OpenUCT Guide

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MEASURING IMPACT

A
FIVE-STEP GUIDE
for scholarly units

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Cover image by Stacey Stent

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This [first] version June 2015

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ACKNOWLEDGEMENTS
Thank you to Linda Cilliers and Ed Rybicki for their reviews and valuable comments. Thanks also to COMPRESS.dsl for editing and layout. Grateful acknowledgements are due to the Carnegie Corporation of New York for financial support in producing this resource.

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INTRODUCTION

Are you part of a research unit or academic department that is interested in making an impact and being able to demonstrate or report on the extent to which your work is being cited and utilised? Are you interested in sharing your content online in order to boost the visibility and application of your work? This guide provides five practical steps to help you professionalise your scholarly communication activity, expand your current approach around impact measurement, and generate new forms of usage data.

The guide is aimed at scholarly units (i.e. research units, academic departments and faculties), but it can be adapted for use by an individual scholar or institution. In such a context, the focus is very much on tracking the usage of individual research outputs rather than trying to provide a summative view of the unit's overall impact.

It is important to note that we are dealing with a context in which impact is closely equated with reuse. We will look at the various kinds of data that can be generated, and the stories that can be told on the basis thereof, to demonstrate the reuse or application of content.

Traditionally, scholars have relied on the Impact Factor and formal citation in scholarly literature to demonstrate significance. In the decades since its introduction in 1972, the Impact Factor has been the globally adopted proxy for scholarly impact and a primary tool for evaluating the quality of scientific work. This indicator calculates a score based on the average number of citations in peer-reviewed publications indexed by Thomson-Reuter databases over a set period. However, it is being challenged as the main measure for gauging the impact of scholarly enterprise – particularly in terms of return on investment and positive influence in a development context, where evidence of change is required.[1] To a large extent, the Impact Factor has been overtaken by the H-index in formal assessment processes, as it is based on citations

1 For an overview of the main areas of critique concerning the Impact Factor, see Stephen Currey's now seminal blog post: Sick of Impact Factors **http://occamstypewriter.org/scurry/2012/08/13/sick-of-impact-factors/**; and Jeroen Bosman's Nine reasons why Impact Factors fail and using them may harm science **https://im2punt0.wordpress.com/2013/11/03/nine-reasons-why-impact-factors-fail-and-using-them-may-harm-science/**

received by an individual author (rather than the journal) and is judged to be a more appropriate reflection of career trajectory.

IMPACT BEYOND FORMAL CITATION

Rapidly evolving scholarly communication practices, increased financial pressure, growing expectations on academia to address 'real-world' issues and a new focus on open access sharing, however, have shifted the landscape significantly as far as the impact agenda is concerned.

The wide range of scholarly output beyond traditional books and journal articles now available to both academic and non-academic audiences has stimulated significant activity around dissemination and content visibility, accompanied by novel ways of tracking content online.

THE RISE OF ALTMETRICS

Internationally, the Altmetrics movement has emerged in response to the need for a more nuanced indication of impact which takes into consideration a wide range of scholarly outputs disseminated via a wide range of channels to a wide range of audiences. Altmetrics does not purport to be an alternative to traditional bibliometrics (dominated by the Impact Factor), but rather aims to establish a more expansive view in which various metrics are taken into consideration to gain a sense of network interaction, stakeholder influence and public response.

Figure 1: New areas in which academics can measure and pursue impact

Source: ***http://altmetrics.org/manifesto/***

THE METHODOLOGICAL CHALLENGE AND NEED FOR EXPERIMENTATION

Stakeholders in the global research assessment environment are asking tough questions about how to measure and report on impact. The absence of clear guidelines, or a neatly articulated framework, constituting a credible alternative to the Impact Factor means that researchers, funding bodies and institutions find themselves in a perplexing transitionary period. Current global developments indicate that the impact conversation is evolving rapidly, and Altmetric data are set to become a mainstream feature of research management. The challenge is to find new, context-appropriate methodologies to make sense of the many kinds of usage data that are available in a way that is meaningful, consistent over time and of global relevance. The imperative is particularly acute for scholars operating in a development context, where strategy calls for impact beyond citation and engagement with a wide range of networks beyond the traditional scholar-to-scholar environment.

STEP 1

IDENTIFY YOUR IMPERATIVES

Impact is not a number. The framework in terms of which you evaluate your work follows from your mission and the strategies you put in place to fulfil your core objectives. In the case of an academic research unit or department, you will need to invest some time in consolidating your approach to impact measurement in line with your mission and strategic objectives.

ASK QUESTIONS ABOUT YOUR MISSION

Mission statements may be lengthy expressions of a unit's ambitions, but most typically they are captured in a line or two, employing quite broad, generic language, such as: 'We strive for academic excellence and policy relevance' or 'To undertake research that is relevant to the needs of our country and beyond'.

To articulate an impact framework that speaks to your mission, it is useful to interrogate the statement a little further, asking questions like:

- What constitutes excellence in your context?
- Who do you see as your main audience in fulfilling your mission?
- Where (geographically) do you see your target audience as being located?
- What are your most important communication channels for reaching your desired audience?
- What usage/uptake indicators are your funders and other stakeholders interested in?
- Are your communication interests vested mainly in the formal scholar-to-scholar paradigm or in an expanded, informal scholarly context?

The answers to these questions will provide you with a sense of where you should be directing your efforts. There is no intrinsic right or wrong in this context. What is important is: (a) that the mission is articulated; and (b) that you understand what the mission means in terms of underlying imperatives.

IDENTIFY OBJECTIVES AND RELEVANT MEASURES

Once you have a sense of what your imperatives are, you can set objectives to reach your goals. Table 1 provides examples of the kind of objectives that might be matched to the various aspects of your mission. The detail of these objectives can be honed on the basis of responses to the questions about the mission statement posed above.

