

The adoption of professional social networks by researchers at South African public universities



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Background: Professional social networks (PSNs) have changed the research landscape by influencing how different communities of scholars engage within the community. Whilst there has been much research on this topic focusing on students and large public communities, perceptions around PSNs by scholars remain largely uncertain.

Objectives: This study determines the degree to which academic staff engage with PSNs at different public universities in South Africa.

Methods: The study adopted a quantitative approach using an online survey that was completed by 950 academic and research scholars at 17 public universities in South Africa. Additional support was provided with a qualitative approach using 10 semistructured interviews.

Results: Scholars at South African public universities have adopted traditional, generic and PSNs to disseminate publications, enhance online visibility and collaborate with peers both nationally and globally. Scholars' disinclination to use PSNs was associated with plagiarism, copyright, commercialisation of content, privacy, security challenges, issues related to the design, government and organisational challenges. Furthermore, there were no official policies, guidance from institutions, support from governments or professional social networking services.

Conclusion: Scholars have adopted PSNs but do not use these online systems extensively. This is attributed to a lack of support from various stakeholders, missing policies and system misalignments, resulting in reduced research productivity. University leadership should be guided by this study and introduce active measures to encourage collaboration and dissemination of research outputs.

Keywords: social networking sites; academic social networks; types of social networks; collaboration; information sharing; research production; diffusion of professional social networks; South African universities.

Introduction

Social networking has accelerated changes in all fields of endeavour. Emergent professional social networks (PSNs) aim to aggregate scholars' research work and to enhance collaboration. Professional social networks give scholars an opportunity to collaborate and disseminate research outputs quickly and avoid the delays that come with traditional publishing systems (Swanepoel & Scott 2018). Traditional publishing systems build strong connections with scholars to facilitate research production but have difficulty connecting with a larger audience (Beall 2013). Aggregators such as Academia.edu, ResearchGate and Google Scholar measure research outputs and reach a larger audience.

Professional social networks become more important as they change the way scholars teach, conduct research, share ideas, collaborate and disseminate research output (Nitza & Roman 2016). The problems associated with the adoption and use of PSNs and the underlying patterns between the benefits and challenges are often understudied. Little is known about how professional social networking is perceived by scholars in South African universities. Whilst there are benefits associated with adopting different types of PSNs, there are also challenges involved. This article reports on the benefits and challenges of adopting PSNs by South African higher education academics. These objectives were achieved by answering the following questions:

- What are the benefits of adopting and using PSNs in research in South African tertiary institutions?

- What are the challenges to more accelerated adoption and usage of PSNs to support research productivity in South African universities?

Literature on professional social networks

According to Carrigan (2019:16), academic PSNs are online platforms that allow academics and researchers to construct a public profile within a constrained system. With this definition in mind, any social network facilitating the sharing of a connection amongst scholars can be classified as professional. Platforms such as Academia.edu, ResearchGate and LinkedIn, amongst others, are usually classified as PSNs. Scholars use these platforms to communicate, share information and collaborate with other scholars. The concept of PSNs is usually misunderstood by isolating them from generic social networks (GSNs) such as Facebook and Twitter. In this article, professional social networking is not limited to a classification of specific platforms but rather perceived as an enabling feature of any social network platform. In other words, a social network platform that enables a scholar to perform professional duties is perceived and classified as professional. When debating over platforms such as Facebook and Twitter, many people think the platforms cannot be used as professional networks. When it comes to social network sites, the user decides its professionalism based on how it is used.

The concept of a social network was first introduced in 1997 with Six Degree (Boyd & Ellison 2008). By the year 2000, the Internet became popular with chatrooms with a reach of millions of online users. MySpace and LinkedIn were introduced in 2003. In 2006, Facebook and Twitter were introduced to the world. In 2008, ResearchGate and Academia.edu were introduced. From this time forward, the Internet started being bombarded with different social networks to the point that today it is challenging to know how many social network platforms are operational. Whilst Facebook and Twitter are designed to be used by anyone on the Internet, platforms like Academia.edu, ResearchGate are limited to specific targeted groups.

