Utilisation of South African Research on Higher Education

Jan Botha
Gabriele Vilyte

EDITORS

Acronyms

AAIR	Australasian Association for Institutional Research
AEHE	Assessment and Evaluation in Higher Education
AIR	Association for Institutional Research
AJPHERD	African Journal for Physical, Health Education, Recreation and Dance
AJPHEs	African Journal for Physical Activity and Health Sciences
AOSIS	African Online Scientific Information Systems
ASAUDIT	Association of South African University Directors of Information Technology
ASSAf	The Academy of Science of South Africa
BRICS	Brazil, Russia, India, China, South Africa
CAGR	Compound Annual Growth Rate
CAMPROSA	Campus Protection Society South Africa
CHE	Council on Higher Education
CHELSA	Committee for Directors of Higher Education Libraries in South Africa
CIRPA	Canadian Institutional Research and Planning Association
China AIR	China Association for Institutional Research
CPUT	Cape Peninsula University of Technology
CREST	Centre for Research on Evaluation, Science and Technology
COP	Community of Practice
CSI	Corporate Social Investment
CUT	Central University of Technology
DfID	Department for International Development
DHET	Department of Higher Education and Training
DHSS	British Department of Health and Social Security
DIA	Department for Institutional Advancement
DoE	Department of Education
DoL	Department of Labour
DSI	Department of Science and Innovation
DST	Department of Science and Technology
DUT	Durban University of Technology
DVC	Deputy Vice-Chancellor
EACEA	European Education and Culture Executive Agency
EAIR	European Association for Institutional Research
ECHEA	Eastern Cape Higher Education Association
EU	European Union
HE	Higher Education
HEDA	Higher Education Data Analytics
HEDSA	Higher and Further Education Disability Services Association
HEIR	UK & Ireland Higher Education Institutional Research Network
HEIs	Higher Education Institutions
HELTASA	Higher Education Learning and Teaching Association of Southern Africa
HEMIS	Higher Education Management Information System
HEMP	Higher Education Management & Policy

HEP	Higher Education Policy
HER	Higher Education Research
HERD	Higher Education Research & Development
HERDSA	Higher Education Research and Development Society of Australasia
HESA	Higher Education South Africa
HEQ	Higher Education Quarterly
HEQC	Higher Education Quality Committee
HEQF	Higher Education Qualifications Framework
HOD	Head of Department
ICCT	Information Communication and Computer Technology
ICT	Information and Communications Technology
IEASA	International Education Association of South Africa
IHE	Innovative Higher Education
IJAD	International Journal for Academic Development
IBSS	International Bibliography of the Social Sciences
IPMS	Institutional Planning and Management Support
IPU	Intellectual Property Unit
IR	Institutional Research
JCSD	Journal of College Student Development
JES	Journal of Educational Studies
JHE	Journal of Higher Education
JHEPM	Journal of Higher Education Policy and Management
KPIs	Key Performance Indicators
LA	Learning Analytics
LDA	Latent Dirichlet Allocation
LDP	Leadership Development Programme
LSSE	Lecturer Evaluation of Student Engagement
M&E	Monitoring and Evaluation
MENA-AIR	Middle East and North Africa Association for Institutional Research
MIS	Management Information Support
MoU	Memorandum of Understanding
MTSF	Medium-Term Strategic Framework
NCHE	National Commission for Higher Education
NDP	National Development Plan
nGAP	New Generation of Academic Personnel
NGO	Non-Governmental Organisation
NMU	Nelson Mandela University
Norw	Norwegian Register for Scientific Journals, Series and Publishers
NPHE	National Plan on Higher Education
NPM	New Public Management
NPPSET	National Plan for Post-School Education and Training
NRF	National Research Foundation
NSC	National Senior Certificate
NSFAS	National Student Financial Aid Scheme
NSI	National System of Innovation
NUFFIC	Netherlands Universities Foundation for International Cooperation

NWU	Northwest University
MEC	Management Executive Committee
MTA	Material Transfer Agreement
MUT	Mangosuthu University of Technology
OECD	Organisation for Economic Cooperation and Development
ODL	Open Distance Learning
ORD	Office of Research and Development
PSET	Post School Education and Training
QA	Quality Assurance
QAA	Quality Assurance and Accreditation
QEP	Quality Enhancement Project
ResHE	Research in Higher Education
RevHE	Review of Higher Education
RHE	Research on Higher Education
RSA	Republic of South Africa
RU	Rhodes University
SAAIR	Southern African Association for Institutional Research
SAACDHE	Southern African Association for Counselling and Development in Higher Education
SAACHS	South African Association of Campus Health Services
SAASSAP	South African Association of Senior Student Affairs Professionals
SABINET	Southern African Bibliographic Information Network
SADC	Southern African Development Community
SAFMA	South African Facilities Management Association
SAHECEF	South African Higher Education Community Engagement Forum
SAIA	South African Institute for Advancement
SAJHE	South African Journal of Higher Education
SAK	South African Knowledgebase
SAMJ	South African Medical Journal
SAPSE	South African Post-Secondary Education
SARHE	South African Research on Higher Education
SARIMA	Southern African Research and Innovation Management Association
SASSE	South African Survey of Student Engagement
SAQA	South African Qualifications Authority
SciELO	Scientific Electronic Library Online
SciSTIP	DSI/NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy
SDGs	Sustainable Development Goals
SEAAIR	Southeast Asian Association for Institutional Research
SHE	Studies in Higher Education
SIAMPI	Social Impact Assessment Methods for research and funding instruments through the study of Productive Interactions
SMU	Sefako Makgatho Health Sciences University
SPU	Sol Plaatje University
SSS	Student Support Services
SU	Stellenbosch University

TAIR	Taiwan Association for Institutional Research
TEAM	Tertiary Education and Management
THE	Teaching in Higher Education
TLAD	Teaching, Learning and Academic Development
TUT	Tshwane University of Technology
UB	University of Botswana
UCDG	University Capacity Development Grants
UKZN	University of Kwazulu-Natal
UNESCO	United Nations Educational, Scientific and Cultural Organization
Unisa	University of South Africa
UCT	University of Cape Town
UFH	University of Fort Hare
UFS	University of the Free State
UJ	University of Johannesburg
UL	University of Limpopo
UMP	University of Mpumalanga
UoT	University of Technology
UN	United Nations
UniVen	University of Venda
UniZulu	University of Zululand
UP	University of Pretoria
USAf	Universities South Africa
USSA	University Sport South Africa
UWC	University of the Western Cape
VC	Vice-Chancellor
VUT	Vaal University of Technology
Wits	University of the Witwatersrand
WoS	Web of Science
WPPSET	White Paper for Post-School Education and Training
WSU	Walter Sisulu University

A bibliometric study of South African research publications on higher education

2

Jan Botha, Heidi Prozesky and Herman Redelinghuys¹

1 Introduction

The aim of this chapter is to identify and describe, by means of a bibliometric study, the body of research on higher education produced by researchers and practitioners affiliated with South African public universities during the period 2005-2015.

A chapter with such an objective is a necessary requirement for addressing the overarching question considered in this book: what do we know of the uptake, use and impact of South African research on higher education (SARHE)? After all, we need to have a certain body of research before we can investigate its uptake, use and impact, and before we can study its achievements and shortcomings. However, for various reasons it is challenging to gain a sense of the size (the volume of the outputs), the nature or contents of the research (e.g. the themes, the methodologies used, the findings and recommendations) and the producers of a body of research with higher education as its object of study. These reasons include the lack of a generally accepted definition of higher education, differences in the institutional locations of the researchers focusing on higher education, and the different modes and channels of the dissemination of research results in this field of practice and scholarship.

Firstly, we briefly expand on these three reasons and their consequences for a bibliometric study aimed at identifying a set of publications, which can with some confidence, be considered as encompassing South African research on higher education during the chosen time period (2005-2015). Secondly, in the light of this explanation, we describe our approach to this bibliometric study in some detail and then, finally, we present and discuss the results. In recent years there has been a significant increase in the total number of research publications in South Africa. The total number of publications indexed in the Web of Science (WoS) and in all fields of study increased from 3 850 in 2011 to 14 670 in 2015 (Mouton et al., 2019b:39). Aligned with this trend, and as our results will show, there was also a significant increase in publications on higher education produced from 2005 to 2015 by researchers affiliated with public universities in South Africa.

¹ To cite this chapter: Botha, J., Prozesky, H. & Redelinghuys, H. (2021). 'A bibliometric study of South African research publications on higher education'. In: J. Botha & G. Vilyte (eds.), *Utilisation of South African Research on Higher Education*. Stellenbosch: African Sun Media. pp.43-76.

In light of these introductory comments, the objective of the chapter can be (re)stated in more specific terms as follows: in the corpus of publications recorded in the South African Knowledgebase (SAK) for the period 2005-2015, identify and describe the set of publications that focus on higher education, and that were produced by authors affiliated with South African higher education institutions (we call that set **T** for 'target'). In Chapter 3 we report the results of a topic model used to map the diversity of prominent themes in this set of publications.

2 What is a bibliometric study?

Bibliometrics can be defined as “a set of quantitative methods used to measure, track, and analyse print-based scholarly literature” (Roemer & Borchardt, 2019:28). Our bibliometric study involved the retrieval of South African publications on higher education (SARHE), and an analysis of three dimensions of the resulting dataset, namely, (1) the output types (journal articles or book chapters/monographs or published conference proceedings), (2) the authors and (3) the journals. We did not conduct a citation analysis because our primary source of data, the SAK, is not a citation index.

