

**The current state of science journalism in South Africa:
Perspectives of industry insiders**

by

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Declaration

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Abstract

Science news reporting in the South African media does not enjoy the same status as other beats such as politics, sport and business. While extensive research has been conducted into the importance and quality of science journalism in South Africa, on the African continent and globally, current research regarding the personal experiences and perceptions of science journalists in South Africa is in short supply. This study examines the current state of science journalism in South Africa, according to industry insiders. The research was conducted using the interpretive paradigm and phenomenological approach in social theory as theoretical framework. The researcher employed qualitative or interpretive research methods and undertook a participant observation study. Data was collected through qualitative, semi-structured, in-depth interviews with 20 science journalists, science communicators and science writers in South Africa. The researcher investigated participants' opinions and perceptions regarding the current state of science journalism, challenges in the field of science journalism, the relationship between scientists and journalists, the role of science communication, the value of postgraduate studies in science journalism, the importance and value of the South African Science Journalists' Association and the future of science journalism in South Africa. The research found that there were both positive and negative sentiments on the part of the participants regarding the state of science journalism in South Africa.

Opsomming

Verslaggewing oor wetenskap in die Suid-Afrikaanse media geniet nie dieselfde status as ander spesialisvelde soos die politiek, sport en ekonomie nie. Alhoewel uitgebreide navorsing al gedoen is oor die belangrikheid en kwaliteit van wetenskapjoernalistiek in Suid-Afrika, op die Afrika-kontinent en wêreldwyd, is daar bykans geen navorsing oor die persoonlike ervarings en persepsies van wetenskapjoernaliste in Suid-Afrika nie. Hierdie studie ondersoek die toestand van wetenskapjoernalistiek in Suid-Afrika, volgens dié in die bedryf. Die navorsing is uitgevoer met behulp van die interpretatiewe paradigma en fenomenologiese benadering in sosiale teorie as teoretiese raamwerk. Die navorser het kwalitatiewe navorsingsmetodes gebruik en het 'n deelnemende waarnemingstudie onderneem. Data is ingesamel deur middel van kwalitatiewe, semi-gestruktureerde, in-diepte onderhoude met 20 wetenskapjoernaliste, wetenskapskommunikasiespesialiste en wetenskapskrywers in Suid-Afrika. Die navorser het data oor deelnemers se menings en persepsies oor die toestand van wetenskapjoernalistiek, uitdagings op die gebied van wetenskapjoernalistiek, die verhouding tussen wetenskaplikes en joernaliste, die rol van wetenskapkommunikasie, die waarde van nagraadse studie in wetenskapjoernalistiek, die belangrikheid en waarde van die Suid-Afrikaanse Wetenskapjoernalistiekvereniging en die toekoms van wetenskapjoernalistiek in Suid-Afrika ingesamel. Die navorsing het bevind dat daar beide positiewe en negatiewe sentimente by die deelnemers oor die wetenskaplike joernalistiek in Suid-Afrika is.

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Chapter 1: Introduction and background

“We’ve arranged a global civilisation in which most critical elements profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster.” – Carl Sagan (1996)

1.1 Research problem and motivation for the study

Science news reporting in the South African media does not enjoy the same status as other beats such as politics, sport and business. Science editors and science desks often are curtailed in terms of human and financial resources, training and skills development, according to a study conducted by Claassen (2011:352).

In a study on the relationship between journalists and scientists, Claassen found that “urgent attention” should be given to the status of science reporting in South Africa, “The allocation of journalists who are untrained in science to scientific beats, and the rather haphazard reporting of science by mostly scientifically illiterate journalists, should be changed.” (2011:363)

Considering the power of the media to influence public perceptions and to assist government, business and consumers in making informed choices, specialist science journalists are vital to assist in and improve the public’s understanding of science (Claassen, 2011:352).

Van Rooyen (2004) found that coverage of science and technology in the South African press is insufficient. “Less than 2% of editorial space in some of the country's top publications is awarded to these topics.”