Table 1: Examples of impact objectives based on mission and desired audience

Mission	Audience	Objectives
Academic excellence	– Scholarly peers – Institutional managers – Funders	– Ensure work is visible and freely accessible on the Internet – Identify and engage key academic personas in social network spaces – Profile findings via blog, Twitter and Facebook activity – Ensure work is citable by reputable peers
Policy influence	– Government – CBOs/NGOs – Mainstream media	– Ensure work is visible and freely accessible on the Internet – Influence decision-makers and the policy-making process – Blog about findings – Identify key personas in social network spaces and alert them to your work – Start Facebook and Twitter discussions around pertinent areas – Engage mainstream media on the relevance of your work

Mission	Audience	Objectives
Contributing to teaching and education	– Scholarly peers – Lecturers/teachers – Students – Public	– Ensure work is visible and freely accessible on the Internet – Produce popularly accessible and user-friendly outputs – Repackage content for classroom use – Promote work in relevant forums and social network communities
Community engagement	– CBOs/NGOs – Church groups – Charity organisations – Government – Mainstream media	– Ensure work is visible and freely accessible on the Internet – Produce popularly accessible and user-friendly outputs – Explore alternative technologies and platforms for content delivery (e.g. mobile telephone and radio) – Translate resources, or portions thereof, into local languages – Communicate updates about research interests and partnership opportunities
Building knowledge and contributing to the discipline	– Scholarly peers – Scholarly societies – Journals/publishers – Lecturers/teachers – Librarians – Students	– Ensure work is visible and freely accessible on the Internet – Share and promote availability of source data and a wide range of outputs pertaining to the larger research life cycle – Apply content licensing that allows for reuse, modification and commercial application
Contributing to the profession	– Scholarly peers – Scholarly societies – Practitioners – Industry partners – Journals and trade publications	– Ensure work is visible and freely accessible on the Internet – Communicate updates about research activity and professional partnership opportunities via social media – Utilise structured email and newsletter campaigns – Follow and interact with key professional figures via social media – Blog about research interests and findings – Apply content licensing that allows for reuse, modification and commercial application

Once you have identified your audience and objectives, you can expand your thinking to arrive at what your relevant impact indicators or measures might be. The matrix outlined in Table 2 might help in articulating the impact framework you would like to pursue, that is, what the most appropriate dissemination channels would be, what kinds of output you intend generating, and what your indicators of success might be. The matrix is not definitive, but it will provide you with a broad sense of where you could be directing your activity and what forms of usage data speak most to your mission and imperatives.

Table 2: Matrix of audience, outputs and measures

Audience	Outputs				Measures
	Traditional academic outputs	Grey literature	Blogs	Social media	
Academic	X	X	X	X	Citations, bookmarks, page views and downloads, social media attention
Government/ policy-makers		X	X	X	Bookmarks, social media attention
NGOs/CBOs		X	X	X	Bookmarks, social media attention
Media		X	X	X	Bookmarks, social media attention
Public			X	X	Social media attention
Students	X	X	X	X	Citations, bookmarks, page views and downloads, social media attention

In the table on the preceeding page, ‘Traditional academic outputs’ refers to books, research papers and conference proceedings; ‘Grey literature’ refers to reports, briefing papers, policy briefs, presentations and other forms of scholarly output produced by academics in the course of doing and communicating their work; and ‘Social media’ refers to social networking platforms like Facebook and Twitter. Blogs are differentiated from social media, as they have the propensity to be more scholarly in nature and are increasingly integrated into the scholarly record in a way that Facebook posts and tweets are not. Thus, they form an important, differentiated component of the continuum that exists between traditional outputs and social media.

CONSULT WITH RELEVANT STAKEHOLDERS

The process of strategic engagement with your unit’s impact framework can be by way of various forums, such as board meetings, strategic planning days, staff consultations and evaluations. It is important that the unit’s strategy around impact is articulated collectively (rather than merely as the vision of a small inner circle), and that the process achieves a balance between internal ambitions and external pressures. Once you have a framework in place, it might be useful to consult your library, research office or communications division for input and advice, and to get a sense of what institutional rules or policies pertain to your activities. Consulting with partners (including members of any local communities involved) is also important in ascertaining the extent of available resources and support services.

At this stage, it is also useful to have a conversation with your grant funders and academic collaborators in to share your impact vision and determine whether the indicators you are interested in resonate with your partners and your community.

STEP 2

CURATE

Content curation refers here to the systematic organisation, description and preservation of digital resources for the purposes of sharing and promoting optimal visibility.

GET YOUR HOUSE IN ORDER

Many units and individual academics typically have a significant backlog to deal with when they first start addressing curatorial activity. This is because the curatorial enterprise for journal articles and books has been handled traditionally by publishers as part of the conventional distribution process. If your ambition is to curate and share a sizeable collection of content, you will need a strategy to deal with this systematically.

At the outset, get a clear idea of what you wish to profile and where you are going to begin. If you are dealing with a large collection that stretches back 20 years, pick a viable starting point and identify a sample sub-set of content to work with in defining your systems and in ironing out any teething troubles. It can be useful, for instance, to start by focusing only on the outputs of the previous three to five years. Alternatively, you could choose to focus on thematic areas, prioritising those outputs for which there is most public demand. Whatever your approach, it is crucial that you get a grip on the extent of the collection you are working with and the nature and potential categories thereof.

You might have an archive of paper-based resources you would like to profile, in which case you would need to digitise these for effective dissemination. You might undertake curatorial activity by yourself or with departmental support in the form

of a scholarly communication officer. Either way, institutional or departmental coordination is necessary to ensure that content is prepared in a uniform way.

ASSESS YOUR INTELLECTUAL PROPERTY AND COPYRIGHT FRAMEWORK

Once you have identified and gathered together the content you wish to curate, you will need to check whether you are legally entitled to share that content. Typically, this comes down to the question of who owns or holds the intellectual property (IP) rights to the content. Institutional policy and your grant agreements will provide insight into the IP provisions surrounding your content collection.

Typically, content that has been published previously by an external publisher is most tricky to work with, as IP is sometimes transferred to the publisher in formal publishing relationships. If you are working with previously published content, check any publication agreements you might have on record and refer to the SHERPA-RoMEO database for a sense of what your rights are.[2] Rights need to be assessed on a resource-specific (or object-specific) basis, and your agreement with a publisher must be considered in conjunction with the publisher's policies. In most cases, the resource-specific agreement supersedes the publisher's formal policies in the event of a discrepancy.

Work funded by grant organisations also typically has formally articulated IP provisions. Should a legacy contract be unclear or prevent you from sharing content in the way you would like, it is a good idea to contact the funders and explore the prospect of waiving or amending outdated provisions; there have been significant changes in attitude and flexibility around rights management for content sharing in recent years.

In addition to your research contracts and grant agreements, it is crucial that you familiarise yourself with any institutional policies that might have a bearing on your IP and rights management practice. Consult with your library if you need any guidance in this area.

