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Research Article

Transparency and Openness in High Impact Scientific Publishing: Development of Web-based Assessment Tool (TOSP Index)

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Abstract: *Scientific publications often refer to tackling real-world problems. In the context of social sciences, a scientific publication explains a phenomenon and provides contributing factors that need attention. However, the contributors of this scientific publication, the academicians, lecturers, or professors, often have significant issues in publishing their research papers in reputable journals. The literature has confirmed that one of the proven and significant issues is the author's transparency and openness in writing. To this end, this project developed a web-based self-assessment tool to allow authors to feasibly evaluate their transparency and openness in publishing scientific articles. In total, 8 important constructs were determined and empirically proven to have a significant influence on transparency and openness through surveys with more than 300 authors. This tool would calculate the total score and provide meaningful suggestions to authors to increase their chances of getting their articles published in a reputable journal, boost citation index, and improve global visibility. .*



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1. INTRODUCTION

Scientific publications are important to society in providing and extending knowledge to solve real-world issues and problems. Scientific publications are often referred to by other academicians, practitioners, and policy makers to solve important business-related issues and problems and make

key decisions. In order to make high-impact decisions, empirical evidence was needed to support the decision to lower the risks and gain trust, clarity, and funding. The global push toward transparency and openness in scientific research has embedded open science practices as routine norms in many STEM (Science, Technology, Engineering, and Mathematics) fields, where they demonstrably enhance research integrity, reproducibility, and international collaboration (Nosek et al., 2015). By contrast, the adoption of TOSP remains uneven in the social sciences (Miguel et al., 2014; Nosek et al., 2015). This disparity is likely emphasised in Malaysia, where institutional support, funding mechanisms, and awareness of open practices are still developing. Social science research also brings distinct methodological, ethical, and contextual constraints such as sensitive data, small or non-replicable samples, and community-specific contexts, which complicate straightforward adoption of STEM-centric transparency norms (Ferguson et al., 2023; Hardwicke et al., 2020). The goal of transparency and openness for researchers is to enhance credibility, boost collaboration, and increase the visibility of research output. Open practices are associated with higher reproducibility, wider data sharing, and in several studies, the practice contributes to greater citation impact (Fecher et al., 2015; Gend & Zuiderwijk, 2023; Martinez, 2021) data, code, and methods are made available, others can verify, reuse, and build upon findings, cumulatively advancing knowledge (Martinez, 2021). Despite these benefits, adoption is not uniform across social science fields and career stages, and differences in training, incentives, and perceived risks may shape it. Social science researchers are scholars who study human society and relationships through qualitative and quantitative methods. Bryman (2016) depicts that social science researchers conduct studies to understand social behaviour, analyse policies and practices and develop theories which involving the discipline such as such as sociology, psychology, economics, and political science.

In social sciences research, authors often study the significant factors that contribute to certain phenomena. By assessing those factors, sectors for improvement can be identified, and appropriate planning can be put in place to address the current phenomenon. There are many reasons behind the rejection; however, important research papers by Razlan et al. (2024) have pinpointed that one of the critical and proven reasons is their transparency and openness towards their writing. Therefore, in the social sciences, these factors are assessed to increase the likelihood of research papers being accepted by reputable journals, improve global visibility, and boost the citation index. Razlan et al. (2024) has confirmed that 8 factors significantly affect the transparency and openness of scientific publishing. These factors are confirmed through an extensive research survey that comprises more than 300 samples, and the data are analysed using rigorous statistical methods to provide reliable, justifiable, and replicable results. However, given that the research by Razlan et al (2024) requires social science researchers to complete questionnaires online, using platforms such as Google Forms, and that the resulting data need to be analysed using SPSS, the process of obtaining the results is quite time-consuming and complicated. Firstly, the samples will never know their actual results; secondly, the samples will never know how they fare in terms of openness and transparency in their writing. Thus, this self-evaluation assessment tool provides quick feedback with scores and graphical results to display their performance. The development of this web-based assessment tool is to systematically evaluate transparency and openness practices among Malaysian social science researchers. The tool will enable large-scale data collection, automated calculation of a Transparency and Openness Index (TOSP Index), and identification of barriers and facilitators influencing the adoption of TOSP.

