Perceived e-visibility by Environmental Sciences Researchers at Unisa

Leslie S. Adriaanse¹ and C Rensleigh¹
ladriaan@unisa.ac.za http://orcid.org/0000-0001-5363-5059
crensleigh@uj.ac.za http://orcid.org/0000-0002-0577-4852

Abstract

Online research tools allow researchers to embrace online research communities and establish an online presence. An online presence implies e-visibility which embodies online visibility, discoverability and accessibility. In December 2014 an e-visibility survey was conducted on environmental science researchers at Unisa to determine their perceived e-visibility. The results indicate that the majority of researchers are emerging researchers with an average age of 40; with a master’s degree and they are employed at lecturer level. The majority of participants have online research e-profiles and they prefer e-profiling, using online research social networking tools. In addition, the majority prefer free resources (Google Scholar) to fee-based citation resources (Scopus and Web of Science) in order to ascertain their online research presence and traditional research impact. The low percentage of profiling, using traditional fee-based citation resources translates into low online visibility. A low percentage of researchers participated in self-archiving their research output to repositories is reported; this has an impact on online research discoverability and accessibility and suggests low discoverability and accessibility of online research. The development of an e-visibility strategy would allow the enhancement of e-visibility by increasing online research visibility, discoverability and accessibility.

Keywords
E-visibility, online presence, online visibility, research e-profiles

1 Introduction

Advances in technology and the proliferation of online citation resources and academic social networking tools allow researchers to embrace online research practices and
become part of online research communities (Jeng, He & Jiang 2015:1). These online research communities are seen to embrace and accommodate the needs of researchers with similar interests by using social networking technology. This affords researchers the opportunity to actively create an identifiable online presence and allows for active participation and research dissemination in online research communities (Menendez, Angeli & Menestrina, 2012:56; Arda, 2012:67; Goodier & Czerniewicz 2012:1; Redden, 2010:219; Lin & Tsai 2011:1249; and Mangan 2012:1).

The research for this article forms part of a larger PhD longitudinal comparative study spanning a two-year period aimed at developing an e-visibility strategy for the researchers of the School of Environmental Sciences (SES) at Unisa. The objective is to increase their e-visibility (online research presence) by creating and actively maintaining researcher e-profiles on existing citation resources and academic social networking tools. The study places emphasis on the definition of the concept “e-visibility” and determines the existing citation and social networking status for SES.

This article reports on the results of the e-visibility survey conducted to establish the perceived e-visibility of the SES researchers.

2 Literature review
2.1 Defining e-visibility

Research by Lawrence (2001:521), indicated that research available online increased the impact of the published paper and suggested that researchers who published online were likely to be downloaded and cited up to 4.5 times more than printed (offline) research. A number of studies focus on creating research e-profiles to increase the online presence of researchers (Chang 2012:1; Alsagoff 2012:1; Cann, Dimitriou & Hooley 2011:15; Goodier & Czerniewicz 2012:1).

Studies by Bar-Ilan, Haustein, Peters, Shema and Terliesner (2012:1), Ale Ebrahim and Salehi (2013:3) and Norman (2012:9) encouraged researchers to focus on publishing in online journals with a high impact for increased visibility to be discoverable and accessible. It has become essential to have an online research presence.
Chung and Park (2012:207) define a researcher’s online presence on the Web “as the number of web (co-) mentions of each researcher” which translates into the number of times a researcher or his/her research output is mentioned; or the number of search hits retrieved for the author on the Web. Norman (2012:4) suggested that the research should be visible online to wider audiences on online platforms in an online format. Another study by Ale Ebrahim, Salehi, Embi, Tanha, Gholizadeh, Motahar and Ordi (2013:120) on researcher visibility indicated that a researcher and his/her research output must be discoverable. This translates to published research being easy to find and searchable on online search platforms and databases for other researchers. Studies by Norman (2012:4), Repanovici (2011:126) and Ale Ebrahim and Salehi (2013:3) pointed out that research accessibility translates into research output being easily accessed by other researchers. It therefore implies that the research is stored online on repositories for dissemination and archival purposes (Repanovici 2011:116; Norman 2012:4); and is retrievable and downloadable for perusal and citing by researchers (Czerniewicz & Wiens 2013:39).