A bibliometric study of publications in the humanities and social sciences, such as this study of publications on higher education, needs to be viewed against the background of a fairly critical stance of many humanities scholars towards bibliometric indicators and metrics-based evaluation. Hammarfelt and Haddow (2018), who surveyed humanities scholars in Australia and Sweden, found considerable ambivalence among them regarding the use of bibliometric measures, and it would be reasonable to assume that the views of humanities scholars in South Africa would be similar. While there is scepticism, or even direct criticism, of the use of such measures, and while it is considered by many as incommensurable with the values of the humanities, about a third of the respondents in Hammarfelt and Haddow's survey indicated that they nevertheless use bibliometric indicators in some form or other (e.g. to showcase their achievements) and they acknowledge that these indicators had an effect on their publication patterns. Hammarfelt and Haddow (2018:933) conclude that “the current trend towards quantification of research performance, what we also call ‘metric culture’, becomes especially troublesome in the humanities, as these disciplines have traditionally relied on ‘orders of worth’ that cannot easily be aligned with bibliometric indicators”.

We acknowledge and share many of the reservations of scholars in the humanities about the use of bibliometric indicators for evaluative purposes. Our bibliometric analysis of SARHE is primarily aimed at describing, not evaluating, this field of research. We are following a descriptive (or top-down), rather than an evaluative (or bottom-up) bibliometric approach (Van Leeuwen, 2004). The most important difference between these two approaches is found at the level of validity of the underlying research output. However, when we discuss the journals most frequently used for SARHE publications we also make a few evaluative observations. We also acknowledge that a description limited to quantitative indicators will not yield a fully nuanced account of SARHE. While we acknowledge these limitations, we maintain that a description based on bibliometric indicators does provide a valuable, albeit partial, view of this field of scholarship in South Africa.

3 Challenges involved in a bibliometric study of SARHE publications

As we mentioned in the introduction, a bibliometric study of SARHE publications is challenging for three reasons: (1) higher education is not a traditional academic discipline; (2) both scholars and practitioners contribute to knowledge and research outputs on higher education; and (3) most higher education practitioners do not publish their research in scholarly outlets. Below, we discuss these factors in more detail and explain how we accounted for them.

Firstly, from the historical overview of the study of higher education since the middle of the 20th century (presented in Chapter 1), it is clear that there is not a broadly accepted definition of higher education as a field of study or area of interest. Higher education studies have been described as “an active, but confused field, lacking many of the attributes of scholarly work that you find in well-recognised disciplines or fields of study with their learning programmes” (Strydom, 2002:95). Research on higher education can best be defined as an interdisciplinary field of scholarship, rather than as a traditional academic discipline. As an intellectual field, it is broader and more general than an academic or university-based discipline (Whitley, 2000). It is similar to what Weingart (2010:12) characterises as an area of priority, primarily for political and/or economic players such as funders of research (e.g. research councils and foundations, government departments and industry). As “frames of orientation for the delineation of subject matters and the formulation of research problems”, such areas of priority extend across disciplinary boundaries (i.e. they are transdisciplinary). These observations on higher education as a field of practice and study have implications for a bibliometric study such as ours. One implication is that the existing systems, according to which subjects or scientific fields are classified in standard citation indices, are not of much use to locate SARHE publications. Therefore, we developed a set of themes or thematic clusters that encompass higher education as a field of practice and research as comprehensively as possible. These themes were used to guide our identification of the keywords we used to search across all subject categories (see par 5.1).

Secondly, the institutional locations of researchers who consider higher education as an object of their research are diverse (Harland, 2009). Based on their various locations, they can be described as academic researchers (affiliated with academic faculties, institutes or centres in higher education institutions, with independent research institutes, or with NGOs), as well as practitioners. These practitioners are increasingly referred to as higher education professionals (Altbach, 2014:1319). In institutions, they are typically based in the support services, or in various units in the administration, or they serve leadership positions. They may also be employed by regulatory bodies or government agencies in higher education systems, or work for NGOs focusing on higher education (Kehm, 2015). In a worldwide inventory of research centres, academic programmes, journals and publications in higher education, Rumbley et al. (2014) found that, in 2013, at least 6 000 higher education researchers worldwide were working in academic faculties, institutes and centres. In addition to these researchers, they estimated that university administrations across the world employed more than 6 000 institutional researchers. However, Teichler (2016) is critical of the methodology and comprehensiveness of the survey of Rumbley et al. and suggests that the number of institutional researchers is probably much higher. While acknowledging that there are no

statistics available on how many of the world's 18 000 universities engage in institutional research or have specific offices or departments devoted to this task, Altbach (2014:1314) estimates that perhaps half of them are involved in institutional research (IR). He further states that "the number of universities and individuals engaged in IR is growing rapidly as the need for data and analysis for larger and complex academic institutions is required". He also maintains that the largest volume of research on higher education is produced by the practitioners (or professionals) working in support service or administration and not by scholars located in academic units.

The third factor we needed to account for is related to the second: due to the diversity of their institutional locations, not all researchers focusing on higher education – in particular the majority of the IR practitioners – publish their work in standard scholarly outlets (although some do). Their research is usually only of interest to a particular higher education institution and is therefore not made available to a wider audience. This (larger) part of the body of research into higher education (existing in the form of so-called 'grey literature') is beyond the scope of this chapter. For feasibility reasons, we limited our study to research on higher education as published in scholarly outlets (journal articles, book chapters/monographs, and published conference proceedings). Only these output types qualify as peer-reviewed scholarly publications in terms of the South African research outputs policy (Department of Higher Education and Training, 2015). The majority of these publications are produced by academics, although some higher education practitioners may also sometimes publish their work in scholarly outlets. To address this bias, we attempted to identify, and include in our data, the publications of these practitioners through the South African higher education professional organisations (see par 5.2).

Aligned with the focus of this book – the uptake, use and impact of research on higher education in Southern Africa – and for feasibility reasons, we limit our investigation in this chapter to the scholarly publications of scholars and practitioners *affiliated with public universities in South Africa*. A bibliometric study of such a set of publications is possible, because a comprehensive database of the research publications of all academics and practitioners affiliated with South African public universities is available, namely the SAK. The SAK is a database owned by the Centre for Research on Evaluation, Science and Technology (CREST) at Stellenbosch University, which developed and maintains it. Although we used the SAK as our primary data source, we also used other avenues and sources to address its biases and compile a more comprehensive dataset of SARHE publications, as explained in the next section.

4 Approach to the retrieval of SARHE publications from the South African Knowledgebase and a selection of other sources

The South African Knowledgebase (SAK) contains the bibliographic information of the research publications (journal articles, book chapters/monographs, and published conference proceedings) submitted by South African public universities to the DHET for subsidy purposes (DHET, 2015). It is important to note that the SAK does not include the publications of individuals affiliated to South African private higher education institutions, science councils, or NGOs working in higher education (except when a publication was

co-authored by an individual affiliated with a public higher education institution). This is one of the limitations of this study. In further research, a systematic approach to locate these publications (e.g. through a study of annual reports, authors' bibliographies and other means) may yield a more comprehensive SARHE dataset. However, through the author-based (par 5.2) and journal-based (par 5.3) investigations this limitation was partly addressed. We included authors who are not affiliated with a public higher education institution in South Africa only when they co-authored a publication with South African authors who had such an affiliation.

In 2018, the SAK contained 221 324 unique publications representing 426 496 authorships. Authorships are not unique authors; rather, each time an author produces a publication, either alone or with other authors, it is recorded as an authorship. In other words, a publication with more than one author is recorded as many times in the SAK as the number of (South African public university-affiliated) co-authors it has. Analysing authorships allowed us to analyse various bibliometric properties of SARHE over time, but when we needed to analyse individual authors over the period as a whole, we extracted from SAK and analysed a dataset of individual authors.

For the purposes of this study, we decided to limit the investigation to the period 2005-2015, because, at the time of our data extraction in 2018, the SAK contained sufficiently reliable and comprehensive information for this period only.

The SAK includes comprehensive information on each author and publication. Information fields on authors include a unique ID, the institution with which an author was affiliated at the time of a publication, his/her surname, alternative surname, initial(s), first name(s), common name, gender, race, date of birth, nationality, academic rank, status of appointment, alternative institutional affiliations, e-mail address, institutional organisational unit at the time of a publication (faculty, school, college, department, unit, centre, or institute), and ORCID iD. Although the SAK does not include citations, the availability of demographic information distinguishes it from citation indices. This information is of particular importance in the South African context with its ongoing transformation imperatives.

There is indeed a wealth of information available in the SAK. So, how can a dataset of SARHE publications be retrieved from the SAK?

We formulated the problem statement as follows: given the SAK corpus of outputs produced by South African higher education institution-affiliated authorships from 2005 to 2015, identify the set of publications that focus on higher education. Let us call that set **T** for 'target'.

This is the classic information-retrieval problem and the same one that web search engines try to solve (Baeza-Yates & Ribeiro-Neto, 2011). To explain this problem, we apply a few of its core concepts to our study as follows:

- It is necessary to distinguish between the sought-after, idealised set of publications, T_{truth} , and the set **T** actually retrieved by any particular method.
- It is necessary to keep in mind two perspectives on the quality of a retrieval method:

- **Precision:** What proportion of retrieved publications in T are in fact T_truth? This is calculated as the number of true positives divided by the size of the retrieved set (true positives + false positives).
- **Recall:** What proportion of T_truth was actually obtained? This is calculated as the number of true positives divided by size of T_truth (i.e. true positives + false negatives).

Our retrieval approach consisted of five phases (see Figure 2.1), namely:

1. a keyword search of two fields in the SAK: publication titles and journal titles;
2. a search of the fields containing information about authors in the SAK (surname, initial, first name, common name) of those authors identified through the membership lists of professional associations in higher education in South Africa;
3. the retrieval of all the publications, as recorded in the SAK, of the top ten SARHE authors identified in 1) and 2); and then, moving beyond the SAK,
4. the retrieval of the articles in top international journals in higher education that were produced by authors affiliated with South African higher education institutions (see par 5.3 for a list of those journals, as well as the criteria whereby they were selected); and
5. the retrieval of all the publications in the *South African Journal of Higher Education* (SAJHE) (see par 5.3 for the rationale for including all the articles in SAJHE).

We will call the result of the retrieval of publications by means of the keyword search Dataset A and the result of the retrieval of publications based on authors and journals Dataset B (see par 6).