Once you have clarity on your legal rights around sharing your content, it is a good idea to add a Creative Commons licence to your material to facilitate open access

2 See: **http://www.sherpa.ac.uk/romeo/**

sharing and reuse.[3] This does not diminish your copyright in any way; instead, it articulates a set of 'exceptions' to the 'All Rights Reserved' framework in which users can legally do nothing with your content other than downloading, reading and citing portions of it. This is a particularly good idea if you would like your content to be reprinted by others or utilised for educational purposes. Whatever the provisions of the licence you choose, you will always retain the principle of attribution through Creative Commons licensing, meaning that users will always be legally required to name you as the source/author of the work.[4]

Applying a Creative Commons licence is a relatively straightforward process. The licence always contains a combination of four standard stipulations: 'Attribution', 'Share-Alike', 'No Derivatives' and 'Non-Commercial'. Figure 2 shows the various licensing-provision combinations, with a description of what each of these allows.

Figure 2: Overview of various Creative Commons licensing provisions

	CC Symbol	Description
1	BY	**[BY] By Attribution** Permits all uses of the original work, as long as it is attributed to the original author (Note: Attribution is in all six licences)
2	BY SA	**[BY-SA] By Attribution – Share Alike** As above, but any derivative work must also use a similar license, hence "Share Alike"
3	BY ND	**[BY-ND] By Attribution – No Derivatives** Licensed works are free to use / share with attribution, but does not permit derivative works from the original
4	BY NC	**[BY-NC] By Attribution – Non-Commercial** Licensed works are free to use / share / remix with attribution, but does not permit commercial use of the original work
5	BY NC SA	**[BY-NC-SA] By Attribution – Non-commercial – Share Alike** Does not permit commercial use of the original work, and any derivatives from it must use a similar licence
6	BY NC ND	**[BY-NC-ND] By Attribution – Non-Commercial – No Derivatives** Does not permit any commercial use or derivatives of the original work. *Note: this is the most restrictive of CC licenses, and is often regarded as a "free advertising" license*

Source: ***http://openscience.com/creative-commons-and-proprietary-licences/***

3 For more detail on Creative Commons licensing, see **http://creativecommons.org/licenses/**.

4 Note: CC-Zero places work entirely in the public domain, making it the one Creative Commons licensing provision that is the exception to the attribution rule. This licence is most typically used for data sharing and should only be applied after detailed consideration has been given to your overall IP framework. You will also need to check on your institution's position on public-domain sharing, as this is often in contravention of institutional policy where institutions hold non-exclusive shared copyright in content produced by academics employed by them.

In today's highly technological communication environment, it is crucial that licences are machine-readable, so that automated processes also respect your licensing provisions. Creative Commons licences have 'human', 'lawyer' and 'machine' components in order to be easily understood, to have legal standing and to function in a machine-driven environment.

Working with copyright can be intimidating at first. Make it easier for yourself by disaggregating the different types of content you are working with (e.g. published vs unpublished; grant-funded vs non-grant-funded) and establish sets of 'rules' or principles for such categories. While copyright needs to be assessed on a resource-by-resource basis, you will quickly become familiar with the overarching principles that apply to your everyday practice. Consult your library and legal services division for assistance.

DEPOSIT YOUR CONTENT IN AN INSTITUTIONAL REPOSITORY OR SIMILAR PLATFORM

Typically, scholarly content is curated using a platform, such as a repository, which provides a centralised means of ascribing metadata to your resources, and keeps the location of these resources consistent over time.[5]

Traditionally, many units and individual academics have utilised websites as the principal platform for content profiling. Generally, however, websites do not have the same affordances for content curation as do repositories: they often shift location; only link to an object (which still needs to be hosted elsewhere); do not have the capacity to associate rich, expandable metadata frameworks; and do not provide the unique resource identifiers (URIs) required for Altmetrics tracking and new forms of citation. In terms of long-term sustainability, it is better to host and describe your content in a centralised, institutionally supported repository and to link that content to multiple locations (such as your website) for dissemination.

Should you not have an institutional repository, or should your repository be designed to share only limited content types such as journal articles (or pre- or post-prints thereof), you may wish to investigate curating your other content through discipline-

5 Metadata is, quite simply, data about data (in a context where all digital objects constitute data). Usually, this is information about the resource, such as title, author, publication details, abstract and keywords; lately, however, it also includes licensing provisions, grant numbers and other administrative details. Different content types and different disciplines have different characteristics in terms of preferred/required metadata.

specific repositories,[6] or speak to your library to find out whether any other curatorial platforms are available. Private web-based services such as Figshare[7] provide a cheap, user-friendly repository service for a wide range of content types and formats. While external, private services are utilised increasingly by scholars all over the world, there are concerns regarding long-term preservation/sustainability, and the first prize is always a local, institutionally backed solution (provided that it meets your requirements and the institutional backing is solid). You should also consult institutional and faculty/departmental policy to check whether it contains any provisions in this regard.

ADD METADATA TO YOUR RESOURCES

Metadata is key. It significantly promotes the findability of your work online and provides valuable contextual information for scholars and other users, giving them a clear indication of the nature of your work, the circumstances in which it was produced, and the affordances for reuse. Ascribing metadata can be a labour-intensive exercise, so it is worth getting a sense of which metadata fields are considered mandatory, significant or simply nice to have. Ask questions like:

- Which metadata fields are significant for my discipline?
- Does my metadata provide all the necessary detail for someone who wants to cite my work?
- Are my metadata choices appropriate for all the content types/genres I wish to share?

Metadata is usually associated with a resource at the point that it is uploaded to a repository. However, you may be acting as a scholarly communication or content officer curating content on behalf of a broader academic community, in which case it would be valuable for you to establish a system for capturing metadata in consultation with the author as soon as a resource is generated/released. Setting up your own spreadsheets and data-capturing systems makes the description component of repository deposit significantly easier and provides you with an independent record of the material you are working with.

6 Popular disciplinary repositories include Research Papers in Economics (RePEc) and the well-known arXiv repository, which shares e-prints in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance and statistics. For an overview of disciplinary repositories, see: **http://oad.simmons.edu/oadwiki/Disciplinary_repositories**.

