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3 **Enablers and Barriers to Knowledge Management in Universities: Perspectives from South**  
4 **Africa and Mauritius**  
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8 **Abstract**  
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11 **Purpose:** Universities need to manage their knowledge assets, and, to work creatively to maximise  
12 the enablers and minimise the barriers associated with knowledge management processes. This  
13 research offers a comparative perspective on knowledge management in universities in two  
14 countries whose university sectors are at different stages of their development, South Africa and  
15 Mauritius.  
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19 **Design/methodology/approach:** Semi-structured interviews were conducted with expert  
20 informants from thirteen high-ranking universities in Mauritius and South Africa, who held senior  
21 roles in research and its management within their respective universities  
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25 **Findings:** Both enablers and barriers (e&bs) were evident in relation to: strategies and policies,  
26 organisational structures, rewards and incentives, culture, technology, leadership, human  
27 resources, resources and funding, and university-industry linkages, although the significance of  
28 these e&bs varied between the three knowledge processes, knowledge creation, knowledge  
29 sharing, and knowledge transfer. Overall, Mauritius, with a less developed university sector, faced  
30 more challenges in respect of knowledge management than did South Africa.  
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34 **Originality/value:** This study's theoretical contribution is a holistic framework for enabling KM  
35 in universities on the basis of a mapping between KM e&bs and KM processes. This comparative  
36 country level study, embracing a number of universities, offers insights into national policy, and  
37 cultural expectations that influence the extent and nature of barriers and enablers to effective KM.  
38 The insights offered by this study will be valuable for Mauritius and South Africa, and also for  
39 universities in other countries.  
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47 **Keywords:** *Knowledge management, Knowledge creation, Knowledge sharing, Knowledge*  
48 *transfer, Universities, Research.*  
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## 1. Introduction

Sub-Saharan Africa (SSA), with a population of about 1.078 billion, is one of the poorest regions in the world, despite a population growth rate of around 2.7% (World Bank, 2018). The population of SSA is expected to double by 2050 to around 2.4 billion. Nevertheless, the region holds enormous economic potential that might be realised through reforms that boost its competitiveness, including human capacity building. Human capacity building can be achieved by developing the knowledge sector; globally, universities are considered as a key driver for a knowledge-based economy and have considerable potential to act as an engine of economic growth and development. It is imperative that the knowledge created by SSA's universities is used to drive innovation. However, universities face a wide range of challenges, including the emergence of the knowledge society, the globalization and internationalization of universities, reduced budgets and government support, increased enrolment at undergraduate level, and, widening access. Effective knowledge management (KM) practices will help universities to improve their efficiency and effectiveness, to be more competitive, and to contribute to the wealth of their country (Alexandropoulou *et al.*, 2009; Fussy, 2018).

Universities are involved in the knowledge management processes of knowledge creation, sharing and transfer (Alexandropoulou *et al.*, 2009; Adhikari, 2010; Fullwood *et al.*, 2013). Whether or not universities have an explicit knowledge management strategy (Cranfield and Taylor, 2008; Trivella and Dimitrios, 2015), it is important that they manage their knowledge assets, and, in particular, that they understand and work creatively with the enablers and barriers associated with knowledge management processes. Whilst previous studies have reported on enablers and barriers to knowledge management (Arntzen *et al.*, 2009; Tian *et al.*, 2009; Ramachandran *et al.*, 2013), none has performed a comparative study at country level. Hence, this study embraces a number of universities in two countries, South Africa and Mauritius, to offer insights into national policy, and the cultural expectations that influence the extent and nature of barriers and enablers. More specifically, this paper aims to: (a) identify and compare the perceived enablers and barriers to knowledge creation, sharing and transfer in universities in the two countries; (b) to propose a conceptual framework for embedding KM in universities; and, (c) to offer unique insights into knowledge creation, sharing and transfer in the under-researched sector of Sub-Saharan

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3 universities. This will act as a basis for recommendations for improving knowledge management  
4 effectiveness in research environments in universities worldwide.  
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8 In this study, knowledge management (KM) in universities is regarded as having three main  
9 strands, knowledge creation, knowledge sharing, and knowledge transfer as these KM processes  
10 are closely linked to the three missions of universities (teaching, research and service to society).  
11 To fulfil these three missions, universities globally create knowledge through research, share  
12 knowledge through teaching and learning, and transfer knowledge to the society through  
13 consultancies, a trained workforce, cross pollination between research and business,  
14 communication, popularization of science, and job creation through spin-offs (Rowley, 2000;  
15 Alexandropoulou *et al.*, 2009; Adhikari, 2010; Fullwood *et al.*, 2013; Ramachandran *et al.*, 2013).  
16 Despite the significant research interest in the KM processes in universities, very few previous  
17 studies on KM in universities have covered all three KM processes, knowledge creation,  
18 knowledge sharing, and knowledge transfer.  
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## 29 **2. Literature review**

### 30 31 32 **2.1 Knowledge management in universities**

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36 Universities create knowledge through research, share knowledge through teaching and learning  
37 and transfer knowledge to the society through consultancies and a trained workforce (Rowley,  
38 2000; Adhikari, 2010; Ramachandran *et al.*, 2013). On the other hand, previous research has  
39 demonstrated that universities often do not have an explicit KM strategy nor an institution-wide  
40 approach to KM, and, even if they are aware of the importance of such a strategy, it is difficult to  
41 implement (Cranfield and Taylor, 2008; Trivella and Dimitrios, 2015). It is, therefore, important  
42 to be aware of the enablers and barriers associated with KM processes, such as knowledge creation,  
43 knowledge sharing and knowledge transfer in universities.  
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## 2.2 Previous research on Enablers and barriers to knowledge management in universities

Previous studies have revealed several enablers (factors enhancing KM) and barriers (factors having an adverse effect on KM). Many of these factors can have either a positive or a negative impact on KM processes, such as knowledge creation, knowledge sharing, and knowledge transfer. The most often identified factors include culture, rewards and incentives, technology, leadership, organisational structures, and university-industry linkages. A few studies have also identified the importance of strategies and policies, human resources, and resources and funding. In this section, the order of factors is broadly in accordance with the attention that they have received in previous research.

**Culture** has been the most extensively researched enabler or barrier for KM implementation in universities (Cranfield and Taylor, 2008; Ramachandran *et al.*, 2013). Culture has been shown to effect: knowledge creation (Siadat *et al.*, 2012); knowledge sharing (Arntzen, *et al.*, 2009; Tian *et al.*, 2009; Goh and Sandhu, 2013); and, knowledge transfer (Gera, 2012; Torre *et al.*, 2018). However, culture is complex and difficult to control in KM implementation (Cranfield and Taylor, 2008). Some researchers suggest that the culture in universities is individualistic, and to some extent, self-serving (Tian *et al.*, 2009; Fullwood *et al.*, 2013) and that academics prefer to work independently (Goh and Sandhu, 2013). On the other hand, other researcher have demonstrated that a strong knowledge sharing culture can enhance KM processes, such as knowledge creation (Tian *et al.*, 2009; Gera, 2012).

**Rewards and incentives.** In universities, the embedded and international reward structure places a high value on evidence of individual achievement in research and scholarship (Rowley, 2000). This poses a challenge for universities who need to create incentives that recognize academics' contributions to knowledge sharing systems (Arntzen *et al.*, 2009; Gill, 2009). Academics engage in knowledge sharing and appreciate the opportunity to improve and extend their relationships with colleagues through knowledge sharing. However, they also view working with others as generating opportunities for internal promotion and career development elsewhere in the sector (Fullwood *et al.*, 2013). Similarly, reward and recognition systems are needed that incentivize innovative work practices and knowledge sharing with external organizations (Gera, 2012).

