‘Traditional metrics, altmetrics and researcher profiles: A survey of faculty perceptions and use’

by

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Research problem

This study investigated faculty perceptions and use of traditional and alternative metrics (altmetrics), as well as their perceptions and use of researcher profiles at a medium sized University in New Zealand.

Methodology

A quantitative study was carried out through an anonymous online survey sent to all research active academic staff (approximately 450). The survey contained a 33 point questionnaire combining open ended and closed questions.

Results

The survey received a 20% response rate (91 partial and 88 complete responses). No respondents considered traditional metrics were extremely accurate in reflecting the value of scholarly work, and only a few felt altmetrics were extremely accurate. Uptake of metrics is related to the perceived importance of those measures to academic promotion and research assessment. Sciences reported the greatest awareness and use, closely followed by social sciences. Arts and humanities expressed the least awareness and use. Respondents felt that traditional metrics should play less of a role in research evaluation and academic promotion, and that altmetrics should play a greater role. Many were also keenly aware of the dissonance between what they see as the value or impact of their work and what actually is measured and valued by the multiple institutions of academia. Respondents felt researcher profiles increase visibility, citation rates, altmetrics, but the time and skill required to maintain profiles presents a barrier to their uptake.

Implications for libraries

The metrics landscape is complex and controversial, and uptake is nuanced and highly context dependent even within disciplines. Librarians should work to understand the larger debate around quantitative and qualitative indicators of impact as well the specific disciplinary milieu and individual researcher needs before providing advice and support.

Keywords:

Impact indicators; impact measures; bibliometrics; traditional metrics; altmetrics; researcher profiles; faculty perceptions; academic engagement; evaluation gap; scholarly communication

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1. Introduction

The present study investigates faculty perceptions and use of formal[1] and informal[2] measures of the impact of their research, as well as their perceptions and use of researcher profiles at a medium sized New Zealand University. It also asks what role the academic library plays in supporting faculty to engage with these tools and explores the problematic nature of demonstrating impact.

In an environment where research funding is highly prized, funders demand value for money. One way of demonstrating this value is through evidence of the impact of the research funded (Bayley & Phipps 2017). In New Zealand, the contemporary research landscape is dominated by the Performance Based Research Fund (PBRF) established in 2002 to encourage and reward research excellence in degree-granting institutions (Tertiary Education Commission [TEC], 2019). In effect, research impact or performance is assessed and then institutions are funded on the basis of that performance (Crawford, 2016; TEC, 2016). During the 2018 PBRF round researchers were asked to submit 'evidence portfolios' detailing their research outputs and contributions since the last round in 2012, and to demonstrate the impact of that research. As the 2018 PBRF deadline approached academics were encouraged to identify the impact of their research, and to ensure that all their publications were attributed to them across various researcher profiles and that any affiliated institutions were appropriately recorded and recognised. Thus in New Zealand (and in other English-speaking universities) research assessment regimes prevail, and research is becoming, as Roberts (2019, para. 9) duly notes, "more heavily influenced by the language of 'metrics'".

Despite enthusiastic uptake by University leaders, funders, governments and some within the Library and Information Science (LIS) field, the concept of impact and how it can be demonstrated or measured is the subject of considerable debate. This includes definitions of impact and discussions of the value of both quantitative methods such as bibliometrics and qualitative methods such as peer review (Archambault & Larivière 2009; Federation for the Humanities and Social Sciences, 2017; Wouters, 2017).

Nonetheless, most studies begin with a definition of impact similar to that articulated by Roemer & Borchardt (2015) which focuses on "the traceable influence that a scholarly entity has on other

[1] These measures refer to traditional metrics such as citation counts, H-index, journal impact factor.
[2] These measures refer to alternative metrics such as article downloads, social media and news mentions.

research in the discipline" (p. 236). Building on this basic definition of impact, other scholars have worked to broaden the definition to include aspects of 'impact' that have been historically difficult to capture. The expanded definition of impact, according to the Federation for the Humanities and Social Sciences (2014) incorporates humanities and social sciences perspectives, and focuses on

> …the influence scholarly and creative enquiry has upon wider society, intended as well as unintended, immediate as well as protracted. It includes the influence such research has upon future researchers within the discipline as well as in other disciplines and on public policy, quality of life, social cohesion, business innovation, the environment, artistic and creative practices, commercial and economic activity, administrative and institutional development, and political and cultural understanding. (p. 7)

While the assessment of impact has a long established history as a mode of inquiry in the Library and Information Science field, and many bibliometric tools have been produced to quantify that impact, (and more recently to increase research visibility), comparatively little is known about how academics perceive these measures and what factors influence their decisions to engage with such tools.

As tertiary institutions look to the next PBRF round, they are asking researchers to plan how their research can generate impact and to factor this into their research planning. The current study will offer insight into the current practices, barriers to uptake, and future needs of academics in relation to traditional metrics, altmetrics and research profiles. This information will help inform university practice (the research office, the library, research administrators) to better help academics to create and maintain researcher profiles that ensure their work reaches the audiences who need it, and also to help the same academics to easily identify and report on the impact of their research, through both formal and informal impact measures. While it is unclear whether PBRF will exist in six years' time, some form of reporting and measurement is likely to be required. Academics who harness the tools to help increase the impact of their research now are likely to reap the benefit in the future.

2. Literature Review

Bibliometrics has a long history in LIS and, until recently, the literature has focused more on how research impact is measured. In many ways, this overarching focus on impact measurement is understandable given that bibliometrics was one of the few rigorous scientific tools available to LIS practitioners upon which acquisition and subscription decisions could be made. However, as the notion of 'impact' has gained ascendancy within the academy, (linked to intensifying competition between institutions and global rankings for research accreditation) very little attention has been paid to academics' perceptions of those measures (DeSanto & Nichols, 2017; Thuna & King, 2017). Studies of researcher profiles and academic social media investigate which platforms are popular and whether the altmetrics generated lead to citations and (Lupton, 2014; Mikki, Zygmuntowska, Gjesdal, & Al Ruwehy, 2015). This study hopes to also determine the reasons for the choice of various platforms.

This literature review will outline broadly the current bibliometric environment, by firstly, discussing traditional metrics (purpose, academic uptake, criticisms), followed by altmetrics (purpose, academic uptake, criticisms), and finally, researcher profiles (purpose, academic uptake, criticisms).

2.1 Traditional metrics

2.1.1 The purpose of traditional metrics

Developed by and for scientists, then broadened to encompass other disciplines, bibliometrics originated in the 1960s and focuses on traditional academic publications such as books and journal articles, and describes the methods used to measure 'publication patterns' such as identifying how many articles a researcher has published, or by analysing citations to see how an article has influenced other research (McBurney, & Novak, 2002). Citation count, H-index, and Journal Impact Factor are three of the most well-known metrics[3].

[3] Citation count refers to the number of times a publication has been cited in another published item. H-index (developed by physicist Jorge Hirsch in 2005 (Spicer, 2015) refers to the aggregated impact of a journal or a researcher on their field based on the number of citations of their work. An H-index of 10 means a researcher (or a journal) has 10 published papers that have been cited at least 10 times by other published works, and this formula is used to average out the effect of the one paper that was cited 100 times. Impact factor The Journal Impact Factor was a metric originally developed to help librarians make decisions about which journals were worth subscribing to (Garfield, 2006) and is now one way of measuring a journal's influence, and importantly it is only used to compare journals within a certain field as publications

Referred to more recently as traditional metrics compared to more recent altmetrics, these metrics can be categorised into four levels:

- author (e.g. article, chapter, including how many produced and how many times cited);
- the venue (e.g. journal, publisher, conference; e.g. the journal ranking or impact, or the reputation of the publisher) ;
- author output over time (productivity and total citation rates); and
- institutional output over time (e.g. institutional ranking) (Roemer & Borchardt, 2015).

2.1.2 Academic uptake of traditional metrics

> Faculty who report better understanding of scholarly metrics also report them as a more important part of the [promotion] process. Likewise, respondents who reported not understanding scholarly metrics reported that metrics were not important to their [promotion] process. From this we can gather that most faculty learn about scholarly metrics when scholarly metrics become important to their career advancement (DeSanto & Nichols, 2017, p. 157)

In the main, studies of traditional metric uptake are interested in disciplinary differences, with an assumption that metrics are used more often in sciences than social sciences and humanities (DeSanto & Nichols, 2017). Some studies found high rates of awareness and use of metrics in all disciplines (Thuna & King 2017; Vinyard & Colvin, 2018). One study found most faculty were interested in their citation rates, and around two thirds had some awareness of journal metrics, and considered the library for publishing advice (Vinyard & Colvin, 2018). A separate study showed that 85% of researchers reported being influenced by journal impact factor or reputation; almost 95% were keen to maximise the impact of their research by reaching the broadest audience possible; and over 60% agreed that societal impact should be a key measure of research performance for promotion or funding proposal (Ithaka S + R, 2018). Additionally, over a third felt the library was very valuable in helping them to assess the impact of their published work; and in assisting them to create a researcher profile (Ithaka S + R, 2018).

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rates vary between fields. Journal metrics are used to indicate the importance of journals in a field according to the number of articles published per year and the number of citations to those articles.

The abiding notion that there are stark disciplinary differences has tended to preoccupy researchers to such an extent that questions regarding perceptions of impact measures are seldom asked with any analytical rigour. Although this research is concerned with the way faculty perceive impact measures and what factors influence their decisions to engage with them, disciplinary factors will be at play, so it is worthwhile to examine the literature on disciplinary uptake.

Arts and Humanities

In the bibliometric literature, arts and humanities are often found to be resistant to the use and application of scholarly metrics because these metrics do not capture what is valued in these areas. In fact, a recent study found arts and humanities scored lowest in use and understanding of scholarly metrics; where over 80% considered traditional metrics did not accurately reflect the importance of their scholarship, and over 60% deemed them unimportant to professional advancement (DeSanto and Nichols, 2017). Another study found one third of Humanities researchers used metrics for research evaluation or promotion (Hammarfelt & Haddow, 2018). Thuna & King (2017) found 86% of humanities faculty reported awareness of impact metrics, but only 33% used them in publishing decisions.

Humanities were found to use bibliometrics strategically, for instance, highlighting the high citation rate of an article in a low-ranked journal (Hammarfelt & Haddow, 2018). The same study found some researchers used metrics despite their discomfort about their inability to accurately reflect the value of their work; and other researchers (usually late career), while being conversant with metrics, did not use them because of this.

Social Sciences

Social sciences were more aligned with sciences in that 58% felt metrics accurately reflected the importance of their work and over 80% considered metrics were important to professional advancement (De Santo & Nichols, 2017). Thuna & King (2017) found 85% of researchers were aware of metrics but only 25% used them in publishing decisions, academic promotion and grant applications. In another study nearly half of social sciences researchers used metrics for research evaluation or promotion of their work and in CVs and grant applications (Haddow & Hammarfelt, 2019). The same study found that some social scientists used the metrics despite unease about their accuracy, while others who were knowledgeable about metrics chose not to use them.

Sciences

There is considerable evidence to support conventional wisdom that scholarly metrics are commonly used in sciences. Thuna and King (2017) found 97% of sciences faculty were aware of metrics, 42% kept up to date with them, and a surprisingly high 45% believed metrics had "no effect on them" (p. 19). In their study, DeSanto & Nichols (2017) found 85% felt metrics accurately reflected the importance of their work and over 80% considered metrics were important to professional advancement.

In the context of the present study, the points of interest are not so much the high or low rates of use and adoption among scholars, but the perceptions that inform these levels of usage.

2.1.3 Criticisms of traditional metrics

> The current trend towards quantification of research performance, what we also call 'metric culture' becomes especially troublesome in the humanities, as these disciplines have traditionally relied on 'orders of worth' that cannot be easily aligned with bibliometric indicators (Hammarfelt & Haddow, 2018, p. 933)

Traditional metrics have been criticised for serving disciplines like sciences which publish in established English-language journals where outputs are frequent, and frequently cite others (Archambault & Larivière, 2010; Roemer & Borchardt, 2015). This has led to claims that quantity is preferenced over quality in as much as it encourages researchers to publish more often in order to boost their publication and citation counts (DeSantos & Nichols, 2017). Journal metrics can negatively influence research when scholars focus on publishing in high profile journals, and the role of author assumes more importance at the expense of collaborating and sharing research (Björnmalm, 2018).

The main metrics tools used to rank journals and provide citations draw their data from the two major proprietary citation databases: Web of Science and Scopus (Roemer & Borchardt, 2015). However, not all journals are indexed by Web of Science or Scopus ranking services (Vinyard & Colvin, 2018) and furthermore it can take up to seven years for a journal to be ranked with an Impact Factor (Web of Science) or a CiteScore (Scopus).

Rankings favour established journals, and disadvantage those who publish in highly regarded journals which have no or low ranking. Even within journals there are limits to what counts as citable material, with essays and opinion pieces excluded (Atchison, 2017). At the same time, the journals read by practitioners do not necessarily have rankings, yet these unranked journals are exactly where researchers who want to influence practice are publishing (DeSantos & Nichols, 2017).

Web of Science and Scopus favour English language journal articles, which privileges Sciences (where the issues researched tend to be universal in nature), over the Social Sciences and Humanities (where issues are more culturally specific, and therefore may be of best use published in the mother tongue) (Archambault & Lariviere, 2006). This poor coverage of non-English journals means very few non-English journals have an Impact Factor (Hammarfelt & Haddow, 2019) and this therefore disadvantages non-English language research.

The H-index is determined by citation counts, but these are not accurate or exhaustive because they typically exclude non-article publications, therefore this index score does not represent all of a scholar's work (Atchison, 2017). Arts, humanities and law are disadvantaged as journals are not the main source of output for these disciplines, they are more likely to produce books, book chapters or (as in the case of Law especially) publish in national journals that don't attract an international audience.

Google Scholar Citations which launched in 2011 (Roemer & Borchardt, 2015) has attempted to level the playing field by indexing open access materials, institutional repositories, publisher websites, and online publications, but it has been criticised as lacking the rigour of Web of Science and Scopus because it indexes non-scholarly work (Harzing, 2017). Other criticisms relate to the lack of standardization of author names so works may not be attributed correctly; citation counts which may include duplicates; harvesting online information only which excludes print only journals and the references in them; as well as those in journals to which Google is denied access by the publisher (Harzing, 2018). Further problems arise according to Ward, Bejarano, and Dudás (2015) because, as Web of Science, Scopus and Google Scholar each use their own data to compute metrics, inaccuracies and inflated metrics can result.