Professional social networks usually differ in the ways in which they function, but the construction of profiles is usually made up of the same information, such as first names, surnames, date of birth, gender and location. These details are often required for a user to subscribe. For an academic profile, a user, in addition to the above, is also requested to provide a biographical sketch, a list of publications, research experience and academic skills. In common with most social media networks, users can post content, comment on posted content, share the content (with anyone or just a target group), upload articles, perform one-on-one chats, use group chats and make video calls. These features are important for enhancing research and academic collaboration. Scholars usually subscribe to multiple platforms to cover for a lack of certain features from another platform. There is seldom a single platform that is inclusive of all features to meet the needs of scholars.

Some key drivers for adoption by scholars include awareness (Sheikh 2016), which is driven by the pressure coming from the world around scholars' institutions (Azambuja & Nikolaeva 2019), self-promotion, acquisition of ideas, belonging to a network of researchers, interacting with peers (Meishar-Tal & Pieterse 2017), increasing visibility (Jeng, He & Jiang 2015), ease of use and connecting with other scholars without the restrictions that come with offline conferences and workshops (Wyse et al. 2016).

Professional social networks allow scholars to enhance their profiles, expose scientific voices to a larger audience, share ideas and publications quickly and access more research content (Yan & Zhang 2018). It can also be beneficial for a collaboration to start online and then convert to an offline collaboration (Althoff, Jindal & Leskovec 2017). Conversations in offline conferences can be tweeted to open the conversation to a larger audience. Professional social networks can assist scholars in disseminating publications (Palmer & Strickland 2017), reach a non-scientific audience and enable access to advanced citation and altmetrics that differ from traditional metrics (Li & Gillet 2013).

With these benefits in mind, some challenges forming barriers to adoption are also raised. These challenges include concerns around user interface (Bhardwaj 2017); the lack of several features which slow adoption and usage (Bhardwaj 2017); missing guidelines; the lack of training (Williams & Woodacre 2016); privacy issues; exposure to exploitation (Hoffmann, Lutz & Meckel 2014); plagiarism; copyright and legal issues (Ashraf & Mohamed 2016); the lack of time; the lack of confidence in computer skills (Osterrieder 2013); the lack of trust, clarity and integration of institutional policy (Coppock & Davis 2013); commercialisation of content; the lack of credibility; and the quality of content (Lupton 2014:3). The lack of awareness, time limitations and concerns related to copyright were raised in a qualitative study conducted by Swanepoel and Scott (2018) in South Africa.

With many tools available online, their approval and acceptance remain limited in the community of scholars. There is a need for comprehensive training which highlights the strengths and weaknesses of each platform to allow scholars to make the right choice. On Academia.edu, scholars can find, follow scholars, post publications, share publications and participate in discussions in a community of scholars (Academia.edu 2022), but they cannot reach a non-scholar community. These features are also provided by ResearchGate with the same limitations (Thelwall & Kousha 2015), except those publications are more open, whereas Academia.edu commercialises publications. On Mendeley, scholars can upload publications and contribute by providing comments on uploaded publications (Elsevier 2022). Just like Mendeley, Zotero facilitates the creation of groups in which scholars can connect, collaborate and access research papers published by other researchers (Chen et al. 2018) and also facilitate the management of bibliographies. Another interesting platform that enables collaboration is Office 365, currently known as

Microsoft 365, where scholars can use Microsoft Word, Teams, SharePoint, Yammer and other inclusive features to collaborate on drafts of journal articles, books and conference proceedings, as well as chat and perform video calls (Mercurio 2018).

Scholars can, instead of using their Facebook profile as a research space, create a research page where they can post research-related activities and research outputs. Scholars can also build networks with their colleagues on Twitter by following those interested in their field. Whilst Twitter is mostly used in South Africa (Statcounter 2020), only a small percentage of South African scholars (6%) are using hashtags to share and discuss new and existing publications (Joubert & Costas 2019). LinkedIn is another interesting platform where scholars can write posts and articles, share videos, check accessibility by other scholars and expand professional networking (LinkedIn 2022).

WhatsApp and Google Scholar, even though not classified as social networks, are often used by scholars. Google is usually used by scholars to access their publications and their citations per year metrics (Martín-Martín et al. 2018). With the use of web crawlers, Google Scholar consolidates publications that have been made available on ResearchGate, Academia.edu, Facebook, Twitter, LinkedIn, Mendeley and Zotero, amongst others. It is necessary that this platform is not excluded from the list of PSNs, as it connects and consolidates professional content from other social network platforms to ensure the content is searchable by anyone on the Internet. WhatsApp, on the other hand, is a messaging application which facilitates social connections through group chats (Gon & Rawekar 2017), where scholars can discuss and collaborate on topics to enhance research collaboration and productivity (Nitza & Roman 2016).