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3 Recently, Torre *et al.* (2018) suggested that weak incentives for researchers  
4 to transfer knowledge to society is a barrier to successful engagement in KT.  
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8 **Technology** is viewed as an enabler for KM (Arntzen *et al.*, 2009; Gill, 2009; Adhikari, 2010;  
9 Ramachandran *et al.*, 2013), and its processes, knowledge creation (Tian *et al.*, 2009;  
10 Supapawawisit *et al.*, 2018) and knowledge sharing (Fullwood *et al.*, 2013). Appropriate  
11 information and communication technologies can help universities to move towards a knowledge-  
12 based learning organization, if they can achieve a ‘good fit’ between information technology (IT),  
13 socio-organizational factors, and a sustainable organizational culture (Arntzen *et al.*, 2009; Gill  
14 2009; Adhikari 2010). In Bangkok University, development of knowledge sharing structures such  
15 as, knowledge repositories, collaborative tools and emails-forum-chat-video have been used to  
16 facilitate knowledge sharing (Arntzen *et al.*, 2009). Information Technology was found to be one  
17 the most extensively used KM enablers in public universities in Malaysia (Ramachandran *et al.*,  
18 2013) and in Thailand (Supapawawisit *et al.*, 2018). However, in a UK-based study, academics  
19 were neutral with regard to the importance of technology, possibly due to their high level of  
20 autonomy (Fullwood *et al.*, 2013).  
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32 **Leadership** or top management support is an important driver of KM (Twum-Darko and Harker,  
33 2015). Previous studies have examined the role of leadership in HE for developing knowledge-  
34 based organizations, and to support KM and knowledge sharing (Gill, 2009; Fullwood *et. al.*,  
35 2013). Most studies have concluded that leaders can play an important role in initiating KM (Gill,  
36 2009; Ramachandran *et al.*, 2013). However, Fullwood *et. al.* (2013) did not find leadership to be  
37 central to knowledge sharing and Supapawawisit *et al.* (2018) found it to be the least critical factor  
38 for research and innovation in public universities in Thailand.  
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46 **Organizational structure** is also important for effective KM (Rowley, 2000; Adhikari, 2010;  
47 Eftekharzade and Mohammadi, 2011), and its processes, knowledge creation (Supapawawisit *et*  
48 *al.*, 2018), knowledge sharing (Arntzen *et al.* 2009; Fullwood *et al.*, 2013) and knowledge transfer  
49 (Fuller *et al.*, 2019). Adhikari (2010) advocates the importance of both formal (physical layout of  
50 offices) and informal (communities of practice) organisational structures to facilitate social  
51 interaction.  
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5 **University-industry linkages** can facilitate knowledge transfer and stimulate production of new  
6 knowledge. However, KT requires time and space to develop a shared understanding, nurture  
7 relationships and identify mutual interests amongst partners (Gertner *et al.*, 2011). Guimón (2013)  
8 identifies the inherent mismatch between the research orientations of firms and universities and  
9 their focus on different outputs (e.g. new products vs publications) as barriers to KT. Universities  
10 in developing countries generally face greater challenges in such alliances, because they look to  
11 the Government to provide the overall framework for developing these linkages, through the  
12 formulation of policy directions and reward systems (Bano and Taylor, 2014). Also, the linkages  
13 between universities and industry are often informal and weak (Zavale and Macamo, 2016) due to  
14 lack of time, insufficient internal capability to manage relationships, and difficulty in identifying  
15 partners (Hughes and Kitson, 2012). In developed countries, these linkages emerge from  
16 incentivising universities' KT activities (Rossi and Rosli, 2015).  
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27 **Strategies and policies** reflect the individual universities' vision and mission, and national policy  
28 perspectives regarding knowledge creation, sharing and transfer (Cloete and Bunting, 2013;  
29 Hewitt-Dundas, 2012). Clear and effective policy directions are necessary to strengthen research  
30 capacities and enhance knowledge production and technological innovation (Cloete and Bunting,  
31 2013; Fussy, 2018). According to Fuller *et al.* (2019), government policies in the UK need to be  
32 re-evaluated to ensure that they drive third stream activities, which promote knowledge transfer  
33 from universities for economic impact, through innovation and entrepreneurship.  
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41 **Human resource** has received limited attention as a facilitator of KM in universities (Gill, 2009;  
42 Eftekhazade and Mohammadi, 2011; Gera, 2012; Supapawawisit *et al.*, 2018). On the other hand,  
43 human resource management is a critical driver of research and innovation creation in public  
44 universities in Thailand (Supapawawisit *et al.*, 2018). Gera (2012) is also of the view that human  
45 resource management, supported by IT and KM, can minimize or eliminate knowledge transfer  
46 gaps, leading to improved competitiveness and performance.  
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53 **Resources and funding** have received very limited attention, although a recent study found  
54 financial resources to be the most critical factor for enhancing research and innovation in public  
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3 universities in Thailand (Supapawawisit *et al.*, 2018). However, previous studies have found that  
4 lack of resources, including lack of time, is a key impediment to knowledge sharing (Arntzen *et*  
5 *al.*, 2009) and knowledge exchange (Hughes and Kitson, 2012). No past study has identified  
6 funding as either an enabler or a barrier to KM in HE.  
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11 More generally, the relationship between KM processes and enablers in the context of universities  
12 has received very limited attention. A recent conceptual KM model proposed (but not tested) by  
13 Ojo (2016) for Nigerian universities incorporates five KM processes (knowledge  
14 identification/creation, storage, sharing, application, and evaluation), that are supported by six key  
15 enablers (organisational culture, leadership, information technology, reward mechanisms, social  
16 capital, and performance measurement). This model has some parallels with Rivera and Rivera  
17 (2016)'s empirically tested KM model for Mexico, which includes four KM processes (knowledge  
18 creation, storage, transference, and application) and six enablers (leadership, culture, structure,  
19 human resources, information technologies, and measurement). These studies conclude that KM  
20 processes can be facilitated through a set of KM enablers, leading to improvements in performance,  
21 research processes, research outputs, teaching and learning, administrative processes, curriculum  
22 planning, and societal impact.  
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### 33 34 **2.3 Research gap and contribution** 35

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37 The majority of studies have been conducted in countries with well-developed university systems,  
38 such as the UK (Cranfield and Taylor, 2008; Rossi and Rosli, 2014; Fuller *et al.*, 2019) and  
39 Malaysia (Ramachandran *et al.*, 2013; Goh and Sandhu, 2013). Hence, there is a knowledge gap  
40 in relation to countries with developing and aspirational university sectors, such as several of the  
41 countries in the sub-Saharan African region.  
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48 The majority of previous studies on enablers and barriers for effective KM in universities have  
49 examined only one or two factors focussing on either knowledge creation, knowledge sharing or  
50 knowledge transfer (Gera, 2012; Fullwood *et al.*, 2013; Ramachandran *et al.*, 2013). In past  
51 studies, culture, reward and incentives, and technology were found to be prominent factors  
52 impacting knowledge sharing and knowledge creation in universities (Arntzen *et al.*, 2009;  
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3 Fullwood *et al.*, 2013; Supapawawisit *et al.*, 2018). Very few previous studies have investigated  
4 factors such as, strategies and policies (Cloete and Bunting, 2013; Fussy, 2018), human resources  
5 (Eftekharzade and Mohammadi, 2011) and resources and funding (Hughes and Kitson, 2012) in  
6 relation to KM in HE. In addition, only Ojo (2016) and Rivera (2016) have proposed conceptual  
7 models of KM processes and enablers. No previous study has explored more than six factors whilst  
8 specifically considering the three KM processes (knowledge creation, knowledge sharing and  
9 knowledge transfer).

### 17 **3. Methodology**

#### 21 **3.1 Research Context**

22 This study adopted case study as the research strategy, defined by Yin (2014 p.16), as “an empirical  
23 inquiry that investigates a contemporary phenomenon (the “case”) in depth and within its real-  
24 world context, especially when the boundaries between the phenomenon and context may not be  
25 clearly evident”. By undertaking a comparative study, this research addressed the deficit associated  
26 with country-level comparative studies on knowledge management in HEI’s. Mauritius and South  
27 Africa, two of the most competitive economies in the sub-Saharan region, were chosen as the case  
28 study sites on account of their geographical proximity, and shared aspiration to be the most  
29 competitive and innovative country in the Sub-Saharan African region, and because very few past  
30 studies on knowledge management in HEIs have been reported in Sub-Saharan Africa.