In response to the dominance of metrics and their widespread misuse in the evaluation of research and researchers, a number of initiatives have sought to stem what Wilsdon et al. (2015) have called the "metric tide" including DORA, the Leiden Manifesto, and HuMetricsHSS. The 2012 Declaration on Research Assessment (DORA) made 18 recommendations for funding agencies, institutions, publishers, metrics providers, and researchers, all aimed at best practice in research assessment. Simply put, DORA calls for an end to the use of journal impact factor as a proxy for the quality of the research therein (Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015). The Leiden Manifesto (2015) enumerates 10 best practice principles for the use of metrics in research assessment. The essential argument is for quantitative and qualitative evidence to be considered equally when evaluating research, and ensuring that what can be quantitatively measured does not replace judgement in determining value. These initiatives call for the responsible use of research metrics[4]. Five key principles (robustness, humility, transparency, diversity, reflexivity) (Wilsdon et al. 2015), underpin the responsible metrics framework, which seeks appropriate use of quantitative indicators (aka metrics) in research assessment.

Other responses include HuMetricsHSS - an initiative for envisioning humane ways to measure or indicate research excellence within a humanities and social sciences context (HuMetricsHSS, n.d.)

2.2 Altmetrics

> Part of the value of altmetrics is the ability to measure forms of impact partly or wholly unrelated to what citation captures" (Priem, 2014, p. 5)

2.2.1 The purpose of altmetrics

Scholarly activity increasingly occurs online. The social web enables this information to be used and shared, and for that using and sharing activity to be tracked. This has created new ways to measure the impact of that activity. Altmetrics is "..an approach to uncovering previously invisible traces of scholarly impact by observing activity in online tools and systems" (Priem, 2014, p.5) to record informal measures of use or impact such as views, downloads, Twitter mentions, captures in reference managers, and citations in blogs and news articles.

[4] For more about responsible metrics, see The UK Forum for Responsible Research Metrics https://www.universitiesuk.ac.uk/policy-and-analysis/research-policy/open-science/Pages/forum-for-responsible-research-metrics.aspx

A number of studies have determined that altmetrics, while indicators of a type of attention different from traditional metrics, can also be indicators of future impact. In a meta-analysis of studies between 2001 & 2011, Bar-Ilan (2012) found correlations between an item being on Mendeley and being cited in Google Scholar, Web of Science and Scopus. In an analysis of ResearchGate articles, Thelwall and Kousha (2017) found that article view counts were correlated with both Scopus citations and Mendeley readers which reflects a wider readership than for those articles indexed in Scopus alone. Other studies have found positive relationships between Twitter activity and citations (Eysenbach, 2011; Peoples, Midway, Sackett, Lynch, Cooney, 2016). (Moved from introduction).

Altmetrics can be applied across four levels in the same way as formal metrics, i.e. author (e.g. article, blog, chapter, dataset); the venue (e.g. journal, publisher, conference); author output over time; and institutional output over time (Roemer & Borchardt, 2015). Altmetrics can be used for evaluation (of traditional outputs more holistically and of non-traditional outputs), analysis (using instruments that afford greater breadth and depth), and prediction (of emerging trends and research areas) (Priem, 2014, p. 14). The advantages altmetrics have over traditional metrics are the diversity of sources and the traceability of web based activity, the speed with which activity can be measured, and the openness about what is measured and how (Woutas & Costas 2012).

Diversity of sources and traceability

As altmetrics measure diverse nontraditional outputs such as software, datasets, blog posts, and unpublished outputs, altmetrics can track the impact of influential work that will never be cited (Piwowar, 2013, Priem et. al, 2013). Altmetrics capture broader societal engagement with research (by people who don't cite) such as use in policy, practitioner publications, news, and classrooms (Atchison, 2017; Bornmann, 2014; Piwowar, 2013). These measures of public impact are essential because not only do the public benefit from medical or educational research (for instance) but also, as much research is taxpayer funded, an assurance of the value of that research is required to ensure the funding continues (Priem, 2014).

Speed

Citations take time as they rely on published work to be cited in other published work (an up to two year delay from publication to citation due to the lengthy peer review process). Usage information via altmetrics is fast due to the immediacy and informal nature of the media. The speed with which

ideas and findings can be communicated across the globe on social networks is instantaneous and impacts the work of others (Priem et. al, 2010, Piwowar, 2013). Altmetrics as early indicators of future citations (Bar-Ilan, 2012; Vinyard & Colvin, 2018) can enable new researchers without a strong publication record to demonstrate impact.

Openness

There are myriad sources of altmetrics, so it is essential that the type of attention being counted is transparent and open. The company *Altmetrics* has created an aggregated score by assigning value to the number and significance of mention or interaction (views, clicks, downloads, tweets, likes, bookmarks etc) (Atchison, 2017).

Finally, while some consider altmetrics measure what traditional metrics do not (Sugimoto, Russell, Meho & Marchionini (2008) other researchers are interested in determining whether altmetrics can assess research quality with any rigour in an attempt to learn if there are any parallels with traditional metrics. Several studies have found a correlation between an item being added to the Mendeley reference manager and being cited (Bornmann & Haunschild, 2018; Thelwall, 2018; Zahedi, Costas and Wouters, 2014), thus garnering evidence of rigour.

2.2.3 Academic uptake of altmetrics

Recent studies have shown that, compared to traditional metrics, altmetrics have much lower rates of understanding across all disciplines (Sutton, Miles & Konkiel, 2018; Thuna & King, 2017). De Santo & Nichols (2017) found over 70% of researchers had no or limited awareness of altmetrics and only seven percent reported tracking or using them.

Studies of researchers in humanities (Hammarfelt & Haddow, 2018) and social sciences (Haddow & Hammarfelt (2019) found that they used Academia.edu and ResearchGate to showcase and track research achievements and audience, where traditional metrics are not available. The same studies considered that this indicates firstly, that researchers used altmetrics as a way to assume control over how they are evaluated, and secondly, that Academia.edu and ResearchGate statistics were better than Google Scholar and Scopus for their discipline.

In exploring the uptake of altmetrics in social science, Htoo and Na (2017) analysed citations for items from across the ten most popular sources of altmetrics (Mendeley, Twitter, CiteULike,

Facebook, blogs, news, Google+, Reddit, F1000 and Pinterest) to find the correlation between citation counts and altmetric mentions. For the period studied (2008 - 2013) they found altmetric presence was low but showed a steady increase; that disciplines with higher citation rates also had higher altmetrics, and that for the lower cited disciplines, altmetrics showed readership beyond that captured by citations (Htoo & Na, 2017).

2.2.3 Criticisms of altmetrics

> While uncritical application of any metric is dangerous, this is doubly so with altmetrics, whose research base is not yet adequate to support high stakes decisions (Priem, 2014, p. 11)

> As currently constructed, altmetrics measure as much the level of publicity efforts from the publisher and author as they do the actual attention paid to the work (Crotty, 2018, para. 11)

Altmetrics have been criticised for their heterogeneity, lack of robustness, manipulability and newness. Just as citations vary from mere mentions to in-depth analyses, altmetrics vary from a Facebook 'like' by an amateur to an expert recommendation in a blog post (Haustein, 2012).

Hetereogeneity

The variety of user motivations when interacting with items makes it impossible to give definitive value to metrics generated, rendering invalid attempts at "a universal interpretation of the meaning of altmetrics" (Chen, Hayes, Larivière and Sugimoto (2018 p. 18). As Priem observes "a tweet from a Nobel laureate is much more meaningful for many purposes than a tweet from the general public (as well as, arguably, more meaningful than a traditional citation)" (2014, p. 17).

Manipulation

Researchers with multiple social media accounts can generate fake mentions. Companies like Twitter constantly promote content to users which can artificially generate activity (Priem, et al, 2010; Bornmann, 2014). As one guard against these celebrity metrics, a "Kardashian Index" or K-index has been developed to measure the number of Twitter followers a scientist has against their citations, and therefore differentiate the noise from the substance (Ward, Bejarano, & Dudás, 2015 p. 182).

Newness

Altmetrics do not yet capture all the attention a work attracts. Typos on Twitter or the absence of DOIs in an article may mean citations are missed (Atchinson, 2017). There is also an age bias in that it is more likely to be younger technologically connected researchers using social media platforms to share their work and interact with others (Bornmann, 2014; Chen, Hayes, Larivière & Sugimoto, 2018).

Robustness

The field is evolving. Altmetrics will take time to gain credibility, as did traditional metrics (Priem, 2014). It is argued there is not sufficient empirical research on altmetrics to determine their reliability and validity (Bornmann, 2014), and they are dependent on data quality and the technical systems harvesting the information (Atchison, 2017; Bornmann, 2014; Haustein, 2012).

Wouters and Costas (2012) suggest future research should address conceptual frameworks, standardising existing tools and data, and calculation and normalisation. In 2014 Priem wrote that while a theory of altmetrics should be a priority it need not be a pre-requisite for their use, arguing that bibliometrics also suffered the same gaps in theory in the developing stages.

While positioned as a welcome alternative to traditional metrics, commentators such as Bornmann and Haunschild (2016) point out that the principles of responsible metric use espoused by DORA and the Leiden Manifesto apply equally to these metrics.

We turn now to the subject of researcher profiles where the discourse is somewhat more straightforward.

2.3 Researcher profiles

> The researcher profile is not merely an ephemeral snapshot at a specific point in time, but instead it serves as a scholarly portrait of a scientist, and has a great potential to promote the scholar's oeuvre, discoverability, reputation, and, in the long run, citations. (Ward, Bejarano, & Dudás, 2015, p. 178)

2.3.1 The purpose of researcher profiles

Services have developed in the last two decades to enable researchers to increase the discoverability, shareability, and citability of their work (Shanks & Arlitsch, 2016, p. 296), and while the offerings vary, a commonality is the promotion in some way of a researcher's profile[5]. Self-promotion is now an essential part of the publication cycle. Research impact, traditional metrics, altmetrics and research profiles are interlinked. Profiles promote a researcher's work to help it reach its intended audience. Impact happens when that audience is reached. Metrics can help to provide evidence or indicators of that impact.

There are many types of researcher profiles ranging from formal scholarly identification systems (such as ORCID, Google Scholar, Researcher ID) through to less formal academic social networks like ResearchGate each affording different services and levels of autonomy.

While there is research about how social media can provide metrics there is less on "researcher profiles and the impact of these profiles on scholarly communication, collaboration, and research" (Ward, Bejarano, & Dudás, 2015, p. 177). Literature about (and institutional support for) researcher profiles is focused on what the multiple tools do, rather than encouraging researchers to consider (and create) their online persona in a holistic way (Thompson & French, 2016).

Making research and related scholarly communication available through a profile enables a wider impact than that afforded by published articles alone. As Ward, Bejarano, and Dudás (2015) observe "an article may be publicly endorsed within hours of publication, mentioned in a tweet or blog, discussed on a forum or a social network site, and saved in a reference manager" (p. 181). Altmetrics from these sites can demonstrate this impact, for instance, showing articles which are highly viewed, or downloaded but which are not widely cited (Priem, Piwowar, & Hemminger, 2012).

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[5] Online profiles allow researchers to publicise themselves, their scholarly outputs and related activities as well as their institutional affiliations, and also, to connect and collaborate with others. Here, the term researcher profile describes any web-based platform that provides one or more of the following: author/researcher identification; academic and professional networking; and reference and citation management (Shanks & Arlitsch, 2016). These can be further categorised as being related to search engines (Google Scholar citations), file sharing (Academia.edu, figshare, ResearchGate), researcher IDs (ORCID, Researcher ID), citation management (Mendeley) or specific research areas (e.g. Social Science Research Network) (Ward, Bejarano, & Dudás, 2015).

Scholarly social networks also allow researchers to connect with others. Many of these platforms provide web analytics on activity such as profile or document views, downloads, comments, shares.

2.3.2 Academic uptake of altmetrics

One study found most respondents created and maintained profiles but did not use the advanced features (Van Noorden, 2014). Another study found sites with automatically populated profiles such as ResearchGate, Academia.edu and Google Scholar were more highly used, and that highly cited items were also highly downloaded (Mikki, Zygmuntowska, Gjesdal & Al Ruwehy, 2015).

ResearchGate was identified as the most popular site by some international studies (Elasayed, 2015; Mahajan, Singh, & Kumar, 2013; Manca & Ranieri, 2017; Mikki, Zygmuntowska, Gjesdal & Al Ruwehy, 2015). Manca and Ranieri (2017) found motivations for use were increasing research visibility, extending networks, and sharing professional interests. Lupton, in a Twitter-disseminated survey of 711 academics, 50% of whom were social scientists, investigated social media use rather than researcher profiles, and found most respondents used Twitter (90%), LinkedIn (60%), Academia.edu (50%), Facebook (40%) and ResearchGate (30%). Uptake of researcher profiles is positively influenced by peer activity and word of mouth (Ward, Bejarano & Dudas, 2015).

Benefits

Researchers reported positive outcomes through strategic use of researcher profile tools, for instance, including ORCID IDs in articles for *The Conversation*[6] that had increased altmetrics (Thompson & French, 2016) and the same study found that current, easy to read profiles, with comprehensive publications generated increased traffic, contacts from potential collaborators, speaking invitations, and inquiries from prospective students. Other benefits included dissemination of work, discussions, tracking impact, being 'findable', and keeping in touch with colleagues (Jordan & Weller, 2018).

[6] The Conversation is an Australian based non-profit launched in 2011 where media editors work with academics to re-purpose research stories for a general audience It has UK, US, Australia and New Zealand facing websites. See more here https://theconversation.com/nz

Concerns

Faculty concerns related to the amount of time required to create and maintain profiles (Jordan & Weller, 2018), privacy and the blurring of professional and personal boundaries, risks to career through ill-considered posts, potential for social media to add to workload, risk of becoming a target of abuse, risk of ideas being plagiarised, and lastly, concerns about breaching copyright (Lupton, 2014).

2.3.2 Criticisms of altmetrics

Profiles take time to set up and time to maintain. In one study only 39% of respondents reported benefits of profiles, but 72% reported problems (Jordan & Weller, 2018). For academics it is virtually impossible to have no digital profile, but, according to Ward, Bejarano, & Dudás, (2015) an outdated, inaccurate or unflattering profile can misrepresent a researcher or result in undesirable results surfacing in the absence of desirable ones

Commercial services such as Academia.edu, ResearchGate and LinkedIn have deterred users by frequently sending spam emails and subscription requests (Tennant, 2017; Van Noorden, 2014). Copyright is also a concern as ResearchGate and Academia.edu networks exhort users to upload papers rather than link to Open Access items or archived versions in open access repositories. Academia.edu has been subject to takedown notices from publishers (Clarke, 2013; Peterson, 2013), all of which act as a disincentive to their uptake.