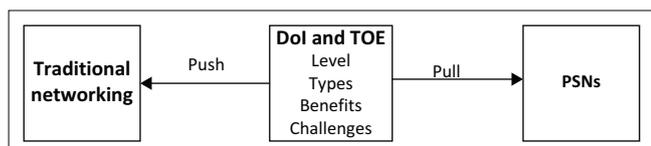
At the University of South Africa, scholars prefer using free search engines instead of fee-based traditional systems for validating and measuring research impact (Adriaanse & Rensleigh 2017), which is then linked to promotions and pay incentives (Dettori, Norvell & Chapman 2019). There has been an increase of predatory publications enabled by weak policies of social networks (Mouton & Valentine 2017). Most social networks used for professional social networking lack filters to eliminate non-reviewed and predatory research publications (Gasparyan et al. 2017). Compromised profiles and unattended profiles can be used by scholars with bad intentions to increase uninspected publications on these platforms.

Scholars are probably consuming information, sharing less and interacting less with others. In the South African context, the research conducted has used qualitative methods, focusing on just a few scholars at a few universities. Such results are difficult to generalise to the population of scholars. This article evaluates the extent to which the adoption of PSNs by researchers at the majority of public South African universities is currently unknown.

Research methods

This study adopted a quantitative method to test assumptions and then a qualitative method to understand the experiences of scholars. A qualitative approach was used to strengthen the results obtained from the quantitative approach. A sequential explanatory design was implemented where quantitative results preceded qualitative experiences. The data was consolidated from a survey, which was disseminated online to scholars in different public universities in South Africa. The survey focused on scholars' adoption and usage of PSNs for collaboration and dissemination of research outputs. Likert-scale questions were used to investigate how many participants agreed or disagreed with predefined statements. All Likert-scale responses were factor analysed in the Statistical Package for the Social Sciences (SPSS) to eliminate unreliable data and to identify intercorrelated variables from a large set of variables. The data was validated and relied on Cronbach's alpha test results, which were all above 0.80 (0.893 for adopters, 0.876 for non-adopters). Participants were scholars located at 17 public universities in South Africa including the University of KwaZulu-Natal, Cape Peninsula University of Technology, Central University of Technology, Durban University of Technology, North-West University, Rhodes University, Stellenbosch University, University of Fort Hare, University of Free State, University of Johannesburg, University of Limpopo, University of South Africa, University of Venda, University of Zululand, Tshwane University of Technology, University of the Western Cape, Vaal University of Technology and the University of the Witwatersrand, where ethical clearances and/or gatekeepers' letters were obtained. Informed consent was electronically recorded for all 950 responses that were randomly obtained from these institutions.

In addition, after consenting, 10 interviews were conducted with expert scholars in the field to expand the results obtained from the survey. Participants were academic or research scholars based at public universities in South Africa. These were imported into NVivo for qualitative analysis to confirm and support the views in the questionnaire. With this in mind, the question around the number of interviews to rely on is usually raised by scientists and cannot be ignored. Patton (2002) and Marshall et al. (2013) proposed that a small sample size of interviewees is not sufficient but at the same time did not provide evidence for this argument. However, Creswell (2013) proposed a minimum sample size of between 5 and 25, whilst Hagaman and Wutich (2017) argued that 16 or fewer interviews are sufficient. Because there is no specific agreement amongst scientists on determining the sample size in qualitative studies, this research depended on the statement made by Ryan and Bernard (2003), who concluded that it is not about the quantity or the number of participants in qualitative studies but the relevance of the data. The data obtained from interviews was classified into different thematic groups based on perceived benefits (collaboration and dissemination), challenges (plagiarism, commercialisation of content, profiles, privacy), policies and support (missing support and preferred support).



DoI, diffusion and innovation, TOE, technology–organisation–environment, PSNs, professional social networks.

FIGURE 1: Author's simplified theoretical framework.

Theoretical framework

This article focuses on the variables of the diffusion of innovation (DoI) (Rogers 2003; Khan & Khan 2018) and technology, organisation and environment (TOE) (Rosli, Siew & Yeow 2016) models by evaluating causes and effects using the push and pull factors model associated with PSNs' adoption and usage.

