

# Comparative assessment of information and knowledge sharing among academics in selected universities in Nigeria and South Africa

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*This study investigated information and knowledge sharing among academics in selected universities in Nigeria and South Africa. The study employed quantitative and qualitative research methods. The combined techniques of purposive and probability random sampling were used to select universities and respondents respectively. The questionnaire was administered to a total of 382 respondents comprising only academic staff in both countries. A response rate of 81.41% (311 academics) was achieved. The respondents were drawn from Ahmadu Bello University (ABU), Federal University of Technology Minna (FUT) and Umaru Musa Yar'adua University (UMYU) in Nigeria, and the University of KwaZulu-Natal (UKZN), Durban University of Technology (DUT) and the University of Zululand (UZ) in South Africa. The sample of universities comprised a mixture of established, comprehensive and technology-based universities. The majority of the surveyed academics from the selected universities in both countries were male, from the Humanities, and with master's degrees as their highest qualifications. The majority of academics also had eleven to twenty years of experience in academia. All of the surveyed academics were familiar with information and knowledge sharing and participated in knowledge sharing in different ways. The majority of the respondents in the sample from both countries used computers, information and data storage devices, mobile phones and internet facilities for information and knowledge sharing but the use of old and new technologies varied across the countries with South African academics using more new technologies for information and knowledge sharing. The study notes that the Nigerian respondents revealed significant challenges to information and knowledge sharing in their universities, such as a lack of electricity; inadequate print and electronic information resources; poor research management and support; poor conference, seminar and workshop attendance and communication; and poor attitudes towards sharing among the academics. Not all the sampled universities from across countries shared the same challenges. The study recommends the provision of adequate ICT resources and improved research management, research support, and awareness.*

**Keywords:** South Africa, Nigeria, information and knowledge sharing, academics

## 1 Introduction and theoretical background

This study is largely informed by Social Capital Theory (SCT) and the Technology Acceptance Model (TAM), which were recently discussed in detail by Fari (2015a). Garip (2008) defines 'social capital' as a means of producing goods and services through constant and casual networks involving mutually benefitting parties or individuals, while Fukuyama (2002: 27) explains that it is a mutual standard or set of ideals through which social co-existence is achieved and developed into a constructive beneficial outcome. The World Bank (2009) states that "social capital is the institutions, relationships and norms that shape the quality of a society's social interaction, thus social capital is explicitly relational". By all accounts, the purpose of social capital is to build ties, create mutually beneficial avenues, establish formal and informal networks, bridge the gap between different people, and ensure reciprocity (Godwin & Quisumbing 2008; Chalupnick 2010). The core components of any organisation are the individuals who contribute towards the overall success of the system from its inception to the sharing of knowledge with each other and outside parties. Although Information and Communication Technology (ICT) influences sharing, it would be impossible to conceive knowledge without individuals in an organisation (Coleman 1988). Putnam (2000: 19), a social capital expert, summarises 'social capital' thus:

Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue". The difference is that "social capital" calls attention to the fact that

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civic virtue is most powerful when embedded in a sense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital.

The Technology Acceptance Model (TAM) acknowledges the necessity and complexities of using ICTs in society. It is increasingly recognised that ICTs are vital resources in organisations, and TAM is relevant in the study application of their ICTs in Information Science research (Orlikowski and Robey 1991; DeSanctis and Poole 1994; Salisbury et al. 2002). TAM addresses the inter-relationship and relevance of technology in routine activities, interactions, and communication between individuals or members of a group or society. The model especially focuses on people's understanding, adoption and utilisation of ICTs in their day-to-day activities. TAM was selected and examined in this study to explain the relevance of ICTs in information and knowledge sharing because many important aspects of individuals' behaviour, understanding and intentions with respect to these tools are evident in sharing activities. TAM critically addresses external variables (Thompson, Campeau & Higgins 2006), perceived usefulness (Pearlson & Saunders 2006), perceived ease of use (Abrami & Barrett 2005), behavioural intentions (Yi & Hwang 2003) and actual system use (Thompson, Campeau & Higgins 2006).

Both SCT and TAM have been criticised by various scholars. Bourdieu (1986), for example, argues that social capital is largely beneficial to the dominant members of a group, society or organisation for maintaining supremacy. Social capital is also criticised for being too simplistic and narrow as it undermines the status of individuals in an organisation by regarding them as mere employees (Desjardins 2003: 11). It is also criticised for undermining the capabilities of individuals outside socio-economic and organisational boundaries (Duke, Osborne & Wilson 2005) and emphasising learning processes that are perceived to potentially possess only reciprocal outcomes (Kerka 2000; Cruikshank 2008: 67). TAM is mostly criticised with respect to methodology. Bogazzi (2007) argues that behaviour is far from being a terminal goal and should rather be seen as a motive towards enriching vital goals. Thus, TAM is deficient in explaining the gap between intention and adoption, where many other factors could come into play to speed up or delay the decision to adopt. Finally, TAM is considered to be a deterministic model; an individual's actions are largely driven by his/her intentions.