31 According to the Global Competitiveness Report (GCR), 2019, Mauritius ranks 52<sup>nd</sup> and South  
32 Africa at 60<sup>th</sup> out of the 141 countries, which participated in the survey in 2019. In the sub-Saharan  
33 African region, Mauritius is ranked first and South Africa second (GCR, 2019, p. ix), although on  
34 innovation capability, South Africa is second, whilst Mauritius is third. On the other hand,  
35 according to the *Times Universities World University Ranking (2020)*, nine South African  
36 universities are amongst the Top 30 African Universities, including the top four universities,  
37 whereas none of the Mauritian universities are listed. Two of South Africa’s universities appears  
38 in the top 200 of the worldwide rankings out of 1,400 universities across 92 countries; South Africa  
39 is the only country in Africa with a university in the top 500. According to UNESCO 2017  
40 statistics, the Gross Tertiary Enrolment rate (GTER) for Mauritius (41%) is higher than that for  
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3 South Africa (22%), however, the Gross Domestic Expenditure on Research and Development  
4 (GERD) as a percentage of GDP was higher for South Africa (0.8%) than for Mauritius (0.4%).  
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8 According to the Council of Universities website  
9 ([http://www.che.ac.za/focus\\_areas/higher\\_education\\_data/2013/overview](http://www.che.ac.za/focus_areas/higher_education_data/2013/overview)), South Africa has 26  
10 public institutions, including eleven universities, six universities of technology, eight regional  
11 “comprehensive” universities (established through the merger of a technical higher education  
12 institution and a university), and one health sciences university for a population of about 57.5  
13 million. The university sector also includes 124 private higher education institutions. In Mauritius,  
14 there are 55 institutions, including four public universities and six public and 45 private institutions  
15 (Higher Education Commission (HEC), (<http://www.tec.mu/overview>) for a relatively small  
16 population of about 1.3 million. Most of the private institutions are small institutions (Cloete and  
17 Maassen, in: Muller *et al.*, 2017: 101) involved in providing franchising programmes of awarding  
18 bodies based either locally or overseas or both; many are either branches of or affiliated with  
19 overseas institutions from, for example, Australia, India, South Africa, and the UK.  
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### 30 31 **3.2 Research approach** 32 33

34 In selecting the universities to be included in this research, the key criteria were: the research  
35 ranking and productivity of the university (with high being preferred), engagement with  
36 knowledge management processes, and the willingness of staff with an appropriate research-based  
37 portfolio to participate.  
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42 The study used interviews with expert informants from thirteen high-ranking universities in  
43 Mauritius and South Africa, all of whom held senior roles in research and its management within  
44 their respective universities. Qualitative research using semi-structured interviews that sought to  
45 generate in-depth insights was deemed appropriate (Saunders *et al.*, 2019). Furthermore, the study  
46 adopted an interpretivist stance that was inductive in nature. Purposive sampling was conducted,  
47 in which participants were selected on the basis of recommendations from university vice-  
48 chancellors. This purposive sampling approach gave good access to interviewees ‘who are in a  
49 position to answer the questions and to provides the insights that the researcher was seeking’  
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3 Rowley (2012, p. 264). Meetings were planned to suit the convenience of the busy interviewees'  
4 schedules.  
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8 An interview schedule was designed, and piloted through meetings with three senior academics  
9 (two professors (former deans) and one Director General (equivalent to Vice Chancellor), all with  
10 extensive experience in research and research management. Heads of institutions were contacted  
11 in order to obtain approval to interview them or their senior colleague(s). Prior to each interview,  
12 the researcher provided interviewees with information on the study, the interview guide, and  
13 knowledge management terminology and definitions to facilitate discussion. Permission to record  
14 each interview was obtained through a consent form. Participation was voluntary and interviewees  
15 were informed that interviews and any documents provided during and after the interview were  
16 confidential; interviewees were free to decline to answer any questions or to withdraw from the  
17 interview at any time. The interviews lasted between 45 minutes and an hour.  
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27 In Mauritius, face-to-face interviews were conducted with eleven senior managers and academics  
28 holding research and innovation portfolios, including Director Generals, heads of faculty, heads  
29 of academics (equivalent to Pro-VCs), and senior academics and researchers from four public and  
30 three private universities. These seven universities in Mauritius are amongst the top HEIs in  
31 Mauritius. In South Africa, Skype interviews were preferred due to travel constraints. In Skype  
32 interviews, the interviewee and interviewer are in a virtual face-to-face situation (Rowley, 2012).  
33 During the Skype interviews, interviewees were willing to share information and reported that they  
34 found the research area to be relevant and interesting. In South Africa, interviews were conducted  
35 with eight senior managers involved in research and/or research and innovation management,  
36 including Deputy Vice-Chancellor, Pro Vice-Chancellor, Directors of Research, Innovation and  
37 Post-Graduate Studies from six public universities, all of which are amongst Top 30 universities  
38 in the country and in Africa (Table 1). All interviews were recorded using a handheld recorder.  
39 The information obtained was verified with information available online and through documents  
40 provided by the participants.  
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Each interview was transcribed verbatim into Microsoft Word and interview transcripts were reviewed and coded. Transcription helped in familiarization with the data. The next step was data reduction through thematic analysis. Summary notes were made to facilitate the identification of patterns and themes in the study data (Miles and Huberman, 1994). Next, data display, including drawing out insights by using comparative tables, was conducted. During the data reduction stage, the authors worked with Word documents. Although the analysis was guided by the themes in the interview schedule, it was not restricted to them. An inductive approach was used to confirm the initial list of enablers and barriers drawn from the literature, and to develop a mapping between these and the KM processes, KC, KS and KT, as a basis for undertaking a comparison between the two countries.

*Table 1: Participant Profile*

<b>Country/ Type of Institution</b>	<b>Institution number</b>	<b>Participant Code</b>	<b>Brief description of participants</b>
<b>Mauritius</b>  Public Universities	1	M-A1	Three senior academics and researchers at Associate Professor and Professor level, former Heads of Departments and Heads of Faculties
		M-A2	
		M-A3	
	2	M-B1	Acting Director General
M-B2		Head of Faculty	
	M-B3	Academic researching in KM	
	3	M-C	Head of Faculty
	4	M-D	Director General
<b>South Africa</b>  Public Universities	1	SA-A	Deputy Vice-Chancellor: Research, Innovation and Technology
	2	SA-B1	Executive Director Research and Innovation
SA-B2		Senior Director: Postgraduate School	
	3	SA-C1	Director, Innovation Office
		SA-C2	Director of Research Capacity Development

	4	SA-D	Pro-VC Innovation, Commercialisation and Entrepreneurship
	5	SA-E	Assistant Director Research Data Management
	6	SA-F	Director e-Research

## 4. Findings

### 4.1 Introduction

Findings are reported under each of the clusters of knowledge management processes, knowledge creation (KC), knowledge sharing (KS) and knowledge transfer (KT). For each of KC, KS and KT participants' views on the enablers and barriers (e&bs), as identified from the literature are reported. In each section (4.2,4.3, and 4.4), e&bs are discussed in the same order, but not all e&bs are evident in each of KC, KS and KT, such that the number of e&bs shown under each section varies between sections. Within sections, comments from universities in Mauritius and from universities in South Africa are compared. The mapping between e&bs and knowledge management processes (KC, KS, and KT) is summarised in Figure 1.

### 4.2 Enablers and Barriers to Knowledge Creation

#### *Strategies and policies*

In comparison to Mauritius where interviewees suggested that there was a lack of policies to promote knowledge creation through research, South Africa has numerous strategies and policies to encourage knowledge creation (including a research policy and strategy, and a policy on contract management).

*We don't have a clear-cut policy encouraging people to focus on research. (M-B2)*

*We have a research policy and a strategic document on research, innovation and community engagement plus a specific policy on contracts management. (SA-A)*

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3 However, South Africa's policy to increase the enrolment rates in universities, which was leading  
4 to 'massification of education' and its link to 'input subsidy' from the government poses a barrier  
5 to academics and researchers.  
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8 *Most South African universities have taken on more and more students for financial*  
9 *reasons because we get a government subsidy based on the number of students we register.*  
10 *Most universities have succumbed to that pressure at the cost of research activities. (SA-*  
11 *F)*  
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### 17 **Organisational structures**

18 In South Africa, the presence of dedicated structures, such as the National Research Foundation  
19 (NRF), and Research Offices in universities were regarded as enabling knowledge creation.  
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22 *One of the biggest supporters of research and innovation in South Africa is the NRF. (SA-*  
23 *B2)*  
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25 *We have three offices, which together make up a virtual research office. (SA-C2)*  
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27 South African participants reported on the range of facilities provided to academics and researchers  
28 through the research office, such as, databases, laboratories and support in identifying research  
29 grants, drafting proposals and managing the entire research process through IT-based platforms  
30 (SA-F).  
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34 *We make available the databases, shared laboratories, virtual laboratories, and virtual*  
35 *databases, that are required for knowledge creation. (SA-A)*  
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38 The public universities in South Africa also have research chairs and research centres to promote  
39 research and knowledge creation.  
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41 *We have six research centres where new knowledge is produced from research and where*  
42 *post-graduate research is carried out. (SA-A)*  
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45 Specific structures for knowledge storage such as institutional repositories and library services are  
46 also available.  
47

48 *We have the institutional repository and the open access platform to disseminate research*  
49 *outputs or published articles. (SA-F)*  
50