This tool will assist in data collection to address two research questions:

1. What are Malaysian social science researchers' attitudes toward transparency and openness in scientific publishing?

2. To what extent do Malaysian social science researchers engage in actual transparency and open research practices?

2. LITERATURE REVIEW

TOSP are foundational principles that significantly improve the quality and credibility of research outputs. Transparency and openness have historically been seen as fundamental principles of the scientific culture (Merton, 1973). These principles are intended to validate scientific findings for reproducibility and robustness, thereby increasing public reliability and, consequently, advancing knowledge. The shift of scholarly communication to open science can be considered a natural evolution in response to current issues in the research environment, which have been further worsened by recent crises such as the COVID-19 pandemic. Below are the TOSP attributes that were assessed by the social science researchers using TOSP Index, which are addressed with justifications.

2.1 Sharing and Connecting

The literature consistently demonstrates that sharing and connecting, through practices like open data repositories and collaborative networks, are fundamental drivers TOSP. Razlan et al. (2024) explored how social science researchers navigate transparency and openness in scholarly publishing (TOSP), using qualitative interviews with 20 productive Malaysian-based researchers to find that "sharing and connecting" is one of nine core practices that foster methodological and data transparency, though researchers must balance these with ethical data management. Damian et al. (2022) investigated transparency in cross-national survey research by developing a heuristic model to analyse the factors influencing methodological disclosure, concluding that reliance on secondary publicly available data enhances transparency but requires exhaustive metadata to prevent hidden data limitations. Finally, Schneider (2024) used a cross-sectional survey of 295 researchers across multiple disciplines (natural sciences, social sciences, and humanities) to assess the perceived applicability of open science practices, finding that while sharing is highly valued, a "one-size-fits-all" approach is unsuitable. The study suggested that discipline-specific infrastructures are required to effectively facilitate openness. The literature above shows that sharing and connecting are conceptually recognised as indicators for TOSP if all journal mandates the practice for more robust metadata and toward open practices.

2.2 Data Transparency

Data transparency is a TOSP feature that enables more stakeholders, such as academics, the public, and policymakers, to be involved in the study findings (Milić et al., 2022). Spitschan et al. (2021) added that the availability of open data will enable researchers from institutions that are not well represented. The establishment of processes such as data-sharing agreements is one approach that data transparency can guide and help researchers to adopt more ethical research practices, such as data-sharing. Data sharing is a practice which led the researchers to explain their methods and planned analyses beforehand, providing a clear idea of what they need do for more accountable (Nosek et al., 2015); Munafo et al., 2017). According to Lin et al. (2021), sharing data can make the public more confident in scientific results, especially in fields where data misuse or misinterpretation has been an issue. These benefits lead to easier replication, better and wider access to information and getting more opportunities for global research collaboration.

2.3 Authorship and Publishing

To be open and transparent in scientific publishing, researchers must clearly follow and adhere to the authorship policy in scientific publishing. As highlighted by McNutt et al. (2018), current practice by authors now is not clear or specific contributions, who are responsible for which parts of research

papers that can lead to issues such as insufficient credit and accountability. For these issues, McNutt et al. (2018) recommend that journals should set transparent, clear and consistent standards for authorship, ensuring that each main author, co-author's and all contributors' roles are clearly outlined and justified. This clear guideline authorship will help to reduce issues such as honorary and ghost writing authors, which are arising that threaten the credibility of scientific publishing (Pečkacka-Falkowska & Raj, 2024; Pruschak & Hopp, 2022).

2.4 Open Access Publishing

Open access publishing is an essential part of making scientific publishing more open in academic distribution. The move toward open access promotes research results more accessible to wider audiences, and the benefits from research findings will be equally distributed public across various fields freely (Kodua-Ntim & Fombad, 2020) ; Robinson-Garcia et al., 2020).