In Figure 1, traditional networking methods are associated with the use of e-mails to enhance collaboration and research activities but also with offline systems of collaboration such as attending offline conferences and workshops. The diffusion and innovation (DoI) theory determined the level of adoption of PSNs and the types of PSNs. Benefits and challenges are also evaluated within this model. For a holistic overview, the DoI is combined with the TOE model. This allowed evaluation of the environment and organisation in which PSNs are adopted and used by scholars. The benefits and challenges identified in Figure 1 can pull scholars toward PSNs or push them away from PSNs. Perceived benefits have more chances to pull scholars toward PSNs whilst perceived challenges discourage and push scholars from adopting PSNs. Perceived challenges and benefits also determine the level of adoption and the types of PSNs being adopted. Furthermore, adopting PSNs does not mean scholars are using them. Scholars can default back to traditional networking systems if they discover that PSNs are not responding to their needs. This article is also not suggesting that traditional methods need to be removed from usage but rather that combining different systems can lead to an increase in research productivity at different public universities in South Africa.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Results and discussions

Types of professional social networks

Table 1 classifies PSN platforms from the most used to the least used. The most-used platforms by scholars are ResearchGate, WhatsApp, LinkedIn, Facebook, Google Scholar and ORCID. To project this to the entire population, the most used PSNs by scholars are decreased to ResearchGate, WhatsApp and LinkedIn. Professional social networks used by less than 50% of the entire population of scholars, including Facebook, Google Scholar, ORCID, Academia.edu, Twitter, Office 365, Mendeley, Zotero, Instagram and Scopus.

TABLE 1: Platforms adopted for professional social networking.

#	Platforms	n	% of respondents adopting PSNs, (n = 664)	% of all respondents, (n = 950)
1	ResearchGate	539	81.17	56.74
2	WhatsApp	533	80.27	56.11
3	LinkedIn	520	78.31	54.74
4	Facebook	459	69.13	48.32
5	Google Scholar	447	67.32	47.05
6	ORCID	377	56.78	39.68
7	Academia.edu	314	47.29	33.05
8	Twitter	251	37.80	26.42
9	Office 365	212	31.93	22.32
10	Mendeley	181	27.26	19.05
11	Zotero	47	7.08	4.95
12	Instagram	12	1.81	1.26
13	Skype	6	0.90	0.63
14	Scopus	3	0.45	0.32
15	LabRoots	1	0.15	0.11

PSNs, Professional social networks.

It was discovered that all platforms are not equally used, and some are used in specialised fields, and therefore are not used by most scholars. Such platforms include Instagram, which is used by scholars to share arts, and LabRoots, which targets scholars in specialised medical fields.

The different types of social networks adopted by scholars in South Africa include traditional platforms (Office 365, Skype, Google Scholar), GSNs (Facebook, Twitter, Instagram, WhatsApp) and PSNs (ResearchGate, LinkedIn, Academia.edu, Mendeley, Zotero). This identification of PSNs is more associated with what scholars are using these platforms for. It was discovered that these platforms are being used for collaboration, consumption of information and improving research productivity. Just because a platform is, in its conception, classified as professional does not necessarily make it professional.

Whilst certain individuals confuse PSNs with professional social networking, this article reveals that professional social networking is beyond a typical definition associated with PSNs. Professional social networking in the views of scholars is based on how a particular platform is used for professional purposes. For instance, groups can be created on WhatsApp to enhance collaboration amongst scholars. Therefore, it is used for professional purposes even though the platform itself is generally classified as an instant messaging application. Generic and PSN platforms are being used by scholars for professional social networking. Hence, PSNs include all platforms used by scholars to collaborate, disseminate research outputs, reach a larger audience and consume information, which are inclusive of messaging applications such as WhatsApp.

Levels of adoption and usage

Of the 950 responses received, 664 (70%) scholars have adopted PSNs and 286 (30%) have not. The gender breakdown of participants was 47.5% male and 52.5% female. The same pattern of gender is followed when it comes to scholars who

have adopted PSNs. More female scholars have adopted PSNs than male scholars.

Of scholars who have adopted PSN, 67.4% of scholars have had a presence on these platforms for over 4 years whilst 32.6% fall behind others. The frequency of PSN usage is associated with 66% of daily users, 23% who use PSNs a few times a week, 9% who use PSNs a few times a month and 3% who use PSNs once a week. Sixty per cent of scholars are processing research information on free versions of PSNs whilst 11% have paid subscriptions. This is in line with the results by Adriaanse and Rensleigh (2017), who reported a higher availability of research outputs on free PSNs.