2.4 Summary of literature review

> "...no single metric is sufficient for telling the story of [a scholar's] role and influence within the field" (Roemer & Borchardt, 2015 p. 60)

Measuring research impact is complex and the means used have attracted considerable criticism (Archambault & Larivière, 2010; Roemer & Borchardt, 2015). Traditional metrics capture a narrow aspect of impact (Harzing, 2018). Altmetrics can provide data about academic and wider audience engagement with a wide range of diverse traditional and non-traditional outputs (Zahedi, Costas & Wouters, 2014). However, the field of altmetrics is still developing frameworks and gathering evidence in a quest for rigour. Both forms of metrics can be manipulated and misused and are

subject to calls for their responsible use, in conjunction with qualitative forms of evaluation. Researcher profiles, used well, can assist researchers to reach new audiences, generate altmetrics, find collaborators, and increase citations but they are an extra task (Jordan & Weller, 2018).

The more visible a researcher's work, the more chance it has to generate academic and societal impact, which can be demonstrated through both traditional and alternative measures. I am interested to know how faculty use and perceive impact measures and research promotion, and whether they consider there is a relationship between impact and research promotion.

3. Study Objectives

The present study investigates faculty perceptions and use of formal and informal measures of the impact of their research, as well as their perceptions and use of researcher profiles at a medium sized New Zealand University.

Overarching research question

How do faculty engage with impact measures and promotion of their research?

The central research questions are:

1. What informs faculty perceptions and use of impact measures and research promotion?
2. What factors limit faculty uptake of impact measures and research promotion?

4. Methodology

A literature review was conducted focusing on material published within the last 10 years which reflected the broad issues surrounding traditional metrics, altmetrics and researcher profiles.

A quantitative study was carried out through an anonymous online survey which involved a 33 point questionnaire combining closed and open ended questions. This method was considered the most effective means of garnering maximum participation within the time constraints for both participants and researcher.

A five point scale was used in 12 questions to enable respondents to select responses that best matched their opinion or experience e.g. strongly disagree to strongly agree (Leedy & Ormrod, 2013). The option for "I don't know" or "won't tell" answers are considered non-substantive answers, and it is often advised against using these, however, omitting them risks respondents giving inaccurate data or worse, having them abandon the survey in frustration (Toepoel, 2017). With this in mind, where some questions may have elicited an "I don't know" response (for instance, "How accurately do you feel traditional metrics reflect the value of your scholarly work?", an "I don't know" option was included.

To avoid respondents exiting the survey when confronted with a compulsory question they did not wish to answer, all questions were optional.

4.1 Testing

The survey questionnaire was tested with 20 academic librarians and academic staff from across each of the three major disciplines (sciences, social sciences, arts and humanities) to ensure that the questions provided responses which addressed the research questions. Feedback enabled issues relating to length, clarity, intent and anonymity to be addressed.

4.2 Population and sample

Research participants were sought from the entire research active staff of a university which has an academic staff population of approximately 448 (ITHAKA S+R, 2018), resulting in a 20% response rate (91 partial and 88 complete responses).

4.3 Data collection

The survey was created using the Qualtrics web-based survey tool and was distributed via email to all research active staff.

4.4 Ethical considerations

The research project was approved by the Victoria University School of Information Management Human Ethics Committee. Survey responses were anonymous, and precautions were taken to remove any identifying factors from qualitative comments.

Participants received information about the study, the reason for it, and the ways in which their data may be used so that they could provide informed consent. The Qualtrics software allowed participants to generate a downloadable PDF copy of their responses at the time of completion.

4.5 Data analysis

Qualitative responses were coded and grouped thematically. The data was cross tabulated by discipline. The overall analysis has attempted to draw out themes, trends and key points relating to faculty perceptions and use of formal and informal metrics and researcher profiles. A deductive approach was used to draw conclusions in relation to the main questions.

4.6 Limitations of this study

This small-scale study recruited respondents from one medium sized university in New Zealand which means the findings reflect experiences at that university alone and cannot be generalised. The findings are specific to this institution.

Ideally, as a complement to the survey, semi-structured in-depth interviews would have generated richer data and enabled themes emerging from the survey to be expanded upon.

Self-reported data has several inherent limitations: the social desirability bias where participants may wish to "look good" and consequently report knowing more than they do; and misreports which result from misinterpretation of the questions (Baldwin, 2009; Sullivan, 2009). However, self-report has an established history and is a valid and widely used measure.

The 20% response rate (88 complete, 3 partial) means also that the findings cannot be generalised within the university. Further, when analysed by discipline the numbers become very small, so definitive conclusions cannot be drawn, rather, this study is a snapshot of the experiences of 20% of the academic population at a certain point in time. Data for gender and career stage was collected, but not for ethnicity or age, as the researcher felt that this may have deterred some participants. Further, the voices of Māori researchers are absent, and it must be acknowledged that while attempts were made, the researcher failed to engage those researchers. While it is beyond the scope of this study to engage with issues of gender or ethnicity, the literature acknowledges the way the mechanisms of impact measurement privilege the white, male and English speaking academic establishment.

5. Survey results and analysis

The survey findings begin firstly with demographics. Secondly, for both alternative and traditional metrics, the findings cover sources; help to find or interpret; and understandings of. Thirdly, we look at researcher perceptions of the ability of metrics to reflect the value of their scholarly work. The fourth area covers researcher perceptions of the current and ideal importance of metrics to academic promotion and research assessment. Penultimately, uses of metrics outside of academic promotion research assessment are covered, and lastly, the findings regarding use and concerns about researcher profiles are presented. The survey questions are in Appendix 13.

5.1 Participant demographics

The survey received 91 responses (88 complete and 3 partially complete responses). There were over twice as many respondents from Social Sciences as Arts and Humanities or Sciences (Figure 1).

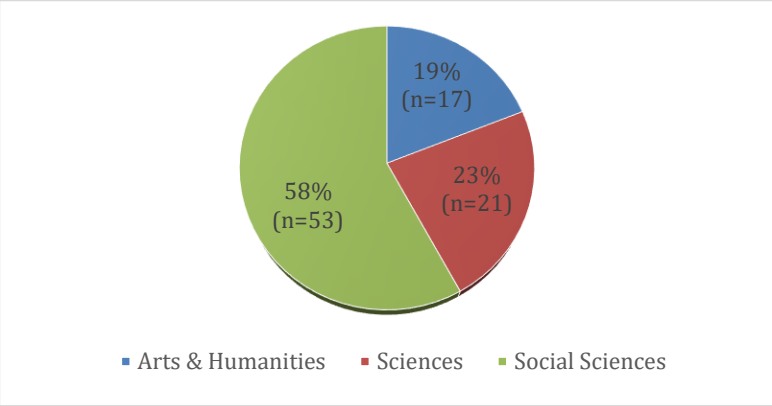

Figure 1: Respondents by discipline (n=91)

By career stage, 42% of respondents were mid, 34% late and 24% early career researchers (Appendix 1). The majority of respondents were male (47%), with 43% female, 3% preferred to self-describe and 7% preferred not to say.

5.2 Type of outputs produced and sources of metrics

Traditional research outputs predominated with 97% of respondents producing journal articles, 65% conference papers or presentations, 49% book chapters, and 26% books (Appendix 2).

For traditional metrics, respondents favoured Google Scholar (57% used it) over any other source including databases like PsychINFO, Web of Science and Scopus (Appendix 3), yet a significant 30%

of respondents "did not seek" traditional metrics. By discipline, sciences sought these metrics the most (over 80%) followed by social sciences (68%) and arts and humanities (60%) (Table 2). Social sciences reported higher use of science-focused Web of Science's JCR (Journal Citation Reports) than sciences.

Table 1: Sources used to seek traditional metrics by discipline (n=91)

	Arts and Humanities	Sciences	Social Science
Databases like PsychINFO, Web of Science, Scopus	18%	38%	32%
Google Books	6%	0%	2%
Google Scholar	29%	67%	62%
Journal Citation Reports from Web of Science	6%	29%	38%
Publisher websites	12%	33%	23%
Scimago Journal and Country Rank (SJR) from Scopus	0%	29%	11%
Source Normalised Impact Factor from Scopus	0%	14%	2%
Other	18%	10%	4%
I do not seek them	41%	14%	32%

For altmetrics sources, equal percentages from all disciplines used ResearchGate over other sources (25% used it). Academia.edu was the second most used source (11%) (Figure 2). Just over a quarter of respondents did not seek altmetrics. Sciences were the heaviest altmetric seekers across more platforms, except Academia.edu, Kudos, and publisher websites. Arts and humanities seek altmetrics least (Appendix 4). The institutional repository was used very little which is surprising given it is an open access repository and heavily promoted within the institution.

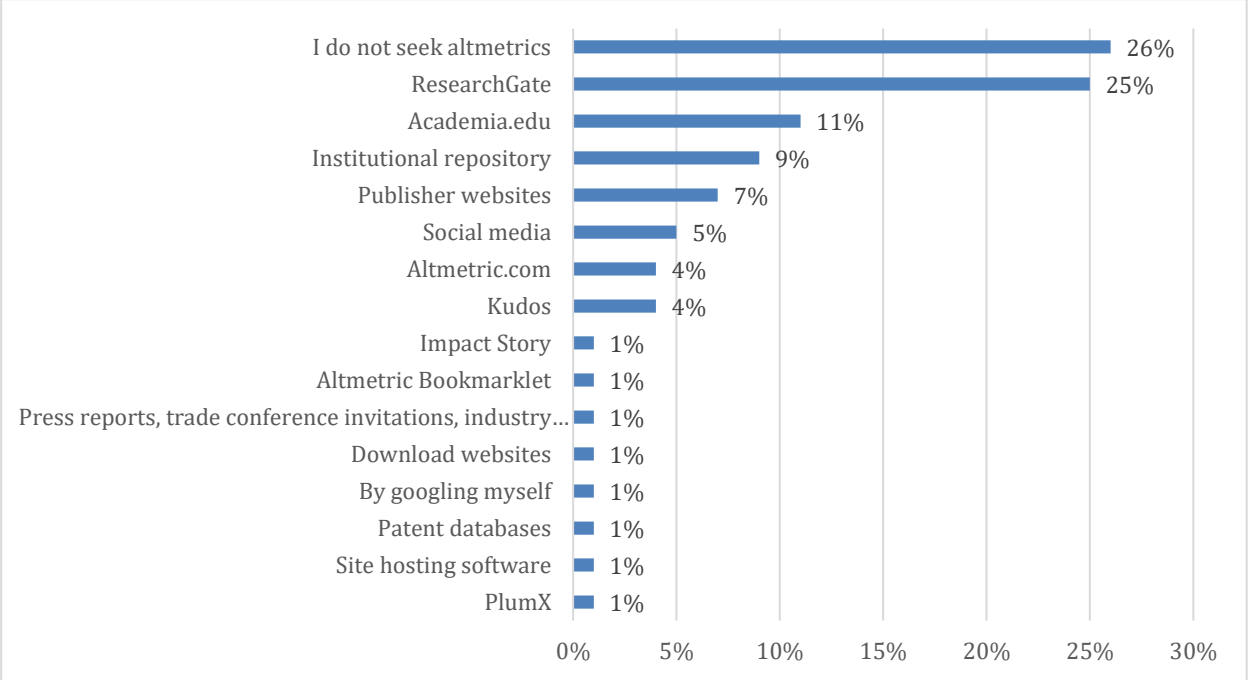

Figure 2: Sources of altmetric information (n=86)

5.3 Help to find or interpret metrics

Over half of the respondents sought help to find or interpret traditional metrics. Of these, 25% asked departmental colleagues, 10% asked research office staff. Significantly 32% asked library staff indicating the library is recognised in this space. Two thirds of researchers 65% did not seek help to find or interpret altmetrics, 14% asked departmental colleagues, 12% asked library staff, and 3% asked Research Office staff. The high number who did not seek help to find altmetrics suggests high levels of confidence, yet the low numbers who use the institutional repository altmetrics indicates there may be a lack of awareness of either the repository itself or as a source or altmetrics

5.4 Understanding of metrics

Traditional metrics

Respondents expressed similar levels of understanding for both author and journal level metrics. Sciences reported the highest levels of understanding followed by social sciences. Conversely, arts and humanities reported much lower levels of understanding (Appendix 5).

Altmetrics

All disciplines reported lower levels of understanding for altmetrics than for traditional metrics, with similar levels in sciences and social sciences and lower levels for arts and humanities (Appendix 6). This is curious, given that altmetrics positions itself as the new easy way to get indicators of impact.

5.5 Accuracy of metrics in reflecting the value of scholarly work

While higher levels of understanding of traditional metrics were reported, lower levels of accuracy were also reported (Figure 3) and this was most marked in sciences. It is significant that *not one* respondent reported traditional metrics as "extremely accurate" and only 10% reported them as "quite accurate". This perception of (in)accuracy provides some indication of how and why respondents do or do not use metrics. Even though no respondents believe they are highly accurate they are still highly used. This goes to the heart of the engagement question, and is linked to the mechanisms of the academic institution that perpetuates the will to measure.