Figure 2.1 Precision and recall of peer-reviewed SARHE publications (visualisation based on McCaffrey, 2016)

5 Retrieving SARHE publications from the South African Knowledgebase and other sources

The process to retrieving SARHE publications from the SAK and other sources is depicted in the flow diagram below (Figure 2.2). In this section each of the phases depicted in this flow diagramme is explained in detail.

Figure 2.2 Flow diagram of the process to retrieve SARHE publications from the SAK and other sources

5.1 KEYWORD-BASED APPROACH TO RETRIEVE SARHE PUBLICATIONS

In order to identify a set of keywords to retrieve SARHE publications from the SAK, we first developed a working definition of ‘higher education as a field of studies’. According to the South African Higher Education Act (101 of 1997, as amended), “Higher Education means all learning programmes leading to a qualification that meets the requirements of the HEQF”. Working with this definition of ‘higher education’, however, would largely exclude the research- and community-engagement functions of higher education institutions, as well as publications related to the institutional and organisational basis of higher education. We therefore decided to use a broader definition based on the classification system of *Higher*

Education Abstracts (Higher Education Abstracts, 2020)² and adapted it with reference to the classifications proposed by Tight (2007, 2012), Bitzer and Wilkinson (2012), Teixeira (2013), Rumbly et al. (2014) and Teichler (2016).

Adding insights based on the experience and knowledge of our team members, as well as the results of our iterative searches through the SAK and other databases, we decided on twelve themes or thematic clusters that cover higher education fairly comprehensively. Table 2.1 lists these clusters as well as the search strings that we formulated for each cluster.

Table 2.1 *Clusters and search strings*

Clusters		Search strings
1	The phenomenon of higher education, higher education institutions, higher education systems	('higher education' or 'post-secondary education' or 'tertiary education' or 'post-school education' or 'higher education institution' or 'higher education provider' or 'academic organization' or 'academic organisation' or 'universit' or 'college' or 'higher education system' or 'higher education structure' or 'higher education policy' or 'classification of higher education systems' or 'type of institution' or 'institution type')
2	Higher education governance, management, and organisation	('institutional mission' or 'institutional vision' or 'planning and management' or 'strategic planning' or 'institutional research' or 'academic organization' or 'academic organisation' or 'external relations' or 'corporate affairs' or 'marketing and communication' or 'external liaison' or 'transformation' or 'renewal' or 'change' or 'governance' or 'management' or 'mission' or 'vision' or 'administration' or 'strategy' or 'department' or 'centre' or 'center' or 'institute' or 'faculty' or 'organization' or 'organisation' or 'marketing') and ('education' or 'universit' or 'college')
3	Students	('student experience' or 'student life' or 'student achievement' or 'student activities' or 'student affairs' or 'student attitudes' or 'student behavior' or 'student characteristics' or 'student development' or 'student engagement' or 'student feedback' or 'student fees' or 'student health' or 'advising service' or 'career service' or 'college environment' or 'university environment' or 'institutional culture' or 'student') and not ('high school' or 'primary school')
4	University staff (employees)	('academic profession' or 'academic work' or 'faculty attitudes' or 'faculty behavior' or 'faculty characteristics' or 'faculty development' or 'faculty employment condition' or 'staff employment condition' or 'faculty evaluation' or 'faculty promotion' or 'faculty recruitment' or 'faculty roles' or 'faculty responsibilities' or 'faculty roles and responsibilities' or 'professor' or 'associate professor' or 'lecturer' or 'registrar' or 'deputy registrar' or 'associate registrar' or 'dean' or 'deputy dean' or 'associate dean' or 'vice-chancellor' or 'vice chancellor' or 'deputy vice-chancellor' or 'deputy vice chancellor' or 'rector' or 'vice-rector' or 'programme director' or 'program director' or 'programme coordinator' or 'program coordinator' or 'provost' or 'vice-provost' or 'ombudsman' or 'librarian' or 'researcher' or 'faculty' or 'head of department' or 'departmental head' or 'departmental chair' or 'chair of department' or 'personnel' or 'staff' or 'professor' or 'lecturer' or 'administrator' or 'director' or 'chancellor') and ('education' or 'universit' or 'college')

² *Higher Education Abstracts* covers more than 200 journals in the fields of education, computer sciences, management, psychology, sociology, and law; papers read at meetings of major education and social sciences conferences; books published by all major higher education publishers; and research reports issued by professional organisations, government agencies, and foundations. Coverage includes materials from the United States and Canada and from foreign publications printed in English (Higher Education Abstracts, 2020).

Table 2.1 *Clusters and search strings (continued)*

Clusters		Search strings
5	Qualifications	('bachelor's degree' or 'master's degree' or 'doctoral degree' or 'higher education certificate' or 'postgraduate certificate' or 'national diploma' or 'qualification framework' or 'PhD' or 'doctorate' or 'diploma' or 'qualification' or 'certificate') and ('education' or 'universit' or 'college')
6	Curriculum, teaching and learning, student success	('pass rate' or 'student success' or 'success rate' or 'cohort analysis' or 'teaching and learning' or 'post graduate' or 'post-graduate' or 'study programme' or 'study program' or 'instructional programme' or 'instructional program' or 'admission' or 'access' or 'selection' or 'enrollment' or 'equity' or 'diversity' or 'attrition' or 'retention' or 'throughput' or 'cohort' or 'curriculum' or 'curricula' or 'teaching' or 'learning' or 'lecture' or 'tutor' or 'test' or 'examination' or 'examiner' or 'graduate' or 'quality' or 'evaluation' or 'accreditation' or 'standards') and ('education' or 'universit' or 'college')
7	Research and innovation	'doctoral degree' or 'doctoral supervision' or 'doctoral education' or ('science policy' or 'supervisory relationship' or 'technology transfer' or 'knowledge' or 'research' or 'scholarship' or 'transfer' or 'academic' or 'academia' or 'theory' or 'theories' or 'theoretical' or 'method' or 'methodolog' or 'science' or 'scientific' or 'scientist') and ('education' or 'universit' or 'college')
8	Engagement	'adult education' or 'continuing education' or 'adult and continuing education' or 'continuous professional development' or ('community engagement' or 'engaged scholarship' or 'community interaction' or 'responsive') and ('education' or 'universit' or 'college')
9	Higher education internationalisation	'higher education internationalization' or 'higher education internationalisation' or 'international education' or 'international student affairs' or 'student mobility' or 'staff mobility' or 'faculty mobility' or ('internationalisation' or 'internationalization' or 'mobility' or 'partner' or 'partnership') and ('education' or 'universit' or 'college')
10	Higher education funding	('financial aid' or 'institutional advancement' or 'student debt' or 'funding' or 'resources' or 'financ' or 'bursar' or 'scholarship' or 'fees' or 'debt') and ('education' or 'universit' or 'college')
11	Higher education facilities	('lecture hall' or 'lecture room' or 'class room' or 'student housing' or 'university housing' or 'student centre' or 'student center' or 'sports fields' or 'sport facilities' or 'facilit' or 'librar' or 'laborator' or 'residence' or 'residential') and ('education' or 'universit' or 'college')
12	Higher education data and information	('information services' or 'information technology' or 'information and communication technology' or 'institutional intelligence' or 'data' or 'ICT*' or 'analytics') and ('education' or 'universit' or 'college')

Using these search strings to retrieve publications from the SAK, we cast the net wide in order to boost the *recall* (that is, the proportion of T_truth obtained). It produced a dataset of 18 032 authorships, but we knew there would also be a large number of false positives. In other words, the level of *precision* (that is, the proportion of retrieved publications in T that are T_truth) achieved by means of the automated retrieval process (through search strings) only, was not satisfactory.

In order to identify and remove the false positives, a research assistant³ classified the authorships into one of three categories: Yes (Y), this publication is definitely about higher education and part of T_truth, or No (N), this is definitely not T_truth, or Uncertain (U). The first author of this chapter then conducted a spot check of the authorships classified as Y or N, investigated all the authorships classified as U, and reclassified them as Y or N.

³ The initial classification of the dataset was done by Renelle Terblanche.

During this iterative manual process, we developed and used the following seven criteria for the initial Y/N/U classification, as well as the subsequent reclassification of the U authorships into Y or N.

1. Publications focusing on teaching and learning in *higher education institutions* were included, while those on institutions offering teaching and learning programmes at other levels of education (such as colleges or primary and secondary schools) were excluded. It is not always possible to determine whether the terms ‘teaching’ or ‘learning’ in the title of a publication refer to education at the level of basic, further or higher education. In those cases, the abstracts of the publications were also consulted.
2. Publications focusing on the curriculum of learning programmes and qualifications in *all fields of studies and in all disciplines offered in higher education* were included. Publications focusing specifically on post-school vocational education and skills training were excluded (see Figure 2.3).

Figure 2.3 Delimitation in terms of levels of education

3. Publications with *higher education institutions as object of investigation* were included. These publications deal with both the structures (the organisational structures, physical structures) and the processes (governance, management, service delivery) of higher education institutions (see Figure 2.4). This criterion was particularly difficult to apply, as illustrated by the following example: not all publications on ‘architecture’ are included; only studies on the architecture of buildings of higher education institutions were.

Figure 2.4 Delimitation in terms of the type of institution

4. Publications on *students* (including student affairs, student experience, student health, student finance, etc.) in higher education were included, but not those on students in primary and secondary education, and not those on sectors in tertiary education other than higher education (see criteria a and b) (see Figure 2.5). Again, it was not always possible to determine whether the term ‘students’ in the title of a publication refers to school education or higher education, or both. In those cases, the abstracts of the publications were also consulted.

5. Publications on the *staff* (academic, professional, technical, support and service staff) employed by higher education institutions were included, while publications on employees at other levels of education (e.g. school teachers) were excluded (see Figure 2.5). It was not always possible to determine whether the term ‘teachers’ in a title refers to school education or higher education, or both. In those cases, the abstracts of the publications were also consulted.