The concept “e-visibility” encompasses the following three themes: 1) the researcher’s online presence; 2) research discoverability; and 3) research accessibility.

For the purpose of this study, e-visibility can be described as “the online presence, discoverability and accessibility of a researcher and his/her research on the Web”. This translates to researchers increasing their online presence to enhance their online discoverability as researchers and enhancing the accessibility of their research for maximum retrieval and downloading in order to increase citation counts and their impact as researchers. E-visibility therefore embodies online visibility, online discoverability and online accessibility of online research. The solution to promote and enhance the e-visibility of researchers would be to use existing online platforms available in online research communities that support online research practices.

The benefits of research e-visibility include the following:

- An online resumé and/or curriculum vitae (CV) provide a platform for researchers to boost their professional research profiles (Bik & Goldstein 2013:1; De Ridder Bromberg, Michaut, Satagopam, Corpas, Macintyre & Alexandrov 2013: 3).
- Articles that enjoy increased online visibility have a tendency to receive more downloads and citations (Lawrence 2001:521; Czerniewicz & Wiens 2013:39).
- Research e-visibility enhances the professional networking of researchers, allowing them to make contact with other researchers and to collaborate (Goodier & Czerniewicz 2012:1; Bik & Goldstein 2013:3; Jeng, He & Jiang 2012:1; Mangan 2012:1). Arda (2012:67) describes this as growing one's research networks and becoming part of an online research community.

- E-visibility provides the researcher with a wider communication network between scientists and the general public which leads to “online outreach” between the two stakeholders (Bik & Goldstein 2013:3).

- Increased e-visibility allows for enhanced benefits, such as crowd-sourced funding and research collaboration in the online research community (De Ridder et al 2013:3).

- Enhanced research e-visibility helps to improve research efficiency by allowing researchers to disseminate and share their research. It allows the researcher to make his/her research output more discoverable and accessible (Bik & Goldstein 2013:1; Mangan 2012:2).

- Being e-visible allows a researcher to source bibliometric and related citation information to track and improve his/her traditional impact on traditional citation resources such as Web of Science, Scopus and Google Scholar.

- The enhanced e-visibility also includes the opportunity for sourcing, tracking and improving their altmetric or non-traditional impact on academic social networking tools such as Academia.edu, ResearchGate, Mendeley, altmetric.com, Plum-X. These academic social networking tools will include the accumulation of attention data and article-level statistics translating to altmetrics to gauge and measure societal impact (Bik & Goldstein 2013:3; Ward, Bejarano & Dudás 2015:179).

Goodier and Czerniewicz (2012:1) believe that researchers take control of their research when they actively start creating and managing their research presence, using online research e-profiles. According to Ward, Bejarano and Dudás (2015:177), the most acceptable methods of creating an online presence include using an e-profile. The research e-profiles therefore become a vehicle that enhances and promotes the e-visibility of researchers and their research output.
2.2 Research e-profiles

An online profile (e-profile) is described as a “digital representation” of a researcher which contains information on the researcher (Ward, Bejarano & Dudás 2015:177). The essential elements necessary for a research e-profile include: 1) electronic representation of the researcher; 2) the researcher’s online reputation; and 3) the researcher and/or research online discoverability and accessibility.

The online representation of a researcher and the linked research is crucial to enhance the online visibility of the researcher. The electronic research profile should ideally form part of an online research community which supports and embraces online research practices. The e-profile is located on an online platform that allows for the inclusion of a researcher’s biographical and professional research information and his/her affiliation to a research and/or educational institution (Ward, Bejarano & Dudás 2015:178). The subscription databases, online archives and academic social networking tools provide an online platform which requires the researcher to register an online e-profile. The registration allows the researcher to become part of the online research community and access the e-profile to either add/or update the biographical and/or professional information and the links to the research. In many instances, the researchers take control of the content uploaded on their research e-profiles.