Despite these criticisms, we find the application of these models to this study and related studies to be relevant (Fari 2015a; Godwin & Quisumbing 2008; Chalupnick 2010).

## 2 Problem statement and purpose of the study

Benjamin (2001) posits that higher institutions of learning support development through the provision and transfer of necessary skills and expertise to the common man. Universally, universities consist of communities of scholars tasked with ensuring the free flow, acquisition, sharing, and transfer of information and knowledge (Salter 1983; Hannah 1998; Banjo 2000). These three authors further observe that in the course of history, universities have been the custodians of societal heritage through the preservation, refinement, recording and dissemination of community norms, values, culture and experiences for posterity. A number of studies have been carried out with respect to information and knowledge sharing (for example, Cabrera & Cabrera 2002; Reus & Liu 2004; Aliyu 2007; Lee & Ahn 2007; Ugah 2008; Umar 2009). While these studies are important, they seldom focus on Africa and African issues and challenges. Furthermore, while knowledge sharing is increasingly encouraged due to its perceived benefits (see, for example, Haa 2006), there appears to be no recent study on knowledge sharing among academics in Africa, nor a comparative study of knowledge sharing among or between universities in Africa. While the two countries lead in research productivity in Africa (Pouris & Ho 2014), it is not known how academics in Nigeria and South Africa share information and knowledge. Furthermore, we are not aware of how knowledge sharing occurs among the universities in the two countries, which would perhaps also reflect on the situation within the two countries and in Africa at large.

The overall aim of the study was to establish how academics in selected universities in Nigeria and South Africa share information and knowledge. In this paper, we address the following research questions:

- Do the academics share information and knowledge?
- What type of information and knowledge do the academics share?
- Why do the academics share information and knowledge?
- How do the academics share information and knowledge?
- What types of information and communication technologies (ICTs) do the academics use for information and knowledge sharing?
- What are the challenges to information and knowledge sharing?
- What are the common solutions to the identified problems?

## 3 Methodology

Osuola (1993) and Roscoe (1969) explain that approaches to social research are diverse, and that the choice of a particular approach is determined by the nature, aims and objectives of the study. This study largely applied the quantitative research method, also known as the traditional, empiricist, experimental or positivist approach, and the qualitative research method, also known as the constructivist, interpretive, post-positivist or naturalistic approach (see Fari 2015b) through a survey. The data for this study was gathered through the use of structured questionnaires administered to a sample of academics from selected universities in Nigeria and South Africa. The study used both

purposive and random sampling to select the universities and respondents respectively. The sample size was 10% of the population of academics in each university. The choice of sample size was informed by Boll and Gall's assertion that a sample size of 10% from a population is enough to ensure the representation of the population (cited by Adetoro in Afolabi 1993). Nkpa (in Opaleke 2012) asserts that 5% is applicable where the population runs in the thousands. The universities selected in Nigeria were Ahmadu Bello University Zaria (ABU), Federal University of Technology Minna (FUT) and Umaru Musa Yar'adua University Katsina (UMYU), while the University of KwaZulu-Natal (UKZN), Durban University of Technology (DUT) and University of Zululand (UZ) were selected in South Africa. We wanted to ensure that the sample consisted of universities that were established (stronger research base), comprehensive (both research and teaching based), and technology-based. The choice of these universities was also determined by convenience. The total sample consisted of 382 academics (281 from Nigeria and 101 from South Africa). Of the total administered questionnaires, 311 (219 from Nigeria and 92 from South Africa) were returned, producing a response rate of 81.41%.

**Table 1 Sampling of academics in selected universities in Nigeria and South Africa**

S/N	University	Type	Population	Sample (10%)	Country
1	ABU	Comprehensive	1,744*	174	Nigeria
2	FUT	Technology	638*	64	Nigeria
3	UMYU	Other	427*	43	Nigeria
4	UKZN	Comprehensive	422**	42	South Africa
5	DUT	Technology	268**	27	South Africa
6	UZ	Other	322*	32	South Africa
	<b>TOTAL</b>		<b>3,821</b>	<b>382</b>	

**Note** (\*) data obtained from the University MIS office

(\*\*) data obtained from the university calendar

## 4 Presentation and discussion of the results

The study's results are presented and discussed in sections 4.1 and 4.2.

