of the six Center for Research Libraries (CRL)-certified repositories (Center for Research Libraries, n.d.) that would be technically difficult and costly for most student journals to achieve;
6. Endogeny: DOAJ limits the proportion of papers published by the journal's editors and reviewers to under 25% (Directory of Open Access Journals, n.d.). It is not a barrier for student journals exclusively because other new and niche journals may also struggle with this requirement;
7. Content delivery: Indexes with metadata and/or content delivery expectations have different technical requirements for metadata, file formats, and delivery methods. Some publishing platforms have built-in connectors to support such delivery, such as DOAJ and Medline exports in OJS, whereas, in other platforms, the same process may require more technical expertise and manual effort.

Canadian student journal inclusion in indexes

The list of current Canadian student journals ($n = 202$) was used to query the indexes for inclusion rates.

Figure 1 demonstrates inclusion in seven of the indexes, with GS indexing addressed separately. Around 15% ($n = 30$) are currently included in at least one of the seven indexes; six journals are found in two or more indexes.

GS appears to be the most accessible indexing channel, with 74% ($n = 146$) of open-access Canadian student journals ($n = 197$) having either significant or limited presence. Journals

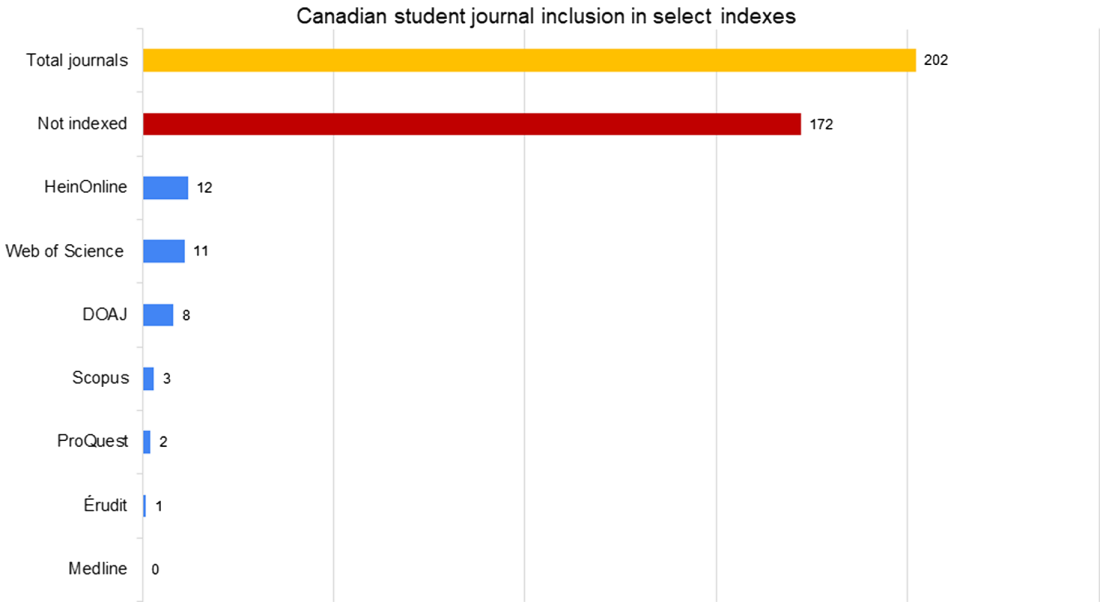

Figure 1. Count of Canadian student journals included in select indexes

that did not make published content openly available on their websites were not included in the GS indexing analysis.

To analyze GS indexing, journals' publishing platforms (Figure 2) were cross-referenced with their appearance in GS search results (Table 1).

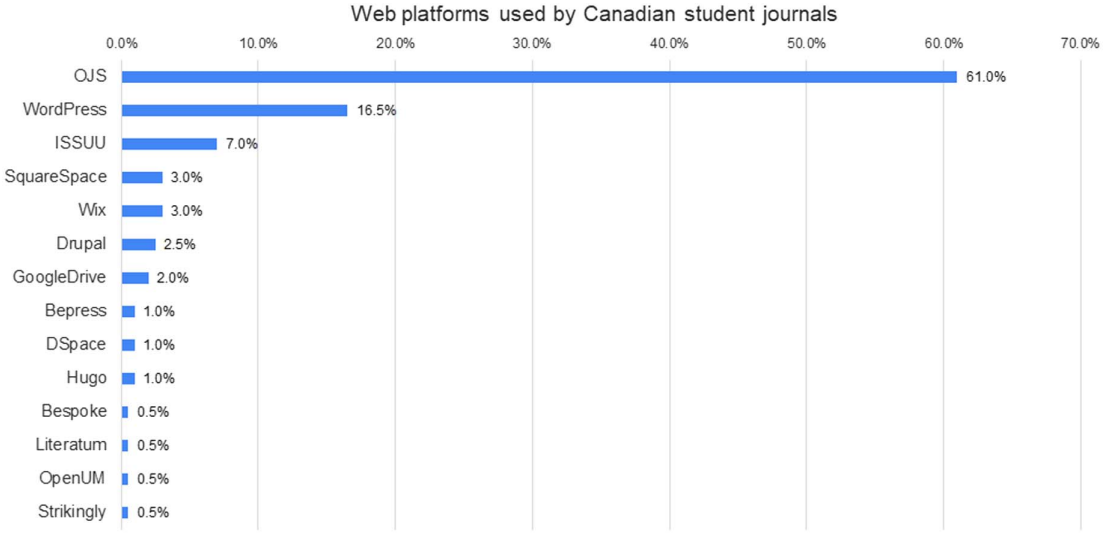

Figure 2. Web platforms used by Canadian student journals

Publishing platform	Journal count	Substantial indexing, count	Limited indexing, count	Not indexed, count	Substantial indexing, %	Limited indexing, %	Not indexed, %
OJS	122	118	2	2	96.7%	1.6%	1.6%
WordPress	33	4	10	19	12.1%	30.3%	57.6%
Issuu	14	0	0	14	0.0%	0.0%	100.0%
Squarespace	6	0	0	6	0.0%	0.0%	100.0%
Wix	6	0	0	6	0.0%	0.0%	100.0%
Drupal	5	1	3	1	20.0%	60.0%	20.0%
Google Drive	4	0	0	4	0.0%	0.0%	100.0%
Bepress	2	2	0	0	100.0%	0.0%	0.0%
DSpace	2	1	1	0	50.0%	50.0%	0.0%
Hugo	2	0	0	2	0.0%	0.0%	100.0%
Bespoke	1	1	0	0	100.0%	0.0%	0.0%
Literatum	1	1	0	0	100.0%	0.0%	0.0%
OpenUM	1	1	0	0	100.0%	0.0%	0.0%
Strikingly	1	1	0	0	100.0%	0.0%	0.0%