Figure 2.5 *Delimitation in terms of staff and students*

6. Publications on *research, knowledge production, science and innovation in higher education institutions*, e.g. publications on science policy (related to higher education) and on research training provided by higher education institutions, were included. It was challenging to draw such a distinction consistently, since ‘higher education’ is globally primarily associated with matters related to teaching, learning, education and training, whereas research, knowledge production, science and innovation are viewed as fields related to (and often overlapping with) higher education, but not necessarily concerning higher education itself (see Figure 2.6).

Figure 2.6 *Delimitation in terms of the field of research*

We removed the false positives which comprised 60% of the total of 18 032 authorships retrieved, as well as some duplicates, which resulted in a dataset of 7 064 authorships of 4 214 unique publications (which we refer to as Dataset A). Thus, through the manual inspection process, we were able to enhance the level of precision significantly, although it is not possible to estimate comprehensiveness of the recall of the resulting database of 7 064 authorships (4 214 publications). The scope of T_{truth} remains unknown.

Given the diffuse nature of studies and research on higher education, and the overlap with education at various levels and with knowledge production and science in a broad sense, claims about the level of precision acquired by combining our wide-ranging keyword search with the manual process as described above, need to remain provisional. In order to improve

on both the recall and precision of the dataset of SARHE publications, we expanded the retrieval process with more refined author-based and journal-based retrieval approaches, as described in the next two sub-sections (5.2 and 5.3).

5.2 AUTHOR-BASED RETRIEVAL APPROACH TO LOCATE SARHE PUBLICATIONS

The author-based retrieval process consisted of two steps, (a) compiling a more comprehensive list of authors responsible for SARHE publications (more comprehensive than that which resulted from the keyword retrieval process described in par 5.1), and repeating the search for SARHE publications in the SAK using this more comprehensive list of authors; and (b) using the names of the ten most productive authors to search the SAK (to locate also their publications that may have been missed by the keyword search), and then, going beyond the SAK, searching the WoS to locate the publications of these most productive authors that may not be recorded in the SAK.

For the first step, we approached 16 South(ern) African professional associations active in higher education, requesting the names and surnames of their members (but not their contact details or any other information), explaining that we wanted to locate the scholarly publications that they may have published in scholarly outlets.

We approached the following associations:

Table 2.2 Professional associations in higher education

Association of South African University Directors of Information Technology	ASAUDIT
Campus Protection Society South Africa	CAMPROSA
Committee for Directors of Higher Education Libraries in South Africa	CHELSA
Higher and Further Education Disability Services Association	HEDSA
Higher Education Learning and Teaching Association of Southern Africa	HELTASA
International Education Association of South Africa	IEASA
Higher Education Legal Practitioners' Forum	-
South African Association of Campus Health Services	SAACHS
South African Association of Senior Student Affairs Professionals	SAASSAP
South African Facilities Management Association	SAFMA
South African Higher Education Community Engagement Forum	SAHECEF
South African Institute for Advancement	SAIA
University Sport South Africa	USSA
Southern African Association for Counselling and Development in Higher Education	SAACDHE
Southern African Association for Institutional Research	SAAIR
Southern African Research and Innovation Management Association	SARIMA

Unfortunately, only three associations responded to the request to provide the names of their members, namely, Southern African Association for Institutional Research (SAAIR), South African Facilities Management Association (SAFMA) and Committee for Directors of Higher Education Libraries in South Africa (CHELSA). In some cases, associations were not willing to share the names of their members without the permission of the members. In a number

of cases the officers of the associations indicated that they were willing to provide the names of their members, but eventually did not do so. For a deeper and more comprehensive understanding of higher education in South Africa, more systematic and comprehensive information on the activities of the associations listed above is very important.

The SAAIR membership list comprised 897 names, SAFMA 1 192 and CHELSA 26. Searching through the SAK for all these names yielded 136 authorships of scholarly publications (132 publications), which we included in Dataset B. Given that the precision (T_truth) of this retrieval is 100%, and given that we received such a disappointingly low response from the professional associations, a follow-up study is warranted. Many of the members of associations such as the Higher Education Learning and Teaching Association of South Africa (HELTASA) and the Southern African Research and Innovation Management Association (SARIMA) are 'third space professionals' (Whitchurch, 2013) whose job description includes academic work (and publication), therefore the higher yield of their scholarly publications was to be expected. In fact, one of the goals of the South African Journal of Higher Education (SAJHE) is to publish the research of HELTASA members.

The second step of the author-based retrieval process consisted of searching the SAK for the names of the ten most productive authors (to locate also their publications that may have been missed by the keyword search), and then, going beyond the SAK, searching the WoS to locate the publications of these most productive authors that may not be recorded in the SAK. Among the 6 952 authorships of Dataset A, the following individuals had the highest number: JW (Johan) de Jager, CC (Charl) Wolthuter, Y (Yusef) Waghid, EM (Eli) Bitzer, P (Philip) Higgs, C (Clever) Ndebele, IM (Isaac) Ntshoe, P (Patient) Rambe, J (Babs) Surujlal and M (Melanie) Walker.⁴ A search of the SAK to locate the publications of these authors yielded a total of 581 additional authorships on higher education. We did not include all the authorships of these ten authors in our dataset – only their publications on higher education. The precision (T_truth) of this retrieval is very high. These 136 + 581 authorships (with duplicates removed) constituted the first two building blocks of Dataset B (see Figure 2.2).

5.3 JOURNAL-BASED RETRIEVAL APPROACH TO LOCATE SARHE PUBLICATIONS

The final part of the retrieval process was journal-based. It consisted of two steps, namely to a) identify and retrieve the publications of South African authors in ten prominent international higher education journals published in English; and b) retrieve all the articles published in the *South African Journal of Higher Education* (SAJHE) during the period 2005-2015.

Our selection of ten prominent international journals was based on the bibliometric studies of Tight (2007, 2012) focusing on specialist higher education journals. Our selection was also informed by the study of Budd and Magnusen (2010) who analysed the citations of the articles published in three core journals in higher education during the period 2001-2006 (namely, *Research in Higher Education*, *Review of Higher Education*, and *Journal of Higher Education*) and identified the 25 most frequently cited journals in the field. Based on these studies, we selected the following 20 journals (listed in alphabetical order).

⁴ This list of the ten authors with the highest number of authorships in Dataset A differs from the final list of the most productive SARHE authors (see Table 2.7), because that list was compiled from the combined dataset A + B and after further cleaning of data.

Table 2.3 *A selection of leading international, English language, specialist higher education journals*

Assessment and Evaluation in Higher Education (AEHE)
Change. The Magazine of Higher Learning
Higher Education (HE)
Higher Education Management
Higher Education Management & Policy (HEMP)
Higher Education Policy (HEP)
Higher Education Quarterly (HEQ)
Higher Education Research & Development (HERD)
Higher Education Review
Innovative Higher Education (IHE)
International Journal for Academic Development (IJAD)
Journal of College Student Development (JCSD)
Journal of Higher Education (JHE)
Journal of Higher Education Policy and Management (JHEPM)
Quality in Higher Education
Research in Higher Education (ResHE)
Review of Higher Education (RevHE)
Studies in Higher Education (SHE)
Teaching in Higher Education (THE)
Tertiary Education and Management (TEAM)

The search of the SAK for the publications of South African scholars in these 20 journals yielded 232 authorships for the period 2005-2015. We also searched the rest of the WoS (beyond these 20 journals) for the publications of the ten most productive authors referred to in the previous sub-section, and that search yielded 153 authorships (13 of them were not recorded in the SAK due to gaps in the annual reports by their institutions to the DHET). These 232 + 153 authorships (after the duplicates were removed) constitute the second building block of our Dataset B. The precision (T_truth) of this retrieval of authorships is high.

Finally, since the SAJHE specialises in higher education studies, it can be assumed that the editorial board publishes articles on higher education only. Therefore, all the articles in this journal were considered relevant for our study of SARHE publications and a 100% precision could be assumed. The retrieval from the SAJHE yielded 1 354 additional authorships (after we had removed a small number of authors not affiliated to South African higher education institutions), which constituted the final building block of Dataset B.

6 The dataset

The retrieval process described above resulted in two datasets: Dataset A, consisting of 7 064 authorships (that resulted from the keyword search of the SAK), and Dataset B, consisting of 2 074 authorships (that resulted from the author-based and journal-based retrieval approaches). Using a manual approach to improve the precision of Dataset A, the number of authorships was reduced from 18 032 to 7 064. However, given the complexity of the field and the non-exact criteria used in this data-cleaning process, we do not claim full precision for Dataset A. On the other hand, for Dataset B, the precision is very high, if not 100%. It is not possible to estimate the comprehensiveness of the recall of the resulting database (A + B), that is, whether *all* the scholarly publications on higher education produced by individuals affiliated with public South African higher education institutions are indeed included. After duplicates were removed, Datasets A and B were combined and together they comprised 8 222 authorships (5 095 publications).

Finally, we decided to exclude all the authorships of articles published in the 18 journals Mouton and Valentine (2017:5-6) identified on the basis of ‘strong evidence’ as ‘probably predatory’. A similar concern led us to exclude the content of one other journal, the AJIPHERD/AJPHEs, because our investigation of the SARHE publications in this journal supports the conclusion of the Academy of Science of South Africa (ASSAf, 2018:63) that AJIPHERD/AJPHEs “probably engage[s] in questionable (that is, unethical) publication practices”. The 19 journals excluded from our dataset are shown in Table 2.4.