### 4.1 Demographic profile of the respondents

The survey results revealed that males constituted the majority of respondents from the selected universities in Nigeria (74% male; 26% female) and South Africa (70.7% male; 29.3%). The disciplines were categorised into three main areas, namely the Natural Sciences, Humanities, and Applied Sciences. The data revealed that the majority of surveyed academics in both countries came from the Humanities (57.1% Nigeria; 41.3% South Africa), followed by the Natural Sciences (27.9% Nigeria; 31.5% South Africa), while the least number of respondents belonged to the Applied Sciences (15.1% Nigeria; 27.2% South Africa). From this sample, there were slightly more academics in the Humanities in Nigeria than in South Africa, while the ratio of South African to Nigerian academics was greater in both the Natural Sciences and Applied Sciences. The highest educational qualification held by the majority of the sampled respondents in both countries was a master's degree (52.5% Nigeria; 51.1% South Africa), followed by a PhD (30.1% Nigeria; 42.2% South Africa), and bachelor's degree (17.4% Nigeria; 6.5% South Africa).

The majority of the respondents from the selected universities in both countries had eleven to twenty years' experience (42% Nigeria; 53.3% South Africa), followed by twenty-one to thirty years (26.6% Nigeria; 26.1% South Africa), and less than ten years (24.2% Nigeria; 17.4% South Africa) of experience. The fewest respondents had over thirty years (7.3% Nigeria; 3.3% South Africa) of experience. The data shows that there were more upcoming academics in the selected universities in South Africa with between eleven and twenty years' experience; this category of academics is considered to be in its prime in terms of teaching and research. However, there were also slightly more academics in Nigeria in the category of ten years or fewer who, in their youth and inexperience, are also deemed to be crucial in the growth and development of a university. Therefore, there are advantages tied to each of the two countries with respect to upcoming academics or succession plans. By percentage, there also seemed to be more over-30s in the selected Nigerian universities, a category that has the longest experience to pass on to the younger generation. The trends in years of experience in the selected universities are very encouraging for academia in both Nigeria and South Africa.

### 4.2 Responses on information and knowledge sharing

Section 4.2 reveals the knowledge sharing activities of the surveyed academics.

#### 4.2.1 Participation in information and knowledge sharing

Information and knowledge sharing among academics occurs across all the stages of scholarly communication, from knowledge creation to knowledge dissemination. Research publication, research networks and collaboration, and scholarly gatherings such as conferences, seminars and workshops, play a key role in enabling information and knowledge sharing. All the surveyed academics from the selected universities in the two countries attested to participating in information and knowledge sharing.

#### 4.2.2 Types of information and knowledge shared

The main type of information and knowledge shared by the surveyed academics from the selected universities in Nigeria and South Africa was information on conferences, seminars and workshops. Conferences, seminars and workshops provide scholars with the opportunity to access, share, and filter knowledge. Riege (2005) asserts that knowledge sharing is a mutual process involving two or more individuals who share and refine their expertise, and benefit from each other's wealth of experience. There are many virtual platforms/spaces that facilitate information and knowledge sharing, and even more types of information and knowledge that can be shared. The Nigerian academics were more interested in sharing information about part-time, visiting and sabbatical jobs (86.3%). The surveyed academics in both countries shared information on scholarship availability (54.4% Nigeria; 75% South Africa), and information on new technology (all academics). The academics evidently recognised the usefulness of technology and visibly embraced its information and knowledge sharing capabilities. The growing number of easy-to-use platforms for knowledge acquisition and sharing and the emergence of Web 2.0, which has facilitated the development of virtual communities (Hsu et al. 2007; Hsu & Lin 2008), could be a contributing factor to the interest in ICTs.

**Table 2** Types of information and knowledge shared

Types of information shared	Country	Very much		Much		Less		Never		Undecided		% Shared
Information on conferences, workshops and seminars	NG	96	43.8%	80	36.5%	43	19.6%	0	-	0	-	100
	SA	69	75%	23	25%	0	-	0	-	0	-	100
Information on scholarship availability	NG	40	18.3%	55	25.1%	24	11%	67	30.6%	33	15.1%	54.4
	SA	29	31.5%	19	20.7%	21	22.8%	0	-	23	25.0%	75
Information on part-time, visiting and sabbatical jobs	NG	84	38.4%	68	31.1%	37	16.9%	30	13.7%	0	-	86.3
	SA	0	-	0	-	8	8.7%	39	42.4%	45	48.9%	8.7
Information on teaching methods/class management	NG	35	16%	32	14.6%	61	27.9%	0	-	91	41.6%	58.4
	SA	19	20.7%	15	16.3%	6	6.5%	0	-	52	56.5%	43.5
Information on new technologies	NG	97	44.3%	85	38.8%	37	16.9%	0	-	0	-	100
	SA	69	75%	23	25%	0	-	0	-	0	-	100
Information on current/on-going researches	NG	39	17.8%	46	21%	91	41.6%	0	-	43	19.6%	80.4
	SA	87	94.6%	5	5.4%	0	-	0	-	0	-	100
Information on communal activities	NG	53	24.2%	39	17.8%	88	40.2%	29	13.2%	11	5%	81.8
	SA	11	12%	9	9.8%	5	5.4%	31	33.7%	36	39.1%	27.2
Research supervision	NG	98	44.7%	52	23.7%	16	7.3%	40	18.3%	13	5.9%	75.8
	SA	49	53.3%	35	38%	8	8.7%	0	-	0	-	100
Research collaboration	NG	64	29.2%	58	26.5%	73	33.3%	0	-	24	11%	89
	SA	47	51.1%	45	48.9%	0	-	0	-	0	-	100
Research students mentoring	NG	94	42.9%	63	28.8%	38	17.4%	9	4.1%	15	6.8%	89.1
	SA	46	50%	37	40.2%	9	9.8%	0	-	0	-	100