51 Mauritian participants also regarded libraries as an enabler, and some commented on the  
52 development of digital libraries.  
53  
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55  
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1  
2  
3 *Knowledge created is stored in files, books, libraries, journals papers, theses, committee*  
4 *minutes, and reports generated in the university. Nowadays, most of it is stored*  
5 *electronically. (M-A1)*  
6  
7  
8  
9

### 10 ***Rewards and incentives***

11 Most of the participants from *public* universities in Mauritius mentioned incentives that encourage  
12 knowledge creation, such as, sponsorships to attend conferences, both locally and overseas, and  
13 grants to staff to upgrade their qualifications. Some universities also encouraged their academics  
14 to participate in exchange programmes with overseas institutions. However, lack of reward  
15 mechanisms to support knowledge creation through research was considered as a barrier to  
16 knowledge creation.  
17  
18  
19  
20  
21

22 *The staff development scheme provides opportunities for academic staff to upgrade their*  
23 *credentials, to present their research papers overseas and to work with laboratories and*  
24 *share expertise with another colleague. (M-A2)*  
25  
26

27 *I believe if you want research and innovation, you need to have a policy framework that*  
28 *rewards research and innovation (M-B1).*  
29  
30

31 On the other hand, academics and researchers in South African universities benefit from several  
32 awards, rewards and incentives. Participants mentioned a number of awards that acknowledged  
33 academics' contribution to research and innovation, including: researcher of the year, innovator of  
34 the year, emerging researcher of the year, at both faculty and institutional level, and lifetime  
35 achievement awards at national level.  
36  
37  
38  
39

40 *We have the 'researcher of the year and the 'innovator of the year' awards (SA-C1)*

41  
42 *Every year the institution rewards the researcher of the year and the emerging researcher*  
43 *of the year [...] at the faculty level and the institution level. Our NRF together with our*  
44 *Department of Science and Technology have national awards as well [...] lifetime*  
45 *achievers award, young achievers' awards for young people who show immense promise*  
46 *as a scientist (SA-C2).*  
47  
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51 In addition, output subsidies are monetary rewards and incentives to encourage academics and  
52 researchers to engage in research and knowledge creation. The funding is used to develop research,  
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3 attend conferences or buy equipment. High impact research outputs by academics and researchers  
4 are considered as key indicators of their performance, ultimately leading to promotion  
5

6 *We have monetary incentives; we give a small amount to the academics for their career*  
7 *development [...] It gives a feeling of a direct reward over and above the salary [...] they*  
8 *use that money wisely. (SA-A)*  
9

10  
11  
12 *We have a Performance Management System (PMS), which looks at all academic's*  
13 *performance and one of the key performance indicators for academics is research outputs*  
14 *[...] it's kind of a way to incentivize them monetarily. Also the promotions policy document*  
15 *has a heavy weighting towards knowledge generation and knowledge dissemination and*  
16 *research. Also, we have a research publication award annually to incentivize the*  
17 *researchers (SA-D).*  
18  
19  
20  
21  
22

23 Accreditation as a 'NRF rated' researcher is another major incentive for South African  
24 academics/researchers to undertake high quality research and publish in high impact journals.  
25

26 *We have a system of accreditation through the NRF, level A, B, C, it is a research standing*  
27 *based on peer-review. It puts an academic in a position to qualify for funding from the*  
28 *NRF. (SA-A)*  
29  
30

31 Such accreditation helps researchers to position themselves as leaders in their field, which helps  
32 in attracting national and international funds and collaboration for research, which, in turn,  
33 supports the universities in positioning themselves as research-intensive institutions and lifting  
34 their ranking.  
35  
36  
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38  
39

#### 40 **Leadership**

41  
42 Compared to Mauritius, where lack of vision and frequent changes in leadership was reported by  
43 participants, the university leadership in South Africa was considered as committed and visionary.  
44

45 *We are in a phase where we do not have any topmost management. (M-C)*

46  
47 *In the last five years, the university has witnessed change in leadership three times. (M-*  
48 *A1)*  
49

50  
51 *The reason why we are so far ahead of any other university in this country is because the*  
52 *leadership at the university is committed to supporting research in the 21<sup>st</sup> century, it is*  
53 *making huge investments in systems that support the research process. (SA-F)*  
54  
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3 All the participating universities in South Africa had dedicated leaders, such as, Pro VCs or Deputy  
4 VCs for research and innovation and commercialisation, while in Mauritius, with the exception of  
5 one university, where a Pro VC had research portfolio, most institutions had only more junior  
6 heads of research.  
7  
8  
9

### 10 11 ***Human resources***

12 Mauritian participants reported having qualified and experienced academics in public universities  
13 and were proud of their expertise.  
14  
15

16 *We have the highest number of PhDs of any university in Mauritius. Of 42 full time staff,*  
17 *21 have PhDs. (M-B1)*  
18

19 *We have a lot of expertise, but then the question is that how do you harness that expertise*  
20 *(M-A2).*  
21  
22  
23

24 South African participants felt that there should be more academics with PhDs. Their government  
25 is addressing this issue through policy measures by increasing the percentage of PhD qualified  
26 staff in the higher education sector from the current 34% to over 75% by 2030 (NDP, 2030).  
27  
28

29 *Only 45% of our staff have doctorates, so clearly that is one challenge that we are working*  
30 *on. We are trying to get all our staff to enrol for higher degrees. (SA-B2)*  
31  
32

33 In addition, there was a paucity of experts in areas pivotal to knowledge management, such as data  
34 managers, infrastructure managers, data scientists, and project management.  
35  
36

37 *The challenge is in terms of skills and competencies of data managers and infrastructure*  
38 *managers. Also [...] As soon as we train them, they go out to the industry and earn more*  
39 *money. (SA-F)*  
40  
41

42 *Many academics are not used to managing big research and innovation projects. They*  
43 *may be good at research but lack project management skills (SA-C1).*  
44  
45  
46

47 To facilitate knowledge creation, research offices in South African universities organise research  
48 capacity development, including workshops and training on writing proposals, research  
49 supervision, and mentoring of young academics by retired and senior academics.  
50  
51

52 *We have programmes to develop research capacity, such as workshops on research*  
53 *supervision, and on how to write proposals (SA-C1)*  
54  
55  
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3 *We have a special programme for post-retirement re-appointments specifically of seasoned*  
4 *academics who mentor the younger academics, it is one of the management interventions”*  
5 *(SA-A).*  
6  
7  
8  
9

### 10 ***Resources and funding***

11 Time was the resource that was most under pressure. This was due to heavy teaching loads and  
12 administrative duties, which impeded high quality research and knowledge creation in both  
13 Mauritius and South Africa.  
14  
15

16  
17 *We are expected to carry a heavy teaching load, heavy administration load, heavy student*  
18 *counselling, and interaction load. We are expected to do service, that is consulting [...]*   
19 *you're probably holding down a family life. Somewhere all of that does not add up.*  
20 *Unfortunately, this is [...] probably leading to seeking out publishing opportunities in less*  
21 *than honourable publications and paying to get published. (M-A3)*  
22

23 *Academics and researchers and innovators are spending a significant amount of their time*  
24 *in undergraduate teaching and it does not leave time for any kind of research and*  
25 *innovation. (SA-D)*  
26  
27

28 In Mauritius, lack of funding for research was a major challenge for most participants. Lack of  
29 funding results in limited investment in, for example, well-equipped laboratories for research and  
30 development.  
31  
32

33 *We have budgetary constraints. We have very big visions, but we do not have the resources*  
34 *to realise these visions. (M-C)*  
35  
36

37 On the other hand, South African universities receive input and output subsidies from the  
38 government through the NRF, which are linked to funding received for student enrolment (input  
39 subsidy) and research outputs (output subsidy) in high-indexed journals by academics and  
40 researchers of the institution (SA-A).  
41  
42

43 *We get a huge amount of funding, we get about 250 Million Rand (Approx. 15 Million*  
44 *USD) a year, through the NRF; that is a big enabler of research in South Africa. (SA-B2)*  
45  
46

47 Nevertheless, South African participants found the funding environment to be very competitive.  
48  
49

50 *Even though some funding is available, it takes a lot of time, and is not guaranteed, due to*  
51 *the competitive environment. (SA-C1)*  
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3 Table 2 summarises the enablers and barriers to knowledge creation in universities. In Mauritius,  
4 lack of strategies and policies, leadership, and resources and funding were considered to be barriers  
5 to KC, whilst organisational structures and rewards and incentives, were identified as both enablers  
6 and barriers. Human resources were considered to be an enabler. In South Africa, organisational  
7 structures, rewards and incentives, and leadership were enablers for KC, and strategies and  
8 policies, human resources, and resources and funding, were deemed to be both enablers and  
9 barriers to KC.  
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11  
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17 [Insert Table 2 here]  
18  
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### 20 **4.3 Enablers and Barriers to Knowledge Sharing**