Table 2.4 *Journals excluded from the SARHE dataset (“probably predatory journals”)*

African Journal for Physical, Health Education, Recreation and Dance (AJIPHERD); continued in 2016 by the African Journal for Physical Activity and Health Sciences (AJPHEs)
African Journal of Business Management
Anthropologist: International Journal of Contemporary and Applied Studies of Man
Corporate Board: Role, Duties and Composition
Corporate Ownership and Control
International Business and Economics Research Journal
International Journal of Educational Sciences
International Journal of Sustainable Development
Journal of Applied Business Research
Journal of Communication (Delhi)
Journal of Economics (Delhi)
Journal of Governance and Regulation
Journal of Human Ecology
Journal of Social Sciences
Journal of Sociology and Social Anthropology
Mediterranean Journal of Social Sciences
Problems and Perspectives in Management
Studies of Tribes and Tribals
Studies on Ethno-Medicine

The exclusion of the authorships in the journals listed in Table 2.4 resulted in a dataset comprised of 7 321 authorships. As some surnames of authors are quite common, a final process of author disambiguation was required. During this process, we determined whether authors who share the same surname and the same (or similar) initial(s) are indeed the same person. We did so primarily by investigating, together with available SAK data, author profiles on Google Scholar, ResearchGate and Semantic Scholar, but in some cases more general searches on Google were required, which led us to other sources of information, namely, the staff profiles of higher education institutions, social networking sites such as LinkedIn and Facebook, and the original publications. Since one of the main outcomes of the author disambiguation process is the verified first names of authors, we used these first names, in conjunction with images (where available), to identify the gender of authors for whom such data were not available in the SAK. This process of author disambiguation, with a focus on gender, also allowed us to identify those women authors whose surnames had changed because their marriage status had changed during the period of investigation. Correcting for this issue, and for a few other errors⁵ in the dataset of 7 321 authorships, produced a final set of 7 287 authorships.

The analyses presented in the following section are based on this dataset of 7 287 authorships of 4 397 unique publications produced by 3 770 authors.

7 Results of an analysis of the dataset

We present the results of our analysis of the dataset in the following categories:

1. volume of SARHE authorships and how it has changed over time;
2. SARHE output types (journal articles, book chapters/monographs, and published conference proceedings) and how they have changed over time;
3. diversity (in terms of race and gender) and institutional representation of SARHE authorships and how it compares with the trends in the SAK;
4. individual authors with more than ten SARHE authorships;
5. journals in which SARHE articles were most frequently published.

7.1 NUMBER OF SARHE AUTHORSHIPS AND CHANGES OVER TIME

During the period under investigation (2005-2015), the SARHE authorships constituted 2,5% of the total number of authorships in all fields of studies recorded in the SAK (N=318 801). As Figure 2.7 shows, the volume of the SARHE output increased slightly more than three-fold during the period under investigation: from 308 authorships in 2005 to 1 037 eleven years later (1 062 in 2014).

⁵ At various stages during the process of extracting and finalising our dataset, it was necessary to clean the data. This was necessary because the publication output reports submitted annually to the DHET by higher education institutions (from which the SAK is constructed), sometimes contain inaccuracies.

Figure 2.7 Number of SARHE authorships over time, 2005-2015

We also compared the SARHE trend with the trend in SAK as a whole, presented in Figure 2.8 below, which shows that the increase in volume is similar for SARHE and SAK.⁶

Figure 2.8 Number of SARHE and SAK authorships over time, 2005-2015

⁶ It should be remembered that the SARHE dataset (comprising 2,5% of the SAK) is included in the total SAK dataset with which it is compared.

In order to measure the extent of this similarity, we calculated the compound annual growth rate (CAGR) for both datasets. For the SARHE authorships it was 11,7%, while for the SAK as a whole it was slightly higher at 12.4%. In terms of the increase in output volume from 2005 to 2015, the trend in higher education studies and research is therefore similar to the trend in all fields of studies produced by South African public universities.

7.2 OUTPUT TYPES OF SARHE AND CHANGES OVER TIME

For most of the analyses we conducted, authorships were the unit of analysis. However, when the publication itself becomes the subject of investigation (e.g. output types, as we report here in par 7.2), the individual publications should be treated as the unit of analysis. If not, the analysis erroneously compares a ratio over time of a number that itself changes over time. For example, in the case of SAK, the average authors per publication increased from 1.719 to 2.059 between 2005 and 2015.

During the period as a whole, the majority of the 4 397 SARHE publications were journal articles (72%). Published conference proceedings constituted 20%, while only 8% of publications are classified as book chapters/monographs. Table 2.5 below presents these percentages and the frequencies on which they are based, and compares this distribution across outputs types with that found in the SAK. It shows that, in the SAK, journal articles constituted a much larger share (81%) of the total output, while the percentage of published conference proceedings in the SAK is lower (13%) than SARHE. The percentage of book chapters/monographs for SARHE (8%) and the SAK (7%) are, however, quite similar.

Table 2.5 SARHE and SAK publications by output type

	SARHE		SAK	
	N	%	N	%
Journal article	3 175	72	132 844	81
Published conference proceedings	878	20	20 602	13
Book chapters/Monograph	344	8	10 982	7
Total	4 397	100	164 365	100

Our analysis of changes over time shows that all output types in SARHE increased over the period 2005–2015, although not at the same rate. Journal articles increased slightly less than three-fold (from 251 to 692), while published conference papers increased almost five-fold (from 54 to 267). Book chapters/monographs increased quite substantially, from a very low base of 3 in 2005 to 78 in 2015.

The increasing preference among SARHE scholars for published conference proceedings and book chapters/monographs *vis-à-vis* journal articles is in both cases slightly more pronounced than in the SAK as a whole. In the SAK, the proportion of published conference proceedings increased from 7% to 15% (an 8-point increase), while the SARHE proportion increased from 16% to 27% (an 11-point increase). On the other hand, the proportion of articles reduced from 83% to 63% (a 20-point decrease) (Figure 2.10).

In Figure 2.9 we show the changes in proportion of output types in SARHE over time:

Figure 2.9 Proportions of SARHE output types over time, 2005-2015

Figure 2.10 Proportion of published conference proceedings in SARHE and SAK over time, 2005-2015

In the SAK the proportion of book chapters/monographs increased from 3% to 8% (a 5-point increase), while the SARHE proportion increased from 1% to 8% (a 7-point increase) (Figure 2.11).

Figure 2.11 *Proportion of book chapters/monographs in SARHE and SAK over time, 2005-2015*

Although the journal article remains the most popular form of outlet for scholarly publications across all fields of studies, including SARHE, our trend analysis points to the use of more diverse forms of outlets to disseminate research findings.

7.3 DIVERSITY AND INSTITUTIONAL REPRESENTATION OF SARHE AUTHORSHIPS

Given “the imperative to transform the knowledge production enterprise in South Africa to achieve greater inclusivity and representativeness by all South Africans” (Mouton, 2019b:22), we have analysed the changes in this regard in the SARHE dataset and compared it with the SAK as a whole.

The proportion of Black (AIC = African, Indian and Coloured) authorships in SARHE increased from 23% in 2005 to 46% in 2015, representing a change of 31 percentage points. For the SAK, this proportion changed from 17% to 38%, i.e. 21 percentage points (Figure 2.12).

Figure 2.12 *Proportion of AIC authorships in SARHE and SAK over time, 2005-2015*

The proportion of female authorships in SARHE has increased from 43% to 55% (12 percentage points), while for the SAK as a whole, the proportion changed from 30% to 33% (3 percentage points) (Figure 2.13).

Figure 2.13 *Proportion of female authorships in SARHE and SAK over time, 2005-2015*

Inclusivity and representativeness also apply to the institutional location of researchers. While it can be expected that the distribution of SARHE scholars (or scholars in any field of studies, for that matter), will not be equal across all the public higher education institutions in the country, it is important for a descriptive study such as this to note the distribution. This is an indication of the relative strengths of institutions with staff active in SARHE. During the period 2005-2015 as a whole, slightly more than half (52,7%) of the authorships⁷ in SARHE were affiliated, at the time of their publications, with six of the 26 South African higher education institutions (Table 2.6).

Table 2.6 *Institutional affiliation of authorships, ranked in descending order of frequency of authorships*

Affiliation	N	%	Cum. %
University of South Africa (Unisa)	768	10,5	10,5
Stellenbosch University (SU)	733	10,1	20,6
University of KwaZulu-Natal (UKZN)	631	8,7	29,3
University of Cape Town (UCT)	599	8,2	37,5
University of Pretoria (UP)	580	8,0	45,5
Northwest University (NWU)	527	7,2	52,7
University of the Free State (UFS)	423	5,8	58,5
University of Johannesburg (UJ)	421	5,8	64,3
Witwatersrand University (Wits)	412	5,7	70,0
University of the Western Cape (UWC)	373	5,1	75,1
Tshwane University of Technology (TUT)	306	4,2	79,3
Cape Peninsula University of Technology (CPUT)	252	3,5	82,7
Rhodes University (RU)	247	3,4	86,1
Nelson Mandela University (NMU)	229	3,1	89,3
Central University of Technology (CUT)	157	2,2	91,4
University of Limpopo (UL)	126	1,7	93,2
Durban University of Technology (DUT)	117	1,6	94,8
Vaal University of Technology (VUT)	96	1,3	96,1
University of Venda (UniVen)	82	1,1	97,2
University of Zululand (UniZulu)	82	1,1	98,4
University of Fort Hare (UFH)	65	0,9	99,3
Walter Sisulu University (WSU)	35	0,5	99,6
Mangosuthu University of Technology (MUT)	12	0,2	99,8
Sefako Makgatho Health Sciences University (SMU)	4	0,1	99,9
University of Mpumalanga (UMP)	4	0,1	100,0
Total	7 281	100,0	

⁷ There were still a few 'others' in the dataset. We checked the affiliations provided on the actual publications and decided to delete them from the dataset. Also, we have six individuals with dual affiliations, which we decided to code as missing. The total for this table is therefore 6 authorships less (n=7281).

7.4 AUTHORS WITH MORE THAN TEN INDIVIDUAL AUTHORSHIPS

There are 3 770 individual authors in our dataset. In this section, we present information of the authors with the highest number of authorships. This is a purely quantitative measure. In a descriptive study such as this one, it is insightful to know who is responsible for the highest number of authorships. It also serves to 'personalise' the study somewhat, going beyond the numerical data in most of the rest of the chapter. A total of 48 individuals produced more than 10 authorships during the period 2005-2015. Table 2.7 lists these authors from highest to lowest number of authorships in the dataset.