Key NG = Nigeria; SA = South Africa

#### 4.2.3 Reasons for information and knowledge sharing

In a society that is said to be information driven, the success or failure of our day-to-day activities is strongly determined by how informed we are during their execution; levels of success can be improved through sharing. According to Britz and Ponelis (2012: 464), the global flow and sharing of knowledge enhances research and development in all fields, facilitated by the interaction and movement of scholars. Nelson (2004) likewise notes that information and knowledge sharing leads to familiarity with others in the same field. Gamble (2002) advises that if you are able and willing to share with most, if not all, of the members of your group, you can be said to occupy a central position in the group.

One of the more interesting properties of information and knowledge sharing as identified by Newman (2000) is that the world of scientific communities is small; there are no barriers with respect to time and geographical location. Scholars thus have the advantage of being effective in collaboration and the communication of research results. Communities of Practice (CoPs) and professional and inter-disciplinary knowledge sharing platforms (such as LinkedIn, library consortia, Web 2.0 and Web 3.0) are therefore vital in the acquisition, processing, transfer and sharing of knowledge and expertise among colleagues and for interdisciplinary sharing and research collaboration. Information sharing among professionals, especially in the field of science, is a desirable element for productivity. Scientists in developed countries, as observed by Umar (2009), deliberately establish information sharing networks in order to facilitate their significant breakthroughs and

improve their productivity in the field of science. Walsh, Cohen and Cho (2007) opine that the main motivations behind knowledge sharing between academics and their peers are cost, occupational achievement, and scientific contest. The authors argue that scientists working in highly competitive fields, especially the life sciences, are usually less likely to disclose or share their knowledge. Gill (2008) supports this notion, suggesting that in knowledge sharing, the main considerations are self-centred and perceived benefits. In related studies, Heller and Eisenberg (1998) and Rhoten and Powell (2007) determined that sponsorship and/or scholarships motivate knowledge sharing between academics and organisations. Other factors influencing knowledge sharing among scientists include being acknowledged by others with the hope of gaining popularity and becoming more influential in one's field (Mukherjee & Stern 2007). Researchers have also reported that many individuals and researchers share knowledge for economic and/or social reasons (see, for example, Bouty 2000). Information and knowledge sharing can also be said to shape academic values, norms, and one's general outlook on life. The overall discussion alludes to the fact that information and knowledge sharing activities are embarked upon by participants due to perceived short-term and long-term benefits.

This study revealed that there were similarities in the reasons for information and knowledge sharing with regards to improving research output (94.1% Nigeria; 100% South Africa), supporting research activities (91.3% Nigeria; 100% South Africa), gaining popularity among colleagues (84.9% Nigeria; 100% South Africa), and strengthening academic culture (83.6% Nigeria; 100% South Africa), as also noted in related studies. Table 3 provides some of the reasons for information and knowledge sharing as indicated by the respondents.