7 See: **http://figshare.com/**

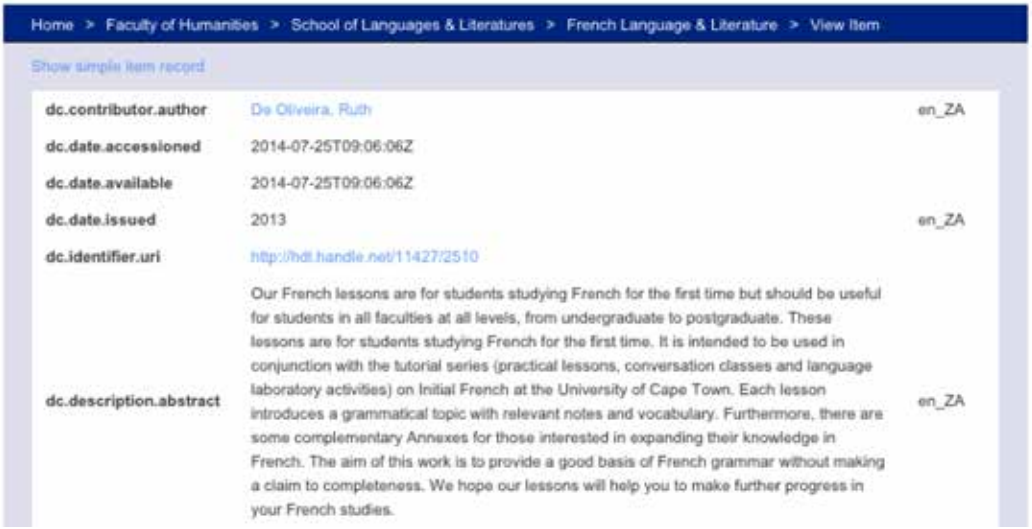
CAPTURE UNIQUE RESOURCE IDENTIFIERS

In addition to providing affordances for content description and long-term preservation, repositories are valuable building blocks of scholarly communication infrastructure because they provide unique resource identifiers (URIs) that are associated with each individual digital object. These identifiers are crucial for the utilisation of Altmetric tracking tools, in that they provide an object-specific 'identity number' that can be read and tracked across the web.

Digital object identifiers (DOIs) are one of the most commonly used forms of URIs, but there is an increasingly wide range of 'handle' and identifier services that can serve a similar purpose. Your repository will assign a URI of some kind to digital objects upon ingestion, and this will form part of the object's metadata. Thus, you can extract an object's URI by viewing the object's metadata once it is in the repository.

If you are planning to utilise any Altmetrics tools, it is a good idea to capture the URIs associated with your resources after repository deposit. Plug these into the content spreadsheets you are working with. These spreadsheets can then carry the full set of diagnostic details pertaining to your resources, with URIs being easily extractable when you need them.

Figure 3: Extract of a metadata record from the OpenUCT repository indicating the URI (or 'handle')



STEP 3

DISSEMINATE AND COMMUNICATE

Once you have a well-curated house in order, you can invite visitors in. It is, however, not enough to have a well-curated store of your content. In today's media-saturated environment you need to engage actively in disseminating and promoting your outputs. Having your content (or digital objects) well organised makes it easier for you to start pushing that content through various channels to a range of audiences.

GET A SENSE OF THE STORIES YOU WOULD LIKE TO TELL ABOUT YOUR WORK

In order to facilitate the impact-tracking process, it is useful to develop systems around your dissemination and communication activities. Try to construct some order in your processes, be analytical, establish strategies, and get a sense of the stories you would like to be able to tell about your work.

The impact framework matrix presented in Step 1 should provide you with a sense of direction in terms of embarking on a communication process. It is useful to pose the following questions:

- Why are you are attempting to communicate this information (i.e. what are you trying to achieve)?
- Who are you intending to communicate it to?
- What are your available resources?
- What would you like to measure?
- What is the exact nature of the content (assuming that you might be engaging with somebody else's material)?

This last component – having a real understanding of the nature of the content – is particularly important, and should not be taken for granted. It is useful to ask yourself questions like these:

- What makes this work special?
- Is anything similar currently happening in the field?
- What are the niche audiences that might be interested in this resource?

The more nuanced your understanding of the content, the more sophisticated your dissemination strategy can be.

Overall, it is important for you to determine whether you are interested in the formal or informal categories of activity outlined in Table 3. The answers to the questions above, combined with whether your interests lie in the formal or informal realm, will provide you with a sense of how you might go about dissemination (level of information translation/processing required), where you should ideally be focusing your efforts (which channels), and which indicators you are most interested in (citation or other metrics).

Table 3 maps out the various impact measures into formal and informal categories, identifies which audiences are typically being engaged with by each, and suggests the rate at which you can expect data to be generated.

Table 3: Impact measures, target audience and time frequency

FORMAL	**Citations**	Academic	Slow
	Bookmarks	Academic/Public	Rapid
INFORMAL	**Page views and downloads**	Academic/Public	Immediate
	Social media	Academic/Public	Immediate

GET A CONVERSATION GOING AROUND YOUR RESEARCH

Social media is the most effective tool for communicating your content to a wide range of stakeholders. The great benefit of tools like Twitter and Facebook is that they engage networks, providing unprecedented scalability in the communication of a message and, by extension, the prospect of engagement with networks of which you are as yet unaware but which might have a significant need for or interest in your work.

Utilising a service like Twitter is very useful for engaging networks and stimulating a conversation around your research. This multidirectional conversation approach provides affordances for tracking engagement with your resources. You might, however, need to invest in your social media presence and spend time building a profile before you experience the full return in terms of network engagement. While there is no single recipe for optimal social media engagement, there are certain norms and conventions that either aid or limit engagement.

If you are tweeting or sharing a link to your resources on Facebook, try to be consistent about the system or URIs or URLs you are utilising. It is a good idea to use the repository URIs consistently, as these will generally be compatible with Altmetrics tools and remain stable over time. You might also want to utilise a URL-shortening tool such as the 'goo.gl' or 'bitly' when sharing lengthy URLs on Twitter. Be sure, though, to check whether the shortening tool you are using is compatible with your tracking tools before investing in any particular service.

LEVERAGE THE COMMUNICATION EFFORTS WITHIN YOUR RESEARCH COMMUNITY

As a research unit, you might find that your outputs are being shared and discussed via multiple communication channels, driven by various sectors of your research community – some internal, some external. Formal unit profiles representing the institutional entity can be complemented by the voices of individual researchers within the unit who have their own communication strategies. You might also find that other entities have an interest in promoting your work. It is a good idea to have a sense of who holds these key network accounts and how the interests of such content promoters align with your own. The partners most closely aligned to you in your social media channels become part of the story you will tell around your network engagement.