The researcher’s online reputation refers to the authentication of the researcher to accurately identify another researcher and illuminate author ambiguity (Chang, 2012:1; Piwowar & Priem 2013:10). This is achieved by providing each researcher with a unique identification number (ID) that can accurately identify the researcher and distinguish him/her and the linked research from other researchers with the same name in the same disciplines. This implies that the researcher is part of a research community and that the affiliation to a research and/or professional institution forms the foundation of the researcher’s professional network (De Ridder et al 2013: 2). Enjoying membership of a professional research network denotes endorsement to the network of the researcher and his/her research. A research e-profile inherently encompasses research reputation management (Ovadia 2014:166).

The online research discoverability and research accessibility translates into the researcher and the research output content being discovered, retrieved and downloaded by other researchers on online platforms to peruse and cite (Czerniewicz
& Wiens 2013:39). For an online research community to create the ideal environment for online research e-profiles and an online infrastructure, the following components need to be present:

- The first component includes the identification and seniority of the researcher. It effectively identifies the researcher in relation to his/her research and/or academic institution and contains all the relevant biographical and geographical information pertaining to the researcher. This component also includes the seniority of the researcher in the institution and his/her position, research awards and prizes, grants and research projects are also mentioned (McDonald 2015:56; Menendez de Angeli & Menestrina 2012:56; Ortega 2015:520).

- The second component refers to the networking centrality of the researcher. This involves the impact of the researcher on the specific scientific community and his/her connectedness to the research community. The establishment of communication channels in the research community is viewed as key to the connectedness of the researcher and the attention he/she receives from other researchers (Menendez, de Angeli & Menestrina 2012:58).

- The third component is the impact of the researcher’s publication which refers to the opportunity he/she has to link the research publications to a specific research profile. The online research platform created by the research e-profile allows for measuring performance indicators derived from bibliometrics and altmetrics from user interactivity on online platforms to gauge the research and the societal impact of the researcher (McDonald 2015:56). The online research community records various usage statistics, user activity and interaction such as views, downloads, shares and citations.

- The fourth component refers to the online activity of the researcher. This translates to the online activities of the researcher with the research e-profile and helps to gauge the currency of the information on the profile and how frequent the researcher updates the research e-profile.

There are three types of researcher e-profiles: 1) traditional citation e-profiles; 2) non-traditional research e-profiles; and 3) consolidated e-profiles. The traditional citation e-profiles include ResearcherID by Thomson Reuters (http://www.researcherid.com); Scopus Author Profile by Elsevier (http://www.scopus.com/authoridentifier) and
Google Scholar Citation Profile (http://scholar.google.com/citations) (Ward, Bejarano & Dudás 2015:179).

Non-traditional research profiles are created on various websites and social networking tools that include: institutional repositories, such as Unisa Institutional Repository (Unisa IR) by DSpace (http://uir.unisa.ac.za); subject repositories such as Figshare (https://figshare.com/) or ArXiv (http://arxiv.org/); and academic social networking tools/websites, such as ResearchGate (http://www.researchgate.net); Academia.edu (http://www.academic.edu); Mendeley (http://www.mendeley.com); Twitter (http://www.twitter.com); and altmetric analysing tools, such as Altmetric.com (http://www.altmetric.com) (Arda 2012:72; Chang 2012:1; Campos & Valencia 2015:1; Ovadia 2013:166; Niesche 2013:1; Bar-Ilan 2014:217).

The consolidated profile can be described as an e-profile which consolidates various research profiles into one which is accessible to a wider audience. ORCID (http://www.orcid.org) is an example of a consolidated e-profile (Foley & Kochalko 2012:319; Mikki, Zygmuntowska, Gjesdal & Al Ruwehyl 2015:170). ORCID creates a central registry of unique identifiers for individual researchers which allows for open and transparent linking mechanisms between various existing research profile platforms with author ID systems that include scholarly publication lists, such as Thomson Reuter's Researcher ID, Scopus, Google Scholar, ResearchGate, Academia.edu, and institutional websites to enhance the research profile.