**Table 3 Reasons for information and knowledge sharing**

Reasons	Country	Strongly agree		Agree		Agree less		Do not agree		Undecided		% Agree
To avoid duplication of effort	NG	79	36.1%	81	37%	35	16%	23	10.5%	1	0.5%	89
	SA	53	57.6%	29	31.5%	10	10.9%	0	-	0	-	100
To be current in my discipline	NG	67	30.6%	59	26.9%	42	19.2%	39	17.8%	11	5.0%	77.2
	SA	92	100%	0	-	0	-	0	-	0	-	100
To become popular among colleagues	NG	65	29.7%	74	33.8%	47	21.5%	26	11.9%	7	3.2%	84.9
	SA	49	53.3%	37	40.2%	6	6.5%	0	-	0	-	100
To be familiar with others in my field	NG	59	26.9%	66	30.1%	27	12.3%	47	21.5%	20	9.1%	69.4
	SA	47	51.1%	32	34.8%	13	14.1%	0	-	0	-	100
To improve collaboration	NG	73	33.3%	64	29.2%	34	15.5%	21	9.6%	27	12.3%	78.1
	SA	38	41.3%	54	58.7%	0	-	0	-	0	-	100
To uncover new ideas	NG	67	30.6%	59	26.9%	68	31.1%	0	-	25	11.4%	88.6
	SA	89	96.7%	3	3.3%	0	-	0	-	0	-	100
To strengthen academic culture	NG	69	31.5%	75	34.2%	39	17.8%	9	4.1%	27	12.3%	83.6
	SA	41	44.6%	51	55.4%	0	-	0	-	0	-	100
To foster unity among academics	NG	67	30.6%	74	33.8%	36	16.4%	21	9.6%	21	9.6%	80.8
	SA	39	42.4%	53	57.6%	0	-	0	-	0	-	100
To improve research output	NG	87	39.7%	64	29.2%	55	25.1%	0	-	13	5.9%	94.1
	SA	53	57.6%	39	42.4%	0	-	0	-	0	-	100
To support research activities	NG	89	40.6%	87	39.7%	24	11%	0	-	19	8.7%	91.3
	SA	92	100%	0	-	0	-	0	-	0	-	100
To enable sharing	NG	92	42%	97	44.3%	30	13.7%	0	-	0	-	100
	SA	79	85.9%	13	14.1%	0	-	0	-	0	-	100
To enable free flow of information	NG	39	17.8%	46	21%	99	45.2%	16	7.3%	19	8.7%	84
	SA	67	72.8%	25	27.2%	0	-	0	-	0	-	100

#### 4.2.4 Patterns of information and knowledge sharing

Sharing information and knowledge through consultation and informal communication is a widely-recognised phenomenon in information science literature. Authors such as Amabile et al. (2001) highlight the significance of scholars' communication networks. Others have developed their own theories. Crane (1972), for example, developed the concept of invisible colleges, and showed that the most productive members in these networks have more social ties, influence, and visibility than those who are less productive. Lasker and Weiss (2003) and Stoan (1991), among others, determined that the amount of contact a scholar has with other researchers is the strongest predictor of their publication efficiency, while Sonnenwald and Liewrouw (1997) and Boydell and Rugkása (2007) found that communication behaviour and the

success of information and knowledge sharing in project teams correlate positively with perceived individual effectiveness and project performance. The contact mentioned may not necessarily be physical; literature review is also a form of contact among scholars.

Regarding the question of how academics share information and knowledge in this study, most of the surveyed academics attested to sharing information and knowledge with academics in their fields (82.6% Nigeria; 100% South Africa) and during seminars, workshops, and conferences (93.6% Nigeria; 100% South Africa). Studies confirm that formal academic gatherings are the leading platforms for knowledge sharing (Gamble 2002; Walsh, Cohen and Cho 2007). The academics from the selected universities in both countries explored other patterns of sharing, such as participation in joint publication (64.4% Nigeria; 100% South Africa). They also indicated a strong measure of research collaboration with academics within their institutions (79% Nigeria; 100% South Africa). A significant number of the academics stated that they shared information and knowledge with academics in their countries (79% Nigeria; 85.9% South Africa). The latter points to inter-university research collaboration which could be motivated by many factors, including, but not limited to, the building of trust, a sense of belonging, and participatory practices, thereby strengthening academic culture and professionalism. This point is supported by the number of academics who shared information through professional memberships (77.6% Nigeria; 81.4% South Africa). Despite the fact that there were more South African academics involved in different patterns of sharing, the majority of the academics from the selected universities in both countries demonstrated very similar patterns of sharing, as summarised in Table 4.

**Table 4 Patterns of information and knowledge sharing**

Patterns	Country	Strongly agree		Agree		Agree less		Do not agree		Undecided		% Agree
Participating in joint publication	NG	39	17.8%	48	21.9%	54	24.7%	41	18.7%	37	16.9%	64.4
	SA	69	75%	23	25%	0	-	0	-	0	-	100
With academics in my field	NG	49	22.4%	86	39.3%	47	21.5%	31	14.2%	7	3.2%	82.6
	SA	92	100%	0	-	0	-	0	-	0	-	100
With academics in my institution	NG	56	25.6%	68	31.1%	49	22.4%	31	14.2%	15	6.8%	79
	SA	57	62%	17	18.5%	18	19.6%	0	-	0	-	100
With academics in my country	NG	53	24.2%	57	26%	63	28.8%	27	12.3%	19	8.7%	79
	SA	26	28.3%	34	37%	19	20.7%	0	-	13	14.1%	85.9
Through professional memberships	NG	57	26%	65	29.7%	48	21.9%	40	18.3%	9	4.1%	77.6
	SA	37	40.2%	25	27.2%	13	14.1%	0	-	17	18.5%	81.4
During seminars, conferences and workshops	NG	86	39.3%	94	42.9%	25	11.4%	0	-	14	6.4%	93.6
	SA	92	100%	0	-	0	-	0	-	0	-	100

#### 4.2.5 Use of ICTs for information and knowledge sharing

The literature review revealed that ICTs are useful in knowledge management, which involves the storage, processing, and sharing of information and knowledge (Aina 2004; Beebe 2004). Jones (2006) explains the usefulness of ICTs such as web portals in connecting researchers for the sharing of ideas, especially in a university system, while Abdullah et al. (2007) shed light on the benefits of ICTs in promoting knowledge sharing in universities and other higher institutions of learning.