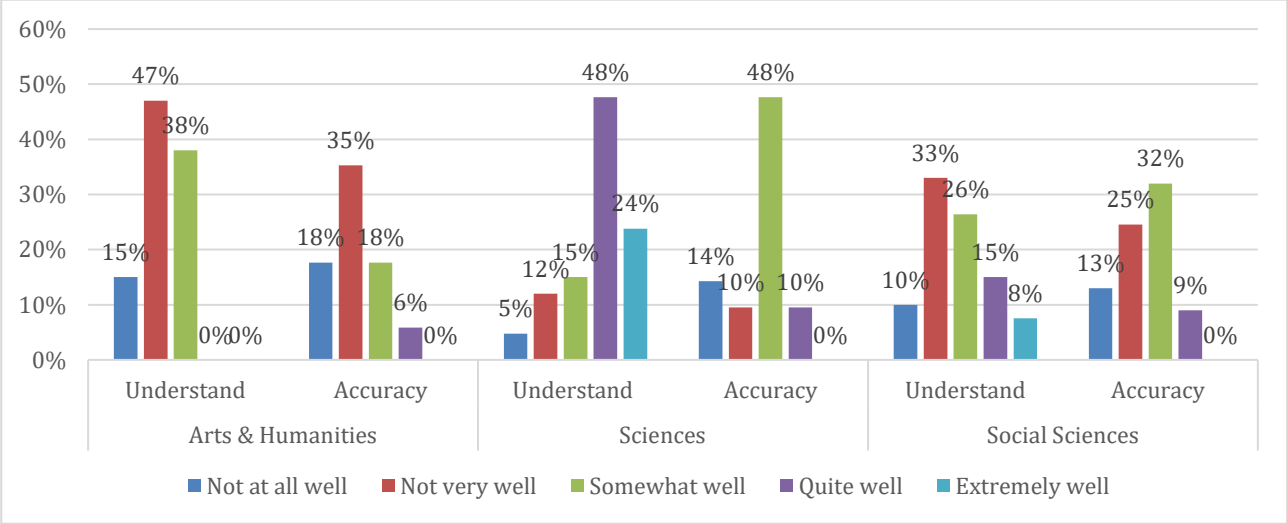

Figure 3: Understanding compared to accuracy of traditional metrics (n=91)

Accuracy of traditional metrics

It is significant that none of the respondents considered traditional metrics were extremely accurate. Sciences reported the highest accuracy levels followed by social sciences, while in arts and humanities accuracy levels were much lower with over half considering them not accurate

(Figure 3). Similar numbers in each discipline (around 25%) did not know how accurately traditional metrics reflected the value of their work.

The general tone of the reasons given for the accuracy rating was negative, and centred around relevance, manipulation, journal rankings, inequitable comparisons, and measurement. Over 25% of respondents considered traditional metrics were not a relevant measure of the type of work they did or the audience it serves. Two lesser themes centred around the way that metrics can be manipulated (through circumventing the peer review process and through strategic marketing); and the way that journal rankings influence researcher decisions to aim either for the highly ranked journal which helps with career advancement, or to conduct research that is valued in applied and professional settings and which does not. The message here is that high ranking journals and audience reach seem to be mutually exclusive. Comparisons (of author H-index for example) were considered inequitable across disciplines and career length. More positively, some felt that while metrics were imperfect, there was value in having some form of measure "they are an imperfect guide, but they do well compared to the other options".

Accuracy of altmetrics

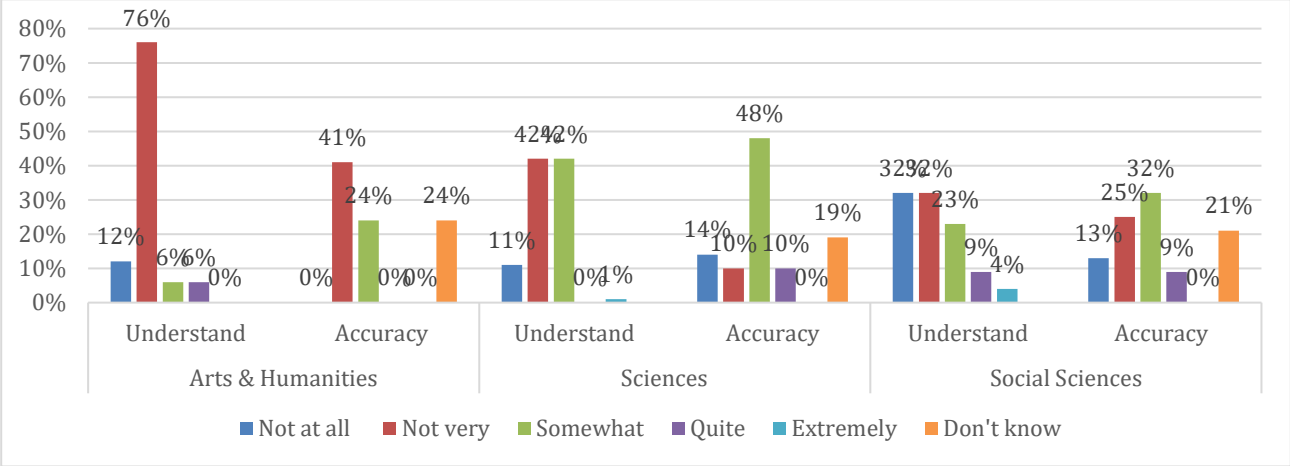

Figure 4: Understanding compared to accuracy of altmetrics (discipline)

Across all disciplines, altmetrics were considered slightly less accurate than traditional metrics (Figure 4). Interestingly, the number of respondents who felt they were not at all accurate was greater for traditional metrics than for altmetrics.

For altmetrics, overall responses were evenly spread across “accurate”, “not accurate” and ”don’t know” (Figure 4). Sciences reported the highest perceptions of accuracy followed by social sciences. Most arts and humanities considered them either “not very” or “somewhat” accurate (Appendix 8). Just over a third of social sciences and arts and humanities reported not knowing how accurate altmetrics were, while this was only 16% in sciences. Oddly, uncertainty about the accuracy of altmetrics is not a deterrent to their use.

Reasons for the accuracy rating centred around indicators of engagement (altmetrics capture “community impact and uptake of research” including policy makers and educators), and lack of robustness. Even though altmetrics are widely assumed to capture practitioner engagement, a few respondents said the opposite, in that they were not accurate as they were unable to capture practitioner engagement with research outputs.

5.6 Importance of metrics to academic promotion

To gauge faculty perceptions of the relationship between metrics and promotion, respondents were asked to indicate the current and the ideal level of importance of traditional and altmetrics to academic promotion. Across disciplines, respondents felt that traditional metrics should be less important than they currently are to academic promotion (Figure 5). This reveals that people engage with these metrics because of institutional imperatives rather than an innate desire to quantify their work in such a way.

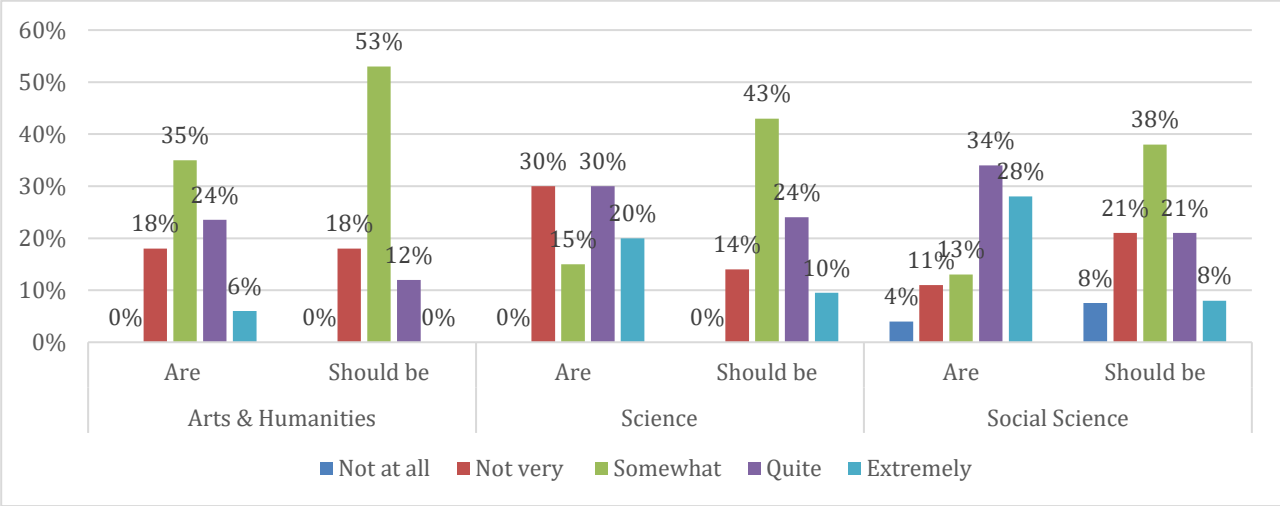

Figure 5: Importance of traditional metrics to academic promotion (current/ideal) (discipline) (n=91)

Social sciences reported the highest levels of importance of traditional metrics, followed by sciences and arts and humanities. Interestingly, equal numbers from sciences reported metrics as being both "not very" and "quite" important to academic promotion.

Across the board, more people felt altmetrics should be more important than they currently are for academic promotion. Arts and humanities indicated the highest ideal levels of importance, followed by social sciences and sciences (Figure 6).

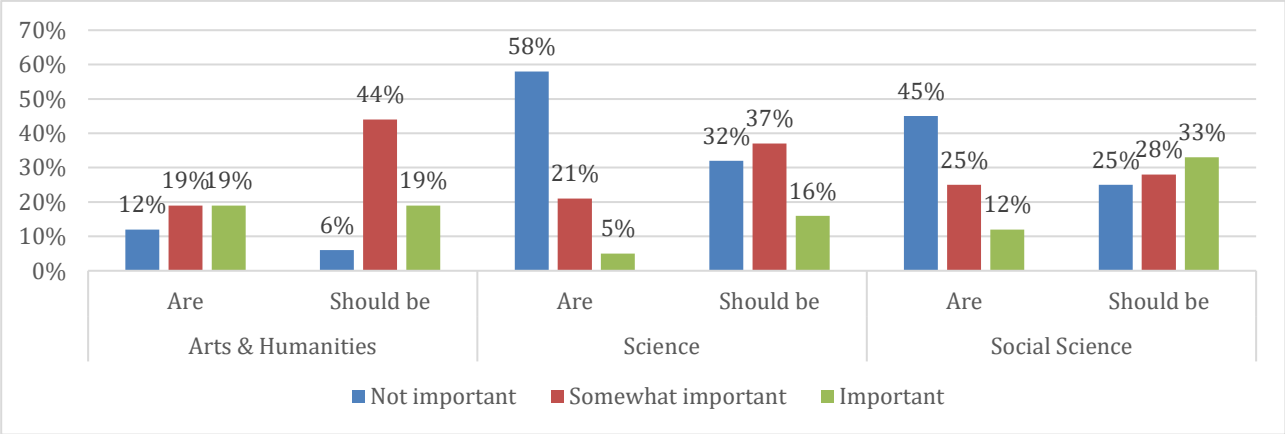

Figure 6: Importance of altmetrics to academic promotion (current/ideal) (discipline) (n=88)

The reasons given for rating the current level of importance suggest that while traditional metrics do not accurately reflect the value of their scholarly work, faculty recognize that they are a component of promotion processes. Comments centred around the following: explicit evidence that metrics are important; that research outputs are more highly valued than teaching or other contributions. Lesser themes were that they provide a way of measuring impact or academic performance, that journal rankings are important, and that they are subject to manipulation. In contrast to the theme of metrics being pivotal to career advancement, some respondents noted personality, contributions to teaching, and money generated through research contracts as being just as important.

Reasons for the ideal level of importance centred around the need for a more holistic and nuanced approach to measurement that would focus less on "maximising numerical objects" and more on "solving important problems". It would also take into account 'difficult to assess' impact including teaching and unpublished work; would consider contributions to the discipline and the university; would look beyond journal rankings; and take more time and care in engaging and considering the

merit of people's work on an individual level. A lesser theme was of measurement as impartial, quick, and as a way of incentivising and rewarding important research. Lastly, the notion of 'what is valued' highlighted that some felt "the quantity and quality of research outputs should be paramount" that international reputation attracts postgraduate students and research funds, and outweighs the esteem of departmental colleagues. By contrast a respondent felt that metrics should be less important, as "the focus on publication means that work gets split, and 'non-promotional work' gets dumped on certain staff, often women".

Overall, social sciences and arts and humanities reported that altmetrics had highest levels of current importance to academic promotion. Sciences reported the lowest levels of importance (Appendix 10). Half of arts and humanities reported not knowing how important altmetrics were, while this was under 20% in social sciences and sciences.

Reasons for the current and ideal importance rating centred principally around altmetrics as indicators of engagement, that "being in the news does seem to have an impact" and that they "offer informed commentary that can respond to the quality of academic work and the esteem in which work is held". They also included the value of altmetrics as important indicators of influence; value in promoting the University, linking to the community and generating future research funding; and in providing a more rounded picture alongside traditional metrics.

Conversely, an equal number of respondents felt that altmetrics were not valued because they were not well understood by the institution, and that "unless we become more like the UK where public impact is now seen as very important, these measures will always be well behind the traditional measures". Finally, comments suggested that while "the big picture is considered" in relation to promotions, altmetrics lack the robustness to be taken seriously, and cautioned against equating public popularity as a proxy for quality or importance.

5.7 Importance of metrics to research assessment

Traditional metrics

Respondents considered that traditional metrics should be less important to research assessment than they currently are but that they should still play a role (Figure 7). Sciences reported the highest levels of current importance (72% quite to extremely), social sciences (45% quite to extremely) and arts and humanities (41% quite to extremely).

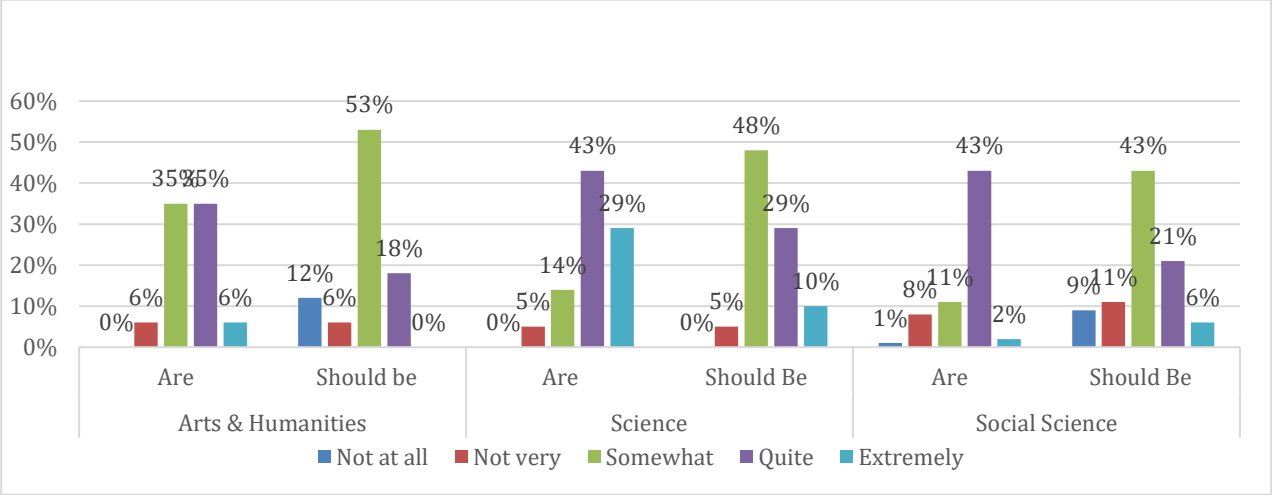

Figure 7: Importance of traditional metrics to research assessment (current/ideal) (n=91)

Reasons for respondents' importance rating, centred around explicit evidence that metrics are important, and frustration at the lack of clarity about how the research assessment (PBRF) panels view metrics. Lesser themes considered metrics as only one factor as "PBRF seems to now take a more holistic view of impact, including giving opportunity to value local and community effects", and lastly, that metrics as a measure of potential impact have a role in valuing "research that makes a difference, as opposed to research that doesn't".

