

# How do Scholars Evaluate and Promote Research Outputs? An NTU Case Study

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**Abstract.** Academic scholars have begun to use diverse social media tools to disseminate and evaluate research outputs. Altmetrics, indices based on social media, have emerged in recent years and have received attention from scholars from a variety of research areas. This case study aims to investigate how researchers at Nanyang Technological University (NTU) Singapore promote their research outputs and how they conduct research evaluation. We conducted semi-structured interviews with eighteen NTU researchers. Results from the study show that NTU researchers still prefer traditional metrics such as citation count, the Journal Impact Factor (JIF) and the H-index for their research evaluation. They find these metrics are essential determinants to identify the quality of a research paper. In terms of altmetrics, most NTU researchers interviewed are aware of them, but have not yet used them in research evaluation. Furthermore, we found that the main methods used to promote research outputs are attending academic conferences and publishing papers in journals. However, NTU researchers also embark on using social networking sites to disseminate new findings. The results of this study contribute to the previous literature to help understand how social media and altmetrics are influencing the traditional methods of promoting and evaluating research outputs in academia.

**Keywords:** social media, traditional metrics, altmetrics, research evaluation

## 1 Introduction

Traditionally, scholars use a handful of methods to promote their research outputs including attending academic conference, publishing papers in academic journals, networking with other researchers in research seminars, etc. However, these strategies may not be applicable for all scholars due to time and resource constraints [1]. Social media tools such as blogs, wikis and social networking sites have become increasingly popular in our daily lives, with the main purpose of facilitating communication [2]. Scholars have also realized the benefits of social media and have begun to adopt diverse social media tools [3]. As such, using social media could become an effective strategy for promoting research outputs within or outside academia, regardless of geographical and temporal distance [4].

Furthermore, in the past, research outputs were evaluated by a variety of metrics such as citation counts, Journal Impact Factor (JIF), H-index, etc. These metrics have been used by scholars across different academic disciplines for decades and could be said to be significant indicators of the impact of research works [5]. Some limitations, however still exist, for example, a paper may get its first citation only after a few years of publication [1]. In recent years, owing to the popularity of social media among scholars, altmetrics, indices based on social media, have been emerging in academia [5]. Altmetrics can measure the outreach of research works to a wider audience in a fast and timely manner. However, there are still barriers to using altmetrics in academia, partly due to the concerns about the quality of altmetrics for research evaluation. Several studies have investigated the relationship between traditional metrics and altmetrics [6]. However, how researchers promote their research works and how they use metrics for research evaluation have not yet been investigated using a qualitative approach.

This interview case study seeks to investigate how researchers at Nanyang Technological University (NTU), Singapore, promote research outputs and how they conduct research evaluation. The results from this study could help us understand the extent to which NTU researchers are using social media tools in their professional work and how they perceive the effectiveness of their current methods of promoting and evaluating research outputs. The following two research questions are addressed in this paper:

- **RQ1:** How do NTU researchers promote their research outputs?
- **RQ2:** How do NTU researchers evaluate research outputs?

## 2 Literature Review

Traditionally, on the article level, research evaluation in academia has been conducted by counting the number of citations of published articles [7]. On the journal level, the JIF is a popular research evaluation metric in academia [8]. Citations however only capture the academic audience of research works [9], and the turnover is slow [10]. In addition, the JIF is limited as it cannot be used for inter-disciplinary comparisons [8]. As a complement to traditional metrics, alternative metrics based on social media, often referred to as altmetrics have been emerging which could provide a more holistic approach to evaluating research outputs [11]. Altmetrics could be applied to evaluate research, both on an article level, as well as on a journal level [12].

Diverse social media tools have been used to different extents by scholars in academia [13]. Researchers stay up to date with the latest findings in their fields by reading other researcher's blogs and social media profiles [14]. The usage of social media however varies across academic disciplines [15]. Lack of time [14] and privacy concerns [16] are some hindrances to using social media in academia. Not all researchers use social media in their professional lives, and it seems easier to manipulate altmetrics than it is to manipulate traditional metrics [17]. Moreover, the use of social media and altmetrics is not widely recognized by most research institutions as part of their promotion review process. However, this might change in future, with the increasing use of these new tools in the research workflow, universities' promotion policies are likely to be adjusted accordingly [18]. But although social media and altmetrics are increasingly

being used in academia [13], little is yet known about scholars' strategies to promote their research findings and how scholars perform research evaluation.