Table 1. GS indexing of Canadian student journals by platform, total counts, and percentages

Figure 3 highlights GS indexing of content from platforms used by at least four Canadian student journals. The data in Table 1 and Figure 3 indicate that journals using OJS have consistently high GS indexing counts, whereas platforms such as Issuu, Squarespace, Wix, and Google Drive are consistently not indexed.

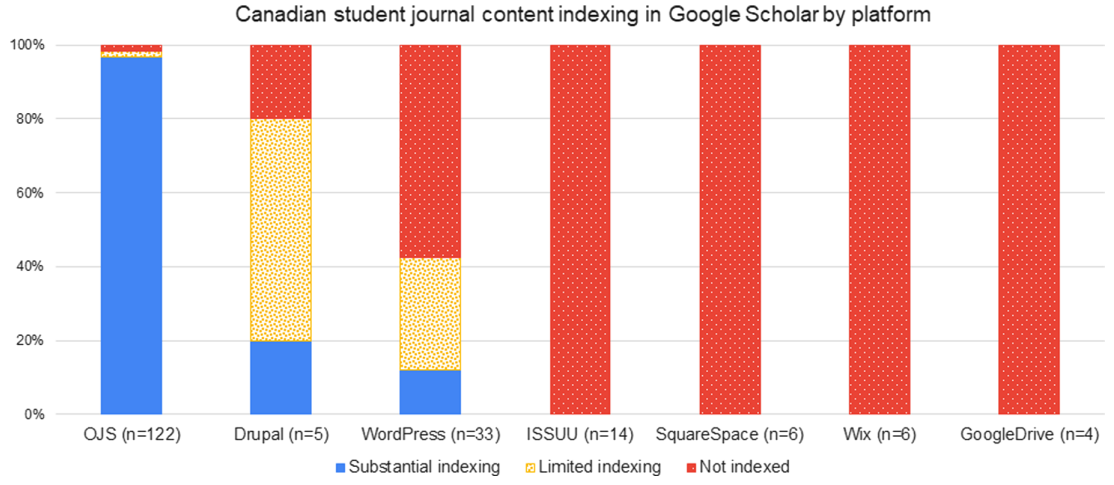

Figure 3. GS indexing of the top seven publishing platforms used by Canadian student journals

However, it is worth noting that, even with its high indexing rates, some OJS journals were still not in GS, as evidenced by the combined 3.2% ($n = 4$) of limited and not-indexed results for OJS journals. Unfortunately, the limited representation of other dedicated journal publishing platforms such as Bepress ($n = 2$) and Literatum ($n = 1$) hinders drawing conclusive observations.

Student editor survey results and follow-up interviews

Publishing practices and potential indexing barriers. When outlining their publishing practices, 34% ($n = 14$) of surveyed journals that publish original research articles ($n = 40$) reported performing peer review on all of their content, and 32% ($n = 13$) reported performing peer review on some of their content. The remaining 34% ($n = 14$) rely solely on editorial review. Considering how prevalent peer review is as an index inclusion criterion, the data support the reality of peer review being a potentially challenging criterion for many student journals to meet.

Approximately 13% ($n = 6$) of survey respondents admitted to having an irregular publication schedule and delays or gaps in issue publication. Such irregularities would make it difficult for some journals to meet regular content delivery timelines set out by some of the indexes.

Finally, 60% ($n = 28$) of survey respondents confirmed that they do not have a publisher or an institutional entity acting in this role, which may present a challenge in applying to indexes that require a publisher-initiated application.

Editors' views on discoverability. Survey respondents ($n = 47$) identified the following as the top five discoverability strategies (Table 2) based on the combined importance ratings ("Absolutely essential" and "Very important"):

- Make content openly available online on the journal's website ($n = 44$);
- Promote journal content via word of mouth ($n = 38$);
- Provide each article with standardized description (title, author, abstract, keywords, etc.; $n = 32$);
- Have the journal included in the institution's library catalog ($n = 31$);
- Send targeted journal promotion to specific reader groups in the department/institution/professional community ($n = 28$).

In contrast, discoverability via indexes, databases, and search engines received lower ranking, with most responses indicating it as "Somewhat important" or "Not important."

Discoverability strategy	Absolutely essential	Very important	Somewhat important	Not important	Unsure
Make content openly available online on the journal's website	41	3	3	0	0
Provide each article with standardized description (title, author, abstract, keywords, etc.)	23	9	8	4	3
Promote journal content via word of mouth	22	16	9	0	0
Have the journal included in the institution's library catalog	17	14	10	2	4
Obtain and display journal's ISSN (International Standard Serial Number)	17	7	9	7	7
Provide each article with a DOI (Digital Object Identifier)	16	7	7	9	8
Send targeted journal promotion to specific reader groups in the department/ institution/professional community	14	14	14	4	1
Distribute print copies of the journal	10	7	9	20	1
Have journal content appear in general search engines such as Google, Bing, etc.	8	14	18	4	3
Have journal content appear in scholarly search engines, such as GS	8	14	15	6	4
Include journal content in scholarly indexes, directories, or databases	6	15	12	8	6

Table 2. Importance of journal discoverability strategies, count of Likert scale survey responses

It is worth noting that, in follow-up interviews, several respondents referred to indexes and databases as "library indexes," possibly due to students typically accessing them through a library website. This suggests a potential confusion between inclusion in the library catalog (which ranked higher) and inclusion in indexes and databases. However, overall, the follow-up interviews confirmed that indexing was of lower priority to student journal editors.