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22  
23

#### 24 ***Rewards and incentives***

25 Participants from both Mauritius and South Africa reported a lack of incentives for knowledge  
26 sharing among peers, even though the staff exchange programme with overseas universities was  
27 identified in South Africa as an enabler to knowledge sharing (SA-E).  
28  
29

30 *There are no incentives, no encouragement from the system to promote sharing and*  
31 *collaboration. (M-A1)*  
32  
33

34 *I don't think there are any incentives or any encouragement to share (SA-D)*  
35

36 In South Africa, national bodies, such as the NRF also promote collaboration and sharing across  
37 institutions through their calls for proposals.  
38  
39  
40

#### 41 ***Culture***

42 A lack of a knowledge sharing culture due to the promotion policy (rewarding individual  
43 achievements rather than involvement in multi-disciplinary and inter-institutional research  
44 projects), leads to individualistic and competitive behaviour that provokes mistrust, fear, and  
45 selfishness in Mauritius.  
46  
47  
48

49 *Culture wise, there is a problem. People tend to be individualistic; there is reluctance to*  
50 *share knowledge. This is also linked to our promotion exercise, which does not give weight*  
51 *to collaboration and sharing. (M-A1)*  
52  
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3 South African participants also reported an academic culture that promotes turf protection,  
4 individualistic behaviour, and a silo mentality amongst academics.  
5  
6

7 *Some people are very protective over their territory and would not easily share (SA-B1).*

8  
9 *There is some resistance to knowledge sharing because people feel that they lose their*  
10 *competitive edge once it is out in the public domain, and somebody can piggyback on their*  
11 *ideas (SA-C2).*  
12  
13

14  
15 *If organisational structure within disciplines and within departments doesn't encourage*  
16 *trans-disciplinary and cross-disciplinary research, it could lead to a lack of knowledge*  
17 *sharing and collaboration and promote working in silos (SA-C1).*  
18  
19

20  
21 *Knowledge sharing is an academic cultural issue [...] historically, academics were*  
22 *encouraged to work as individuals and the most sharing that ever happened was between*  
23 *a supervisor and his/her research group [...] There is also some resistance to knowledge*  
24 *sharing because people feel that they lose their competitive edge once it is out in the public*  
25 *domain. (SA-C2)*  
26  
27  
28

29 Nevertheless, knowledge sharing in South African universities is prevalent at discipline, inter and  
30 intra institutional, and national and international level. Academics are also encouraged to form  
31 multidisciplinary and transdisciplinary collaborations as a basis for bidding for funding  
32 opportunities. However, academics' initial loyalty is towards their discipline; institutions try to  
33 leverage on this by forming research groups around specific research themes.  
34  
35  
36  
37

38 *We encourage multidisciplinary and transdisciplinary groups and provide funding to*  
39 *enrich their research programmes [...] Academics are required to have collaborators both*  
40 *internally (within the department and within the faculty and university) and nationally and*  
41 *internationally. This is part of the university's strategy to raise visibility. There are also*  
42 *several group funding opportunities, which require a group or a consortium to bid; this*  
43 *has led many people to work together. (SA-B1)*  
44  
45  
46  
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49  
50 *Researchers tend to congregate in disciplines and their initial loyalty is to their discipline*  
51 *rather than to their institution. So we (at the e-research office) try to capitalise on this.*  
52 *(SA-F)*  
53  
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3 Knowledge sharing through networking and international partnerships and collaborative efforts  
4 around a ‘community of practice’ and participating in virtual research environments were also  
5 reported by participants in South Africa.  
6  
7

8  
9 *We are part of a very prestigious group of international universities. And there is a lot of*  
10 *sharing and common activities going on. Our University is the first and only African*  
11 *University to be invited to join one of the most prestigious and innovative university*  
12 *consortia in the world, the Universitas 21( <https://universitas21.com>) [...]. Over the last*  
13 *two years, our university has established a programme called ‘Global Excellence and*  
14 *Stature Programme’ [...] bringing together distinguished visiting Professors and top-*  
15 *notch international researchers at the University, postdoctoral students and postgraduate*  
16 *students...to build collaboration with different international partners (SA-B2).*  
17  
18

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22  
23 *We are setting up a centre called ‘Future Africa’ for transdisciplinary science leadership*  
24 *for innovation. We want to draw people from across Africa to build leadership in science,*  
25 *build networks between leaders of science across Africa and develop interdisciplinary and*  
26 *multi-disciplinary research teams. The centre will develop expertise across Africa through*  
27 *transdisciplinary research partnerships across numerous disciplines with the cooperation*  
28 *of international and African scholars (SA-E).*  
29  
30  
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33

34 In Mauritius, the culture of involvement in multi-disciplinary and inter-institutional research  
35 projects requires further development. On the other hand, in South Africa, the environment is  
36 highly competitive due to increasing knowledge production, accreditation of academics and  
37 researchers by the National Research Foundation, and the race for higher ratings and rankings.  
38  
39  
40  
41

### 42 **Technology**

43 Both Mauritian and South African universities have adequate IT infrastructure and connectivity  
44 for knowledge sharing among peers. In addition, South African researchers commented on access  
45 to open access platforms and institutional repositories; neither of these were not mentioned by  
46 researchers in Mauritius.  
47  
48  
49  
50

51 *We have a good information technology system at the university, and we have just*  
52 *implemented a new database management system (M-A1)*  
53

54 *Technology is not an issue for us. (SA-C1)*  
55  
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5 ***Leadership***

6 Frequent changes in leadership was found to be a deterrent in creating a knowledge sharing culture  
7 in Mauritius. However, this was not reported in South Africa.  
8  
9

10 *Earlier, under our Head of Institution, every month we were having knowledge sharing*  
11 *sessions, but for the time being this is not continuing as we are in a phase where we do not*  
12 *have any top management. (M-C)*  
13  
14  
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16

17 Table 2 summarises the enablers and barriers to knowledge sharing in universities of the two  
18 countries. In Mauritius, lack of rewards and incentives, knowledge sharing culture, and frequent  
19 changes in leadership were viewed as barriers to KS. In South Africa, rewards and incentives, as  
20 well as culture, were regarded as both enablers and barriers to KS. IT infrastructure was an enabler  
21 in both countries.  
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27 **4.4 Enablers and Barriers to Knowledge Transfer**  
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29  
30

31 ***Strategies and policies***

32 South African universities have intellectual property policies to encourage knowledge transfer;  
33 these are absent in Mauritius.  
34  
35

36 *We have an Intellectual Property policy, which talks about commercialisation. (SA-CI)*

37 Furthermore, the government of South Africa passed the Intellectual Property (IPR) Act in 2008  
38 to promote knowledge transfer. The IPR Act requires every university in South Africa to have a  
39 Technology Transfer Office. However, participants from South Africa were of the view that the  
40 IPR Act is also a deterrent to knowledge transfer.  
41  
42  
43

44 *One of the problems in South Africa in the last few years is that there has been the*  
45 *'Intellectual Property Act', which means that universities are now becoming more*  
46 *protective of the knowledge that they have created, and how they transfer it. (SA-D)*  
47  
48  
49  
50

51 ***Organisational structures***

52 In comparison to Mauritius, where there was a lack of structures to promote knowledge transfer,  
53 the South African universities, by the virtue of IPR Act (2008), were encouraged to create  
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3 appropriate structures. These included Technology Transfer Offices or Intellectual Property Units  
4 within their research offices, to promote and encourage knowledge transfer and provide support  
5 for contract research, patenting and commercialisation of research results.  
6  
7

8 *We have not organized our knowledge at the university [through, for instance, a web*  
9 *portal] so that it can be transferred, and people can access it. (M-A1)*

10  
11 *We have an office dedicated to support academics and researchers in the patenting*  
12 *process, the Technology Transfer Office. (SA-F)*  
13  
14

15 Furthermore, the IP Units and/or Technology Transfer office (TTOs) in South Africa were also  
16 mandated to create awareness campaigns and training programmes for industry.  
17

18 *We (TTO) run several awareness campaigns on what constitutes Intellectual Property (IP);*  
19 *we bring in an IP Attorney during lunch-time workshops. (SA-C1)*  
20  
21

22 *We have our commercial arm or company 'Enterprises' where we provide all kinds of short*  
23 *courses, training, and expertise to industry. (SA-E)*  
24  
25

26 However, a participant in South Africa mentioned a lack of information amongst academics and  
27 researchers on patenting processes.  
28

29 *There is a lack of information or misinformation about how the patenting process works.*  
30 *We still have academics that believe that a patent is equal to an embargo on releasing*  
31 *information, which is not so [...] they can still publish as long as they've put in their*  
32 *application to patent, but that's something that is not clearly understood in our institution*  
33 *(SA-C2).*  
34  
35  
36  
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#### 40 **Rewards and incentives**

41 Both Mauritian and South African universities have financial incentives to support knowledge  
42 transfer. However, in Mauritius, there was no uniform policy for the sector, although there were  
43 various incentives, such as financial benefits, or a reduced teaching load.  
44  
45  
46

47 *If the staff bring in consultancies, they are paid. (M-B1)*  
48

49 In South Africa, if the knowledge transferred through the technology transfer office is successfully  
50 commercialised, the inventors get a financial incentive.  
51

52 *If knowledge is transferred through the technology transfer office, in the event of a*  
53 *successful commercialisation, researchers get 30% of the benefits. (SA-C1)*  
54  
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### **University-industry linkages**

In South Africa, the government, through the NRF, has launched mechanisms to encourage university-industry linkages.