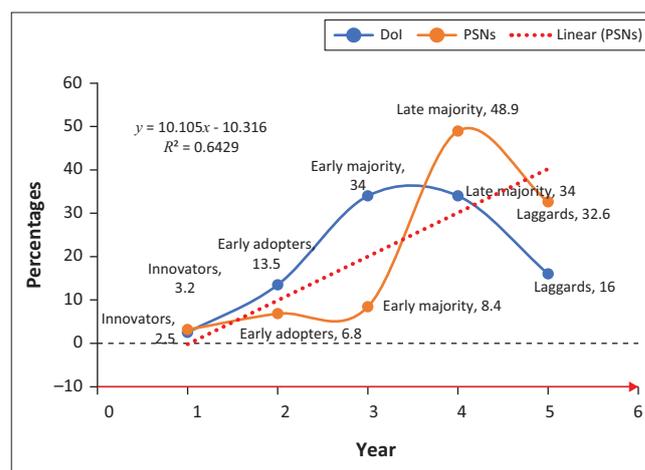
In relation to disciplines, 40% of adopters are in the social sciences, 27% in the humanities, 26% in applied sciences and 7% in the formal sciences. The results revealed a majority of adopters in all disciplines. Of the 30% non-adopters, certain scholars were willing to adopt PSNs within a year. These were identified as late adopters.

With the use of the Diffusion of Innovation (DoI), Figure 2 reveals how PSNs have spread through a community of scholars in South Africa. Following the DoI ordinary deviation curve, the results from this study are introduced in a graph to see the adoption level. The results have revealed that it has been more than 4 years since 67.4% of scholars in South Africa have been professionally social networking, and 32.6% have not adopted these platforms. The 67.4% of adopters is a cumulative of 3.2% in the fourth year, 6.8% in the third year, 8.4% in the second year and 48.9% in the first year of adoption. Reversing these numbers provides us with an accurate picture of the level of adoption in the DoI ordinary deviation curve in Figure 2 and gives us an idea of how professional social networking has been spreading over the years. The timeline of the data collected is in line with the timeline on the curve of the DoI.

The *R*-square of 0.6429 in Figure 2 reveals that 64.29% of variability in adoption of PSNs is explained by the regression line, which is correlated with the diffusion in the DoI model. Now that the level of adoption has been established, it is necessary to investigate the reasons scholars in South Africa adopt or resist professional social networking to collaborate and enhance research productivity.

Perceived benefits of professional social networking

Univariate analysis allows for classification of the data in two extremes of agree and disagree and excludes neutral responses because of the lack of having a position. This method was used to exclude neutral responses and focus on scholars who provided their position in the forms of agreement or disagreement to certain statements. Table 2 reveals that scholars have a positive perception toward PSNs. Whilst research by Collins, Shiffman and Rock (2016) revealed that regardless of the benefits associated with PSNs, a small



PSNs, Professional social networks; DoI, Diffusion of Innovation.

FIGURE 2: Diffusion of professional social networks at South African universities.

TABLE 2: Perceived benefits of professional social networks.

Perceived Benefits	Agree		Disagree	
	<i>n</i>	%	<i>n</i>	%
Perceived benefits – Adopters (<i>n</i> = 664)				
PSNs enhance my effectiveness in information sharing	495	75	60	9
The positive results of using PSNs are obvious	368	55	77	12
Collaborate with other researchers outside the current affiliated institution on PSN	433	65	134	20
Share articles with other researchers around the world	454	68	122	18
Share scientific knowledge quickly	405	61	140	21
Collaborate with other researchers around the world	438	66	117	18
Easily disseminate and communicate research results	329	50	162	24
I have been using PSN for research and collaboration for quite some time	461	70	96	14
Use of image and video to collaborate	260	39	308	46
Perceived benefits – Non-adopters (<i>n</i> = 286)				
PSNs allow scholars to reach fellow scientists	169	59	17	6
PSNs are used to collaborate with other scholars around the world	133	47	37	13
PSNs facilitate articles sharing with other researchers around the world	153	53	28	10
PSNs facilitate the discovery of recommended papers for research	107	37	51	18
PSNs allow users to attract more citations to their research	109	38	41	14
PSNs are consistent with traditional research techniques	96	36	68	24
PSNs allow collaboration with other scholars outside their affiliated institution	161	56	23	8

PSNs, Professional social networks.

number of scholars have adopted these platforms; however, the results in Table 2 reveal a different picture.