### 3 Methodology

To address the research questions, semi-structured interviews were conducted at Nanyang Technological University (NTU) Singapore, to capture the thoughts and perspectives of researchers. In total, 18 NTU researchers were invited for the interviews. The interviews were conducted between March and June in 2017, with a total of 16 interview questions directly asked to discover the behaviors and perceptions of NTU scholars using different metrics in their research evaluation, as well as their methods to promote their research. Participants were recruited via email invitation. Each interview lasted between 10 to 20 minutes. All interviews were recorded with a digital recorder, and then manually transcribed. Participants were mainly from China, Singapore and India. All interviews were held in English. Personal information relating to the interviewees was kept strictly confidential. NVivo 11, a qualitative data analysis software program, was employed for the interview data analysis.

Table 1 summarizes the demographic information of the 18 interview participants. Participants were assigned codes P1 – P18. Of the 18 interviewees, 5 were female and 13 were male. To conduct a comparison analysis, we took steps in the recruitment to ensure that interviewees were from two main academic areas: “hard sciences” comprising sciences, computing and engineering, and “non-hard sciences” comprising humanities, arts, business and social sciences. We also ensured that participants were at two academic career levels (faculty members and non-faculty members).

**Table 1.** Demographics of the interview participants (N = 18).

	<b>Total</b>	<b>%</b>	<b>Participants</b>
<b>Gender</b>			
Female	5	28	P1, P11, P15, P16, P18
Male	13	72	P2, P3, P4, P5, P6, P7, P8, P9, P10, P12, P13, P14, P17
<b>Discipline</b>			
“Hard Sciences” (sciences, computing and engineering)	9	50	P1, P2, P3, P4, P5, P6, P7, P8, P9
“Non-hard Sciences” (humanities, arts, business and social sciences)	9	50	P10, P11, P12, P13, P14, P15, P16, P17, P18
<b>Career Level</b>			
Faculty	6	33	P7, P8, P9, P16, P17, P18
Non-faculty	12	67	P1, P2, P3, P4, P5, P6, P10, P11, P12, P13, P14, P15

## 4 Results

In the following, the interview results pertaining to the two research questions are presented.

### 4.1 RQ1: How do NTU researchers promote their research outputs?

Of the 18 participants interviewed, almost all of them (17) mentioned that they attend academic conferences in their fields, hold presentations and present posters to promote their research outputs. Publishing research findings in journals was regarded as another important venue to promote research by 16 respondents except P12 and P14. One faculty member (P16) stated that “...*present findings in conferences, publish in journals. They are effective in that they are likely to reach the intended audience. My strategy is choosing appropriate journals or conferences...*” Besides, 3 participants (P11, P12 and P18) from non-hard sciences pointed out that networking with other researchers at workshops and research seminars was also an ideal venue to disseminate their research work.

Apart from traditional methods, it should be noted that some researchers used social media in their academic life. Half of the 18 scholars (P1, P2, P3, P4, P8, P10, P12, P15 and P17) said that they participate in academic social networks like ResearchGate and Google Scholar, and they believed that online platforms could be an alternative method for research dissemination, where researchers were able to create their own personal page and update their latest publications. One interviewee (P9) stated “...*at ResearchGate I get regularly updates like who is citing my paper or there is a download request for the full version and they also provide some statistics. Also, Google Scholar is quite nice, then I can directly see who cited you, where it was published, and things like that...*”. For most researchers, Facebook and Twitter are used mainly for private communication with friends and family members. However, one faculty staff (P8) from hard sciences preferred to use social media platforms like Facebook and Twitter to promote research findings. The interviewee was planning to have a Twitter account for students to share tweets about publications to get more attention from the general public. Figure 1 describes the common methods used by the 18 NTU scholars to promote their research outputs.