The study revealed that the majority of the surveyed academics in both countries used computers, mobile phones, social media, and the internet. Based on TAM, they perceived these ICTs to be useful and easy to use (Fari 2015a). However, digital cameras/photos (81.3% Nigeria; 53.7% South Africa) and CD-ROMs (88.1% Nigeria; 23.9% South Africa) were mostly used by the Nigerian academics, while teleconferencing (17.4% Nigeria; 80.4% South Africa) and videoconferencing (13.3% Nigeria; 64.1% South Africa) were largely used by the South African academics, suggesting that South African academics were using more new technologies for knowledge sharing than their Nigerian counterparts in this sample. In cases where frequent interruptions of the power supply occur, such as in Nigeria, the use of portable information storage devices such as CD-ROMs and USBs would be common. The finding also suggests that many of the Nigerian academics had to use rather outdated technology such as CD-ROMs for lack of other options, in contrast to the South Africans who had access to the latest technologies. Fax machines (2.3% Nigeria; 44.6% South Africa) were found to be less used by the academics in both countries. It would appear that, in the age of mobile phones and email services, fax machines are becoming obsolete for information and knowledge sharing. The types of ICTs used for information and knowledge sharing are summarised in Table 5.

#### 4.2.6 Challenges to information and knowledge sharing

There are many challenges to information and knowledge sharing. Buckland (1991) lists six barriers that need to be overcome in order to enable information and knowledge sharing, namely:

**Table 5 Types of ICTs used for information and knowledge sharing**

Type of ICTs	Country	Very Much		Much		Less		Never		Undecided		% Use
Computers	NG	99	45.2%	87	39.7%	23	10.5%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Mobile Phones	NG	98	44.7%	99	45.2%	22	10%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Social media	NG	76	34.7%	59	26.9%	56	25.6%	15	6.8%	13	5.9%	87.3
	SA	92	100%	0	-	0	-	0	-	0	-	100
Fax machine	NG	0	-	0	-	5	2.3%	119	54.3%	95	43.4%	2.3
	SA	13	14.1%	11	12%	17	18.5%	40	43.5%	11	12.0%	44.6
Radio	NG	58	26.5%	53	24.2%	69	31.5%	0	-	30	13.7%	86.3
	SA	13	14.1%	11	12%	39	42.4%	8	8.7%	21	22.8%	68.5
Television	NG	68	31.1%	86	39.3%	39	17.8%	0	-	26	11.9%	88.1
	SA	37	40.2%	25	27.2%	19	20.7%	0	-	11	12.0%	88
Digital Camera/Photos	NG	37	16.9%	45	20.5%	95	43.4%	29	13.2%	12	5.5%	81.3
	SA	9	9.8%	17	18.5%	23	25%	21	22.8%	22	23.9%	53.7
Internet facilities	NG	98	44.7%	97	44.3%	24	11%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
CD-ROMs	NG	47	21.5%	49	22.4%	97	44.3%	9	4.1%	17	7.8%	88.1
	SA	7	7.6%	11	12%	4	4.3%	11	12%	59	64.1%	23.9
USB Drive	NG	89	40.6%	88	40.2%	42	19.2%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Teleconferencing	NG	0	-	0	-	38	17.4%	98	44.7%	83	37.9%	17.4
	SA	21	22.8%	30	32.6%	23	25%	17	18.5%	1	1.1%	80.4
Videoconferencing	NG	0	-	0	-	29	13.3%	98	44.7%	92	42.0%	13.3
	SA	17	18.5%	27	29.3%	15	16.3%	32	34.8%	1	1.1%	64.1

1. Identification – a suitable source needs to be identified.
2. Availability – the user needs to be able to inspect the source or a copy of it.
3. Price to the user – the toll and trouble of acquiring the source must be acceptable to the user.
4. Cost to the provider – what has to be expended by the provider of the information.
5. Cognitive access – the sufficient expertise of the user to understand the information.
6. Acceptability – the reluctance of the user to accept a particular source as credible.

Challenges to information and knowledge sharing, especially in Africa, include changes in researchers' behaviour, motivation and influence (Mulligan & Mabe 2011); culture and race (Ford & Chan, 2003; Trefry 2006); lack of trust (Ngulube 2005); lack of basic hands-on skills; poor infrastructure and facilities (Osunade, Philips & Ojo 2007; Fari 2011); negative attitude to knowledge sharing among academics (Aliyu 2007); and information illiteracy (Umar 2009).