*Our NRF have a programme called 'THRIP' (The Technology and Human Resources for Industry Programme) which is about research with industry partnerships [...] where industry partners are expected to submit the application. (SA-C2)*

In addition, incubators to encourage partnerships with industry were in evidence.

*An important innovation from the Innovation Office is an incubator, which encourages partnerships with industry partners. (SA-C2)*

Despite these measures, participants were of the view that the level of technology transfer and technology linkages in South African universities is still at a low level compared to that in other countries.

*In terms of innovation, technology transfer and patents, we are certainly not at the same level as Singapore or other places, so that continues to be a challenge [...] Singapore and China have close relationships between industry, government and the universities. Here, industry-university linkages have not been made. (SA-B2)*

Similarly, in Mauritius, knowledge transfer with industry is limited to a few public universities, due to weak university-industry linkages, and the absence of a dedicated knowledge transfer office in most universities. Knowledge transfer is restricted to organising tailor-made courses and CPDs.

Table 2 summarises the enablers and barriers to knowledge transfer in universities in the two countries. In Mauritius, lack of strategies and policies and organisational structures were viewed as barriers to knowledge transfer, while in South Africa, these two factors were viewed as both enablers and barriers. Financial incentives were found to be an enabler for KT in both countries, but weak university-industry linkages were regarded as a barrier in both countries.

## **4.5 Enabling Knowledge Management in Universities Framework**

The insights outlined above form the basis for the proposal of the 'Embedding Knowledge Management in Universities Framework' (Figure 1). The framework summarises the central tenet of this study, that knowledge management processes (knowledge creation, knowledge sharing, and



1  
2  
3 knowledge transfer) are both facilitated and constrained by a wide range of KM enablers and  
4 barriers. These include: strategies and policies, organisational structure, rewards and incentives,  
5 culture, technology, leadership, human resources, resources and funding, and university-industry  
6 linkages. This research also reveals that the extent of the impact of these e&bs varies both between  
7 universities, and between the three knowledge management processes included in this study. For  
8 example, the following six factors either facilitate or inhibit knowledge creation: strategies and  
9 policies; organisational structures; rewards and incentives; leadership; human resources; and,  
10 resources and funding. Four factors enable or hinder knowledge sharing: rewards and incentives;  
11 culture; technology; and, leadership. Knowledge transfer is facilitated or hindered by: strategies  
12 and policies; organisational structures; rewards and incentives; and, university-industry linkages.  
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20 [Figure 1]  
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23

## 24 **5. Discussion**

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28 In past studies, culture, reward and incentives, technology, leadership, and organisational  
29 structures were found to be prominent factors impacting knowledge sharing and knowledge  
30 creation in universities (Arntzen *et al.*, 2009; Supapawawisit *et al.*, 2018). As in previous studies  
31 (Tian *et al.*, 2009; Fullwood *et al.*, 2013), in Mauritius, lack of a knowledge sharing culture was  
32 perceived as a barrier, whereas in South Africa, culture was identified as a barrier as well as  
33 enabler. South Africa had dedicated structures (Adhikari, 2010; Fuller *et al.*, 2019) and numerous  
34 rewards, awards and incentives to promote knowledge creation (Supapawawisit *et al.*, 2018),  
35 sharing (Kim and Ju, 2008), and transfer (Rossi and Rosli, 2015); these initiatives may contribute  
36 to the high ranking of South African universities in the region. Universities in both countries had  
37 adequate IT infrastructure and connectivity for knowledge sharing, although South Africa had  
38 institutional repositories and open access platforms as enablers, which were lacking in Mauritius.  
39 Evidence from Malaysia and Thailand also confirms IT to be critical for enhancing research and  
40 innovation (Ramachandran *et al.*, 2013; Supapawawisit *et al.*, 2018).  
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51  
52 Lack of strategies and policies were regarded as barriers in Mauritius, whereas South Africa had  
53 numerous strategies and policies to promote knowledge creation, sharing and transfer (as also  
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3 reported by Cloete and Bunting, 2013; Fussy, 2018). Lack of visionary leadership and frequent  
4 changes in top leadership were seen as barriers to creating a culture for knowledge creation and  
5 sharing in Mauritius. On the other hand, dedicated and committed leaders were regarded as key  
6 enablers for enhancing research, innovation and commercialisation in South Africa. These findings  
7 identify top management support as one of most important drivers of KM (Twum-Darko and  
8 Harker, 2015) and that leaders can play an important role in initiating KM (Ramachandran *et al.*,  
9 2013).

10  
11  
12 Mauritian participants reported having qualified and experienced academic staff, but South  
13 African participants suggested that the absence of sufficient staff with a PhD was a barrier to future  
14 development. Other studies have also reported that human resource is a vital factor (Eftekharzade  
15 and Mohammadi, 2011). In particular, consistent with earlier studies, lack of resources, such as  
16 time, was a barrier for all three processes in both countries (Arntzen *et al.*, 2009; Hughes and  
17 Kitson, 2012). University-industry linkages were perceived as weak in both countries. Similar  
18 findings were reported from Mozambique (Zavale and Macamo, 2016), another sub-Saharan  
19 African country.

## 30 31 **6. Conclusion and recommendations**

32  
33  
34 Compared to South Africa, Mauritius has fewer enablers and more barriers to KM. Nevertheless,  
35 despite being leaders in the region, South African universities also face numerous challenges,  
36 which arise from the increasing demand for universities in the country. This study proposes a  
37 holistic framework for enabling KM in universities, which summarises the relationship between  
38 KM processes and KM enablers in universities (Figure 1). In Figure 1 all enablers and barriers are  
39 shown as enablers, since the ideal situation is that barriers can be managed and converted to  
40 enablers. More specifically, the study found that six enablers and barriers, namely, strategies and  
41 policies, organisational structures, rewards and incentives, leadership, human resources, and  
42 resources and funding, facilitate and/or inhibit knowledge creation. Four factors, rewards and  
43 incentives, culture, technology, and leadership, enable and/or hinder knowledge sharing, and  
44 knowledge transfer is facilitated and/or constrained by: strategies and policies, organisational  
45 structures, rewards and incentives, and university-industry linkages.

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3 The study concludes that an enabling environment can lead to knowledge creation, knowledge  
4 sharing and knowledge transfer in universities. An enabling environment embeds: a positive  
5 knowledge creation and sharing culture, awards, rewards and incentives, dedicated organisational  
6 structures, state-of-art IT infrastructure, conducive strategies and policies, visionary leadership to  
7 provide strategic direction, close university-industry linkages, qualified human resources, and  
8 adequate resources and funding. These factors help universities to contribute in national innovation  
9 systems and economic development.  
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17 Previous research on knowledge management in universities has focused mainly on academics in  
18 a single country, such as the UK or Malaysia. This research contributes to the area of public policy  
19 as well as to knowledge management practice. It does this by exploring the understanding and  
20 perceptions of senior management and academics involved in research and research management  
21 regarding the enablers and barriers to knowledge management in universities located in two  
22 countries in the sub-Saharan African region. Many of the enablers and barriers discussed in this  
23 paper are also in evidence in universities located in other countries, such as the UK and Malaysia.  
24 This study should support policy makers in other countries to further embed knowledge  
25 management in their universities.  
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34 Further research needs to be conducted into KM enablers and barriers in a wider range of contexts  
35 and countries in order to enhance understanding of role of KM in universities. For example, whilst  
36 this study covers a number of universities in two countries, it does not specifically report on the  
37 differences between the universities within a specific country. In addition, in some countries in the  
38 world, such as the United States, private universities are an important part of the university sector;  
39 it would be useful to explore whether different enablers and barriers apply in these contexts.  
40 Another potential avenue for research is to investigate the relative impact of investment in different  
41 KM enablers on research and innovation. Such research would offer senior university managers  
42 insights that might help them to choose where to invest their resources. In addition, future research  
43 should gather more views from academic leaders, managers, administrators and government  
44 officials.  
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## References