There were no significant differences in distribution strategy ranking between graduate and undergraduate-led student journals, except for the following four strategies, in which "Absolutely essential" and "Very important" responses were combined for analysis:

- More undergraduate journals prioritized sending targeted promotion in the department/institution/professional community (71% [$n = 17$] of undergraduates vs. 45% [$n = 9$] of graduates; Figure 4) and distributing print copies of the journal (50% [$n = 12$] of undergraduates vs. 25% [$n = 5$] of graduates; Figure 5);

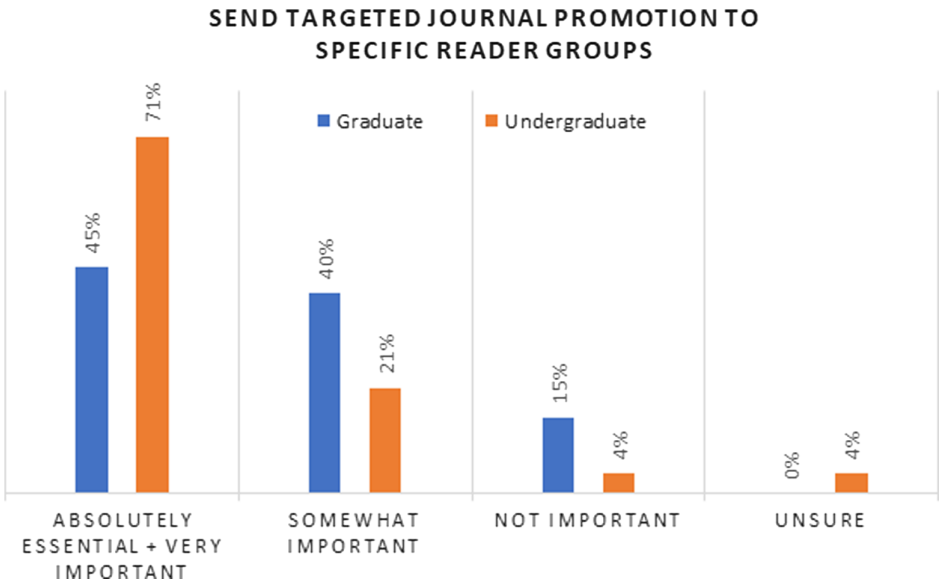

Figure 4. Ranking of "Send targeted journal promotion to specific reader groups in the department/institution/professional community" by graduate versus undergraduate-led journals

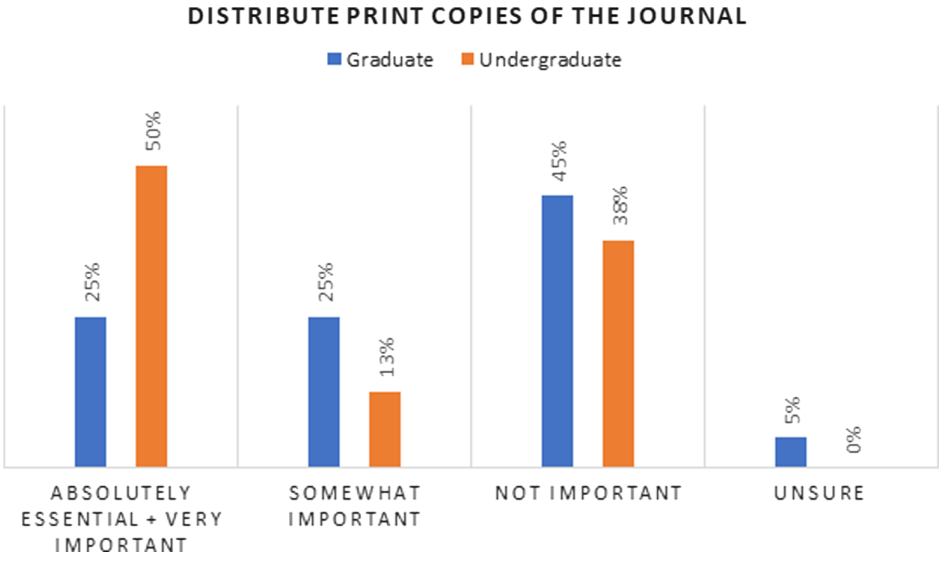

Figure 5. Ranking of "Distribute print copies of the journal" by graduate versus undergraduate-led journals

- More graduate journals prioritized content inclusion in scholarly indexes and databases (65% [$n = 13$] of graduates vs. 29% [$n = 7$] of undergraduates; Figure 6) and in scholarly search engines such as GS (70% [$n = 14$] of graduates vs. 29%

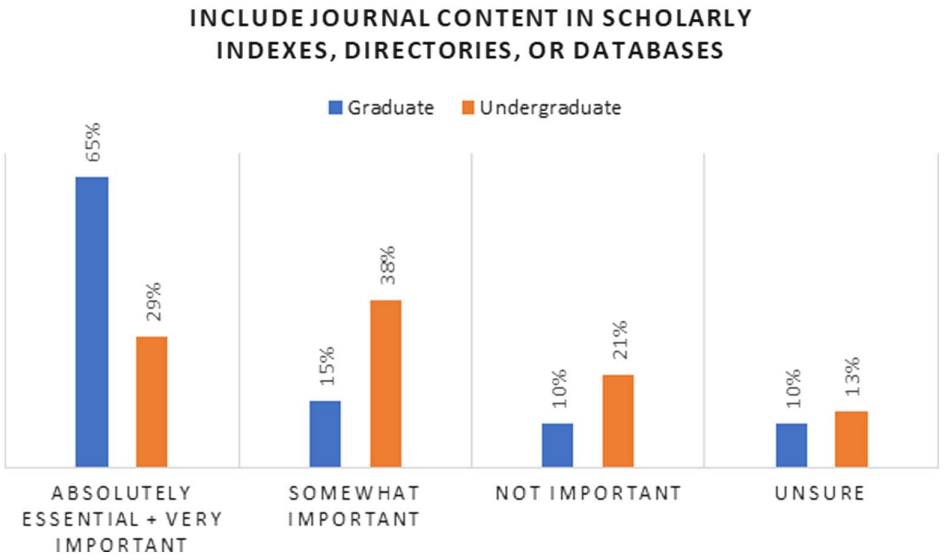

Figure 6. Ranking of "Include journal content in scholarly indexes, directories, or databases" by graduate versus undergraduate-led journals