In recent times, the emphasis in social media communication has shifted significantly to the incorporation of visual content. YouTube is widely used by scientists and educators to illustrate concepts, and infographics have been very popular as a means of data visualisation. Embedding visual components draws in a broader audience and enables people to interpret your message in a quicker, more user-friendly way. Today, most social media platforms, such as Instagram (for image-sharing) or WhatsApp (for message-boarding), are incorporated in academic communication campaigns. It can be useful to coordinate and promote such dissemination channels at unit level.

The institutional culture in your unit will dictate the extent to which you can regulate your approach to social media activity, either from a single, unified voice or from multiple accounts. Some units are more laissez faire about multiple voices running concurrently in a somewhat unregulated manner (the idea being to create 'buzz' around resources, however possible), while others require a more controlled approach. Your positioning on the impact framework matrix discussed in Step 1 might provide you with some clues as to which approach is optimal for your context.

While it can be valuable for a research unit or academic department to establish a unique voice in the dissemination of its research, it can also be useful to have a sense of your institution's communication activities, so that these can be leveraged wherever possible. Communications activity seldom happens in isolation, and ideally needs to be undertaken with some knowledge thereof by institutional partners and other key stakeholders.

It is crucial that your communication activities are ongoing and iterative. Establishing and being part of an ongoing conversation with a community takes constant attention and activity, and there are many affordances to be explored in pursuing a more dynamic approach to sharing throughout your work process. You may wish to circulate preliminary findings for comment or review, or to generate debate around previous research work because of new developments in the field. Part of the communication exercise entails your being on constant alert for opportunities to contribute to debate, to draw attention to your work and to promote your presence in various networks.

Most guidelines on utilising social media for marketing or profile purposes make it explicit that the exercise is not just about broadcasting – it is also about engagement. Encourage engagement by writing blog posts that invite commentary, post questions on Facebook, reciprocate by commenting on other blogs and Facebook posts, and always try to respond promptly. You will need to establish a routine to engage regularly and build momentum. Remember that it can take a few months of investment before you start to see results. Spend this time getting to know your audience, and establish new relationships within your social network.

STEP 4

TRACK USAGE

Several tools are available to track both formal and informal scholarly communication activity, and many of them are relatively inexpensive. Some are interoperable with repositories and other scholarly communication infrastructure, meaning that they can be integrated into everyday workflows and an expanded vision of scholarly communication practice.

Typically, each of these tools showcases a different range of impact measures, and some may prove more appropriate than others, depending on your context and other variables such as whether analysis is being done at institutional, departmental or individual academic level, and what kind of object is being tracked.

Traditional bibliometric tools can be complemented by new Altmetric services, which increasingly are being expanded and professionalised (as is evidenced by the current National Information Standards Organisation (NISO) initiative around standardisation in this area). Because bibliometric tools can vary significantly in the nature of their reportage and in the user groups profiled, it is useful to experiment with numerous services concurrently, gauging which usage data sets are most appropriate for your purposes and best complement each other in your overall assessment.

WHAT KIND OF THINGS CAN YOU MEASURE?

Your positioning on the impact matrix in Table 2 will provide you with a sense of the measures that are most important or appropriate for your context.

Citations

To date, citations or references in peer-reviewed, formally published, scholarly literature have been the gold standard in impact measurement and continue to be an important indicator. Impact measures such as the Impact Factor and SCImago measure overall journal performance rather than that of individual articles, but, in recent years, publishers like the Public Library of Science (PLOS) have pioneered new means of delivering article-level citation metrics (ALMs).

Citation is a scholar-to-scholar activity, in that it is a particular convention that has predominance in the academic context. Citation, thus, measures usage 'by a very specific group for a fairly small range of purposes' (Neylon, Willmers & King 2014: 5). Many traditional bibliometric (and new Altmetric) tools provide citation data for analysing demographic detail relating to the researchers who are citing your work and where they may be located. If your strategic ambitions include engaging new networks in particular geographical regions, such data can be useful in demonstrating activity in this regard.

Google Scholar automatically computes and updates new citations of your work as it finds them on the web. All you need to do is create a Google Scholar profile, which is free and takes only minutes to complete. You can choose to have your list of articles updated automatically, or review the updates yourself, or manually update your list of articles at any time. Google Scholar profiles are useful, because they automatically calculate your H-index, an increasingly popular metric of individual researcher productivity in the formal publishing environment. You can also check who is citing your publications, graph citations over time and compute various kinds of citation metrics. Bear in mind, however, that Google citations are generated by robots searching the web and the algorithms generating these citations are currently not as transparent or stable as the methods for generating formal citation in peer-reviewed literature.

One of the main downsides of counting citations is that they are contingent on formal publication processes (such as peer review) and take time to accumulate. They also generally do not carry an indicator of intent, and it is seldom clear why a specific paper is being cited (e.g. whether in a statement of endorsement or refutation). The greatest limitation with formal citations, thus, is the relative time-lag factor to which they are subject and the circumscribed range of interactions they serve to demonstrate. Their advantage is that they are a well used and familiar measure with established usage conventions, requiring little explanation or rationalisation in reportage. The

focus on scholarly literature also provides a relatively stable measure of the importance of a piece of work in the disciplinary cannon.

Bookmarks

With the increasing deluge of content available on the Internet, academics frequently bemoan the challenge of keeping track of the material they are reading and referencing online. The need to do so has given rise to a host of tools for curating personal collections of web content extending beyond formally published literature.[8] These tools make it possible to build up a personal index of articles, blog postings, news stories and other resources through the process of bookmarking.

Certain bookmarking services (such as Mendeley, Zotero and Citeulike) are focused on scholarly audiences and are able to provide data on certain indicators, such as the number of users that have bookmarked a paper, and demographic information on discipline, career stage and geographical location. Bookmarking is often driven by social media activity in the immediate wake of publication and, consequently, this information is available before the work has been cited.

Bookmarking a paper is a purposeful act which can tell us more about the level of interest than a page view, but less than a citation (which demonstrates actual use) (Neylon et al. 2014). Bookmarking does, however, have the potential to capture use-case scenarios that have been difficult to garner in the past because they fall outside of formal citation practice. Examples of this include papers that make good background reading, and position papers that are important to scholars and other members of a broader community but are not frequently cited.

Nuance is required in the analysis of bookmarking data, particularly because different bookmarking services have very different user profiles. Within the scholarly realm, there is also some differentiation by discipline – Zotero traditionally has a stronger base in the social sciences, humanities and information sciences, while Mendeley and Citeulike are more popular in the fields of science, technology, engineering and mathematics. Naturally, these services are able to report only on the activities of users who have signed up to utilise them. As is the case with citation, it is very difficult to determine the intention behind the creation of a bookmark.