Perceived benefits associated with scholars using a particular PSN platform include reaching other scientists from other locations to collaborate with other researchers, share and disseminate publications and discuss ideas. The more scholars use PSNs, the more they collaborate and share research articles. Scholars perceive PSNs to be easy to use. Table 2 reveals that images and videos are not used much for collaboration. This might reveal that scholars are using instant messaging more to connect with their peers,

or it might be that image or video features are absent on the platforms used or that scholars are not aware of these functionalities; they may also lack the ability to operate these kinds of features. Also, because these results were collected before coronavirus disease 2019 (COVID-19), which forced many scholars to use platforms such as Zoom, Microsoft Teams and Google Meet to collaborate, such a perception might have changed by the time this article is published.

From the perspective of non-adopters in Table 2, most scholars are aware of the benefits associated with PSNs, such as reaching others around the world to collaborate, to discover research publications and to boost their citation index. These benefits are also associated with the reasons scholars join or are pulled toward PSNs.

Table 2 reveals that the position of adopters and non-adopters in relation to perceived benefits associated with PSNs is the same. They both perceived PSNs as a way to quickly disseminate publications and to collaborate for the benefits of increasing citation index. It was revealed that both adopters and non-adopters are very aware of the benefits associated with professional social networking.

The section below presents responses obtained from the interviewees in an attempt to respond to the question: 'what have you perceived as benefits of using professional social network tools?' From the interviewee perspectives, collaboration, dissemination, benefits and drivers were often raised as pull factors towards adoption and usage of social networks for professional social networking.

Perceived benefits

'[W]hen I download a paper, I get more recommendations for similar papers, and I can network with scholars, and I can see exactly what their research interests are.'

'[...]if you put your work there using [generic] social media, for instance, Facebook, you will find that you meet a bigger audience, that is, even those who are not solely in academia but other thinkers whom you might think they cannot contribute to your work.'

'It [PSN] is open media because all my publications are on ResearchGate.'

'It [ResearchGate] makes my life easier. I only wait for less than 24 h; the article will be with me.'

'[W]ith ResearchGate and LinkedIn, you also can link with other researchers in the same field. If you do research and it automatically ...links to, and you also form a group there. Over that network, you have access immediately to their publications.'

'They [professional social networks] sort of aggregate your work.'

'I use Academia.edu because it allows me to kind of like put out the stuff I want to.'

Collaboration

'I suspect most people [scholars] use social network[s] more for social instead of actually doing academic [and research] work on it.'

'I think it goes without saying that that's how professional academics are communicating [collaborating] now, through these various tools.'

Dissemination

'[I] really like, you know, so when I know people are working on interesting things and you wait and wait and wait and wait; then they put up a thing on Facebook, they say, "yes, we have published." And then, the first 20 can click on that and get a free download or something. Or, you know, it's on Twitter. Twitter, Facebook. Those are mostly the vehicles people I know use to tell you, "yes, we've got it, we've done it. Go and read it. Have a good look." I like it, having the ability not to have to wait for such a long time for the book to come out or to go to the conference.'

Drivers

'[...]the likelihood of my finding good interaction of it [PSN]...'

'[...]the fact that you are collaborating with various scholars across the globe makes it easier for you to get funding.'

'[I] think what influenced my decision is the knowledge that [on] all the social media platforms, you come across people from different disciplines who may add this dimension or that dimension to your research work...'

'I think we are forced to use [professional social networks].'

'Particularly that we are in COVID-19, that's where you are going to find the usefulness of [professional] social network[s].'

'I was involved in a company offering computer-based mathematics.'

Perceived challenges can explain not only non-adoption but also the passive profiles of scholars who have adopted PSNs.

Perceived challenges of professional social networking

Just because most scholars have adopted PSNs, this did not translate to effective use of PSNs. Most scholars are passive adopters. Most non-adopters claimed they trust PSNs but have not been comfortable adopting the platforms. For scholars who have adopted PSNs for collaboration and dissemination of research outputs, they are passive users because of challenges associated with the platforms they are registered with (Table 3). Concerns about copyright and intellectual property, plagiarism issues, possibilities of being compromised, commercialisation of personal ideas and the lack of credibility are the most cited and highly correlated challenges raised by scholars. Scholars who have engaged with PSNs have a certain level of trust associated with PSNs, but such trust is not at the same level as that of those operating using traditional networking systems of collaborating and disseminating research outputs.