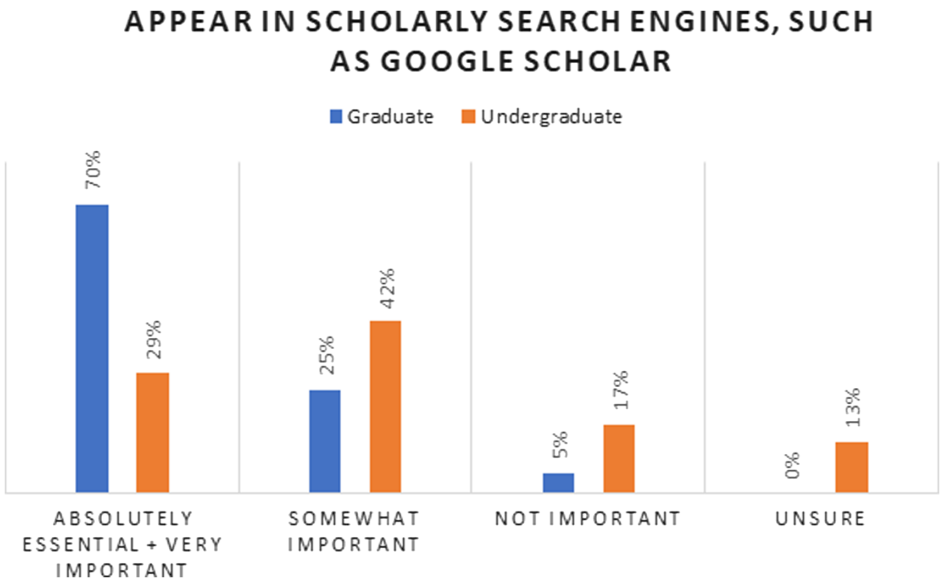

Figure 7. Ranking of "Have journal content appear in scholarly search engines, such as Google Scholar" by graduate versus undergraduate-led journals

[$n = 7$] of undergraduates; Figure 7). The difference between the two groups was less pronounced when it came to general search engine indexing, e.g., Google, Bing, etc. (45% [$n = 9$] for graduates and 50% [$n = 12$] for undergraduates).

Discipline-based differences in distribution strategy ranking were not as pronounced. An interesting observation here is that law journals' high ranking of database and search engine inclusion strategies (Figures 8 and 9) corresponds to law journals' high indexing rate (12 out of 15 Canadian student law journals are in HeinOnline), as reflected in Figure 1. Law journal-specific considerations are further elaborated on in the Discussion section.

None of the survey respondents were indexed in Scopus or WoS, which would explain why measuring journal impact via index-supplied metrics received zero responses. Overall, a slight majority of respondents (56%, $n = 30$) indicated that they did not have a benchmark for measuring their journal's impact (Figure 10).

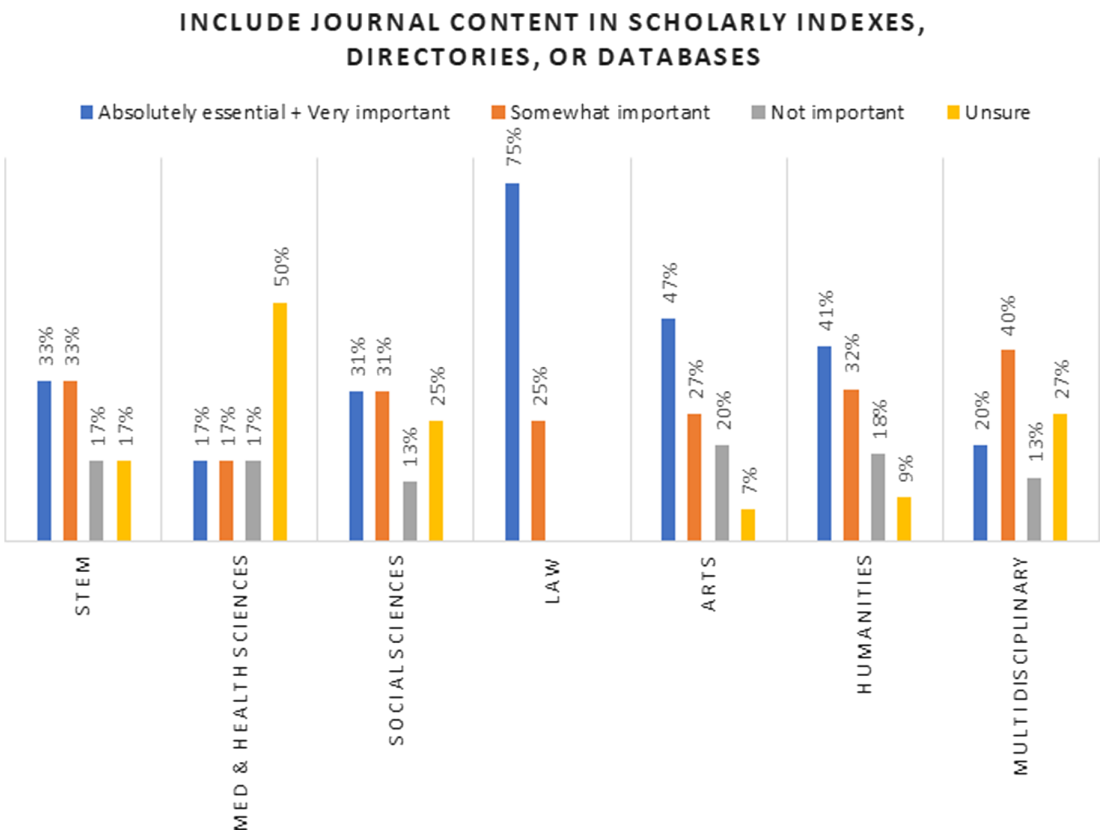

Figure 8. Ranking of "Include journal content in scholarly indexes, directories, or databases" by discipline