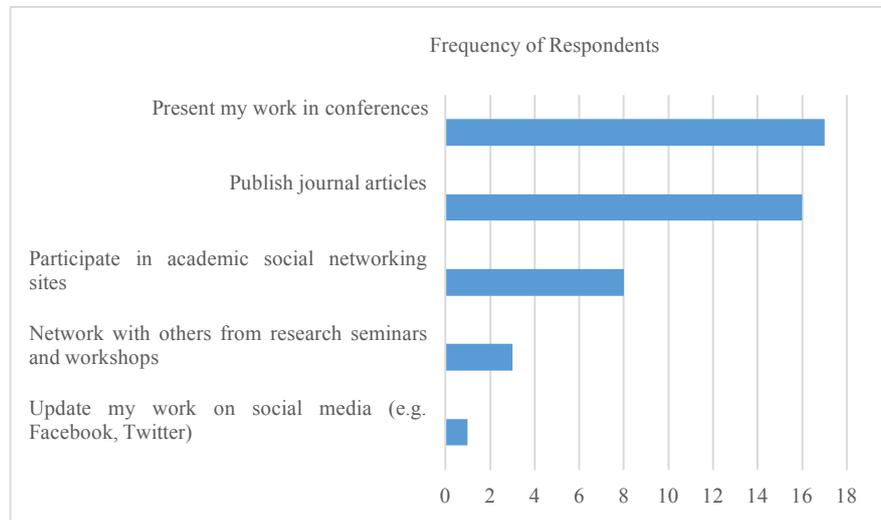


Fig. 1. Strategies to promote research outputs.

#### 4.2 RQ2: How do NTU researchers evaluate research outputs?

The interview results provide insights to understanding which metrics are currently used by NTU scholars to evaluate research works. Based on the interview analysis, all 18 participants agreed with using traditional metrics to evaluate research outputs and they were quite familiar with some of them, especially citation count and the JIF. They believed that these metrics have already been tested by previous scholars and widely used over a long period, and were thus acceptable as a standard way to evaluate research outputs in academia. One interviewee (P1) stated: *“I think the most professional method for research evaluation is using traditional metrics because this is the only way other people will agree with your research works.”* Further, to determine the quality of a research paper, most interviewees (16 out of 18) preferred to check in which journal the research paper was published, the given journal’s impact factor and the ranking of the journal in the relevant discipline. As one researcher (P15) stated: *“Regarding the quality of an article, I would firstly look at the impact factor of the journal, the university or the institute where the researcher is from and the researcher’s previous publications or citations. Mostly based on the traditional metrics.”* Therefore, traditional metrics especially citation count and the JIF were highly accepted and used by NTU researchers, according to the responses of the participants.

However, more than half of the interviewees (10 out of 18) (P4, P6, P8, P9, P11, P12, P13, P14, P15 and P18) still argued that some limitations exist in the traditional ways of evaluating research outputs. For instance, research papers from certain academic fields such as computer science and engineering are likely to get a much higher citation count than those from social sciences. This might be a reason for researchers from certain minor research areas not to consider traditional metrics for research eval-

uation. One scholar (P18) from non-hard science said: *“Maybe in some fields like computer science or engineering, they can easily get a lot of citations, but for social science, it is very hard to get high citation counts and media to know your work. So, to some subjects, it is not a fair game...”* In addition, two respondents (P7 and P9) were sceptical about the reliability of citation counts due to the possibility of gaming them. For example, one researcher (P7) stated: *“...I think that there are limitations such as it is possible to game the current statistics, just based on Google Scholar or WoS...”*. Therefore, it is not sufficient to take only traditional metrics into consideration when evaluating the quality of research findings as well as when evaluating the contribution of an academic researcher. Considering additional dimensions in the evaluation process would help to give a more holistic view of the impact of the research work.