- Adhikari, D.R. (2010), "Knowledge management in academic institutions", *International Journal of Educational Management*, Vol. 22 No. 2, pp. 94-104.
- Alexandropoulou, D. A., Angelis, V. A. and Mavri, M. (2009), "Knowledge management and universities: present state and future trends", *International Journal of Knowledge and Learning*, Vol. 5 No.1, pp. 96-106.
- Arntzen, A.A.B., Worasinchai, L. and Ribière, V.M. (2009), "An insight into knowledge management practices at Bangkok University", *Journal of Knowledge Management*, Vol. 13 No. 2, pp. 127-144.
- Bano, S. and Taylor, J. (2014), "Universities and the knowledge-based economy: perceptions from a developing country", *Higher Education Research & Development*, Vol. 34 No. 2, pp. 242-255.
- Cloete, N. and Bunting, I. (2013), "Strengthening knowledge production in universities: Five South African case studies", Programme on Innovation, Universities and Research for Development (IHERD) hosted at the OECD and funded by the Swedish International Development Cooperation Agency (SIDA), pp. 1-51.
- Cloete, N. and Maassen, P. (2017), Roles of universities and the African context. In: Muller, J., Cloete, P. and Van Schalkwyk, F. (eds), *Castells in Africa – Universities and Development*: Cape Town: African Minds. pp. 95–112.
- Cranfield, D.J. and Taylor, J. (2008), "Knowledge management and universities: a UK case study", *Electronic Journal of Knowledge Management*, Vol. 6 No. 2, pp. 85-100.
- Eftekhazade, S.F. and Mohammadi, B. (2011), "The presentation of a suitable model for creating knowledge management in educational institutes (universities)", *Procedia - Social and Behavioral Sciences*, Vol. 29, pp. 1001-1011.
- Fuller, D., Beynon, M. and Pickernell, D. (2019), "Indexing third stream activities in UK universities: exploring the entrepreneurial/enterprising university", *Studies in Higher Education*, Vol 44 No. 1, pp: 86-110.
- Fullwood, R., Rowley, J. and Delbridge, R. (2013), "Knowledge sharing amongst academics in UK universities", *Journal of Knowledge Management*, Vol. 17 No. 1, pp. 123-136.
- Fussy, D. S. (2018), "Policy directions for promoting university research in Tanzania", *Studies in Higher Education*, Vol 43 No. 9, pp: 1573-1585.

- 1  
2  
3 Gera, R. (2012), "Bridging the gap in knowledge transfer between academia and practitioners",  
4 *International Journal of Educational Management*, Vol. 26 No.3, pp. 252-273.  
5  
6 Gertner, D., Roberts, J. and Charles, D. (2011), "University-industry collaboration: A CoPs  
7 approach to KTPs", *Journal of Knowledge Management*, Vol. 15 No. 4, pp. 625-647.  
8  
9 Gill, A. (2009), "Knowledge management initiatives at a small university", *International Journal*  
10 *of Educational Management*, Vol. 23 No. 7, pp. 604-616.  
11  
12 Goh, S.K. and Sandhu, M.S. (2013), "Knowledge sharing among Malaysian academics: influence  
13 of affective commitment and trust", *Electronic Journal of Knowledge Management*, Vol. 11  
14 No. 1, pp. 38-48.  
15  
16 Guimon, J. (2013), "Promoting university-industry collaboration in developing countries", *The*  
17 *Innovation Policy Platform*, pp.1-11. Available at: [www.innovationpolicyplatform.net](http://www.innovationpolicyplatform.net)  
18 (accessed 10 December 2019).  
19  
20 Hewitt-Dundas, N. (2012), "Research intensity and knowledge transfer activity in UK  
21 universities", *Research Policy*, Vol. 41 No. 2, pp. 262-275.  
22  
23 Hughes, A. and Kitson, M. (2012), "Pathways to impact and the strategic role of universities: new  
24 evidence on the breadth and depth of university knowledge exchange in the UK and the  
25 factors constraining its development", *Cambridge Journal of Economics*, Vol. 36 No. 3, pp.  
26 723-750.  
27  
28 Kim, S. and Ju, B. (2008), "An analysis of faculty perceptions: attitudes toward knowledge sharing  
29 and collaboration in an academic institution", *Library & Information Science Research*, Vol.  
30 30 No. 4, pp. 282-290.  
31  
32 Miles, M. and Huberman, A. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, Sage,  
33 Beverly Hills, CA.  
34  
35 National Planning Commission, South Africa (2011), *National Development Plan 2030: Our*  
36 *future make it work*, Available at: [https://www.gov.za/documents/national-development-](https://www.gov.za/documents/national-development-plan-2030-our-future-make-it-work)  
37 [plan-2030-our-future-make-it-work](https://www.gov.za/documents/national-development-plan-2030-our-future-make-it-work) [Accessed July 22, 2019]  
38  
39 Ojo, A. (2016), "Knowledge management in Nigerian universities: A conceptual model",  
40 *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 11, pp: 331-  
41 345. Retrieved from <http://www.informingscience.org/Publications/3607>  
42  
43 Ramachandran, S.D., Chong, S.-C. and Wong, K.-Y. (2013), "Knowledge management practices  
44 and enablers in public universities: a gap analysis", *Campus-Wide Information Systems*, Vol.  
45  
46  
47  
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52  
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1  
2  
3 30 No. 2, pp. 76-94.  
4

5 Rivera, G. and Rivera, I. (2016), "Design, measurement and analysis of a knowledge management  
6 model in the context of a Mexican university", *Innovar Open Access*, Vol. 26 No. 59, pp. 21-  
7 34.  
8  
9

10 Rossi, F and Rosli, A. (2014), "Indicators of university–industry knowledge transfer performance  
11 and their implication for universities: evidence from the United Kingdom", *Studies in Higher  
12 Education*, Vol. 40 No. 10, pp. 1970-1991.  
13  
14

15 Rowley, J. (2000), "Is universities ready for knowledge management?", *International Journal of  
16 Educational Management*, Vol. 14 No. 7, pp. 325-333.  
17

18 Rowley, J. (2012), "Conducting research interviews", *Management Research Review*, Vol. 35 No.  
19 3/4, pp. 260-271.  
20  
21

22 Saunders, M., Lewis, P. and Thornhill, A. (2019), *Research Methods for Business Students*, 8<sup>th</sup>  
23 ed., Pearson, England.  
24

25 Siadat, S.A., Hoveida, R, Abbaszadeh, M. and Moghtadaie, L. (2012), "Knowledge creation in  
26 universities and some related factors", *Journal of Management Development*, Vol. 31 No. 8,  
27 pp. 845-872.  
28  
29

30 Supapawawisit, B., Chandrachai, A. and Thawesaengskulthai, N. (2018), "The critical factors of  
31 research and innovation creation in public universities in Thailand", *International Journal of  
32 Trade and Global Markets*, Vol. 12 No. 1-2, pp. 109–117.  
33  
34

35 Tian, J., Nakamori, Y. and Wierzbicki, A.P. (2009), "Knowledge management and knowledge  
36 creation in academia: a study based on surveys in a Japanese research university", *Journal of  
37 Knowledge Management*, Vol. 13 No. 2, pp. 76-92.  
38  
39

40 Torre, D. L., Perez-Esparrells, C. and Casani, F. (2018), "The policy approach for the third mission  
41 of universities: The Spanish case (1983-2018)", *Regional and Sectoral Economic Studies*,  
42 Vol. 18 No. 1, pp. 13-33.  
43  
44

45 Trivella, L. and Dimitrios, N.K. (2015), "Knowledge Management Strategy within the Higher  
46 Education. The case of Greece", *Procedia - Social and Behavioral Sciences*, Vol. 175, pp.  
47 488-495.  
48  
49