Sciences placed higher value on the ideal level of importance of traditional metrics to research assessment, followed by social sciences and arts and humanities. Reasons for respondents ideal importance rating of traditional metrics centred around metrics as an impartial and quick measurement, the inherent inequities of metrics, and the need for a more holistic and nuanced approach that values work beyond its academic reach.

Altmetrics

All disciplines reported that altmetrics should be more important to research assessment than they currently are, which contrasts with traditional metrics, where it was felt they should be less important than they currently are. Social sciences showed the strongest support followed by arts and humanities, then sciences (Figure 8).

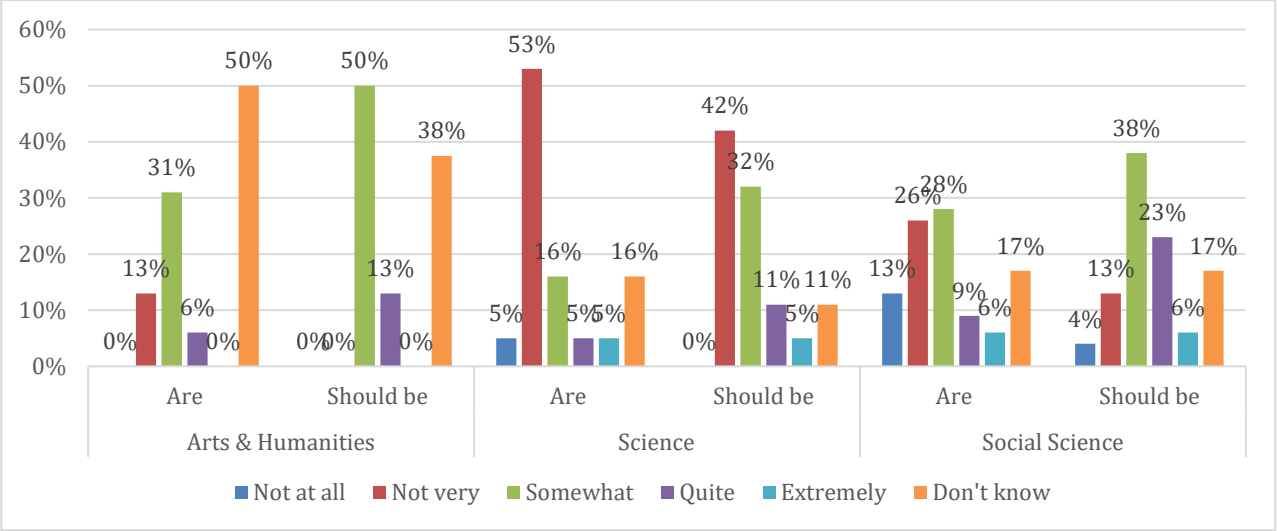

Figure 8: Importance of altmetrics to research assessment (current/ideal) (discipline) (n=88)

In general respondents indicated altmetrics should be of more importance to research assessment than they currently are. Responses given for the 'ideal' importance rating echo previous responses, principally that, altmetrics serve as an indicator of engagement and "relate more to impact than academics talking to themselves and each other". Others commented that the appropriate emphasis is on traditional metrics; that altmetrics lack robustness and, when used without caution, risk being overvalued. Lastly, comments suggested that altmetrics should be one of a range of tools and that "a wide range of kinds of research impact and contributions should be allowed to contribute to promotion and research assessment".

5.8 Uses for metrics beyond research assessment and academic promotion

Just under 40% of respondents indicated they looked at traditional metrics outside of research assessment or academic promotion for two main reasons. The first reason is in order to assess the

impact of their own scholarly work “I like to update myself as to how much impact my research is having in the field. It is out of natural and professional curiosity that I want to know”.

The second reason is to assess the impact of a journal in relation to publishing. The comments show different ends of the spectrum, from the positive response “I always look at Scimago before deciding on a journal to which to submit a manuscript. I only submit to Q1 journals” to the pained response “making decisions about journals to target (I hate the system but at the same time have to function within it - while looking for opportunities such as this survey to highlight issues)”.

Only 18% of respondents reported seeking altmetrics, the main purpose being to see the level of engagement outside of academia “I like to try to gauge how my work may be being shared in the professional sector as that is who the research is aimed at”. A lesser use was for research “I read critical reviews of live performance in newspapers and in journals when I am researching particular performances”.

5.9 Researcher profiles

Nearly all respondents (97%) had a profile, with many having more than one (Figure 9). The top four were ORCID, University staff profile, ResearchGate and Google Scholar. Academia.edu was ranked 7th out of 12. Accounting for the mandatory staff profile, and the institutional imperative to have an ORCID ID, ResearchGate is the clear winner of the researcher-initiated profiles.

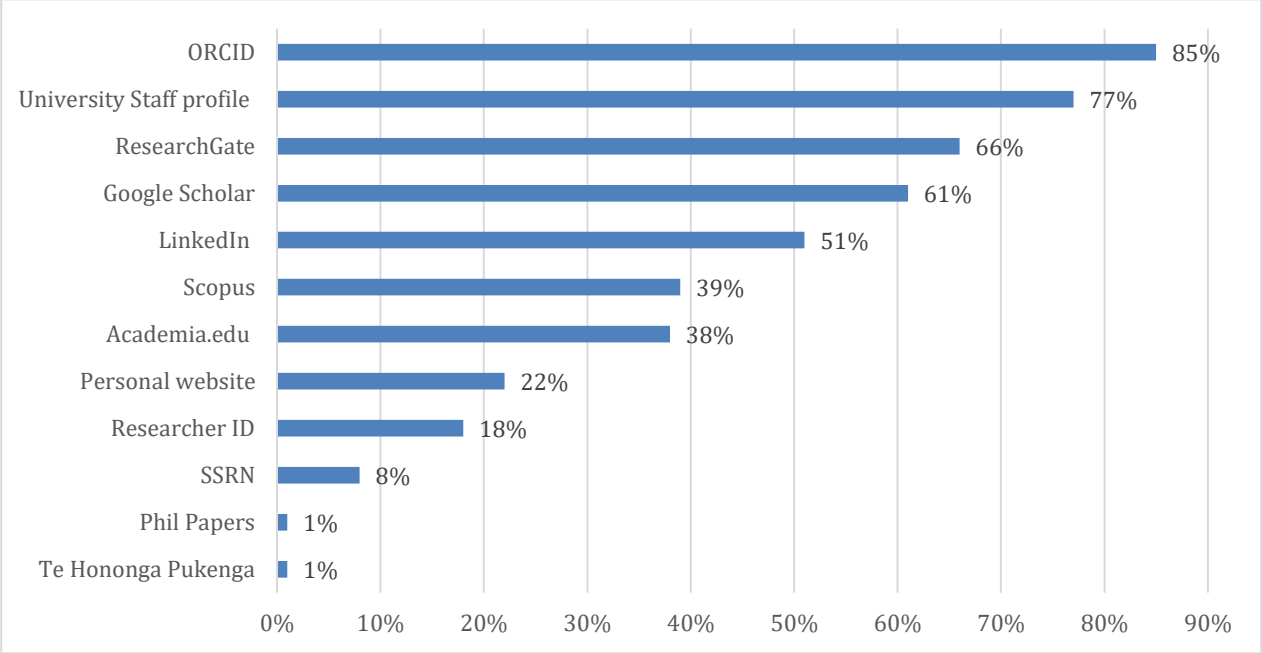

Figure 9: Researcher profiles held by staff (n=88)

5.10 Profile preferences

One third felt their profile reflected their research activities well, just on half reported somewhat well, while 17% felt it did not (Figure 10). Arts and humanities reported the highest levels of accuracy, followed by sciences, and social sciences.

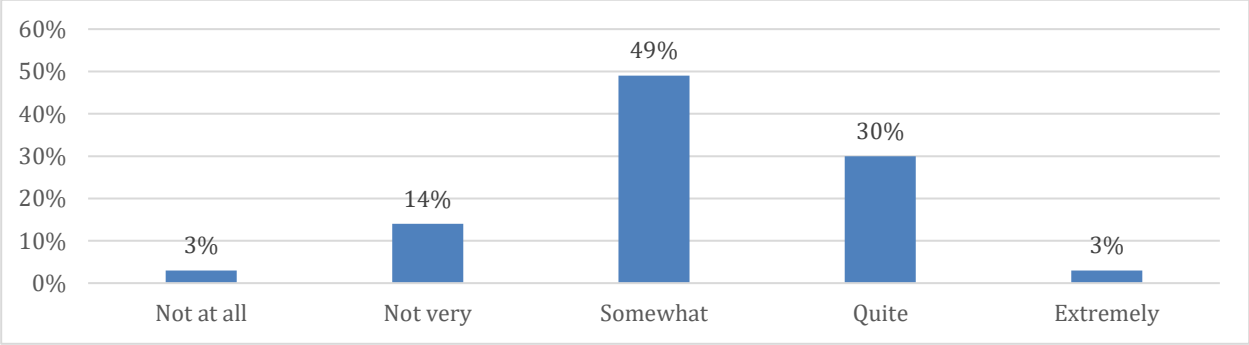

Figure 10: How well does your profile reflect your activities as a researcher? (n=86)

ResearchGate and Google Scholar were the most popular profiles, followed by the University staff profile and ORCID. Of 46 responses, Academia.edu was ranked best by only two, despite nearly 40% having a profile on that platform.

Table 2: Popularity of profiles by discipline

Site	Number of respondents			
	Overall	Arts and Humanities	Sciences	Social Sciences
ResearchGate	16	4	7	5
Google Scholar	11	0	5	6
University Profile	9	2	1	5
ORCID	7	1	3	3
Personal Website	3	0	2	1
LinkedIn	3	0	0	2
Academia.edu	2	1	0	1
Philpapers	1	1	0	0

Below are the reasons users preferred the various profiles, in order of popularity:

- ResearchGate (n=16)

  A comprehensive repository of research outputs, easy to upload and share research outputs, easy to create projects which people can follow. Gets the most traffic including many followers who see, read and/or request work, used by others in the same research area, provides the most relevant notifications about other work.

- Google Scholar (n=11)

  A complete list of publications (generated automatically) (journal articles, books, book chapters); citations; visibility; access.

- University staff profile (n=9)

  Most comprehensive and updated, used to introduce speakers at conferences, helps potential students learn about scholars' research interests, results in students approaching academics for

supervision, visibly connects researchers with the institution and also links to ResearchGate and ORCID profiles.

- ORCID (n=7)

  A publication list that can be generated by exporting items from other systems, linked to the University, necessary for publication in certain journals.

- Personal website (n=3)

  Allows students with limited access to digital publications to access work free of charge and researchers have total control over it.

- LinkedIn (n=3)

  Has the broadest reach, is more efficient and dynamic, user friendly.

- Academia.edu (n=3)

  Used widely by colleagues in the same field, generates the most engagement with their work.

- Philpapers (n=3)

  Degree specific, high quality, accurate.

5.11 Concerns about researcher profiles

By far the largest concern for respondents was how to reduce the time and effort to maintain them. Other concerns were knowing how profiles could benefit them and which profile would be best for their needs, and being able to target one's activities strategically and cohesively. One respondent asked "are there research findings on how best to maximise these platforms?". Lastly respondents were keen to know about how to upload content without breaching copyright and one asked "what should I do when people on ResearchGate ask for full versions of my work?"

Respondents were critical of the for-profit model of Academia.edu with the associated pressure to pay for full service and the deluge of marketing emails. Others referred to negative consequences such as loss of privacy, identity theft, and being open to ridicule and one-upmanship. A final concern related to inflexibility and limitations of individual platforms.

Seeking help with researcher profiles

Nearly 50% had not sought help, 24% asked library staff, 17% asked academic colleagues, and less than 10% asked administrative or Research Office staff. Of those who did seek help, the library featured higher than other sources across all disciplines.

6. Summary of findings

Sources of metrics

The most popular sources of metrics were Google Scholar for traditional metrics and ResearchGate for altmetrics. Sciences sought metrics most, arts and humanities least. All disciplines sought traditional metrics more than altmetrics. Metrics from the University's open access institutional repository (which generates altmetrics) were used by only 9% of respondents compared to 57% for Google Scholar and 25% for ResearchGate.

Understanding

This study found higher levels of understanding of traditional metrics than altmetrics, with sciences reporting higher levels than social sciences and arts and humanities.

Accuracy

No one considered traditional metrics an extremely accurate reflection of the value of their work. More respondents from sciences considered them "somewhat" or "quite" accurate than from social sciences or arts and humanities. Approximately one quarter from each discipline reported "not knowing" how accurate they were. The main objection to traditional metrics was the "evaluation gap" (Wouters, 2017) where traditional metrics were not considered a relevant measure of the work produced or the audience it benefitted.

Altmetrics were considered slightly less accurate than traditional metrics, with half from social sciences and arts and humanities and 16% from sciences "not knowing" how accurate they were, and a very small number from sciences and social sciences who considered them "extremely"

accurate. The main argument in support of altmetrics was their ability to capture engagement outside of academia.

Importance of metrics to academic promotion

Respondents felt that *traditional* metrics should play less of a role in academic promotion. In terms of their actual importance, social sciences rated traditional metrics as being more important, than did sciences and arts and humanities. Sciences reported traditional metrics should ideally be more important to academic promotion than did social sciences and arts and humanities.

Social sciences and arts and humanities felt *altmetrics* were more important to academic promotion than did sciences. While all disciplines felt they should be more important than they are currently, Sciences reported the largest gap between 'current' and 'ideal' levels of importance.