As previously mentioned, some interviewees said that they had noticed the existence of altmetrics when they were using academic social media platforms like ResearchGate or Google Scholar to promote their research. They might occasionally judge whether their works were popular through viewing the comments and downloads of their publications, but they had not used them formally as indicators for research evaluation. One third of the interviewees mentioned that altmetrics could be a good tool to complement traditional metrics. For example, one researcher (P8) from a hard science discipline stated *“I think we should go by both metrics, the traditional metrics as well as the altmetrics. There should be a weightage given to the altmetric score, especially in cases where the traditional metrics do not give enough information about the research outputs of a researcher. For example, in tenure and promotion, if people look at the traditional metrics and they feel this is not conclusive enough, then they should look at altmetrics and see if that gives them a more complete picture of the research impact of the researcher.”* Also, a few interviewees (P11, P15 and P17) from non-hard sciences indicated that they were willing to use altmetrics in the future if NTU were to establish relevant policies on the adoption of altmetrics in the research evaluation process. One respondent (P17) from social sciences stated *“Personally I don't care so much for now as that is not part of my performance evaluation. If NTU says you need a certain kind of media exposure to get your bonus, to get your tenure promotion, I think of course everyone will pay attention to it.”* Thus, this leads to the assumption, that probably most NTU researchers have not yet used social media metrics as criteria to assess the quality of research outputs.

Several reasons could explain why altmetrics have not yet been adopted by the NTU researchers interviewed. First, they were more familiar with traditional methods to decide whether their research findings had significant impact. For instance, one faculty staff (P17) from non-hard sciences indicated: *“I rely more on traditional metrics like citation counts and H-index. They have been here for so many years and they have specific criteria for filtering research outputs. The peer-review process is a good method to check the quality. Citation counts is also a good indicator.”* Second, participants were also concerned about the quality of altmetrics. For example, readers on social media may not spend as much time and effort on reading the paper and may give comments without careful consideration. One research staff (P14) argued: *“altmetrics such as the number of likes and retweets cannot mean so much. Maybe some people like it only because they want to show they have seen or noticed it.”* Researchers were

somewhat skeptical that social media is not about quality, but popularity. On the one hand, they found that if more effort was put into promoting works online, then one would probably receive more likes or tweets. The number of likes only means the paper has received more public attention, but it is not necessarily related to the quality of the paper. On the other hand, they found that altmetrics seem only suitable for research outputs on certain topics of interest to the general public. For example, common people could be more interested in research findings related to their daily life rather than in advanced theories with intricate terminology. Hence, the research works related to public issues or social events may get a higher altmetrics from a general audience. In sum, the interviewees found that while traditional metrics are used more in academia, among colleagues and researchers who work in the same field, altmetrics could serve as a signal for non-experts to determine the popularity of a publication by showing quantitative comparisons on social media platforms.

## **5 Discussion and Conclusion**

Understanding methods to promote research works and metrics to evaluate research outputs is of importance as this could help both researchers and research institutions to assess the significance of research outputs from a more comprehensive perspective. This study adopted a qualitative method to investigate how NTU scholars promote their research and what metrics are used to assess their research impact. Currently, attending academic conferences and publishing paper in journals are the two main methods to promote research findings among NTU researchers. With the popularity of social media in academia, NTU researchers have begun to use academic social networking sites like ResearchGate and Google Scholar as an alternative way to promote their research. However, currently, the usage of social media tools like Facebook and Twitter for promoting research is still low among participants in that these tools are used more for communication with friends and families.

In terms of metrics used for research evaluation, the results of this study reveal that most participants use traditional metrics such as citation counts and the JIF frequently in their professional lives. These metrics serve as good indicators to determine the quality of research outputs. NTU researchers have noticed the existence of altmetrics in various social media platforms; however, they have not considered using them in their current research career. The strong reliance on traditional methods and quality concerns regarding altmetrics were two main hindrances for the usage of altmetrics by the interviewees. Altmetrics were however found to be a potential tool to complement traditional metrics as they could make the research evaluation process more comprehensive. We also found that a few researchers were willing to use social media and altmetrics given that they are supported by the university.

This case study was based on 18 semi-structured interviews with researchers from NTU, Singapore. These participants provided us with a wealth of knowledge about how they promote their research findings and how they evaluate research outputs. The results could help understanding the effective methods for research promotion and

whether new metrics on social media platforms could be incorporated into the traditional research evaluation methods. The limitation of this study is the limited sample size due to the resource and time constraints. Future studies should include more researchers from different fields and different institutions to give a more comprehensive picture about how metrics are used for research evaluation in academia.

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