50 Twum-Darko, M. and Harker, L. A. L. (2015), "Factors influencing knowledge sharing amongst  
51 universities academics at a university in South Africa", *Corporate Ownership & Control*,  
52 Vol. 12 No. 2-2, pp. 280-292.  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 UNESCO. (2017), UNESCO Institute for Statistics. Available at: <http://data.uis.unesco.org/>  
4 [Accessed July 30, 2019].  
5  
6 World Economic Forum (2019). Global Competitiveness Report. Geneva: World Economic  
7 Forum.  
8  
9 World Bank (2018), Sub-Saharan Africa data. Available at: [https://data.worldbank.org/region/sub-](https://data.worldbank.org/region/sub-saharan-africa)  
10 [saharan-africa](https://data.worldbank.org/region/sub-saharan-africa) [Accessed January 6, 2020].  
11  
12 World Bank (2018), Available at: [https://www.worldbank.org/en/news/feature/2018/12/21/year-](https://www.worldbank.org/en/news/feature/2018/12/21/year-in-review-2018-in-14-charts)  
13 [in-review-2018-in-14-charts](https://www.worldbank.org/en/news/feature/2018/12/21/year-in-review-2018-in-14-charts) [Accessed January 6, 2020].  
14  
15 Yin, R. K. (2014), *Case Study Research: Design and Methods*. 5<sup>th</sup> edition, Thousand Oaks, CA:  
16 Sage.  
17  
18 Zavale, N.C. and Macamo, E. (2016), “How and what knowledge do universities and academics  
19 transfer to industry in African low-income countries? Evidence from the stage of university-  
20 industry linkages in Mozambique”, *International Journal of Educational Development*, Vol.  
21 49 July 2016, pp. 247-261.  
22  
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**Table 2: Enablers and barriers to knowledge creation, knowledge sharing and knowledge transfer in Mauritian and South African Universities**

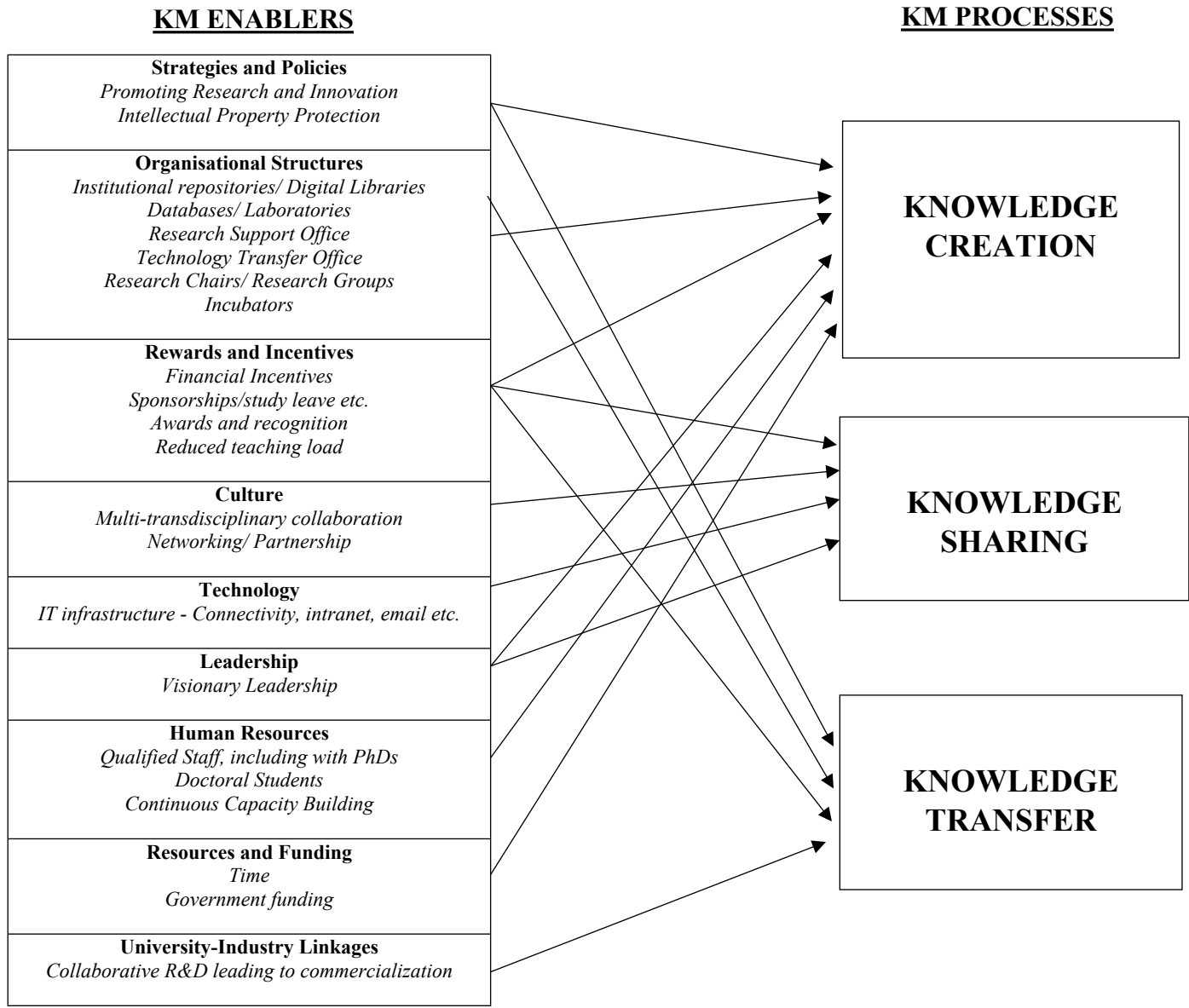
KNOWLEDGE CREATION				
	MAURITIUS		SOUTH AFRICA	
	Enablers to KC	Barriers to KC	Enablers to KC	Barriers to KC
<b>Strategies and Policies</b>		Lack of policies to encourage and promote research	Strategies and policies for research management	‘Massification’ of universities Focus on undergraduate teaching High student to staff ratios
<b>Organisational structures</b>	Library and digital information resources	Limited access to data and databases	Institutional repositories and library services Dedicated structures at National and Institution Level Databases Laboratories	
<b>Rewards and incentives</b>	Sponsorship for conference attendance Opportunities to upgrade qualifications Book purchase Access to journals Study leave	Lack of reward mechanisms that encourage and promote research	Awards, rewards and incentives e.g. researcher of the year, innovator of the year.	
<b>Leadership</b>		Lack of vision	Visionary leadership	
<b>Human Resources</b>	Qualified and experienced academic staff in <i>public</i> universities		Research capacity development	Too few academics with PhDs Lack of experts with IT and project management skills



<b>Resources and Funding</b>		Heavy workloads of teaching and administrative duties Lack of resources and funding for research	Funding from Government (input subsidies)	Heavy teaching loads Competitive funding environment Lack of time
<b>KNOWLEDGE SHARING</b>				
	<b>MAURITIUS</b>		<b>SOUTH AFRICA</b>	
	<b>Enablers to KS</b>	<b>Barriers to KS</b>	<b>Enablers to KS</b>	<b>Barriers to KS</b>
<b>Rewards and incentives</b>		Lack of incentives to encourage knowledge sharing	Staff exchange programme with overseas universities Calls for proposal from Research Councils	Lack of incentives
<b>Culture</b>		Lack of a knowledge sharing culture Promotion policy that fuels individualistic and competitive behaviour, and mistrust Few multi-disciplinary and inter-institutional research projects	Multi-disciplinary and transdisciplinary collaborations Group funding opportunities Communities of practice Networking and partnerships	Turf protection Academic culture, driving individualistic behavior Silo mentality Competitive environment due to: increasing knowledge production, accreditation of academics by the National Research Foundation, and, the race for higher rankings
<b>Technology</b>	Good IT infrastructure Connectivity Intranet Email		Institutional repository Open access platform E-mail	
<b>Leadership</b>		Frequent leadership changes		
<b>KNOWLEDGE TRANSFER</b>				
	<b>MAURITIUS</b>		<b>SOUTH AFRICA</b>	

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	<b>Enablers to KT</b>	<b>Barriers to KT</b>	<b>Enablers to KT</b>	<b>Barriers to KT</b>
<b>Strategies and policies</b>		Lack of IP strategies/policies	IP Act (2008)	IP Act as a deterrent to knowledge transfer
<b>Organisational structures</b>		Lack of interactive web portal Research repository	Technology Transfer Office/IP Units Instruments for university-industry linkages	Lack of information on patenting process
<b>Rewards and incentives</b>	Financial incentives for consultancy work Reduced teaching load in a few private universities		Financial incentives	
<b>University-industry linkages</b>		Weak industry-academic linkages		Weak industry-university linkages Low level of technology transfer



**Figure 1: Framework for Enabling Knowledge Management in Universities**