Importance of metrics to research assessment

Respondents considered that *traditional* metrics should be less important to research assessment than they currently are, but that they should still play a role. Sciences valued them the highest and social sciences and arts and humanities valued them to a similarly lesser extent.

All disciplines reported that altmetrics should be more important to research assessment than they currently are. Social sciences showed the strongest support followed by arts and humanities, then sciences.

Outside of promotion or research assessment, just under 40% used traditional metrics to assess the impact of their own work, or that of a journal, when considering where to publish. Fewer than 20% used altmetrics, and this was in order to gauge levels of engagement with their work outside of academia.

Researcher Profiles

Almost all respondents had a profile, with ORCID, University, ResearchGate and Google Scholar being the top four respectively. Only a third felt their profiles were a good reflection of their activities as researchers.

Aside from satisfying institutional requirements, the main motivations for having a profile were to: increase research visibility; allow others access to their work; and connect with potential collaborators. Just over 80% felt their profile increased their research visibility, just over half felt their profile increased their citation rates and their altmetrics, with more from arts and humanities than social sciences or sciences reporting that they did. Reducing the time and effort in maintaining profiles was the greatest area of need.

Engagement with library help

Just over 50% of respondents reported seeking help with their profiles, with the library the most highly used source of help. A similar number sought help to find or interpret traditional metrics and a third sought help to find or interpret altmetrics, with more seeking library help for traditional metrics and more seeking collegial help for altmetrics.

7. Discussion

> The evaluation gap is the phenomenon—experienced by many academics—that the criteria in assessments do not match the character or goals of the research under evaluation or the role that the researcher aims to play in society. (Wouters, 2017, p. 109)

> It's our responsibility to ensure that our metrics are shaped by our values and that our practices are not undermined by what can be counted— Long. (Michigan State University, 2017, para. 3)

As other research has shown, there are clear disciplinary alignments with these measures. Sciences consider traditional metrics do (to an extent) accurately reflect the value of their work, and they are important to academic promotion and research assessment. Consequently, sciences report higher levels of understanding and use of traditional metrics. The opposite applies for arts and humanities who consider that traditional metrics do not accurately reflect the value of their work and that they are not important to academic promotion and research assessment. As a result, arts and humanities report lower levels of understanding of traditional metrics and even lower levels of use.

> *I think that critical commentary and scholarly engagement is a much more valuable assessment of academic work than number of downloads or citation counts. Arts and humanities researcher*

For most arts and humanities researchers in this study, this kind of criticism was consistent. Contrastingly, social sciences are more aligned with sciences than arts and humanities in their understandings of traditional metrics, perceptions of their accuracy and importance to academic promotion. However, in relation to research assessment, they are more closely aligned with arts and humanities in the degree of importance that they consider traditional metrics should play. Social sciences and arts and humanities also share similar perceptions of the accuracy of altmetrics and their importance to academic promotion, and in thinking that altmetrics should ideally be more important to research assessment than they currently are.

There are also outliers, or perspectives contrary to the general pattern of a discipline, for instance a scientist who feels “metrics are good to know, but [is] concerned about the growth of "audit culture" in academia, the reduction of researchers down to one or two numbers, that do not adequately reflect the individual”.

One of the most interesting findings was that while metrics were seen as flawed, biased, and disadvantageous to certain groups (for instance women who take parental leave); they could also overcome local prejudice and show the international esteem in which that person’s work is held.

> *Before PBRF, some women academics were marginalised in their scholarly fields (in NZ) until PBRF showed that they are internationally recognised, followed, cited and celebrated. Social Sciences researcher*

Some participants said it was made explicitly clear that metrics were important to academic research promotion or research assessment, while others felt this was entirely unclear. Some considered metrics provided an impartial and quick measure, and were a useful proxy for quality, while others felt that the immeasurable could not be measured, and that research outputs should be assessed individually.

Journal rankings represented, for some, an important measure of quality, while for others, they felt compelled to choose between publishing in highly ranked journals to help with career advancement, or publishing in non-ranked journals of value in applied and professional settings

The themes raised by the qualitative comments speak eloquently to the specific ways in which faculty "engage" with the metric landscape which is an important part of this research. These themes are:

- The need for a more holistic and nuanced approach beyond metrics of any sort that values work beyond its academic reach

> *The quality and value and impact of our work as researchers is not reducible to metrics and I oppose the idea that my work must be evaluated on metrics. We are now well through responding to the crises of representation and legitimation in research and we are no longer tied to scientific and positivist measures of generalizability, reliability and validity. Instead, we consider the significance of verisimilitude, affect, ethical processes and aesthetics. Why should our success in research, particularly in arts based and qualitative researcher, be measured in such positivist ways that prioritise the written word over all other forms of communication? Arts and humanities researcher*
>
> *I feel [altmetrics] reflect publicity given to research rather than the quality of the research. Arts and humanities researcher*

- The tension between publishing in a highly ranked journal which increases metrics and the chance of promotion; and reaching end users who will never contribute to traditional metrics

> *Metrics do NOT capture end user impact. With the continued push towards metrics one impedes one's career by engaging with end users. Sciences researcher*

- The inbuilt inequities of metrics

> *Depends on contextual factors influencing research, e.g. high-status Northern hemisphere academic institutions appear to be the baseline for a lot of metrics,*

thus putting NZ researchers at something of natural disadvantage due to geography and levels of institutional support. Arts and humanities researcher

- The ability manipulability of traditional and altmetrics

The system is stacked, for example some publish in peer reviewed journals without being peer reviewed due to personal contacts or being on the editorial boards. This sort of issue brings the whole notion into disrepute. Social Sciences

It's a game that can be 'rigged' / played well or poorly, resulting in more or fewer citations or altmetrics purely on the basis of marketing / strategic work rather than the actual quality of your work. Sciences researcher

- The value of altmetrics as indicators of impact

These non-traditional metrics can have a great deal of impact on the sector of the research and are more likely to highlight/promote the name of the university and can provide strong links with the community and further opportunities for research finds. Social sciences researcher

They appear to be more focused on the contribution of knowledge to the specific research environment as opposed to journal rankings. Sciences researcher

- The value of traditional metrics as quick and impartial measures of impact

Some kind of assessment of research is important to reward and provide further opportunities for those doing important research and this is, all things considered, probably the best of the quick methods to do so. Social sciences researcher

- Institutional imperatives to use metrics

They become a stick to beat us with- i.e. a 'reason' why seeking promotion is turned down". Social sciences researcher

Some use traditional metrics because there is inherent value in quantifying their work in such a way, that is, metrics demonstrate value to them and about them for both research assessment and academic promotion purposes. Others "play the metrics game" not because of their innate value but because they observe that there are benefits in doing so (such as career advancement) or disadvantages in not doing so (lack of promotion). In contrast, there is little imperative to use altmetrics, as they are "not valued by an institution because they are not understood compared with traditional methods" Social Sciences.

Participants have articulated the same concerns as those raised in the literature, particularly around the responsible use of metrics. It seems that the messages conveyed by the responsible metrics movement have barely made an impact upon the context of the researchers who responded to this this study.

8. Implications for academic librarians

There is no homogeneous view of metrics even within divisions or disciplines. When working with faculty in this area, discipline specific approaches are required and librarians must be careful not to be seen as proponents of the measurement agenda. DeSanto and Nichols (2017) called this being "neither blindly critical nor wholly evangelical" (p. 166). An underlying assumption (with even the broadest definition of impact), is that researchers actually care that their work generates impact. With this in mind, librarians, instead of blithely promoting the various tools of impact measurement and research promotion, should first ask the following questions:

- In relation to your research outputs, what does impact mean to you?
- Do you care about impact?
- How do you know when impact has happened?
- What tools help you a) to generate impact and b) to capture it

This research has highlighted ambivalences about the relevance of metrics as indicators of impact, and about institutional factors that maintain their continued currency. Contrasting perceptions are clearly evident, and heavily context dependent. Thus, equipped with a deeper understanding of an individual researcher's position, and a discipline specific awareness of the impact arena, we could tailor individualised advice and support.

9. Suggestions for future research

This small-scale quantitative study represents the experiences of 20% of respondents from one institution, so the findings cannot confidently be applied across the university or to other settings. Rather, they serve as a modest indicator of some of the issues facing researchers within this space. A quantitative approach such as this study (even with open-ended questions) cannot offer as much insight as a qualitative approach involving semi-structured interviews, which would be a logical next step for further research.

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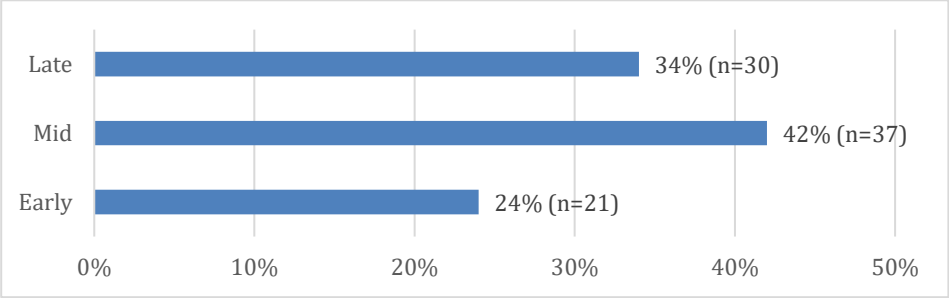
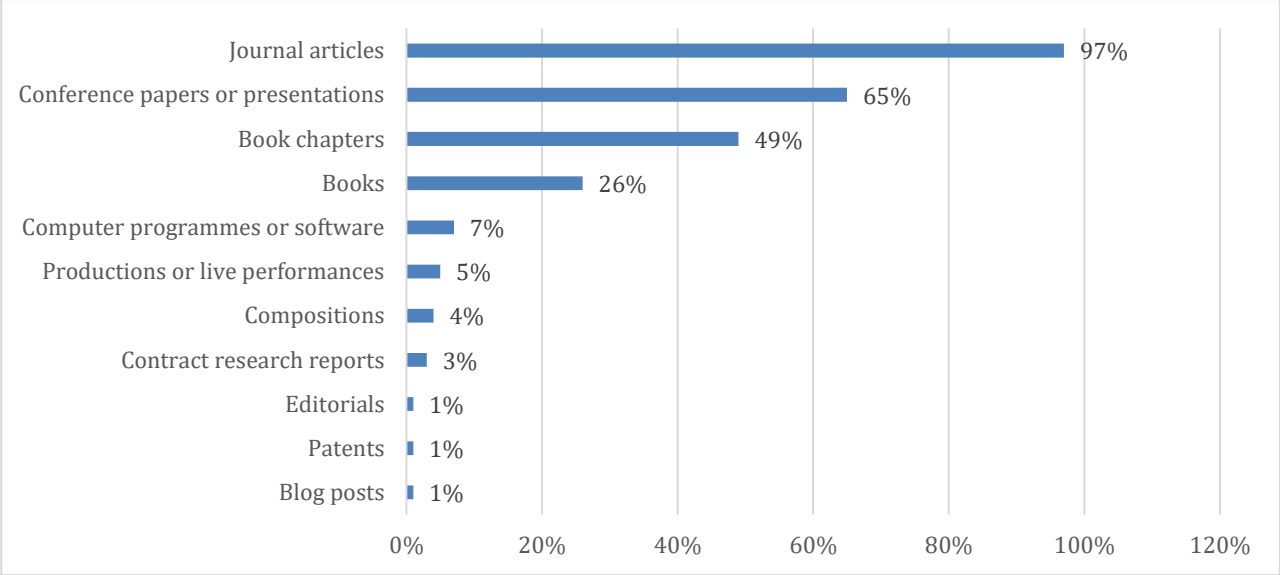
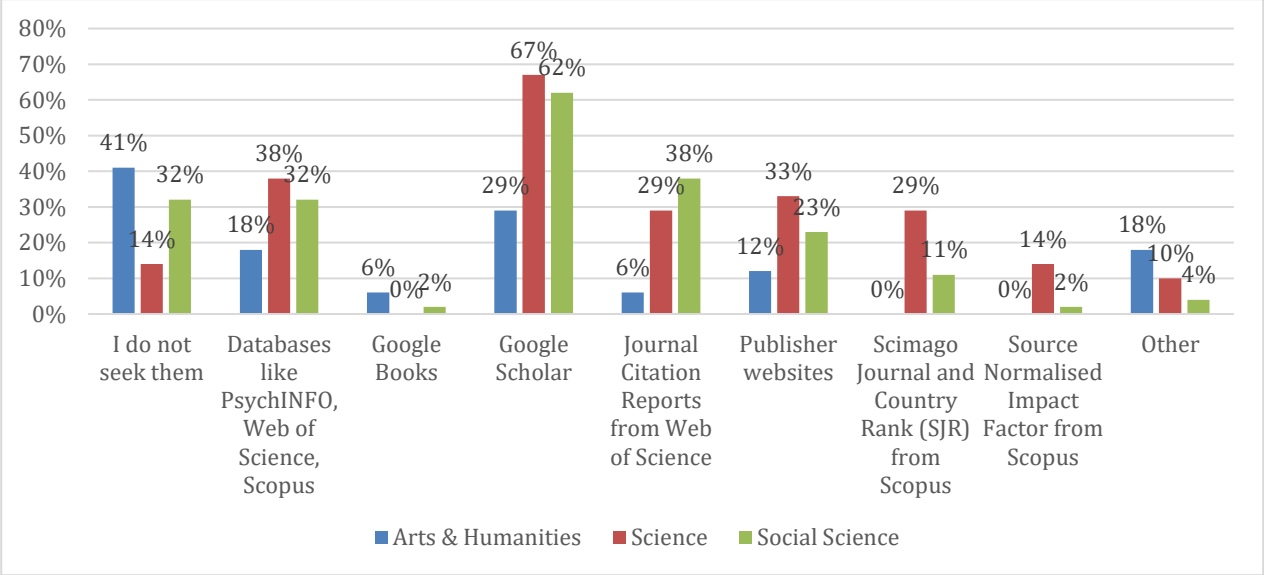
11. Appendices