Some of the most significant challenges are lack of awareness (Association of College and Research Libraries 2000; Ologbonsaiye 1994; Aboyade 1982; Aliyu 2007; Fari 2010) and inaccessibility (Riege 2005). Aguolu and Aguolu (2000) note that inaccessibility can arise because:

- users do not know precisely what they want and, if they do, cannot articulate their needs accurately to the library staff;
- the bibliographic or intellectual access to the content of the library is inadequate, owing to a poor indexing system in the library catalogue or of the library collection itself;
- the circulation policy of the library is inefficient, shelving methods are inadvertent, and guides to the library arrangement are lacking;
- unnecessary physical and administrative barriers are imposed on the use of library material by library management; and
- users may also not know how to use the library catalogue.

Other challenges include the information explosion (Mohammed 2000; Uhegbu 2007); bibliographic obstacles (Aliyu 2007; Mohammed 2000; Banjo 1984); poor infrastructure; declining budgets and rising costs of information products and services and costs to users; staffing issues; crime (Maidabino & Zainab 2011; Holt 2007); and international/diplomatic barriers (Britz and Ponelis 2012).

The challenges affecting information and knowledge sharing were much more pronounced among the surveyed academics in Nigeria. All Nigerian academics alluded to serious problems concerning the inadequacy of information resources in comparison to their South African counterparts (14.2%). The Nigerian academics also noted poor research management in the institutions (98.2% Nigeria; 0% South Africa). Both of these challenges would affect academics' teaching and research processes. The problem extended to poor communication about conferences, seminars and workshops (95% Nigeria; 0% South Africa), which would explain the perception that they were poorly attended (86.3% Nigeria; 14.1% South Africa). Regarding the types of information shared and the types preferred, the majority of academics in Nigeria indicated that they shared information about scholarships/bursaries, part-time work and sabbaticals, which is possible proof of their need to supplement their requirements for funding. In South Africa, additional jobs and bursaries did not feature as challenges. The Nigerian academics also noted negative attitudes with respect to the sharing of information (88.6% Nigeria; 39.1% South Africa) coupled with poor support and sponsorship (100% Nigeria; 0% South Africa).

These challenges result in poor research output and the delayed implementation of research findings. They also influence the visibility of academic publications in Nigeria. For example, in UMYU, it was observed that, while there were up to eleven floating scholarly journals, only two of these were online. The study established that there were significantly fewer problems relating to sharing among the academics in the selected universities in South Africa. It is possible that the ranking by different agencies of most South African universities above Nigerian universities in terms of research output in Africa (Reuters in Adams, King and Hook 2010) could be influenced by South Africa's information and knowledge sharing support system. The challenges are summarised in Table 6.

**Table 6 Challenges to information and knowledge sharing**

Challenges	Country	Very much	Much	Less	Not at all	Undecided	% Affect
Inadequate information resources	NG	219 100%	0 -	0 -	0 -	0 -	100
	SA	0 -	0 -	13 14.2%	75 81.5%	4 4.3%	14.2
Poor research management	NG	69 31.5%	87 39.7%	59 26.9%	0 -	4 1.8%	98.2
	SA	0 -	0 -	0 -	85 92.4%	7 7.6%	0
Poor communication on seminars, workshops and conferences	NG	81 37%	79 36.1%	48 21.9%	0 -	11 5.0%	95
	SA	0 -	0 -	0 -	92 100%	0 -	0
Poor seminars, workshops and conferences attendance	NG	83 37.9%	75 34.2%	31 14.2%	9 4.1%	21 9.6%	86.3
	SA	0 -	0 -	13 14.1%	76 82.6%	3 3.3%	14.1
Poor support to problem No. 4 above	NG	172 78.5%	47 21.5%	0 -	0 -	0 -	100
	SA	0 -	0 -	0 -	92 100%	0 -	0
Negative attitude of sharing among academics	NG	63 28.8%	93 42.5%	38 17.4%	21 9.6%	4 1.8%	88.6
	SA	19 20.7%	12 13%	5 5.4%	56 60.9%	0 -	39.1
Research communication gap	NG	37 16.9%	69 31.5%	87 39.7%	7 3.2%	19 8.7%	88.1
	SA	0 -	0 -	0 -	59 64.1%	33 35.9%	0

#### 4.2.7 Solutions towards effective information and knowledge sharing

The survey revealed that a number of measures can be taken in order to curtail the problems that affect sharing, especially in Nigerian institutions. All surveyed academics from both countries agreed about the provision of adequate information resources, effective research management strategies, and most (91.8% Nigeria; 100% South Africa) agreed on development of institutional repositories in the universities. All academics also mentioned as important timely communication about up-coming research gatherings and the provision of necessary research support, while most (90.9% Nigeria; 100% South Africa) mentioned as important effective research output through seminars, workshops and conferences. However, more Nigerian academics (93.6%) than their South African counterparts (45.6%) felt that open access is a preferable solution to the problems afflicting information and knowledge sharing. Despite the fact that academics in South Africa experienced fewer problems, there is still a need for improvement in the country (see Table 7).