2.5 Peer Review

The peer review process is an important part and the basis for the quality of scientific publishing. Jefferson et al. (2002) and Mulligan et al. (2012) highlight that this process helps to protect and enhance the integrity of a published research paper by providing the authors with a structured evaluation, identifying mistakes in the methodological flows, and ensuring that ethical standards are followed to enhance the overall quality of the research process. Today, the growing movement toward open peer review makes the process of academic communication more open which makes the reviewer's names publicly available alongside the open report. It shows that this current open practice contributes to a visible decision-making process to the public (Rooyen et al., 2010; Wang & Tahamtan, 2017).

2.6 Research Collaboration

Research collaboration means the researchers from the same or different disciplines, from the same or across region work together, which creates a culture of knowledge sharing and ensures all the ethical rules are followed (Durante, 2022). Collaboration in research is an indicator for TOSP because it makes the research process transparent, open and clear among the collaborators from different backgrounds and expertise. This openness practice is important to enhance research reproducibility since the team members are sharing data and methods, enabling other researchers to reuse and build on their findings (Gopalakrishna et al., 2022).

2.7 Reproducibility

Reproducibility of research is a way to make research findings more open and transparent so that other researchers are able to reuse the methodology including data and instruments. When researchers report their results, they must also include full details about how they generate the results, including the data sets, methods of analysis and any algorithms that were applied. This practice not only facilitates ensuring that the original findings are valid and correct, but it also leads to other studies reproducing new studies based on the original work.

2.8 Preprint

Due to preprints revolutionizing the communication of scientific publishing and increasing transparency and openness across the academic and public sectors, it is seen as an essential attribute of TOSP. Preprints are the early versions of research papers, which are shared before formal peer review, which intends to allow for quick dissemination of findings, and it was crucial during the crisis of COVID-19 (Chaleplioglou & Koulouris, 2023; Fraser et al., 2021). Additionally, preprints are evidenced in increasing visibility, access to information and promoting inclusivity as highlighted by Fraser et al.

(2021) and Sever et al. (2019), which lead to higher citation rates and facilitating immediate community feedback, promoting constructive criticism and collaboration (Kirkham et al., 2020; Vale & Hyman, 2016).

3.0 METHOD

The TOSP framework, which is the basis of the TOSP Index have been tested in a pilot study during the actual data collection through an online survey (Google form) with 30 academic researchers at Malaysia's largest public university, and Cronbach's alpha was also tested to evaluate the survey's reliability. In addition, the 8 TOSP attributes from the framework have been confirmed through real data collection with 450 sample size and 217 completed the survey. Thus, the Systems Development Life Cycle (SDLC) framework was used to create the web-based TOSP index to gauge transparency and openness of scientific publishing among social science researchers. This approach ensures a structured, systematic, and replicable software development process. SDLC involves planning, analysis, design, implementation, testing, deployment, and maintenance. Each step was taken to ensure that the tool is reliable, user-friendly, and capable of precisely collecting data from the scholars built using MySQL database.

4. FINDINGS

4.1 System Functionality and User Interface Output

The creation of the web-based Transparency and Open Scientific Publishing (TOSP) Index, which is accessible at <https://tosp.myappx.my/>, is a developed, automated, scalable, and useful evaluation tool for TOSP practices. It was constructed with a MySQL database, which combines the questionnaire administration, real-time data storage, automated scoring, and visualised output generation within a single web environment. The platform is accessible via standard web browsers, enabling efficient large-scale data collection without manual data handling. The web-based Figure 1 shows the main interface of TOSP Index.



Figure 1: TOSP Index Respondents 'Interface Output

Figure 1 displays that the assessment uses Likert-scale items aligned with the open scholarship principles, allowing the scholars to complete the assessment quickly with few technical limitations. This item captures respondents' self-reported engagement with transparent dissemination practices, before journal publication. Each point of practices are rated from Not at all (1) to Great extent (5). The attitudes are rated from Strongly Disagree (1) to Strongly Agree (5). The standardised measurement is ensured across participants through this approach.

TOSP Index's demographic information module is shown in Figure 2, which includes respondents' background characteristics, including gender identity, disciplinary affiliation, age, highest academic qualification, academic position, institutional affiliation, years of research engagement, and publication output over the past five years. Combining the dropdown selections and open-text fields offers both structured data collection and contextual specificity across diverse research profiles. These demographic variables enable meaningful segmentation and comparative analysis of TOSP Index scores across researcher characteristics, enabling nuances transparency and openness practices.