Table 2.7 *Individual authors with more than ten authorships, ranked in descending order of frequency of their authorships*

Name of author	N	Name of author	N
De Jager JW (Johan)	84	Balfour RJ (Robert)	13
Wolhuter CC (Charl)	82	Buckley SB (Sheryl)	13
Waghid Y (Yusef)	79	Garraway JW (James)	13
Bitzer EM (Elias Matthys)	51	Higgs LG (Leonie)	13
Higgs P (Philip)	32	Ocholla DN (Dennis)	13
Rambe P (Patient)	27	Peltzer K (Karl)	13
Ntshoe IM (Isaac Mogapi)	25	Van Wyk B (Berte)	13
Walker MJ (Melanie)	25	Brown CL (Cheryl Lee)	12
Bozalek VG (Vivienne Grace)	24	Coetzee M (Melinde)	12
Leibowitz BL (Brenda)	23	Hay HR (Henriette)	12
Case JM (Jennifer Margaret)	22	Ivala EN (Eunice Ndeto)	12
Wilkinson AC (Annette)	21	Shay SB (Suellen Butler)	12
Le Grange LLL (Lesley)	19	Thwala WD (Wellington Didibhuku)	12
Prinsloo P (Paul)	19	Van Schalkwyk SC (Susan Camille)	12
Schulze S (Salome)	18	Winberg C (Christine)	12
Frick BL (Liesel)	17	Aigbavboa CO (Clinton)	11
Osman R (Ruksana)	17	Czerniewicz L (Laura)	11
Blignaut AS (Anita Seugnet)	16	Du Toit PH (Pieter)	11
Rothmann S (Sebastiaan)	16	Emuze FA (Fidelis)	11
Surujlal J (Babs)	16	Giannakopoulos A (Apostolos)	11
Carolissen RL (Ronelle Louise)	15	Hoskins RGM (Ruth)	11
Frantz JM (Jose Merle)	15	Ng'ambi D (Dick)	11
Gachago D (Daniela)	14	Ngulube, P (Patrick)	11
Soudien CA (Crain)	14	Van der Walt JL (Johannes)	11

Together, these 48 authors constitute approximately one-eighth (13%) of the total number of authorships recorded during this period. The output of the three authors with the highest number of authorships amounted to an average of more than 7 authorships per annum during the period under investigation. In terms of diversity, 40% of these 48 authors are AIC and 48% are female.

7.5 JOURNALS FREQUENTLY USED FOR THE PUBLICATION OF SOUTH AFRICAN RESEARCH ARTICLES ON HIGHER EDUCATION

Since journal articles constitute almost two-thirds of the SARHE outputs, it is important to determine in which journals articles were published most frequently. In Table 2.8 below, we list the ten journals with the highest percentage of article authorships, in descending order of those percentages. A total of 42.7% of the article authorships in SARHE were located in these ten most frequently used journal outlets.

Table 2.8 *Ten journals with the highest percentage of article authorships, ranked in descending order of frequency of their authorships*

Journal	N	%	Cum. %
South African Journal of Higher Education	1 423	26,7	26,7
Alternation: Interdisciplinary Journal for the Study of the Arts and Humanities in Southern Africa	137	2,6	29,3
Perspectives in Education	125	2,3	31,6
Teaching in Higher Education	97	1,8	33,4
Journal of Psychology in Africa	88	1,6	35,0
African Journal of Health Professions Education	86	1,6	36,6
Acta Academica	84	1,6	38,2
Progressio: South African Journal for Open and Distance Learning Practice	82	1,5	39,7
Africa Education Review	80	1,5	41,2
South African Family Practice: Official Journal of the South African Academy of Family Physicians	80	1,5	42,7

The SAJHE constitutes the single largest proportion (26,7%) of all authorships. That is expected, given its specialisation. It is also, at least in part, an artefact of our purposive selection of the content of this journal as part of our search strategy (as explained in par 5.3). Therefore, we conducted an analysis of popular SARHE journals, excluding the SAJHE, to determine which journals together contain a similar majority percentage (42,4%) of the authorships in SARHE. In Table 2.9, we present this list of 25 journals, including the index and publisher information of each. In terms of the formula used for the distribution of state funding to public higher education institutions in South Africa, only journals included in one or more of the lists/indices indicated in Table 2.9 qualify for subsidy. Six of the prominent SARHE journals are only included in the DHET list and not in one of the international lists (*South African Journal of Higher Education*, *Alternation*, *Progressio*, *Journal for New Generation Sciences*, *Journal of Educational Studies*, and *Innovation: A Journal for Appropriate*

Librarianship and Information Work in Southern Africa). This may be an indicator of quality, given that the DHET's policy advice is that "[a]ll South African journals currently not listed in any international index are encouraged to seek inclusion in such indexes and meet the stringent criteria for high quality international journals" (Department of Higher Education and Training, 2015:8).

Table 2.9 Journals with the majority of article authorships (SAJHE excluded), with index and publisher information, and ranked in descending order of frequency of their authorships

	N	%	Cum. %	List/Index						Publisher
				DHET	WoS	Scopus	IBSS	SciELO	Norw	
Alternation: Interdisciplinary Journal for the Study of the Arts and Humanities in Southern Africa	137	4	4							UKZN, Scottsville
Perspectives in Education	125	3	7							UP, Pretoria
Teaching in Higher Education	97	2	9							Taylor & Francis, UK
Journal of Psychology in Africa	88	2	11							Taylor & Francis, UK
African Journal of Health Professions Education	86	2	13							Health and Medical Publishing Group, Pinelands
Acta Academica	84	2	15							Sun Media, Bloemfontein
Progressio: South African Journal for Open and Distance Learning Practice	82	2	17							Unisa Press, Pretoria
Africa Education Review	80	2	19							Taylor & Francis, UK, and UNISA Press, Pretoria
South African Family Practice: Official Journal of the South African Academy of Family Physicians	80	2	21							AOSIS, Durbanville
Journal for New Generation Sciences	79	2	23							CUT, Bloemfontein
South African Journal of Education	72	2	25							SA Education Association, Pretoria
South African Journal of Libraries and Information Science	69	2	27							Forum Press, Pretoria

Table 2.9 Journals with the majority of article authorships (SAJHE excluded), with index and publisher information, and ranked in descending order of frequency of their authorships (continued)

	N	%	Cum. %	List/Index					Publisher
Higher Education	64	2	29						Springer, Netherlands
Curationis: Research Journal of the Democratic Nursing Organisation of South Africa	63	2	31						AOSIS, Durbanville
Education as Change	54	1	32						Unisa, Pretoria, owned by UJ
Journal of Education	49	1	33						UKZN, Scottsville
Studies in Higher Education	48	1	34						Routledge, Taylor & Francis, UK
Mousaion: South African Journal of Information Studies	47	1	35						Unisa Press, Pretoria
South African Journal of Psychology	46	1	36						SAGE, UK
SAMJ: South African Medical Journal	43	1	37						SA Medical Association, Pretoria
Journal of Educational Studies	42	1	38						University of Venda, Toyandou
Innovation: A Journal for Appropriate Librarianship and Information Work in Southern Africa	41	1	39						UKZN, Scottsville
Southern African Linguistics and Applied Language Studies	41	1	40						Taylor & Francis, UK
South African Journal of Physiotherapy	40	1	41						AOSIS, Durbanville
AJRMSTE: African Journal of Research in Mathematics, Science and Technology Education	37	1	42						Taylor & Francis, UK

Key DHET Department of Higher Education and Training
 WoS Clarivate Web of Science (Core Collection)
 Scopus Elsevier's abstract and citation database
 IBSS International Bibliography of the Social Sciences
 SciELO Scientific Electronic Library Online
 Norw Norwegian Register for Scientific Journals, Series and Publishers

8 Discussion

The period of investigation for this bibliometric study was delimited to 2005-2015 because the SAK contains comprehensive information as far back as 2005, and because at the time when this study commenced, we were confident that 2015 was the most recent year that was comprehensively covered in the SAK. The historical context for this period (2005-2015) was marked by significant developments and events. The far-reaching changes in the South African higher education system brought about by the institutional mergers during 2002-2004 were largely finalised by 2005. At the end of 2015 and during 2016, the higher education sector of South Africa experienced widespread student protests that had a major impact on institutions and the higher education system as a whole. Although the period 2005-2015 is located between these two watershed events, and therefore represents a comparatively stable period, there were a number of important developments during that time (Lange & Luescher-Mamashela, 2015). A new funding framework and a new mode of enrolment planning was implemented during the period 2006-2008. In 2009, the Department of Education was divided into two departments: Basic Education and Training, and Higher Education and Training. Between 2009 and 2015, various changes to the Higher Education Act (101 of 1997) were made, expanding government control over higher education (evidenced by the introduction of extended reporting requirements). In 2014, the White Paper for Post-School Education and Training was published (Department of Higher Education and Training, 2014). In our bibliometric study, however, we do not attempt to identify any possible causal relations between these developments and the publication activities and prominent themes in SARHE during this period.

In what follows, we discuss the findings presented above (par 7) under the same headings, namely, changes in the total number of SARHE publications over time, changes in the output types of SARHE publications, diversity and institutional representation of SARHE scholars, authors with the highest number of authorships, and the journals most frequently used for SARHE publications.

A) CHANGE IN THE TOTAL NUMBER OF SARHE PUBLICATIONS AND AUTHORSHIPS

Higher education is clearly a lively area of interest among South African scholars, which means that a continuously expanding body of knowledge is available to scholars, practitioners and decision-makers. There was a significant (slightly more than three-fold) increase in the number of the SARHE authorships during this period. This increase is similar to the increase in publications across all fields (as recorded in the SAK) (Figure 2.8).

B) CHANGE IN THE OUTPUT TYPES OF SARHE PUBLICATIONS

Although the journal article remains the most popular form of outlet for scholarly publications in South Africa across all fields of studies, including SARHE, more diverse forms of outlets are increasingly used to disseminate research findings. The majority of the SARHE publications were journal articles (72%), followed by published conference proceedings (20%), while only 8% of publications were classified as book chapters/monographs. The share of book chapters/monographs is similar for SARHE (8%) and the SAK (7%). However, in the SAK,

journal articles constituted a much larger share of the total output (81% versus 72%) than in SARHE. On the other hand, the share of published conference proceedings in the SAK is smaller than in SARHE (13% versus 20%) (Table 2.5).