8 Popular bookmarking and reference management tools include Mendeley, Citeulike, Zotero, Endnote and Papers.

Page views and downloads

Online visibility is a key factor in today's scholarly environment. Without web presence, you are invisible. Page views and downloads, therefore, constitute an extremely valuable form of usage data. However, they are also the form that appears most abundantly and is most susceptible to gaming or manipulation, making this a precarious set of data to work with.

In the context of scholarly citation, page views can be indicative of visits to either abstracts or full text, and this must differentiated from the act of downloading a PDF file. Page views are captured immediately and can provide pre-publication usage data if you wish to gauge reaction prior to publication. Quickly captured evidence of interest in a nascent idea can be valuable in conversations with prospective funders and collaborators.

Viewing output is an interaction involving less engagement than citation or bookmarking, but which has the capacity to capture interaction with a much wider range of users, especially if the output is open access and freely available to the general public (Neylon et al. 2014). If you have access to demographic data behind downloads, information on geographical location can be of particular interest in your assessment of reach and visibility.

Data on downloads might constitute a more meaningful indicator to you, as there is purposeful intent behind the act of downloading. One of the main challenges of working with page-view and download data, however, can be the sheer volume of data generated. It is useful to have clearly identified indicators against which to examine the data. Examining trends in the data over time might also help you to gain a sense of which indicators demonstrate the most activity and, therefore, become most meaningful in your analysis.

Assessing page-view and download data is easier if you are doing it for your own site. Publishers and other websites have varying methods of data collection for views and downloads, and often provide no differentiation in terms of the amount of time a visitor spends browsing (referred to as 'stickiness') or the percentage of visitors who enter the site and leave rather than remaining to view other pages (the 'bounce rate'). One of the greatest challenges for integration into the scholarly record is that page views and downloads are not resource-specific, with the consequence that, if a scholarly object exists in multiple locations, the data will be duplicated to artificially inflate the impression of usage. Aggregation of such data across platforms requires significant effort.

Social media

Social media constitute a powerful and exciting new horizon for sharing scholarly output. More and more researchers, educators, policy-makers, government officials, funders, journalists and NGOs are using social media platforms like Facebook and Twitter, and this is accompanied by an increasing amount of sharing of and discussion around research outputs.

Twitter is most useful in terms of providing usage data, because the communication exchange and identity of those involved is public; in other words, tweets that link to a specific article can generally be associated with specific users, and provide a sense of geographic origin. Facebook, by contrast, has less publicly available information, but tools like Altmetric.com and Impactstory provide data on interactions on both of these platforms.

Those discussing research via social media channels are potentially showing a level of interest greater than that suggested by the more passive act of viewing a web page (Neylon et al. 2014). One of the benefits of these services (particularly Twitter) is that they enable you to follow traces of the conversation via 'hash tags' and 'mentions', so that you get a sense of who exactly is showing an interest in your work and what that level of interest is. In many cases, the nature of the interaction and the identity of those engaged is more meaningful than the volume of comments, likes or retweets. Thus, a focused, engaged comment or retweet from an important network partner with a broad follower base can be considered more desirable than the simple receipt of a large number of diffuse 'hits'.

Detailed analysis is required to make sense of social media data, particularly in order to differentiate significant from relatively arbitrary activity. Often, users are simply sharing a link or making a passing comment – activity that is not necessarily at all meaningful in the context in which you are trying to illustrate impact. Studies have shown that, within the first three days of publication, tweets can predict an article becoming highly cited, and that social media activity either increases citations or reflects the underlying qualities of the work that stimulate citation (Eysenbach 2011). The real value of this kind of data, however, is that it provides you with an insight into your activity in the social or public realm rather than the formal academic environment.

It may take you some time to make sense of social media data, to identify which components you wish to investigate further for signs of key engagement and to incorporate these into your overall analysis.

HOW DO YOU MEASURE?

The most popular tools for generating Altmetric data are Altmetric.com, Impactstory and Plum Analytics. In the more formal citation context, Elsevier's SciVal is a tool that provides advanced bibliometric measures based on data sourced from the Scopus bibliographic database of citations in peer-reviewed literature. Bear in mind, however, that when using SciVal you will only be able to gather data contained in the Scopus database. Some publishers (such as PLOS) also act as sources of usage data, as they provide article-level metrics (ALMs). The ALM component may require some additional technical investment, though, as these metrics are often delivered via an application program interface (API), which will require a slightly more complex installation process.

Figure 4: Sample of popular Altmetric tools indicating analysis categories of each

Source: ***http://www.wellesley.edu/sites/default/files/altmetrics-ris.png***

Altmetric tools are designed to operate with unique identifiers (typically a DOI), which they utilise to track activity across the web and to provide feedback/reports on citation (including Scopus, Crossref and PubMedCentral), Wikipedia references, Mendeley bookmarks, social media activity (Facebook and Twitter), and blog mentions. Most services are able to generate regular reports that can either be downloaded from the site or sent to you via email. It is useful to establish some system for capturing and comparing these data sets over time.

One of the current limitations in the Altmetric terrain is lack of coordination between publishers, social media sites and service/tool providers, resulting in a situation in which methods of data generation might change without your having received notice thereof – a scenario that has obvious repercussions for your long-term analysis. As the field of Altmetrics grows and becomes more professionalised, it is anticipated that it will stabilise. It is, however, a good idea for you to control for this variability and to try to develop systems that are not overly subject to the fluctuating standards that are inevitable as these systems evolve.

You should never rely on one single tool when gathering bibliometric data, as results can differ depending on the tool used. This is because the content covered by each tool varies, as does the depth of coverage and disciplinary focus. It is also important that your communication and measurement activities run concurrently, though you should bear in mind the varying time frequencies involved with different channels (see Table 3 for a summary of impact measures, target audience and time frequency). Once you know which tools you wish to utilise, it is useful to set a benchmark before you start measuring. Identify the indicators you are interested in assessing (such as number of formal citations, geographical spread of networks, extent of civil society engagement) and try to ascertain what your current status is on these factors. This will help you to determine whether your dissemination and communication strategy is meeting your objectives.

Start by gathering data in a systematic fashion. Capture the data sets delivered by your various bibliometric tools as methodically as possible, paying attention to time stamps and naming conventions that will make sense to other users over time. At first, you may not know how to make sense of all the data. Try to be patient during this process and keep capturing as much data as possible so as to ensure affordances for comparison and cross-evaluation at a later stage (although there may be some danger in becoming overwhelmed simply by capturing too much data).