3 Research Methodology

This article reports on an e-visibility survey conducted in December 2014 which forms part of a longitudinal comparative study (December 2014 to December 2016) aimed at developing an e-visibility strategy for researchers of the School of Environmental Sciences (SES) at Unisa. It involves establishing the perceived e-visibility status of the SES researchers. The e-visibility measuring instruments developed to establish the e-visibility status of the SES researchers include: 1) an e-visibility survey to determine the perceived e-visibility; and 2) a baseline survey, conducted to determine the actual e-visibility.
This article reports on the results of the first phase— the e-visibility survey. The e-visibility themes discussed in the e-visibility survey include:

- Section A - Biographical information
- Section B - Online searching to ascertain online presence
- Section C - Online research profiles
- Section D - Online research discoverability and accessibility
- Section E - Online research social networking presence
- Section F - Online research impact

The e-visibility survey data were collected and analysed to determine the perceived e-visibility status of the SES researchers.

4 Results and Analysis of e-visibility Survey

A total of 62 researchers in the School of Environmental Sciences agreed to participate in the study out of a complement of 76 researchers. The online e-visibility survey was distributed via SurveyMonkey and 47 researchers completed the survey, yielding a response rate of 75.8%. A discussion on some results from each of the sections of the survey instrument follows.

4.1 Section A: Biographical Information

Section A includes questions 1-7 regarding biographical information about the SES researchers. With reference to the age of the respondents, the results indicate that the largest percentage (53%) of the SES researchers fall in the 20-30 age group, with the youngest respondent being 24 years old and the oldest 69 years old. The respondents have a mean average age of 40 years.

Regarding the qualifications of the respondents, the results suggest that the vast majority of SES researchers (93%) have postgraduate qualifications with 39% having master’s degrees, 33% doctorates, 22% honours degrees, 4% diploma and 2% a bachelor or equivalent degree.

In terms of the post level description of the respondents the results suggest that the majority (39.5%) are on the post level of a lecturer followed by the categories junior
lecturer (21%); senior lecturer (14%); professor (14%); manager (7%) and associate professor (4.7%).

Question 4 allowed the respondents to describe themselves as either emerging researchers (69%) or established researchers (23.8%), which included research categories as defined by the National Research Foundation (NRF). In addition, 4.8% indicate a NRF Y2 rating and 2.4% a NRF rating of C2.

Regarding the number of accredited scholarly and non-accredited research publications by the SES researchers, the results indicate that a large percentage of respondents (74%) have published accredited journal articles whereas 47% of the respondents have published non-accredited journal articles. The results also show that 43% of respondents have presented papers at accredited conferences and 53% have presented papers at non-accredited conferences. The results of the publication of books indicate 21% accredited compared to 77% non-accredited books; and, 55% published chapters in accredited books and 72% in non-accredited books. The survey results record no patents. The average publication per SES respondent is as follows: journal articles (3.69), books (0.69), chapters in books (0.87), conference papers (1.33) and patents (0).

4.2 Section B: Online Search Engines

This section is about online search engines and tools used by researchers to ascertain their online research presence. The results indicate that the majority (63.4%) use free search engines and tools included Google, Google Scholar, Bing and Yahoo, to ascertain their online research presence. The results further indicate that the respondents obtained a lower percentage (32.6%) of usage of fee-based tools, which included Web of Science, Scopus and Proquest, in order to ascertain their online presence and their research output. It was also recorded that 4% of the respondents indicated no usage of search engines to ascertain their online research presence.