The passive-active adoption of PSNs is more explained by different factors. Scholars think PSNs are not currently used the way they were supposed to be; hence, they default back to e-mail systems that work well for communication

TABLE 3: Perceived challenges of professional social networks.

Perceived Challenges	Agree		Disagree	
	<i>n</i>	%	<i>n</i>	%
Challenges – Adopters (<i>n</i> = 664)				
I am concerned about copyright issues	396	60	128	19
PSNs' use is becoming an obligation	364	55	138	21
I am afraid of disclosing my research ideas on PSNs	294	44	198	30
Content can easily be commercialised on PSNs	422	64	56	8
My trust in PSNs is not as strong compared to trust in offline research collaboration	343	52	127	19
There are possibilities of becoming a target of an attack on PSNs	361	54	92	14
Challenges – Non-adopters (<i>n</i> = 286)				
I am concerned about plagiarism on PSNs	164	57	46	16
I have concerns about the safety of PSNs	137	48	71	25
There are privacy risks involved in the use of PSNs	172	60	48	17
There are possibilities of becoming a target of an attack on PSN	140	49	34	12
I am concerned about copyright issues	162	57	49	17
I am not comfortable disclosing my research ideas on PSNs	168	59	51	18
There is lack of credibility on PSNs	157	55	42	15
PSN user policies are not aligned with my institution's research policies	43	15	64	22
I trust PSNs	109	38	80	28

PSNs, Professional social networks.

and sending out documents. Some scholars have not seen real benefits from being present on PSNs; some have not explored it yet; some think it is time consuming as it is a distraction in itself. Scholars see subscription to PSNs as an additional burden to their existing academic responsibilities, as they will have to deal with PSN administrative tasks such as keeping the profile up to date. There are also negative experiences linked to privacy and commercialisation of content on PSN, which leads to discontinuity by adopters.

The section below presents responses obtained from the interviewees in an attempt to answer the question: what have you perceived as challenges of using professional social network tools? Concerns were classified as follows.

Commercialisation of content

'[W]ell, you know, so a lot of people [*scholars*] don't like Academia.edu because they say it's a commercial platform that makes money from advertising and selling data to advertisers just like Facebook does.'

'Academia.edu is too much of selling, because when you want to upload information, they will tell you that five people quoted you. When you follow it, they want you to put money before it goes through.'

'There is a commercial [*intent*] because every time I download an article, Academia.edu will tell me, "why don't you upgrade to premium?"'

Privacy

'[I]t is relatively rare to find somebody who says that the privacy of users in the Global South also needs to be protected.'

Multiple profiles

Whilst scholars claimed that some PSNs are easier to use than others, and because all platforms do not offer the same services even though they have common social components, this led to the creation of multiple profiles, which require much administrative work:

'[I] find that proliferation of platforms very difficult to manage. I am not a curator of platforms. I am a person who supposed to do research and teaching. That is quite a significant downside now for me.'

'To manage an online presence on multiple different sites, that is quite expensive.'

Plagiarism and copyright

Issues of copyright, plagiarism and intellectual property are addressed in different institutions in traditional forms but do not cover the professional use of PSNs. Because PSNs record dates and times of posted content, it will be easier to identify who posted the content first. However, if a person posted first but was not the one who said it first outside the social network environment, then this will create conflicts. Maybe a centralised identifier which could process who said what, when and from where is necessary to minimise plagiarism and copyright issues:

'[I] think the issue of plagiarism ... has nothing to do with [*professional social networks*]. Plagiarism will be plagiarism anyway. I mean, it will happen even if [*professional social networks*] were not there.'

'I am very often, am careful about observing the copyrighting, about what I put up. I have not had, unless I just don't know about it ...'

Missing technical support

Universities provide support in traditional modes of disseminating research. Universities have guidelines informed by government support to publish work in accredited journals. Many funding agencies support the process of publishing following traditional publishing processes. These kinds of support need to be extended to PSNs, which can boost research visibility and exposition to large audiences. Scholars did not express a lack of computer skills to operate these platforms but rather the lack of marketing strategies. In the interviews, this was expressed as follows:

'[B]ut also some training on how you could and should use it to either market the university or build partnerships and networks or market your own work. So [I] am not aware of any university that's got a workshop on how to use social network for academics.'