It is useful for one person to take ownership of the data collection and analysis process, as this will help in establishing familiarity and identifying trends. That said, academic departments and higher education institutions have abundant data-analysis expertise. You may wish to invite fellow academics to participate in or critique your data-analysis process once you have a system in place. You will need repeated exposure and input from peers to evolve these processes over time.

STEP 5

FIND AND TELL THE STORY

As Chimes (2015) notes, 'quality, importance and impact are not numbers'. Within the new 'Impact' paradigm, the focus is increasingly on employing the usage data you have gathered about your content to tell stories about your research. These usage data serve as proxies – the numbers not necessarily meaning anything in themselves, but making sense in an analytical framework defined by your mission and the objectives you have articulated. In this context, demonstration of impact is about a rich contextual view in which the return on investment is calculated against intrinsic objectives.

DIG INTO YOUR DATA

It is worthwhile to spend time examining your usage data for any interesting or surprising features. Remember that you are looking for evidence of content reuse or application, a signal that provides evidence of impact.

You can start by asking questions like the following:

- Are there any usage trends that appear to be emerging over time?
- Has any of your content performed in interesting ways (e.g. attracting more interest than you anticipated)? If so, can you get a sense of who has engaged with that content, and for what purpose?
- Who are the principal entities that appear to be engaging with your content?
- Where do the principal entities engaging with your content appear to be located, and do they constitute aspirational partners? (This can be examined from an institutional or a geographical perspective.)

Spend time doing some sleuthing, and follow any trails that might suggest conversation around or use of your work. If you are using a service like Impactstory or Altmetric.com and your data indicates Twitter interaction, click through into the reports that provide further detail on interactions to gain a sense of who exactly tweeted about your resource, what the nature of that tweet was, and whether there is any evidence of retweeting or discussion around the content. This approach can be replicated for multiple scenarios with many of the bibliometric tools – try to capture evidence of any buzz around your content and whether there are indications of a back-story that explains or contextualises the attention your work is receiving.

You will now be moving into a more qualitative realm in which you are sketching connections between phenomena, highlighting any attention received by key individuals and utilising interesting pieces of data to speculate on scenarios in which your work is being utilised.

ASSESS WHICH OF YOUR DATA SPEAK TO YOUR CORE OBJECTIVES

At this stage it is useful to revisit your mission and core objectives. Do the usage data and back-stories that surfaced speak to any of your core objectives? Return to the questions you asked as part of your initial strategising (see page 8).

The kinds of questions we asked were:

- What constitutes excellence in your context?
- Who do you see as your principal audience in fulfilling your mission?
- Where (geographically) do you see your target audience as being located?
- What are your most important communication channels for reaching your desired audience?
- What usage indicators are your funders and other stakeholders interested in?
- Are your communication interests mainly vested in the formal scholar-to-scholar paradigm or a more expanded, informal scholarly context?

Conduct an exercise in which you evaluate your usage data against the responses to those questions. If you identified NGOs and mainstream media as your principal audience in fulfilling your mission, assess whether you have any usage data that suggests engagement with these stakeholder groups. If your funders are interested in your work having an impact on policy-making, can you find evidence of any engagement by the government or other key individuals in this area?

Ultimately, you are looking for evidence of the value of the service that your research provides and for any indication of usage activity around your outputs contributing to meeting core objectives.

CONSTRUCT SCENARIOS

Once you have sketched an outline of interesting features about your data or the performance of individual resources, try to construct a narrative about how your content was utilised, by whom and for what purpose. It is possible that you will not have enough data to tell a conclusive story of impact, in which case it can still be beneficial to speculate on possible scenarios and to relate a small fragment of what might be a bigger story.

The scenarios you articulate about the use or application of your work become important data in themselves. Keep collecting fragments of stories, even if they do not deliver a satisfying and comprehensive picture, as you may find that they form part of a grand narrative which can only be interpreted over time. It is important to have both short- and long-term cycles going in terms of how you collect and analyse your data. Develop a system for capturing and curating your impact stories in a way that enables cross-referencing and analysis over a sustained period.

Once you have started capturing impact stories, try to utilise them wherever possible by incorporating the vignettes into your reporting and evaluation processes. You can also be creative in using these vignettes or insights in a marketing or communication context. A poster demonstrating a pulse around resources or showing how research outputs are utilised by key stakeholders across multiple channels, for instance, might be a useful communication tool within the unit, inspiring individual academics to invest in scholarly communication activity. These stories may also be effective in attracting students who are interested in the practical applications of your work.

Reporting paradigms, in many cases, are still traditional and conservative in their focus on Impact Factor and citation, allowing little room for demonstrating impact through other measures. If this is the case, utilise any reporting fields in which you can provide 'additional detail' or 'any other comments' to showcase your impact vignettes and to highlight any Altmetric data you feel is relevant. It is also useful to embed links to Altmetric profiles on staff profile pages or websites. These can be updated dynamically through linking processes, and provide useful visual indicators.

If you are using your impact stories in reporting to a grant funder or institutional manager, try to obtain feedback from them on the extent to which the stories resonate with their evaluation processes. Commentary of this kind enables you to refine and improve your practice and, ultimately, make it more applicable in your reporting context, facilitating wider buy-in from your academic community.

CONCLUSION

All over the world, research units and institutions are grappling with the issue of how to improve and demonstrate the impact of their work. If you are a content officer or staff member tasked with conducting impact or Altmetrics work for your unit, try to find others (within or beyond your institution) who are doing similar work. Identifying yourself as part of an emerging community of practice in this area can help you to share ideas, obtain insights around new tools, and pick up tips on how to streamline your processes.

The process of engaging with the reuse and impact of your outputs is ongoing and cyclical. It takes time and sustained effort to develop the kind of processes that deliver insights into your communication activity and the extent to which your work is finding application. Bear in mind, also, that you might see nothing of significance in your first forays into collecting bibliometric and Altmetric data. This can be a signal in itself, which can help you to probe the efficacy of your scholarly communication and curatorial efforts. Remember that the better you curate your content and the more open that content is (from both a legal and technical perspective), the better the affordances for that content finding application and you being able to track online usage.