While the proportion of book chapters/monographs in the SAK, as well as in the SARHE remained the same, the number of books and monographs increased. In the case of SARHE, only 33 monographs were submitted to the DHET in 2005, compared to 162 submitted in 2014 and only 98 book chapters were submitted in 2004, compared to 964 in 2015. There are, as yet, no generally accepted 'rankings' of book publishers, as is the case with journals. This prompted the ASSAf (2018:97) to recommend to the DHET to produce such a list. Such a list could be used in future to determine whether a book chapter or monograph is of acceptable quality to qualify for subsidy, and it will also ease the current labour-intensive assessment process. This recommendation is not necessarily a negative assessment of the quality of the books or monographs submitted thus far, but it will mean that a more standardised and rigorous process may be used in future with the expectation that it will ensure and enhance the quality of this type of output.

In the case of published conference proceedings, there was an increase in both the absolute number and the share of published conference proceedings in both the SAK and SARHE (with an even greater change in the share in the case of SARHE compared to the SAK). We will not venture into possible explanations for the increasing popularity of published conference proceedings as outlets for SARHE publications. It is noteworthy that there are calls for the DHET to consider 'capping' the maximum number of published conference proceedings submissions that a single academic may submit for a particular year, and that the DHET in future should only award subsidies for published conference proceedings that are indexed in either the WoS or Scopus (Mouton et al., 2019a:78). Should these suggestions be implemented by the DHET, it may have an impact on the increasing popularity of published conference proceedings among SARHE scholars. Notably, two of the authors in the list of the authors with more than 10 authorships in SARHE (Table 2.7) are listed by Mouton et al. (2017:265) among the top 100 most prolific authors of conference proceedings submissions in the country (for the period 2005-2014, the time frame used in their study). These authors are WD Thwala (with 80 published conference proceedings submissions, he is also the person with the highest number of such submissions in the country) and JW de Jager (with 33 published conference proceedings, he is ranked 30th in the list of the top 100).

c) DIVERSITY AND INSTITUTIONAL REPRESENTATION OF SARHE SCHOLARS

The imperative to transform the research enterprise in South Africa is well documented in the White Paper on Science and Technology (Department of Arts and Technology, 1996) and in various subsequent policy and strategy documents. This imperative can be explained as follows:

In essence, the imperative translates into the goal to achieve greater inclusivity and representativeness by all South Africans in the knowledge production enterprise. It is therefore important to ensure that an increased proportion of knowledge outputs (research publications of various types) is produced by female and black South African scientists and scholars. (Mouton et al., 2019b:22)

The scholars responsible for SARHE publications have become significantly more diverse during the period 2005-2015, with Black authorships constituting more than half of the authorships in 2015, compared to about one-fifth in 2005. The rate of change towards a more inclusive community of scholars was much higher in SARHE than in all the fields together (as recorded in the SAK). In terms of gender, the profile in SARHE changed from a minority of female authorships (43%) in 2005 to a majority (55%) in 2015. Should this trend continue, SARHE may become a feminised area of interest. The change in the gender profile of SARHE differs significantly from that recorded in the SAK, in which the proportion of female authorships increased by only three percentage points during this period (compared to an increase of 12 points for SARHE), and in which the proportion of female authorships remained at only one-third of the total in 2015 (compared to 55% for SARHE). However, the profile of SARHE authors with more than 10 authorships is less diverse than the profile for SARHE as a whole. Less than half of those authors are Black and female.

In terms of institutional representation, the most research productive universities according to the 2018 national ranking by per-capita research-publication output, namely UP, SU, Wits, Rhodes University, UCT and UKZN (Department of Higher Education and Training, 2020), are also among those institutions with which the highest number of SARHE authorships are affiliated. However, notable deviations from the national pattern are that Unisa emerged as the most prolific SARHE institution, whereas it occupied the 12th position in the national ranking by per-capita research-publication outputs; secondly, NWU is in the 6th position in SARHE, compared to its 10th position nationally; and thirdly, TUT is ranked 11th in SARHE, compared to its 21st position nationally. We are mindful of the fact that our SARHE ranking of institutions is based on the absolute numbers of authorships affiliated with an institution, whereas the national ranking is based on output normalised by headcount of permanent academic staff, and as such, we are not comparing like with like. However, this comparison does indicate that there are prolific SARHE institutions other than the most research productive universities in the country. Interestingly, scholars affiliated with two of the 'new' universities, UMP (established in 2015) and SMU (established in 2015) published SARHE outputs shortly after the establishment of these institutions.

D) INDIVIDUALS WITH THE HIGHEST NUMBER OF SARHE AUTHORSHIPS

A number of comments need to be made about the list of the 48 most productive SARHE authors (Table 2.7). Firstly, it is important to interpret this list within the context of the data sources from which, and processes with which, it was produced, as described in this chapter (par 4-6). It can therefore not be deemed as a list of the 'most influential' or the 'most prominent' higher education scholars in the country. If such a list is to be compiled, other data sources and criteria will have to be used that would capture ways in which the terms 'influential' or 'prominent' may be understood. Such a list may then include, for example, individuals who have produced a smaller number of publications that had a high impact, or individuals who are not affiliated with public higher education institutions (but affiliated with, for example, independent research centres or statutory bodies in higher education). Secondly, the fact that these 48 most productive SARHE authors are responsible for a high number of outputs does not mean that the publications of all of them have also been highly cited. Since we worked with the SAK as our primary data source, we did not have the data

available to conduct a citation analysis that would have allowed us to make such finer distinctions. However, a preliminary investigation of the citation information available on Google Scholar shows that these authors' h-indexes vary from impressively high to quite low in a number of cases. A citation analysis of SARHE publications and a more comprehensive study of the scholarly profile of leading SARHE scholars are therefore recommended as topics for further study. Thirdly, it would be interesting to conduct further studies on not only the scholarly profiles of prolific SARHE authors, but also on their involvement in commissions, committees, task teams, etc. (at institutional and national levels) to gain more insight into the relationship between research and policy/practice in higher education. Finally, the fact that an author such as WD Thwala is listed here as a 'SARHE author' while his field of specialisation is Construction Management and Quantity Surveying (in Engineering), illustrates that higher education is a broad interdisciplinary area of studies, rather than a traditional discipline (par 3).

E) JOURNALS MOST FREQUENTLY USED FOR SARHE PUBLICATIONS

Almost half (42%) of the SARHE publications were published in what we identified as the 25 most popular SARHE journals (including the SAJHE) (Tables 2.8 and 2.9). Only three of the most prominent international, English-language journals (*Teaching in Higher Education*, *Higher Education*, and *Studies in Higher Education*, see Table 2.3) are included in this list of journals with the highest percentage of SARHE article authorships, which indicates that SARHE scholars published mostly in local journals during the period under investigation. However, a more detailed set of criteria is necessary if journals are to be categorised as 'international' or 'local'. For example, the journals owned and published by South African universities (e.g. UP, Unisa, UKZN, CUT, UniVen), local commercial groups (e.g. Health and Medical Publishing Group, AOSIS, SunMedia or Forum Press), or local associations (e.g. the South African Education Association, the South African Medical Association or Universities South Africa [USAf]) can be considered as 'local' journals. But there are other journals with a distinctly (South) African focus (for example the *South African Journal of Psychology* or the *Southern African Linguistics and Applied Language Studies*) that are owned and published by international commercial organisations (such as SAGE or Taylor & Francis).

More than a quarter of SARHE articles were published in the SAJHE (Table 2.8). The SAJHE is one of the ten 'mega-journals' in South Africa, publishing on average more than 80 articles per year (ASSAf, 2018:63). The SAJHE is not listed in the WoS, Scopus, IBSS, SciELO or the Norwegian register (that is, the four international lists of journals accredited by the DHET for state subsidy). However, since it is included in the DHET's list of accredited journals, articles published in the SAJHE do qualify for subsidy. During a recent evaluation of journals in education, ASSAf's Committee on Scholarly Publishing in South Africa made a number of critical comments about the SAJHE, noting that (a) while some of the articles published are of very good quality, others are less so; (b) the local or regional focus of the journal is strong; and (c) there is "too strong a bias towards small scale qualitative studies located within critical frameworks" and recommended that the journal "seek to broaden the scope of approaches to higher education represented in the journal to more comprehensively reflect the scope of research on higher education in the country" (Committee on Scholarly Publishing in South Africa, 2020:56). Furthermore, the ASSAf Committee recommended that a new editor be appointed for a shorter term (the current editor was appointed by USAf in 2006 for a term of 20 years) (Committee on Scholarly Publishing in South Africa, 2020:58).

In addition to SAJHE, seven of the other journals have the highest percentage of SARHE article authorships (Tables 2.8 and 2.9). These were also reviewed by ASSAf's Committee on Scholarly Publishing. In the case of the *Journal of Educational Studies* (JES), the Committee recommended its removal from the DHET accredited list (2020:35), which means its content would cease to qualify for subsidy. Regarding a number of the other journals, there are recommendations that the quality be enhanced; that the editorial boards be diversified; that the journals draw on more expertise from the African continent; and that the journals should attempt to attract more articles by international scholars. However, ASSAf's Committee on Scholarly Publishing recommended that these journals all continue to be listed on the DHET's accredited list.

Related to these issues of journal quality is our decision (explained in more detail in par 4) to remove close to one-tenth of authorships from our dataset, because they were published in journals that have been identified as probably predatory or for which the evidence that they partake in predatory practices is strong. Regarding the South African higher education system as a whole, ASSAf (2018:88) observed that publishing in predatory outlets is continuing, although its incidence is declining. We did not have data available to compare the extent of predatory publishing on SARHE with other fields of studies, or with the system as a whole. Yet, even without such comparative data, it is a matter of concern that such a high proportion of SARHE publications appeared in journals that follow questionable practices.