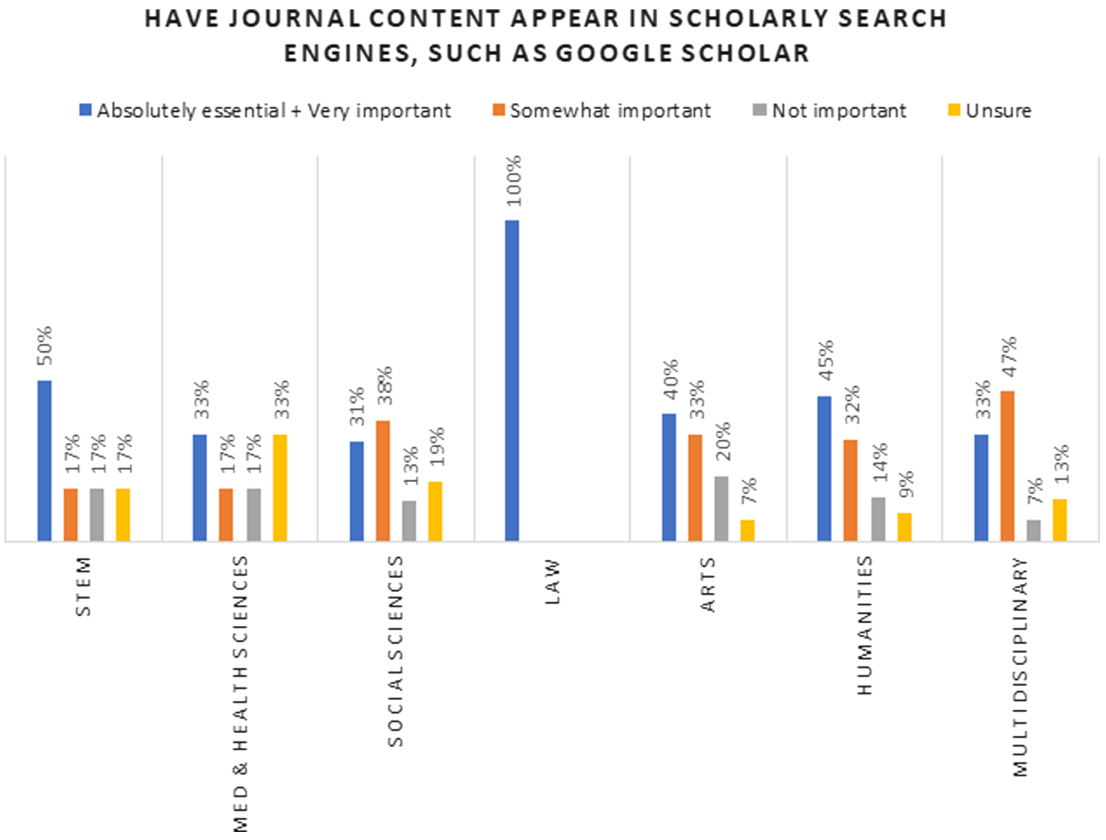

Figure 9. Ranking of "Have journal content appear in scholarly search engines, such as Google Scholar" by discipline

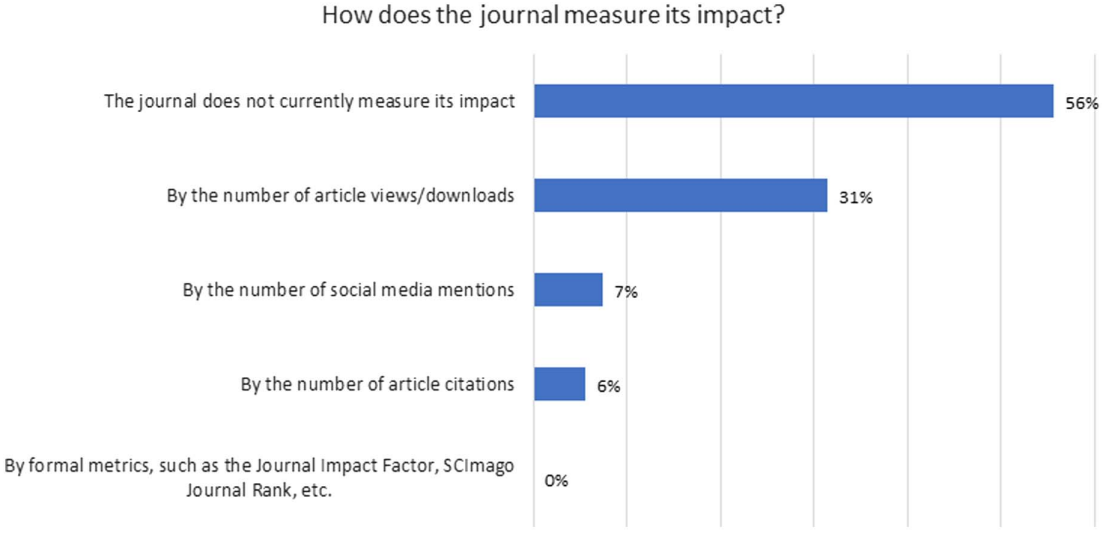

Figure 10. Responses to "How does the journal measure its impact?" (percentage of total responses)

Qualitative responses to the question of "how readers and potential authors usually find out about the journal" revealed the following top five channels, listed from the most to least frequently mentioned:

- Journal's social media presence and promotion;
- Targeted emails within the department, university, and professional channels
- Word of mouth;
- Departmental promotion of the journal via social media and other channels;
- Journal's website.

Most respondents expressed interest in their journal being included in scholarly indexes and databases. Many felt that the quality of their publication and rigor of their peer review process was comparable with, if not better than, that of professional academic journals, whereas others pointed out the importance of identifying the work as coming from students:

> "Yes, I would like the journal to be included in scholarly indexes and databases to not only increase discoverability of the journal, but also provide legitimacy for graduate work and inclusion of graduate student work in the scholarly discourse." (a graduate journal)

> "It may be important though, to make it transparent in search results that the content is coming from a student journal, since the scope of student work may be more narrow than graduate or higher level work." (an undergraduate journal)

Student editors who have gone through an indexing application shared the following about their experiences:

> "Getting into DOAJ really helped with attracting submissions beyond [the university]; we have seen an increase in submissions from across Canada and the US, and even a few international submissions." (an undergraduate journal)

> "It was often complex and a little bit tedious to be included in those databases, and being a completely volunteered team, it is kind of difficult to find the time and resources to do those kind of follow-ups." (a graduate journal)