It is important that your objectives and the strategy you put in place to meet those objectives are realistic. You may need to consider both internal and external resources which will have implications for the funds required to conduct this work. For instance, if you are interested in developing policy briefs to engage non-academic audiences, you may need to bring in the services of a research translation professional or a designer who can make a visually appealing product. You may find the burden of social media engagement too onerous to integrate into your current job description, in which case you might try to generate the funds to employ a communications intern to undertake this function. In such case, it is important to identify who is responsible for the specified tasks, and what the relative time frame are for these activities. Table 3 provides an overview of the different time frequencies associated with various activities. If you are employing a social media intern for six months, it might be

realistic to expect some impact or shift in social media or download statistics, but it would not be reasonable to expect any correlation around citations in such a short time. Expectations need to be tempered by the reality of the environment and your resource/capacity constraints.

It is important to consider your technological requirements when drawing up a budget for your impact and communications activity. Remember that certain Altmetric and bibliometric tools are subscription-based and, therefore, carry their own cost component. You should also bear in mind that many service providers and platforms in this area work with rapidly evolving technologies, in which algorithms are frequently updated. Therefore, you will need to dedicate time to keeping abreast of changes and trends. Utilising social media channels can be a valuable aid in doing this.

If you are interested in making an impact and tracking the usage of your content, investing in people and processes is crucial. This is not a once-off investment; it needs to be iterative and sustained over time. While the foundational phase is probably the most challenging, with things getting easier over time, the systems and tools you establish will require constant minding, development and interpretation. For this reason, it may be useful to consider this aspect of your operations as a component of a senior staff member's formal job description, to work towards a more professional, cohesive approach over time. Resource and time constraints are an everyday reality in all institutions, but the investment made in professionalising your scholarly communication activity in line with your mission can have benefits not only in terms of tracking impact but also in raising the profile of your work, attracting collaborators and boosting student enrolment.

WHO TO ASK FOR HELP

Remember that you are acting as part of an academic community. There is a good chance that you have peers and colleagues who are grappling with similar issues, some of whom may have valuable expertise you can draw on. Consult within your networks and seek institutional guidance before you formalise any strategies.

Interrogating mission and identifying imperatives

When engaging with strategic thinking on these issues, it is a good idea to consult with your research office, innovation division, library, dean/faculty office and/or your funders. Communicate with these stakeholder divisions to get a sense of what their approach is and what their expectations are. If your unit is subject to any review or evaluation processes, it is also a good idea to confer with the entities administering those processes to ensure that you are acting in line with their evaluation frameworks.

Content curation

Be sure to engage with your library when you start your curatorial process. Librarians can contribute valuable metadata expertise and can advise on how best to organise and share your content. If there is an information science or computer science school at your institution, it may also be a source of support and expertise. Such schools are particularly worth exploring if you are trying to source interns, as they may have aligned postgraduate programmes in which there are students looking for experience and part-time work.

Communication

Try to get a sense of who administers communications activity in your faculty or affiliate units, at both formal and informal levels. You could have important synergies with some of these communicators and might be able to share expertise or leverage each other's efforts.

The institutional communications and marketing division may be able to advise you on social media strategy, and you might be able to pick up some tips by paying close

attention to their activities. If there is a marketing school at your institution, it might be a source of support and expertise, particularly if you are trying to source interns.

Don't forget to also explore your communications strategy with your information and communication technology services (ICTS) division. There are often useful tools, platforms and technical processes (such as RSS feeds) available for communicating work.

Legal

It is important that you seek institutional support in your decision-making processes around IP and copyright. Either your library or research contracts and intellectual property services division will be able to advise you on institutional policy and your obligations in terms of funder agreements. They should also be able to give you practical advice on applying Creative Commons licensing to your content.

As an organisation, Creative Commons now has active chapters or representatives in many African countries. Find out if they are active in your area, and engage the organisation directly for support if your institution is still developing expertise in this area.

Technical

Some level of technical support is usually required in establishing your systems and acquiring the tools needed for your various processes. Engage ICTS, the library and other technical support services to gauge whether they have the capacity to assist. Supplement these support services by consulting online forums and user groups to trouble shoot technical difficulties and receive updates on upgrades and new developments.

USEFUL RESOURCES

The following materials may prove valuable as supporting resources for the steps outlined above.

Academics' Online Presence: A four-step guide to taking control of your visibility **http://open.uct.ac.za/handle/11427/2652**

Creative Commons South Africa: Licensor guidelines **http://open.uct.ac.za/handle/11427/9045**

Curation for Participation: An eight-step guide to curating open scholarly content **http://open.uct.ac.za/handle/11427/8431**

ESRC-DFID Joint Fund for Poverty Alleviation Research: Guiding principles on uptake, impact and communication of research **http://www.esrc.ac.uk/_images/esrc-dfid-research-uptake-and-impact-principles-nov-2013_tcm8-30780.pdf**

Sprout **http://lps.sproutsocial.com/twitter-statistics/?utm_source=google&utm_medium=cpc&utm_campaign=EU+Twitter&utm_content=LPS+Twitter+Statistics&utm_term=%2Btwitter%20%2Bstatistics**

Understanding open licensing: Day one – the open landscape **http://open.uct.ac.za/handle/11427/2341**

Using Twitter in university research, teaching and impact activities: A guide for academics and researchers **http://blogs.lse.ac.uk/impactofsocialsciences/files/2011/11/Published-Twitter_Guide_Sept_2011.pdf**

Visibility, impact and online presence for the developing science researcher (MSc, PhD, Postdoc) **http://open.uct.ac.za/handle/11427/2347**

Wild Apricot beginner's guide to social media **http://www.wildapricot.com/membership-articles/bgsm-what-is-social-media**

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MEASURING IMPACT:
A FIVE-STEP GUIDE FOR SCHOLARLY UNITS

Are you part of a research unit or academic department that is interested in making an impact and being able to demonstrate or report on the extent to which your work is being cited and utilised? Are you interested in sharing your content online in order to boost the visibility and application of your work? This guide will provide you with five practical steps to help you professionalise your scholarly communication activity, expand your current approach around impact measurement, and generate new forms of usage data. It is is aimed at scholarly units (i.e. research units, academic departments and faculties), but can be adapted for an individual scholar or institutional approach.

Part of a series:

Measuring Impact: A five-step guide for scholarly units
http://open.uct.ac.za/handle/11427/12936
Open Content Licensing: A three-step guide for academics
http://open.uct.ac.za/handle/11427/12937
Academics' Online Presence: A four-step guide to taking control of your visibility
http://open.uct.ac.za/handle/11427/2652
Curation for Participation: An eight-step guide to curating open scholarly content
http://open.uct.ac.za/handle/11427/8431