9 Conclusion

The aim of this chapter was to identify and describe, by means of a bibliometric study, the body of research on higher education produced by researchers and practitioners affiliated with South African public universities during the period 2005-2015.

To provide a contextual background to SARHE, we devoted the first part of the chapter to important features of the context and producers of research on higher education. Firstly, higher education is not a traditional academic discipline, but should rather be seen as an 'area of priority' for political and economic players, including funders and, in the case of public higher education institutions, the state. Research on higher education is also of importance for higher education leaders and managers in support of decision-making. Secondly, higher education is both a field of professional practice and the object of scholarly research. The producers of this research include academic researchers (based in various locations, such as academic faculties, institutes or centres in higher education institutions, independent research institutes, or NGOs) as well as practitioners (employed in the support services or administration of higher education institutions, serving in leadership positions in higher education institutions, or employed by regulatory bodies or government agencies in higher education systems or NGOs). Thirdly, and as a consequence of the second factor, the research on higher education that finds its outlet in scholarly publications is, arguably, a relatively smaller part of the total body of research on higher education, because practitioners tend to use other modes of dissemination for their findings.

Given this background, it was necessary to describe our methodological approach to the bibliometric study in detail. We explained in a stepwise exposition the choices we made and clarified the criteria we used, as well as the limitations, possibilities, and implications

of our choices. Following the discussion of our approach, we presented the results of the bibliometric study under five headings: (a) the size of SARHE, (b) the types of output, (c) the demography and institutional distribution of the producers of SARHE outputs, (d) the scholars with the highest number of authorships, and (e) the journals in which this research was published.

This study presents only a partial view of SARHE, namely the scholarly publications of scholars and practitioners affiliated with public universities in South Africa. Ideally, a more comprehensive study of research on higher education in South Africa would also include, for example, the following: the SABINET and CREST databases of master's and doctoral theses; various NRF databases (e.g. the applications for NRF rating and applications for funding); the annual reports of statutory bodies and NGOs (that could be accessed through web sites and direct interaction); and the curricula vitae of prolific scholars. In order to diversify the scope beyond scholarly publications, we recommend that a more comprehensive study, which includes grey literature, should be undertaken, using the following potential sources of data: institutional repositories and archives; the documents of practitioners; documents in hard copy on bookshelves; annual reports of institutions; the web sites and databases of statutory bodies, science councils and industry bodies, and so forth.

We have identified in this study a few matters of concern regarding SARHE such as the quality of some publications and some journals, the lack of a broader African and international scope in the research, and the extent of publications in predatory outlets. However, many positive trends also emerged. SARHE is a lively and growing field of research and the scholars involved in SARHE are increasingly more diverse.

Although the profile of SARHE presented in this chapter is a helpful description of the formal characteristics of this field of research, the contents (or substantial characteristics) of SARHE remain to be investigated: What is this scholarship all about? What themes and topics are of interest to the South African scholars responsible for these publications? The results of such a content-related study of SARHE are reported in Chapter 3.

References

Altbach, P.G. (2014). 'The Emergence of a Field: Research and Training in Higher Education'. <i>Studies in Higher Education</i>, 39(8):1306-1320. https://doi.org/10.1080/03075079.2014.949541 ASSAf (Academy of Science in South Africa). (2018). <i>Twelve Years Later: Second ASSAf Report on Research Publishing in and from South Africa</i>. Pretoria: ASSAf. http://dx.doi.org/10.17159/assaf.2018/0030 Baeza-Yates, R. & Ribeiro-Neto, B. (2011). <i>Modern Information Retrieval: The Concepts and Technology Behind Search</i>. 2nd Edition. Boston, MA: Addison Wesley.	Bitzer, E. & Wilkinson, A. (2012). 'Higher Education as a Field of Study and Research in South Africa: A Historical and Thematic Perspective'. <i>Tydskrif vir Geesteswetenskappe</i>, 52(3):382-396. Budd, J.M. & Magnuson, L. (2010). 'Higher Education Literature Revisited: Citation Patterns Examined'. <i>Research in Higher Education</i>, 51(3):294-304. https://doi.org/10.1007/s11162-009-9155-6 Committee on Scholarly Publishing in South Africa. (2020). <i>Report on Grouped Peer Review of Scholarly Journals in Education</i>. Pretoria: ASSAf. https://doi.org/10.17159/assaf.2019/0062

- Department of Arts, Culture, Science and Technology. (1996). *White Paper on Science and Technology: Preparing for the 21st Century*. Pretoria: Government Printing Works. Retrieved from <https://bit.ly/2XJgmVp> (Accessed 3 August 2021).
- Department of Higher Education and Training. (2014). *The White Paper for Post-School Education and Training. Building an Expanded, Effective and Integrated Post-School System*. Pretoria: Government Printing Works. <https://bit.ly/3D3euXv> (Accessed 3 August 2021).
- Department of Higher Education and Training. (2015). Research Outputs Policy. *Government Gazette*, 597(38552), Notice 188 of 2015. 11 March.
- Department of Higher Education and Training. (2020). *Report on the Evaluation of the 2018 Universities' Research Output*. Pretoria: Government Printing Works. <https://bit.ly/3gl7n33> (Accessed 3 August 2021).
- Hammarfelt, B. & Haddow, G. (2018). 'Conflicting Measures and Values: How Humanities Scholars in Australia and Sweden Use and React to Bibliometric Indicators'. *Journal of the Association for Information Science and Technology*, 69(7):924-935. <https://doi.org/10.1002/asi.24043>
- Harland, T. (2009). 'People Who Study Higher Education'. *Teaching in Higher Education*, 14(5):579-582. <https://doi.org/10.1080/13562510903186824>
- Higher Education Abstracts. (2020). 'Issue Information'. *Higher Education Abstracts*, 55(1):1-4. <https://doi.org/10.1111/hea.12130>
- Kehm, B.M. (2015). 'Higher Education as a Field of Study and Research in Europe'. *European Journal of Education*, 50(1):60-74. <https://doi.org/10.1111/ejed.12100>
- Lange, L. & Luescher-Mamashela, T. (2015). 'Governance, Leadership, Management'. In: *South African higher education reviewed: Two decades of democracy*. Preoria: Council on Higher Education. pp.105-142.
- McCaffrey, J.D. (2016). *Precision and Recall in Information Retrieval*. Retrieved from <https://bit.ly/3j55J7E> (Accessed 3 August 2021).
- Mouton, J. et al. (2017). *A Study of Scientific Journal and Book Publishing in South Africa: 2005-2014*. Stellenbosch: CREST. Retrieved from <https://bit.ly/382WKNT> (Accessed 3 August 2021).
- Mouton, J. et al. (2019a). *The Quality of South Africa's Research Publications. Final Report to Department of Higher Education and Training*. Stellenbosch: CREST and SciSTIP. Retrieved from <https://bit.ly/3k7Al25> (Accessed 3 August 2021).
- Mouton, J. et al. (2019b). *The State of the South African Research Enterprise*. Stellenbosch: SciSTIP. Retrieved from <https://bit.ly/3k9DdAU> (Accessed 3 August 2021).
- Mouton, J. & Valentine, A. (2017). 'The Extent of South African Authored Articles in Predatory Journals'. *South African Journal of Science*, 113(7-8):1-9. <https://doi.org/10.17159/sajs.2017/20170010>
- Roemer, R.C. & Borchardt, R. (2019). *Meaningful Metrics: A 21st Century Librarian's Guide to Bibliometrics, Altmetrics, and Research Impact*. Chicago, IL: The Association of College & Research Libraries. Retrieved from <https://bit.ly/3y3hDmw> (Accessed 3 August 2021).
- Rumbley, L.E. et al. (2014). *Higher Education: Worldwide Inventory of Research Centres, Academic Programmes, Journals and Publications*. 3rd Edition. Bonn: Lemmens.
- Strydom, A. (2002). 'Globalisation and Higher Education Studies in South Africa'. *South African Journal of Higher Education*, 16(1):91-98. <https://doi.org/10.4314/sajhe.v16i1.25279>
- Teichler, U. (2016). Higher Education Research: A Consolidated Field?. In: N. Cloete, L. Goedegebuure, Å. Gornitzka, J. Jungblut & B. Stensaker (eds.), *Pathways Through Higher Education Research. A Festschrift in Honor of Peter Maassen*. Oslo: University of Oslo. pp. 143-146.
- Teixeira, P.N. (2013). Reflecting About Current Trends in Higher Education Research: A View from the Journals. In: B.M. Kehm & C. Musselin (eds.), *The Development of Higher Education Research in Europe*. Rotterdam: Sense Publishers. pp. 103-122. https://doi.org/10.1007/978-94-6209-401-7_9

- Tight, M. (2007). 'Bridging the Divide: A Comparative Analysis of Articles in Higher Education Journals Published Inside and Outside North America'. *Higher Education*, 53:235-253. <https://doi.org/10.1007/s10734-005-2429-9>
- Tight, M. (2012). 'Higher Education Research 2000-2010: Changing Journal Publication Patterns'. *Higher Education Research & Development*, 31(5):723-740. <https://doi.org/10.1080/07294360.2012.692361>
- Van Leeuwen, T. (2004). Descriptive Versus Evaluative Bibliometrics. In: H.F. Moed, W. Glänzel, U. Schmoch (eds.), *Handbook of Quantitative Science and Technology Research: The Use of Publication and Patent Statistics in Studies of S&T Systems*. Dordrecht: Springer. pp. 373-388. <https://doi.org/10.1007/1-4020-2755-9>
- Weingart, P. (2010). A Short History of Knowledge Formations. In: R. Frodemann, J., Thomson Klein & C. Mitcham (eds.), *The Oxford Handbook of Interdisciplinarity*. Oxford: Oxford University Press. pp. 3-14.
- Whitchurch, C. (2013). *Reconstructing Identities in Higher Education. The rise of 'Third Space' professionals*. London: Routledge.
- Whitley, R. (2000). *The Intellectual and Social Organization of the Sciences*. 2nd Edition. Oxford: Oxford University Press.