> "Throughout our 1 year tenure, we have not faced any substantial difficulties in working with the scholarly indexes or databases. Often, it is automatic. At times, they will reach out requesting that a backlog of articles be shared in a different format

> which we are happy to provide. None of the requests have been overly cumbersome." (an undergraduate journal)

Self-perception and indexing challenges. Follow-up interviews with seven of the survey respondents demonstrated a range of perceived attitudes regarding the quality of their journal:

> "Our articles are, I think, of quite high quality, with important work on each of the articles, and rigorous peer review, and it would be important to make it more known." (a graduate journal)

> "The early-stage nature of undergraduate research does not seem to justify inclusion in a large database like PubMed which is expected to house professional research articles. We have discussed the need for perhaps a database focused on the results of undergraduate research studies." (an undergraduate journal)

The editors highlighted several challenges with undertaking an indexing application, including limited understanding of the process, complicated requirements, lack of time and capacity, and general doubts about the value of inclusion that would warrant prioritizing this work:

> "I really don't know anything about indexing, and I feel like that was never really taught to me or anyone else that I'm working with." (an undergraduate journal)

> "I think one of the biggest challenges for us is having the time to do these tasks. We're not professionals, everything we do is on our own time while we're also trying to get our own coursework, research, and everything else done at the same time." (a graduate journal)

Institutional support

The primary support from their institutions, as identified by survey respondents, came in the form of funding from the departments or student associations, as well as software (usually OJS) hosting and consultations from the library. Only about half of the survey respondents had a faculty member directly involved with the journal, and most who did were acting in a general advisory board capacity. The journals that did have direct faculty or departmental involvement outlined its benefit for editor training, strategic guidance, and continuity during editorial team turnovers.

DISCUSSION

Index inclusion barriers

Although the indexes vary greatly in their inclusion criteria and application processes, most have some requirements such as English metadata and prior citedness in the index that would present a challenge not only to student journals but also to new, niche, unaffiliated, underfunded, and non-English-language journals.

Requirements such as peer review and low endogeny rates are not unreasonable and are likely expected by index users but, in the student journal context, may present inclusion barriers. Only 66% ($n = 27$) of student journals that publish original research articles reported performing peer review on some or all of their content, thereby making the rest ineligible to apply for indexing. Managing a peer review process and recruiting and training reviewers is a frequent topic of discussion at the annual Student Journal Forum (Maistrovskaya et al., 2023), demonstrating the effort required from editors to figure these tasks out on their own.

DOAJ's under 25% endogeny requirement may be particularly challenging for student journals that view publication opportunity as a perk to offer editors and reviewers in the absence of remuneration. Journals may also hesitate to lose 25% or more of their content to meet this requirement.

Further barriers may come from the complex application process and a long, multistep review (up to 1 year for Scopus and Medline) that may exceed editorial team's term. Content delivery timelines expected by some of the indexes may also be affected by gaps and irregularities in publication often caused by editorial team turnover. Additionally, a requirement for a publisher-initiated application (WoS and Medline) would be a challenge for student journals that do not have a publisher or an institutional entity acting in this role, which constitutes 60% ($n = 28$) of respondents.

Search engine inclusion barriers

Only 15% ($n = 30$) of Canadian student journals are included in at least one of the seven indexes (Figure 1), whereas 74% ($n = 146$) of open-access journals have their content indexed, fully or partially, by GS (Table 1). Survey respondents generally ranked search engine indexing higher on the list of discoverability strategies compared with the academic indexes.

Although this makes GS the most accessible and known of the aforementioned channels, it is essential to recognize that GS indexing is machine-enabled, contrasting with the

human-managed application and quality assurance process used by the other indexes. Some platforms such as OJS have an advantage owing to the out-of-the box GS indexing support. Generic Web platforms such as Drupal, WordPress, Squarespace, and Wix may have themes, techniques, or add-ons that can facilitate better indexing, but the mixed indexing results (Table 1) suggest that these features are either not available out of the box or may require additional knowledge or effort on editors' behalf, thereby creating a barrier to easy indexing.

This means that student journals that have chosen poorly indexable platforms may find themselves at a disadvantage that they may not be aware of. This is particularly evident in case of Issuu, a popular publishing platform used by 7% ($n = 14$) of Canadian student journals. Issuu offers an attractive portable document format (PDF) viewer that mimics leafing through a printed issue but, unfortunately, renders PDFs as images, thereby hindering search engine indexing.

Considering the high priority assigned by editors to making content openly available online, there needs to be more awareness of the impact of publishing platform selection on discoverability and search engine indexing.

Providing standardized quality metadata was ranked as the second top discoverability strategy in the survey, but, just like open-access publishing, it does not automatically translate to better discoverability. For journals publishing on generic Web platforms rather than dedicated publishing platforms, metadata are often added in a way that is human-readable rather than machine-readable, hindering automatic indexing capabilities.

Editors' views on discoverability

Self-perception. Editors' responses highlighted a difference between graduate and undergraduate student journals in their self-perception to belonging in academic indexes.

Graduate editors were more confident in the quality of their publications and rigor of their peer review and believed they would belong in academic indexes. Undergraduate editors, on the other hand, viewed their journals primarily as a valuable learning experience for student authors and editors and questioned their eligibility for inclusion in indexes meant for "real academic journals." Those who wanted to be indexed preferred for it to be in undergraduate-specific indexes or with a clear label indicating student authorship.

Another common source of doubt came from recently founded journals, who believed that they were "not there yet." Although many indexes have a minimum length of publication of 1 to 2 years prior to application, the length of publication alone does not determine quality or

indexing readiness. It is possible that this concern speaks more to editors' lack of capacity to undertake an indexing project early on in their term.

Reaching the audience. Most editors named social media, targeted campus promotion, and word of mouth as the main channels through which readers and potential authors usually find out about the journal. Interestingly, graduate journals placed more emphasis on indexing inclusion than undergraduates who prioritized promotion within their campus communities.

Understandably, student journals prioritize the channels where they expect their audience to be, and academic indexes may not be immediately perceived as such channels. This is reflected in a comment from an editor who chose not to index their journal: "Our aim is to publish content that reflects the identities of the campus community and serve as a public forum for community expression. The board has not expressed interest in being included in scholarly indexes."