Figure 2: The Demographic Module of TOSP Index

The radar chart (Figure 3) and bar chart (Figure 4) display TOSP group analysis. The visualization show social science researchers scores TOSP in eight areas: Sharing and Connecting, Data Transparency, Authorship and Publishing, Open Access Publishing, Peer Review, Research Collaboration, Reproducibility, and Preprints. The axis shown in Figure 3 is the domain-specific cumulative scores. This layout provides at fast visual comparison of TOSP practices, the strengths and weaknesses. The function that integrates the “Generate Analysis & Suggestions” enhances the usability by linking score patterns to the customised comments has evidence the development capabilities of the assessment tool.

Group Analysis (Total Score)

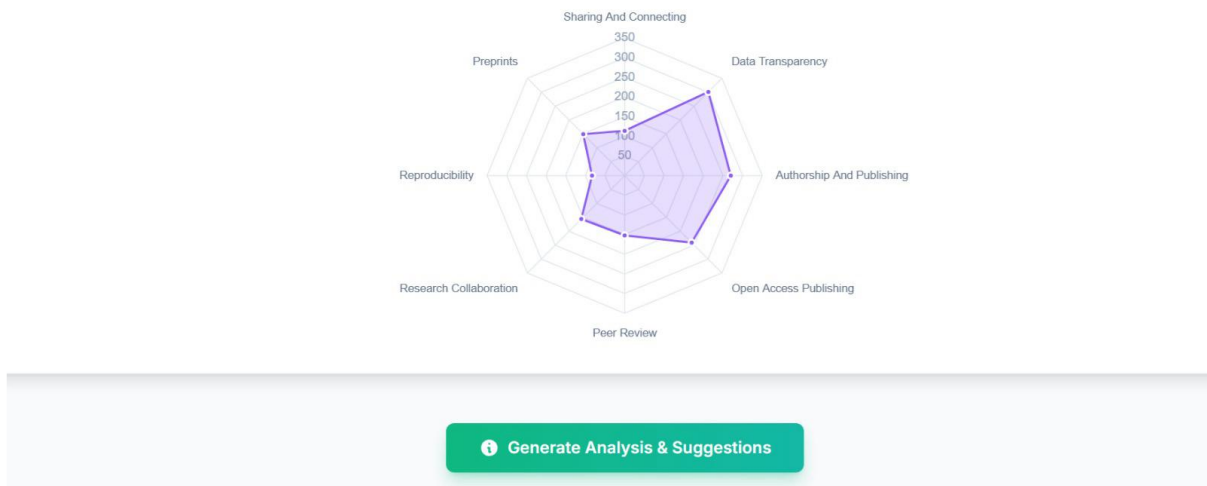


Figure 3: Group Analysis Output of the TOSP Index (Total Score Radar Chart)

Group Analysis (Total Score)

Group 1 | SHARING AND CONNECTING



Figure 4: Group Analysis Output of TOSP Index (Total Score Bar Chart)

5. DISCUSSION AND CONCLUSION

The application of the Transparency and Open Scientific Publishing (TOSP) Index provided a structured and quantitative measure of Malaysian social science researchers' engagement with transparency and openness practices. The tool will support the findings from Razlan et al. (2024), which reveal levels of attitudes and practices toward TOSP principles, by providing in-depth justification and measurement of the adoption score by collecting data using this innovative TOSP index. This pattern aligns with previous studies that highlight the persistent awareness–practice gap in open science adoption (Nosek et al., 2015; Munafò et al., 2017; Razlan et al., 2024). This tool thus helps close the gap between intention and behaviour, advancing Transparent and Open Scientific Publishing (TOSP) in Malaysia and beyond.

The TOSP index facilitates especially early-career researchers or even experienced researchers to systematically evaluate, benchmark and strengthen their scholarly publishing by converting open science standards into a structured framework. This TOSP Index is believed to improve research integrity and confidence in science globally by providing evidence-based evaluation and well-informed policy development, and aligns with global journal requirements that mandate the open scholarship culture.

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