4.3 Section C: Online Research Profile
Section C of the survey focused on the SES researcher’s online profiles as researcher and the websites and databases used to create or register these research e-profiles. The results indicated 6.9% of the respondents used no websites and databases to create or register research e-profiles. A large percentage of respondents (29.7%) use the professional social networking tool, LinkedIn, to create or register their research e-profiles followed by academic social networking tools Academia.edu (24.9%) and ResearchGate (19.8%) respectively. In addition, the respondents indicate the presence of research e-profiles on Google Scholar (11.9%), ORCID (4%) and ResearcherID (1%) as illustrated in Figure 1 below.

![Figure 1: Websites and databases used for online research profiles](image)

4.4 Section D: Online Discoverability and Accessibility

Pertaining to the types of scholarly publications archived and/or uploaded on online archives and repositories (institutional and subject repositories), the results indicate that 38.4% of respondents opt not to upload and/or archive all their scholarly research output on online archives and repositories. The results also indicate a preference for uploading journal articles (21.9%) to the other types of research output, followed by
conference (13.7%), chapters in books (12.3%), slide presentations (5.5%) and pictures/photos/figures (2.7%).

The results further indicate that 63.4% do not upload their research on the institutional repository or subject archives. The implication of not having uploaded and/or archived onto the institutional repository is that the research is not accessible by other researchers and thus less discoverable.

4.5 Section E: Research Social Networking Presence

This section of the survey focuses on websites and academic social networking tools used to create an online presence for research purposes. The results indicate LinkedIn received the largest distribution (26.3%) followed by Academia.edu (16.8%), ResearchGate (14.7%), Facebook (11.6%), Mendeley (8.4%), Twitter (5.3%), Diigo (3.2%) and Delicious and Blogger with 1% respectively. The respondents which indicate no presence on academic social networking tools is 11.6% as illustrated in Figure 2 below.

![Figure 2: Online presence on websites and academic social networking tools](image-url)
The results further indicate that 61.7% of respondents do not use reference management tools with social networking capabilities 23.4% use Mendeley, 6.4% Zotero, 6.4% use Crossref and 2.1% use CiteuLike as reference management tools with social networking capabilities as illustrated in Figure 3 below.

![Figure 3: Online presence on reference management tools with social networking capabilities](image)

4.6 Section F: Online Research Impact

This section of the survey focuses on the SES researcher’s impact with special reference to traditional (citation metrics) and alternative impacts (altmetrics).

Question 14 relates to the websites, search engines and databases used to search for citation information of the researcher in order to indicate the researcher’s traditional research impact, using bibliometrics. The results indicate that the majority of respondents use Google Scholar (40.3%) followed by Scopus (12.5%) and Web of Science (12.5%). The results indicate that 18.1% do not use any websites, search engines or databases to determine their traditional research impact and bibliometric information as illustrated in Figure 4 below.
Figure 4: Websites, search engines and databases used to search for traditional citation impact

Question 15 relates to the websites, search engines and databases used to search for alternative citation information of a researcher (derived from attention data). The results indicate that the majority of respondents (54%) do not use websites, search engines and databases to search for alternative citation impact, 24% use Academia.edu 20% ResearchGate (20%) and 2% Impact Story as illustrated in Figure 5 below.
5 Discussion

The profile of the SES researchers represented by the e-visibility survey indicates that the majority of the respondents are a relatively young group of emerging researchers with an average age of 40 years with a master’s as the highest qualification and lecturer as the highest post level. Research by Jamali, Russell and Nicholas (2014:607) reported similar results where the average age group of the respondents was age 36 to 45 years for researchers participating in an survey on online social networking tools.

Regarding the number of accredited scholarly and non-accredited research publications the results indicate that a large percentage of respondents publish their research in non-accredited books (77%) followed by accredited journals (74%) and chapters in non-accredited books (72%). In addition, there is a preference for using free search engines and tools such as Google, Google Scholar, Bing and Yahoo to ascertain their online research presence to fee-based tools such as Web of Science, Scopus and Proquest.
Regarding online research profiles, the results report a preference for the creation of research e-profiles on free websites and academic social networking tools to formal research e-profiles on traditional citation resources and websites such as Web of Science, Scopus, Google Scholar and ORCID.