However, some respondents acknowledged the lack of data on how the journal is discovered or experienced an increased interest after posting a call for paper in an international forum or after gaining acceptance into indexes such as the DOAJ. This absence of clear feedback from distribution channels or benchmarking for measuring journal impact may make it difficult to anticipate the benefits of indexing inclusion or justify the effort required for indexing applications.

Journals' versus authors' priorities. Editors in certain disciplines recognized that potential authors may be expected or incentivized to select journals that appear in specific indexes. At the same time, editors admitted that this desire might not translate to journal's priority to get indexed because student journal editors focus more on the pedagogical benefits of the publication process: "One of our important goals is to offer a pedagogic experience of publication. We have a lot of exchanges with the authors to work on the text. It's more than other non-student journals do. […] It's not that important for us to put the journal front and center, but I think it would really benefit the articles and the authors to have more of this visibility. […] Maybe that's why we haven't thought about it that much."

Indexing benefits and concerns. Overall, most respondents expressed their interest in being indexed, seeing it as a way to improve recognizability, add legitimacy to student work, improve findability by audiences beyond authors' research networks, and increase submissions. On the other hand, respondents raised capacity concerns, as expressed by one of the editors: "If we start getting too much notice, and then a ton of submissions, and then we grow even more rapidly—we can't support that. We don't have resources for that at all." Although these

concerns are valid, having an established journal impact measurement strategy might help balance them against the benefits that increased exposure via indexing might bring.

Lack of comfort and capacity. Lack of comfort and knowledge regarding the indexing process, the effort needed to understand complex requirements, and limited time and capacity to undertake such a significant project were among the barriers often mentioned by student editors. Combined with the uncertainty regarding the benefits of inclusion and self-perception of not belonging in academic indexes, it is not surprising that many student editors find it challenging to prioritize indexing efforts. Editorial team turnover and periods of hiatus that were mentioned by a number of respondents may further exacerbate editors' ability to develop capacity, complete long-term indexing projects, and maintain consistent online presence.

Law journals. Throughout the literature review, indexing queries, and survey, law journals stood out as a distinct category. In their survey responses, law journal editors consistently rated indexing and search engine inclusion higher than the other journals on their list of discoverability strategies. This aligns with their comparatively high indexing rates; 12 out of 15 Canadian student law journals are in HeinOnline, and 2 out of 3 Scopus-indexed and 4 out of 11 WoS-indexed Canadian journals are law journals.

Law journals often have a long history and strong departmental and institutional support, resembling professional journals despite being student-run. One factor that might make them more attractive for indexes is their focus on publishing work beyond student submissions, unlike many other student journals that prioritize the educational experience and mentorship for student authors. Only a small percentage of survey respondents (13%, $n = 6$) accepted non-student work. Further investigation into the publishing practices of student law journals would provide valuable insights into their success strategies.

Support for discoverability of student journals. Most editors expressed interest in clear step-by-step index application instructions, either in the form of comprehensive guides or training videos. It is worth noting that some of the requested guides already exist but might not be well-known, such as, e.g., DOAJ Application Guide for OJS Journals (Public Knowledge Project, n.d.). Therefore, connecting editors with existing resources would be just as important as creating new ones.

The second most popular request was for dedicated staff to handle discoverability-related activities, including indexing. About half of the respondents currently have no one on the team dedicated to these tasks or have them fall to the Editor in Chief. Although not all libraries are able to offer indexing support to student journals, those that do should advertise it

proactively because many respondents did not recognize libraries as service providers beyond OJS hosting and technical assistance.

Finally, some editors expressed how much they would benefit from mentorship to enhance their understanding of academic indexing and discoverability. Faculty advisors with editorial experience would be ideal mentors, but very few journals had such connections. It is possible that, just like with library support, student editors might not have access to or be aware of mentorship, professional development and networking opportunities, such as, e.g., the annual Canadian Student Journal Forum (Maistrovskaya et al., 2023). Promoting existing opportunities and creating new connections would go a long way to build a sustainable network of support for student journals.

CONCLUSION

Student journal editors invest substantial effort in their publications; however, the lack of discoverability puts their content at risk of being invisible to readers and potential authors. Most editors prioritize campus channels, social media, and word of mouth for promotion and focus less on the opportunities presented by academic indexes and search engines.

Although most of the analyzed academic indexes have requirements that may present barriers for student-led journals, those barriers are not aimed at student journals specifically. The main difference for student journals is the lack of expertise and resources to build understanding of different discoverability channels and to navigate the indexing application processes. Consequently, many editors do not feel like they have a good grasp of what academic indexes do, how they could benefit the journal, and how to get the indexing process started.

Journals relying on automatic search engine indexing for exposure would benefit from better awareness of how their choice of publishing platform impacts this indexing process. OJS serves as an example of a highly GS-indexed platform compared with generic sites such as WordPress, Squarespace, etc.

Although many Canadian libraries offer support to student-run journals beyond publishing software hosting (Library Publishing Coalition, 2023), student editors rarely perceive them as partners in improving discoverability. Many editors expressed interest in guides, instruction, and expertise sharing that is already available (and sometimes explicitly offered as a service) via their libraries. Establishing regular outreach, building relationships, and providing continuity assistance during editorial team transitions would enable student editors to better use various discoverability opportunities and supports.

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APPENDIX A.
Index representative interview questions

1. What is your general familiarity with student-run academic journals?
    a. *Prompt:* What do you think about them?
2. Does your index include any student-run journals?
3. Would you say your index's current inclusion criteria allow student journals to apply? Why or why not?
    a. *Prompt*: If you received an application from a student journal, would it be rejected outright, or would it still be put through evaluation?
4. Do you often receive student journal applications?
5. Which of your index's inclusion requirements do you think would be the most difficult for student journal to meet?
6. Would you like to see student journals included in your index? Why or why not?
    a. *Prompt:* What would a successful student journal application look like?
7. Any final thoughts on indexing of student journals?

APPENDIX B.
Student editor survey questions

First, tell us about your journal.