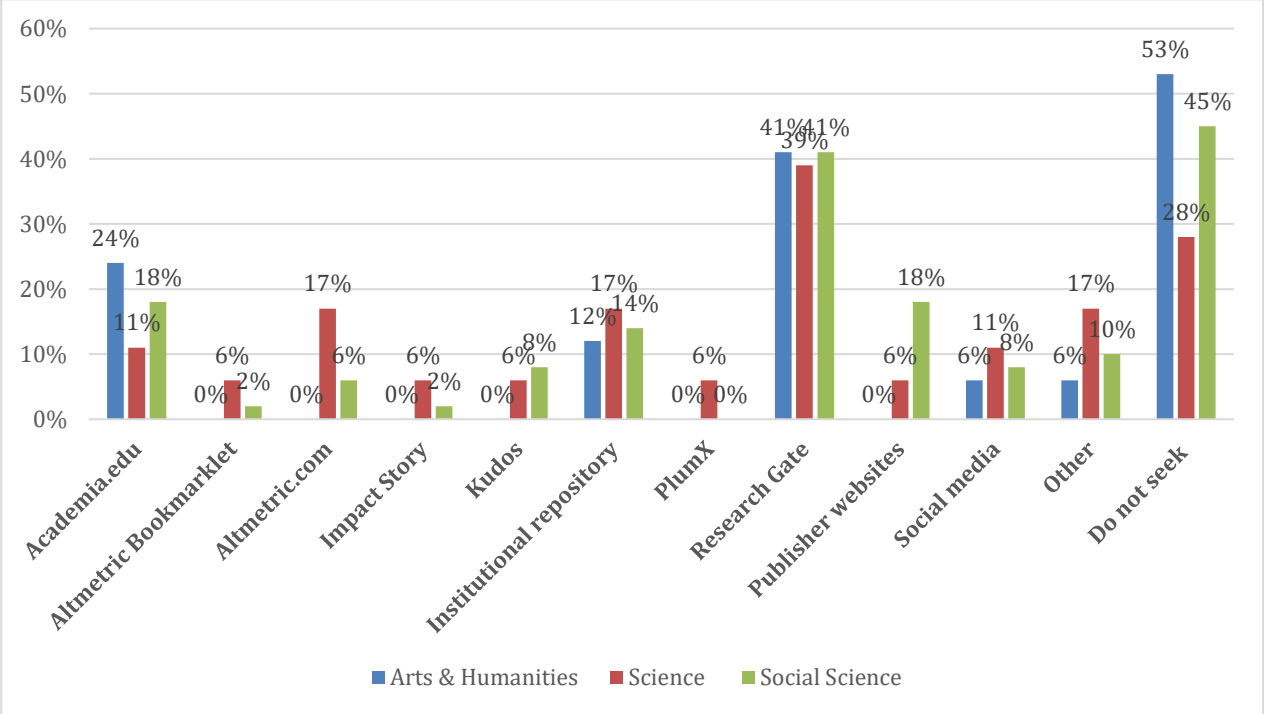
Appendix 1: Respondents by career stage (n=88)



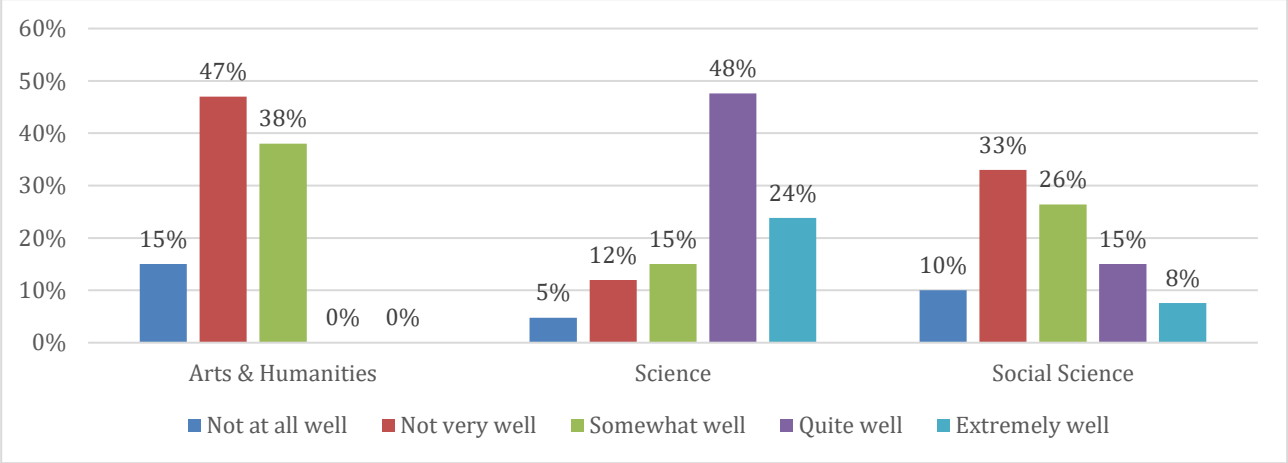
Appendix 2: Type of research outputs produced (n=91)



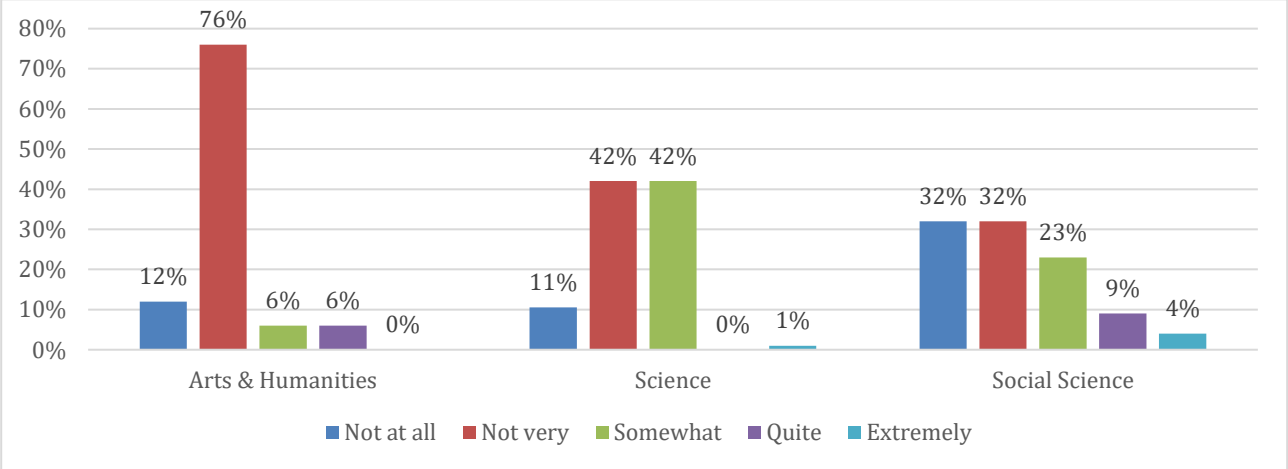
Appendix 3: Sources used to seek traditional metrics (n=91)



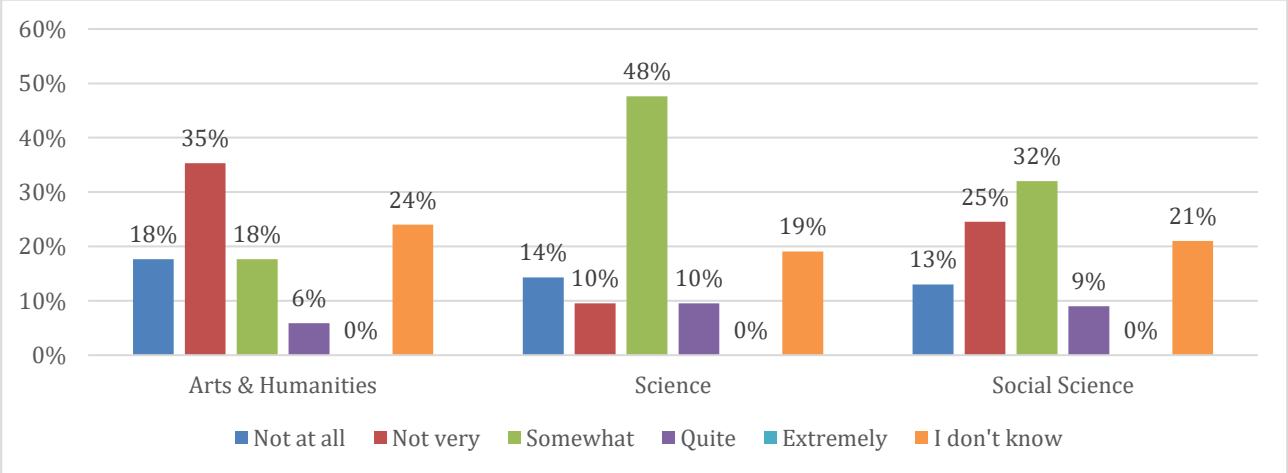
Appendix 4: Sources of altmetric information (discipline) (n=86)



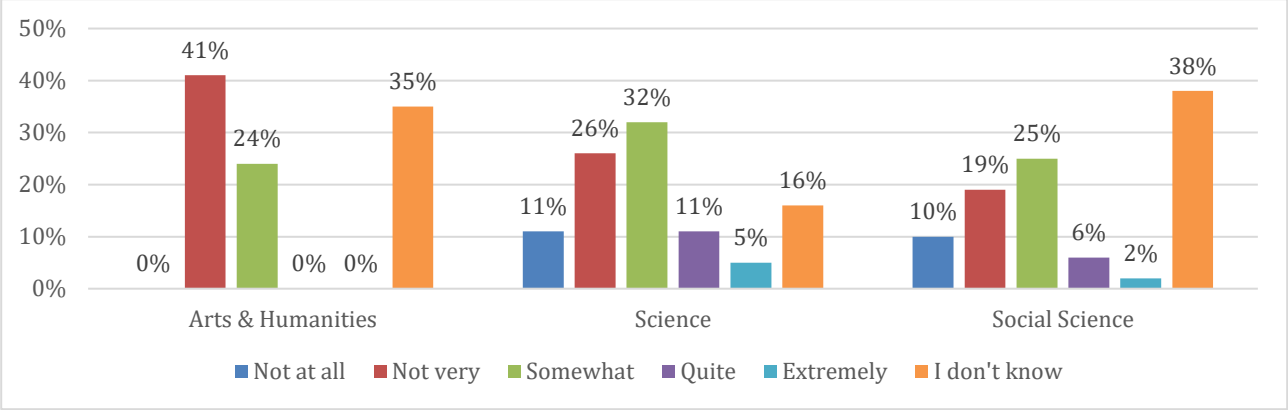
Appendix 5: Understanding of traditional metrics (discipline) (n=91)



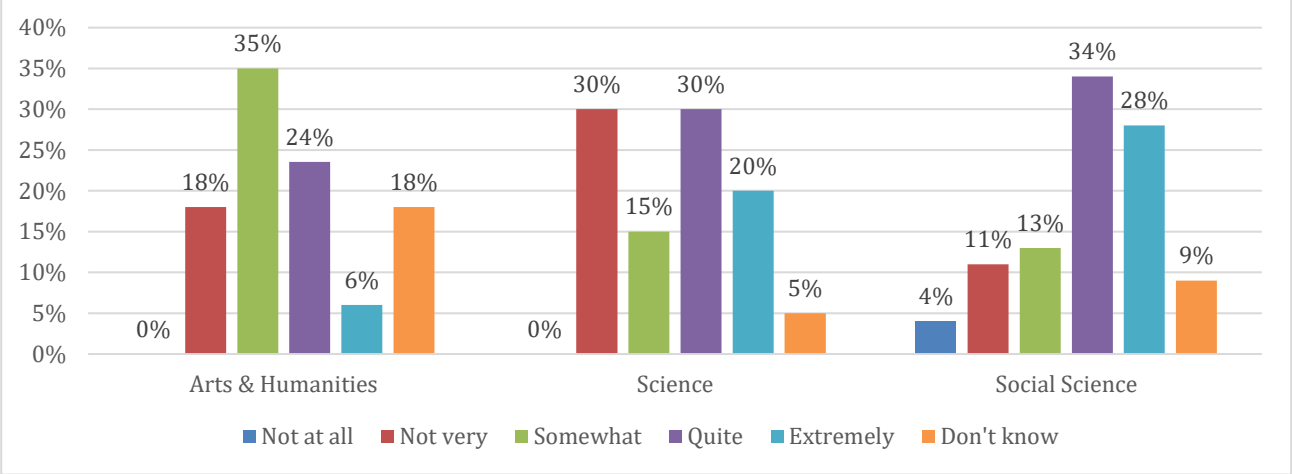
Appendix 6: Understanding of altmetrics (discipline) (n=89)



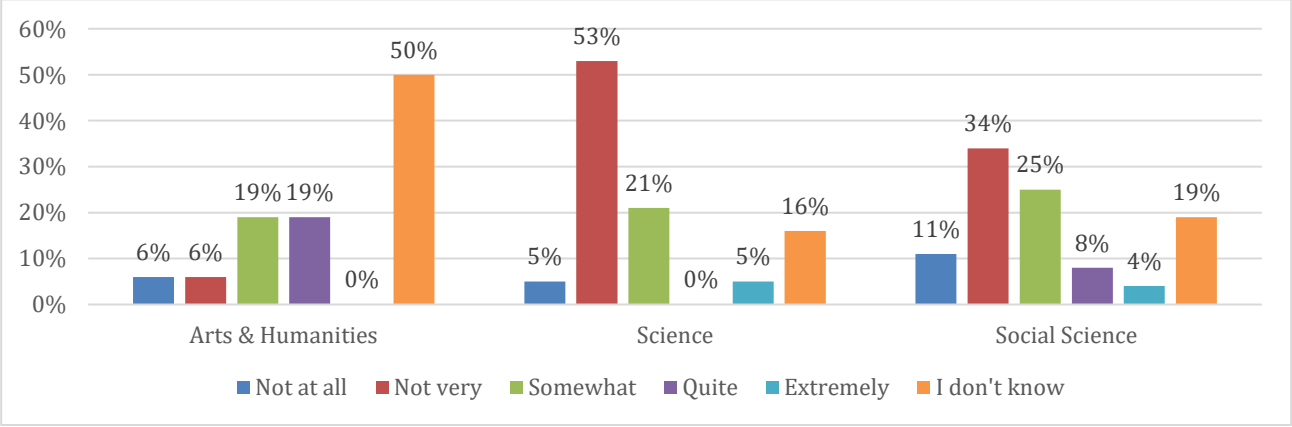
Appendix 7: Accuracy of traditional metrics to reflect the value of scholarly work (n=91)