### 5 Conclusion and recommendations

The study established that the surveyed academics were aware of information and knowledge sharing and that they engaged in knowledge sharing on a number of platforms.



**Table 7 Solutions for effective information and knowledge sharing**

Solutions	Country	Very common		Common		Less common		Not Common		Undecided		% Common
Provision of adequate resources	NG	219	100%	0	-	0	-	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Efficient Research management	NG	75	34.2%	94	42.9%	50	22.8%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Timely information on seminars, workshops and conferences	NG	83	37.9%	91	41.6%	45	20.5%	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Improved seminars, workshops and conferences attendance	NG	85	38.8%	79	36.1%	34	15.5%	12	5.5%	9	4.1%	90.9
	SA	0	-	0	-	0	-	0	-	0	-	100
Provision of research support	NG	219	100%	0	-	0	-	0	-	0	-	100
	SA	92	100%	0	-	0	-	0	-	0	-	100
Open access	NG	89	40.6%	95	43.4%	21	9.6%	0	-	14	6.4%	93.6
	SA	13	14.1%	15	16.3%	14	15.2%	11	12%	39	42.4%	45.6
Institutional repositories	NG	59	26.9%	92	42%	50	22.8%	0	-	18	8.2%	91.8
	SA	75	81.5%	17	18.5%	0	-	0	-	0	-	100

A lot of similarity was noted in the types of knowledge shared. Access and use of ICTs for knowledge sharing varied slightly between the selected universities, with the South African academics reporting better ICT access and use in most cases. The study revealed many challenges to information and knowledge sharing, especially as noted by academics from the selected Nigerian universities. The Nigerian academics cited as challenging the inadequacy of infrastructure and utilities such as electricity; inadequacy of both print and electronic information resources; poor research management and support; poor communication of and access to conferences, seminars and workshops; and poor attitude towards knowledge sharing among the academics. The surveyed South African academics indicated that they were not significantly affected by these problems, which suggests that they enjoy more access to, and use and sharing of information and knowledge. The findings support the perception that South Africa has a functioning and better research policy, management and support system in place that benefits academics and improves their research output. Its system is something that Nigeria should consider and perhaps emulate. The common solutions towards ensuring effective and efficient knowledge sharing, as revealed in the study, include: provision of adequate information resources, especially electronic resources; ensuring a functional research management system that can provide the academics with the necessary equipment and support (for example, sponsorships and bursaries); routine organisation of and support for academic gatherings for the dissemination of research results and timely communication to that effect; and improved awareness among academics regarding the importance of knowledge sharing to improve participation. These solutions were found to be common to solving the identified problems in Nigeria and improving the research status in South Africa. Both SCT and TAM are fundamental for informing information and knowledge sharing research (Fari 2015a) largely because SCT supports networking, collaboration, partnership, teamwork and social cohesion while TAM emphasises the importance of using ICT for knowledge sharing.

We recommend that, in order to be able to move towards improved information and knowledge sharing, there is a need for an in-depth evaluation of the information and ICT literacy levels of the academics in the selected universities for developmental purposes. Furthermore, in the case of Nigeria, the Federal Ministry of Education, in conjunction with various state ministries and the Tertiary Education Trust Fund (TETFUND), should reinvigorate their efforts to increase collaboration with the Nigeria University Commission (NUC), the National Examinations Council (NECO), and all public and private universities in the country. This collaboration would serve to enable research and ICT training programmes for capacity building, such as the Advanced Digital Appreciation Programme Tertiary (ADAPT) that is currently being run in the country, but not receiving enough coverage. Another example is the Petroleum Technology Development Fund (PTDF) which caters for studies and research related to petroleum technology.

Both countries and institutions should invest more in research capacity building and the improvement of staff qualifications (for example, PhD) to enable greater and more effective information and knowledge sharing. The importance and relevance of ICTs alone does not result in their utilisation. Enabling access and use through ICT and information literacy is imperative. Universities should also ensure physical access to ICTs that are necessary to facilitate knowledge sharing and routine academic activities, at all costs. ICTs should be provided free to the academics, or at least at subsidised rates, coupled with the provision of viable internet and electronic/virtual library services. It should be noted that none of these facilities would work without a steady power supply. Other recommended areas are the establishment of comprehensive institutional repositories and the promotion of open access to information resources.

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