Pertaining to the types of scholarly research output archived and/or uploaded on online archives and repositories (institutional and subject repositories), the results indicate that 38.4% of respondents opt not to upload and/or archive all their scholarly research output, while 63.4% have not uploaded their research on the institutional repository or subject archives. The implication of almost two thirds of the respondents not having uploaded and/or archived on the institutional repository is that the research output is not accessible and thus less discoverable to online audiences. In addition, low percentages of self-archiving on institutional repositories mean having low visibility on Google Scholar and academic search engines. Similar results of low participation rates of academics of self-archiving on repositories and online archives were reported by Jantz and Wilson (2008:186), Cullen and Chawner (2011:468), Bankier and Percialli (2008:21) and Lercher (2008:408).

Regarding research e-profiles on social networking tools, LinkedIn receives the highest percentage of support. However, LinkedIn is not considered an academic social networking tool by definition, since no research output/publications were traditionally linked directly to the LinkedIn profile. However, LinkedIn provides a platform which can be described as a professional e-profile containing the professional information of a researcher for employment purposes. The majority of research e-profiles are reported on the academic social networking tools ResearchGate and Academica.edu. Research by Menendez, et al. 2012; and Jamali & Russell (2014:607) suggested similar results with a high distribution of profiles on LinkedIn, ResearchGate and Academica.edu whereas research by (Mikki et al, 2015:170), indicated the highest distribution of e-profiles to be on ResearchGate.

The implication of 23.4% of respondents using Mendeley, means an increase in their online presence by creating an e-profile and linking their research output on Mendeley. Research output linked on Mendeley becomes discoverable and accessible via the Mendeley Papers Crowd-sourced Catalogue and increases their opportunities of their research output being accessed and downloaded for perusal.
Pertaining to ascertaining the citation information of the researcher to indicate the researcher’s traditional research impact, the results indicate that Google Scholar is used by the majority of respondents (40.3%) followed by Scopus and Web of Science (12.5%). This translates to a preference to using free rather than fee-based citation resources to ascertain the researcher’s traditional research impact.

With reference to establishing the researcher’s altmetrics to indicate his/her non-traditional research impact, the results indicate that the majority of respondents (54%) do not use websites, search engines and databases to search for their alternative citation impact. The possible explanation for the majority of researchers not using websites, search engines and databases to determine their alternative citation impact, could be that they are not familiar with the concept “altmetrics”; and they are not aware of the possible value of altmetrics for research evaluation in the higher education environments.

Looking at the results, there seems to be a preference for young emerging researchers to embrace social networking tools to create research e-profiles on social networks.

The results above apply to environmental science researchers at Unisa and cannot necessarily be generalised to all researchers in other disciplines and in South Africa.

6 Conclusions and Recommendations

The e-visibility status described above clearly indicates that a low percentage of SES researchers make use of traditional citation resources for citation metrics and online research e-profiling services. There are however indications of an increased usage of academic social networking tools for e-profiling. However, the results indicate a low online presence on traditional citation resources and a low usage of bibliometric information. This translates to the low online research visibility of SES researchers. The low percentage of SES researchers who participate in self-archiving their research publications on repositories, translates to low discoverability and low accessibility of SES researchers.

The low e-visibility status of the SES researchers allows for the opportunity to create awareness and promote various traditional citation tools for bibliometrics and research
e-profiling; and academic social networking tools for alternative metrics and research e-profiling. The development of an e-visibility strategy for the SES researchers would provide awareness of the benefits of enhanced research e-visibility which translates to having an increased online presence; being more discoverable as a researcher and having one’s research output accessible by creating and maintaining research e-profiles on traditional citation resources, academic social networking tools and consolidated e-profiles. An e-visibility strategy would encourage SES researchers to embrace online research tools and research communities to enhance their e-visibility.

References