1. *Journal title *[open-ended]*
2. *An institution(s) with which the journal is primarily affiliated *[open-ended]*
3. *The journal is led primarily by: *[multiple choice]*
   - □ Undergraduate students
   - □ Graduate students
   - □ Faculty
   - □ Other (Specify)
4. *The journal publishes primarily the work of: *[single choice]*
   - ○ Students from the department(s)/unit(s) with which the journal is affiliated
   - ○ Students from the institution(s) with which the journal is affiliated
   - ○ Students from anywhere
   - ○ Anyone from anywhere
   - ○ Other (Specify)
5. The journal publishes primarily in the subject area of: *[multiple choice]*
   - □ STEM (Science, Technology, Engineering, Math)
   - □ Medicine
   - □ Social Sciences
   - □ Law
   - □ Arts
   - □ Humanities
   - □ Multidisciplinary
   - □ Other (Specify)
6. The journal's publisher is… *[single choice]*
   (Description: A publisher is defined as an organization or a group of people that makes and implements decisions about journal's operations and policies, such as: format and frequency of publication, budget, who can submit to the journal, what type of review will be performed, etc.)
   - ○ A department(s) with which the journal is affiliated
   - ○ A student union(s) with which the journal is affiliated
   - ○ An institution(s) with which the journal is affiliated

- ○ A scholarly society
- ○ An editorial team of the journal
- ○ Unsure
- ○ Other (Specify)

7. What kind of content does the journal publish? *[multiple choice]*
   - □ Original research articles (present results of new research based on primary sources)
   - □ Review articles (summarize the current state of research on a given topic based on secondary sources/literature)
   - □ Book reviews
   - □ Conference papers
   - □ Editorials/opinion pieces
   - □ Commentaries/discussions
   - □ Case studies
   - □ Editorials
   - □ Creative work
   - □ Other (Specify)
8. What kind of review of incoming submissions does the journal perform? *[single choice]*
   - ○ Editorial review (done by members of the editorial team)
   - ○ Peer review (done by reviewers not affiliated with the journal)
   - ○ Editorial review for some submission types and peer review for others
   - ○ Other (Specify)
9. Journal's publication schedule is*: [single choice]*
   - ○ Regular (same number of issues every year)
   - ○ Irregular (variable number of issues every year; issues may be delayed)
   - ○ Rolling (articles are published as they are ready)
   - ○ Other (specify)

Now, let's talk about discoverability and impact.

10. How does the journal measure its impact? *[multiple choice](Description: Impact is understood as the influence the journal has in academic, scholarly, or university research circles.)*
    - □ By the number of article views/downloads
    - □ By the number of article citations

- ☐ By the number of social media mentions
- ☐ By formal metrics, such as the Journal Impact Factor, SCImago Journal Rank, etc.
- ☐ The journal does not currently measure its impact
- ☐ Other (Specify)

11. How do readers and potential authors usually find out about the journal? *[open-ended]*
12. How important are the following strategies for your journal's discoverability? *[matrix] (Description: Discoverability is understood as the result of promotional strategies that help readers find journal content that meets their interests and helps potential authors identify the journal as a possible place of publication.)*

	Absolutely essential	*Very important*	*Somewhat important*	*Not important*	*Unsure*
Make content openly available online on the journal's website					
Promote journal publications on social media, such as Twitter, Facebook, LinkedIn, etc.					
Have journal content appear in general search engines such as Google, Bing, etc.					
Have journal content appear in scholarly search engines, such as Google Scholar					
Include journal content in scholarly indexes, directories, or databases					
Send targeted journal promotion to specific reader groups in the department/institution /professional community					
Have the journal included in the institution's library catalog					
Distribute print copies of the journal					
Promote journal content via word of mouth					
Provide each article with standardized description (title, author, abstract, keywords, etc.)					
Obtain and display journal's ISSN (International Standard Serial Number)					
Provide each article with a DOI (Digital Object Identifier)					
Other (Specify)					

13. Which of the following indexes/databases/search engines is the journal included in? *[matrix]*

	Currently included	*Not currently included*	*In the process of inclusion*	*Unsure*
Directory of Open Access Journals (DOAJ)				
Scopus				
Web of Science				
ProQuest				
PubMed (incl. Medline of PubMedCentral)				
Coalition Publica/Érudit				
HeinOnline				
Google				
Google Scholar				
Other (Specify)				

14. If the journal is included in any scholarly indexes or databases, please say a few words about your experience with the inclusion process and/or with using the index *[open-ended]*
15. Would the journal like to be included in scholarly indexes and databases? Why or why not? *[open-ended]*

Finally, let's talk about supports available to the journal

16. Is there anyone on the editorial team responsible for the journal's discoverability and content promotion? If so, describe the title and responsibilities of this individual(s). *[open-ended]*
17. If a faculty member(s) is affiliated with the journal, what role do they play? *[open-ended]*
18. If the journal receives support from the institution it is affiliated with, outline the kind of support the journal receives or knows exists *[open-ended]*

(Description: This may include support from the affiliated department(s), student unions, or the library; support may be financial, in-kind, consultative, etc.)

19. What kind of support would help the journal make its content more discoverable? *[open-ended]*
20. Is there anything else you would like to share? *[open-ended]*

APPENDIX C.
Student editor interview questions

Introductory questions:

1. Could you tell me briefly about your journal?
    a. *Prompts*: What kind of content do you publish, how long have you been in operation?
2. How has your experience been so far, being a journal editor?
    a. *Prompts*: What challenges have you encountered, what have you found surprising, how do you feel about the amount of work?

Discoverability questions:

3. What does it mean to you for the journal to be discoverable?
    a. *Prompt*: What strategies do you use to increase visibility, to promote journal content?
    b. *Prompt*: How/where do people usually find journal's content?
4. Are you familiar with indexes and aggregators, such as Web of Science, Scopus, Directory of Open Access Journals etc. and what do you think about them?
    a. *Prompt*: What do you think they could offer to a journal like yours?
    b. *Prompt*: If the journal is currently included, how do you feel that impacts the discoverability?
5. Would you be interested in having the journal included in any of them? Why or why not?
    a. *Prompt*: Do you feel there are challenges or barriers to inclusion for a journal like yours?
    b. *Prompt*: If the journal previously applied for inclusion, what was your experience with the process?
6. In an ideal world, blue sky picture, how would you like for your journal and its content to be discoverable?
    a. *Prompt*: What do you think would prevent you from achieving that?
7. Any final thoughts in discoverability and indexing?