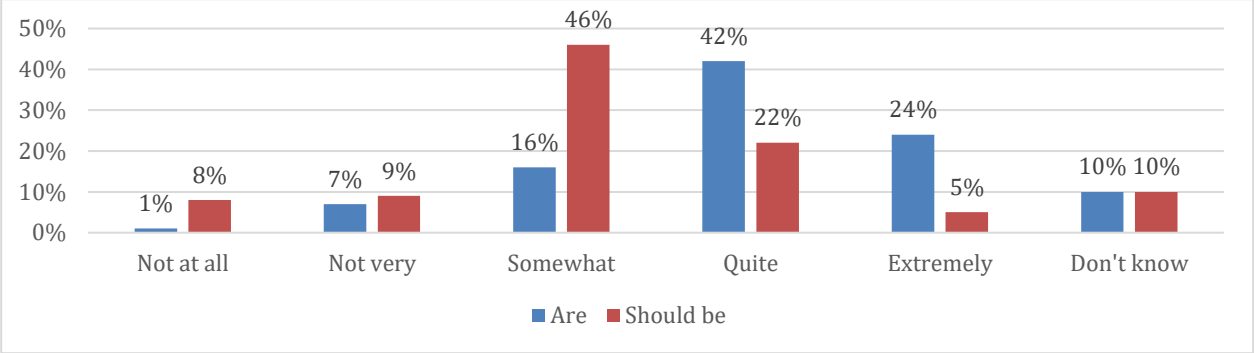
Appendix 8: Accuracy of altmetrics in reflecting the value of scholarly work (discipline) (n=88)



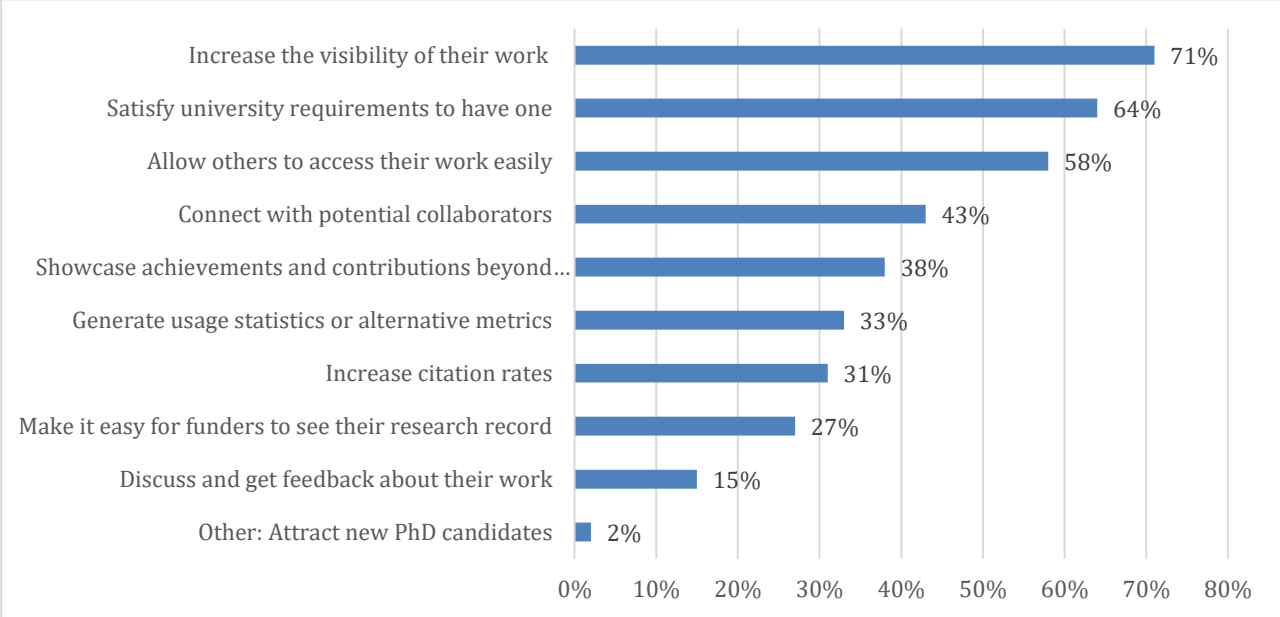
Appendix 9: Importance of traditional metrics to academic promotion (current) (discipline) (n=91)



Appendix 10: Importance of altmetrics to academic promotion currently (discipline) (current) (n=88)



Appendix 11: Importance of traditional metrics to research assessment (current/ideal) (n=91)



Appendix 12: Research profiles allow staff to (n=86)

Appendix 13: Survey

Survey Questions: Metrics, altmetrics and researcher profiles

Researcher Type - Taumata Rangahau

1 Which of the 3 major categories best fits your research? (**Click here** to see examples by category).

- Arts and Humanities
- Science
- Social Science

2 What type of research outputs do you mainly produce (tick all that apply)

- Book chapters
- Books
- Conference papers or presentations
- Compositions (e.g. choreography, film, kapahaka items, karakia, literature, music, multimedia, screenplays, waiata)
- Computer programmes or software
- Journal articles
- Productions or live performances (e.g. dance, exhibition, film, kapahaka, play, orchestral concert)
- Other (please specify) _____

Traditional Scholarly Metrics - Raraunga

3 How well do you feel you understand traditional scholarly metrics?

	Not at all well	Not very well	Somewhat well	Quite well	Extremely well
Author level metrics e.g. citation counts, H-index Journal level metrics e.g. rankings, impact factor, H-index					

4 Where do you seek traditional metrics for your scholarly work? (Tick all that apply)

- I do not search for traditional scholarly metric information

- Databases like PsychINFO, Web of Science, Scopus
- Google Books
- Google Scholar
- Journal Citation Reports (JCR) from Web of Science
- Publisher websites
- Scimago Journal and Country Rank (SJR) from Scopus
- Source Normalized Impact Factor (SNIP) from Scopus
- Other (please specify) _____

5 Where have you sought help to find or interpret traditional metric information? (Select all that apply).

- I have not sought help
- Departmental colleagues
- Library staff
- Research office staff
- Other (please specify) _____

6 How accurately do you feel traditional metrics reflect the value of your scholarly work?

- Not at all accurately
- Not very accurately
- Somewhat accurately
- Quite accurately
- Extremely accurately
- I don't know

6a Please feel free to explain why you gave the above answer (optional).

7 How important do you feel traditional scholarly metrics are to **academic promotion** in your institution?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

7a Please feel free to explain why you gave the above answer (optional).

8 How important do you feel traditional scholarly metrics **should be** to academic promotion in your institution?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

8a Please feel free to explain why you gave the above answer (optional).

9 How important do you feel traditional scholarly metrics are to **research assessment** (e.g. PBRF)?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

9a Please feel free to explain why you gave the above answer (optional).

10 How important do you feel traditional scholarly metrics **should be** to **research assessment** (e.g. PBRF)?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

10a Please feel free to explain why you gave the above answer (optional).

11 Aside from the purposes of research assessment or promotion, are there other times when you look at traditional scholarly metrics?

- No
- Yes (please specify)

Alternative Scholarly Metrics - Raraunga Rerekē

12 How well do you feel you understand alternative scholarly metrics (attention from sources such as blog mentions, downloads, kapahaka compositions, news mentions, page views, policy references, social media mentions, wānanga, whaikōrero)?

- Not at all well
- Not very well
- Somewhat well
- Quite well
- Extremely well

13 How accurately do you feel alternative metrics reflect the value of your scholarly work?

- Not at all accurately
- Not very accurately
- Somewhat accurately
- Quite accurately
- Extremely accurately
- I don't know

13a Please feel free to explain why you gave the above answer (optional).

14 How important do you feel alternative metrics are to **academic promotion** in your institution?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

14a Please feel free to explain why you gave the above answer (optional).

15 How important do you feel alternative metrics **should be** to **academic promotion** in your institution?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

15a Please feel free to explain why you gave the above answer (optional).

16 How important do you feel alternative metrics are to **research assessment** (e.g. PBRF)?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

16a Please feel free to explain why you gave the above answer (optional).

17 How important do you feel alternative metrics **should be** to **research assessment** (e.g. PBRF)?

- Not at all important
- Not very important
- Somewhat important
- Quite important
- Extremely important
- I don't know

17a Please feel free to explain why you gave the above answer (optional).

18 Where do you seek alternative metric information for your scholarly work? (Tick all that apply)

- I do not seek alternative metric information
- Academia.edu
- Almetric Bookmarklet
- Altmetric.com
- Impact Story
- Kudos
- University Institutional Repository
- Publisher websites
- PlumX
- Research Gate
- Social media
- Other (please state) _____

19 Where have you sought help to find or interpret alternative metric information about your scholarly work? (Tick all that apply)

- I have not sought help
- Departmental colleagues
- Library staff
- Research office staff
- Other (please state) _____

20 Aside from the purposes of research assessment or academic promotion, are there other times when you look at alternative metrics?

- No
- Yes (please specify) _____

Researcher Profiles - Tāhuhu Tangata Rangahau

21 Do you have a researcher profile (e.g. Academia.edu, LinkedIn, ORCID, Google Scholar, ResearchGate, Te Hononga Pukenga)?

- Yes
- No (you will be redirected to question 29)
- I don't know

22 Which of the following researcher profiles do you have? (Select all that apply).

- Academia.edu
- Google Scholar
- Linked In
- ORCID
- Personal website
- Researcher ID
- ResearchGate
- Scopus
- SSRN (Social Science Research Network)
- Staff profile on the University website
- Te Hononga Pukenga
- Other _____

23 My researcher profile(s) allow me to (tick all that apply)

- Satisfy university requirements that I have a profile
- Increase the visibility of my work
- Generate usage statistics or alternative metrics
- Showcase my achievements and contributions beyond my research outputs
- Increase my citation rate
- Connect with potential collaborators
- Allow others to access my work easily
- Discuss and get feedback about my work
- Make it easy for funders and publishers to see my research record
- Other (please state) _____

24 From whom have you sought help with your researcher profile? (Tick all that apply).

- I have not sought help
- Academic colleagues
- Library staff
- Research office staff
- Administrative staff
- Other (please specify) _____

25 How well do you feel your researcher profile/s reflect/s your activities as a researcher?

- Not at all well
- Not very well
- Somewhat
- Quite well
- Extremely well

26 Please indicate how well you agree or disagree with the following statement: A researcher profile helps to:

	Strongly agree	Agree	I don't know	Disagree	Strongly disagree
Increase my research visibility					
Increase my alternative metrics					
Increase my citation rates					

27 Which researcher profile(s) best meets your needs and why?

_____

28 Do you have any concerns regarding your researcher profile/s?

_____

29 What information regarding researcher profiles would be most helpful to you? (Tick all that apply)

- Which profile(s) would be best for my needs
- How to add content without breaching copyright or publisher agreements
- How to maintain them in the least amount of time
- An understanding of how they could benefit me
- Other (please specify) _____

Demographics - Ko Wai Koe?

30 How would you describe yourself? (This question relates to your length of service as a researcher)

- Early career researcher
- Mid career researcher
- Late career researcher
- Other (please specify) _____

31 Which faculty or division are you with?

32 Gender

- Female
- Male
- Prefer to self-describe _____
- Prefer not to say

33 Tena koe! Thank you for completing this survey.

Your responses are anonymous. I know nothing about you other than what you have told me in the survey.

There is space below for you to comment further about matters related to metrics or researcher

profiles.

I would be grateful if you would encourage your colleagues to complete this survey by forwarding them the email I sent you.

Nga mihinui,
Anne Ferrier-Watson,
Student of Victoria University, Wellington.

Appendix 14: Participant Information Sheet & Consent Form

Traditional metrics, altmetrics and researcher profiles: A cross-faculty survey of perceptions and use

Information for participants in this anonymous survey.

Tēnā koe. My name is Anne Ferrier-Watson and I am a Masters student in the School of Information Management, Victoria University of Wellington.

I am inviting you to take part in my research. Please read this information before deciding whether or not to take part. Thank you for considering my request.

What is the aim of the project? He aha te aronga o tēnei kaupapa?

I am interested to know how faculty engage with impact measures and promotion of their research, and whether they consider there is a relationship between promotion and impact.

The more visible a researcher's work, the more chance it has to generate academic and societal impact, which can be measured through both traditional and alternative measures

The central research questions are:

1. What informs faculty perceptions and use of impact measures and research promotion?
2. What factors limit faculty uptake of impact measures and research promotion?

It is hoped that the knowledge gained will enable academic librarians to better assist faculty to identify and report on the impact of their research, and to create and maintain profiles that ensure their work reaches as wide an audience as possible.

This research has been approved by the Victoria University of Wellington Human Ethics Committee #0000027255.

How can you help? Āwhina mai?

You have been invited to participate because you are a researching faculty member at the [named] University. The survey will take 10 – 15 minutes to complete. There are 33 questions and none are compulsory, so you can skip those you don't wish to answer.

Your thoughts are important! E whai hua ana ōu whakaaro!

This is a complex and sometimes contentious topic. I have included open ended questions to enable you to express ideas not canvassed by the closed questions, which will allow for a nuanced response to a complex and contentious topic.

What will happen to the information you give? Ka ahatia ki ngā korero?

This survey is completely anonymous. Nobody, including me, the researcher, will be aware of your identity. By answering it, you are consenting for me to use your responses in this research. Your answers will remain completely anonymous and unidentifiable. Once you submit the survey, it will be impossible to retract your answer. Please do not include any personally identifiable information in your responses.

Once you finish the survey, the software will generate a summary of your responses which you can download as a PDF.

All research data associated with the project (electronic and hardcopy) will be stored securely, either on my password projected University drive, or in a locked filing cabinet. The data will be destroyed after 1 January 2026, the reasons it will be kept for seven years is that there is a small likelihood that the investigation will be repeated in four or five years' time. In the next five years there will be a lot of attention paid to metrics and researcher profiles, so it will be worthwhile to see if and how responses change over time.

What will the project produce? He aha ngā hua ka puta?

The final result of the research will be a 10,000 word report that will be made available on the Victoria University Institutional Repository. I will make the report available to [named] University staff (via a link to the above repository). I hope to publish the article in a library journal and present my findings to a New Zealand library conference.

Questions or Concerns Ngā pātai me ngā nawe

Please contact me, the researcher, Anne Ferrier-Watson, ferrieanne@myvuw.ac.nz; or my supervisor, Dr Brenda Chawner, Senior Lecturer, School of Information Management brenda.chawner@vuw.ac.nz 04 4635780.

Human Ethics Committee information - Ngā tikanga matatika

If you have any concerns about the ethical conduct of the research please contact the Victoria University HEC Convenor: Dr Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

Ngā mihinui, Anne Ferrier-Watson