Preferred support

It was discovered that there were no policies at the organisation level or governing level to support the professional use of social networks by scholars. Even if policies are developed at institutional levels, PSNs owners will need to include these governance frameworks in their platforms. Scholars need to learn to read and agree to policies related to usage, copyright of intellectual property and plagiarism before registering on professional social

networking services, as it seems most scholars are rash to register on platforms without reading these policies.

Missing policies

Government intervention is needed, including trainings, improving filters of information and accommodation for visually impaired individuals.

'[I]n terms of these online platforms, even with what we deem as formal, there is no policy guiding our institution.'

'What I am saying is that there is no policy. Even at our university, there is no policy which I know of.'

'[T]he department did not really have a policy you know for professional use of social network or guidelines for disseminating research and making it publicly available using things like Facebook or Academia.edu or any of these things.'

Professional social networks not designed for visually impaired scholars

Scholars with visual impairment have concerns that PSNs are not designed to accommodate them and that PSN owners only target a general population when it comes to the user interface design. People with disabilities are struggling with adoption, as these platforms do not accommodate their condition at all. The views below are explicit enough:

'I've mentioned that I am blind, so one of the challenges is that typically the interface, particularly the web interface, of [professional] social networks is quite difficult to navigate.'

'There are accessibility features, but because of the nature of the service, it is full of dynamic content, things that change, boxes. These are not easy things to navigate with a screen reader for a blind person. So I will say, for me, that is really the main limitation.'

'I don't use Facebook at all. I tried Twitter a little bit, but I did not find it very satisfying.'

Other raised concerns leading to the passive adoption of PSN include the following:

1. After joining these platforms, scholars realise that their colleagues are not available on a platform.
2. Research conclusions are often taken out of context on PSNs.
3. PSNs are not compatible with traditional methods of collaboration.
4. Some scholars are resistant to change.
5. Time constraints are an issue.
6. Scholars may be exposed to being vulnerable beyond their own control.
7. Scholars may not be good at using any social network.
8. Work and family responsibilities may interfere.
9. Scholars may not be able to use PSNs in their research.
10. The sites may seem unprofessional even though they were designed for that purpose.
11. One self-governance researcher reported working better alone than in a group.
12. Scholars feel bombarded with unnecessary information.
13. Platforms are missing that combine both private and professional activities for scholars who prefer this kind of space, where private engagement could lead to a

professional discussion; therefore, such a combination is of importance.

14. PSNs are not designed to accommodate visually impaired individuals.

Scholars want to reach a larger audience who can read their work. Social networks are built to target a small group of individuals and are not able to reach the desired audience. It is necessary to improve the electrical infrastructure to avoid more load shedding as this affects the availability of Internet connection. Whilst professional social networking provides benefits, this article has revealed that there are more challenges than expected. These challenges can be considered by those interested in improving services in the academic environment, in association with professional social networking, collaboration and dissemination of research production. The results presented concur with Jordan and Weller (2018), who confirmed that professional social networking needs to be perceived within the broader context of changes in higher education practice.

Conclusion

This study used quantitative and qualitative approaches to identify factors linked to the adoption of PSNs at various public universities in South Africa. The findings were based solely on results received from scholars at public universities and excluded private universities, professional associations and colleges. These can be targeted by other investigators to broaden the results and by augmenting the minimum qualitative sample size used in the study. In a South African context, there are more challenges than benefits to the adoption of PSNs. As revealed, scholars at various universities have adopted PSNs and use them to an extent. Whilst the level of PSNs' adoption is extremely driven by the perceived benefits, usage and continuity shrink as scholars find it challenging to navigate the different types of PSNs. This causes complete discontinuity or having a passive presence. At governance and institutional levels, there is a need for the implementation of policies that will guide scholars to navigate these online environments without compromising on their existing workload. There is a need for management to support the usage of these tools and integrate them with existing systems for effective usage and continuity. Misalignments between institutions' processes, publishers and PSNs' owners need to be resolved by all parties for better research productivity.

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Authors' contributions

K.V.M. conceptualised, investigated, collected and analysed the data. M.S.M. supervised the study and assisted in its structure. Their contributions to this article were 70% and 30%, respectively.

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Data availability

The data used in this study are available and can be shared upon reasonable request from the corresponding author, K.V.

Disclaimer

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