While extensive research has been conducted into the importance and quality of science journalism in South Africa, on the African continent and globally, current research regarding the personal experiences and perceptions of science journalists in South Africa is in short supply.

Preliminary research on several databases (including *Google Scholar*, *Taylor and Francis Online*, *JStor*, *Sabinet* and the Stellenbosch University library) indicated that, at the time of writing, no research had been conducted purely on the experiences of science journalists regarding the current state of science journalism in South Africa.

Considering the importance of raising the standards of science reporting in South Africa (Claassen, 2011:351), this researcher deemed it worthwhile to study the personal experiences, perspectives and perceptions of science journalists in the country.

This research project is in line with the researcher's interest in, and enthusiasm for, science journalism. Understanding the industry from the perspectives of those working in it will offer an excellent opportunity to improve the researcher's skills and abilities in this specialist field and to add to the body of academic research on science journalism in South Africa.

This exploratory study aims to achieve three goals. Firstly, the researcher will investigate and describe the experiences of science journalists in South Africa. Secondly, this study will detail the challenges faced by science journalists. Thirdly, the researcher will focus on ways to improve science journalism in South Africa, the need for training in science journalism and the role of government and professional organisations such as the South African Science Journalists' Association.

1.2 Literature study

Each of the aspects mentioned in the previous section is briefly discussed in this literature study. An extensive literature review is presented in chapter 2.

1.2.1 Science journalism research in South Africa and gaps in the field of research

Sagan (1996), quoted at the beginning of this chapter, argues that the lack of understanding of science and technology is a "prescription for disaster". Therefore, the importance of science journalism research cannot be understated.

Personal observation reveals that very little qualitative research has been conducted on the state of science journalism in South Africa in recent history. Science journalists are very rarely interviewed by academics to obtain their personal opinions and perspectives regarding their specialist field in the media. The main goal of this study is to provide valuable qualitative information by studying, exploring and describing personal experiences. In addition, this study will hopefully add to the body of academic research in the field of science journalism.

1.2.2 The power of science journalists to shape public opinion and the dangers of inaccurate science reporting

According to the Economic and Social Research Council in the United Kingdom, there is no doubt that “the media has an enormous impact on public perceptions”. The media can compel government, public organisations and business to accept new techniques, discard policies and unite public opinion behind social and economic issues (1993:2).

Nelkin (1995:3), in her book on the relationship between scientists and journalists, argues that most people gain their knowledge of scientific advancement from the mass media. Their knowledge of and opinions regarding science are determined by science journalists’ reporting of current affairs.

Shapin (1990: 990-1007) contends that science has become too complex for the general audience to understand. This creates the need for a mediator or science journalist to make scientific research and discoveries more accessible to the public at large.

Similarly, Van Velden asserts that “the function of the scientific journalist is to transform scientific ideas and results into a form that other groups can understand” (2008:3). If this is not done and when inaccurate and untested theories are communicated as trustworthy research to the public at large, it leaves the audience vulnerable to quackery and pseudoscience (Park, 2000:67).

Furthermore, Claassen (2011:361) found that both journalists and scientists agreed that the South African public was “gullible about much science news, easily believing in miracle cures or solutions to difficult problems”.

As indicated earlier, the researcher aims to detail the challenges faced by science journalists and how (if at all) this impacts on the public understanding and the public opinion of science.

1.2.3 The need for science journalism training and professional organisations

Van Velden (2008:17) writes that journalists should increase their understanding of and education in the sciences to inform the public accurately about scientific news.

At the time of writing this thesis, Stellenbosch University was the only university in Africa to offer specialised science and technology journalism programmes. In his research, Claassen

(2011:363) found that the “virtual absence” of science journalism programmes at universities should receive urgent attention to provide the media industry in South Africa with properly trained science journalists.

One of the goals of this study is to detail means of improving science reporting in South Africa and to explore the need for training in science journalism. In chapter 2, the researcher provides background on industry organisations, higher education programmes and the role of government in promoting science journalism and communication.

1.3 Problem statement and focus

The main goal of this research project is to provide a detailed and in-depth description of the current state of the science journalism industry in South Africa as seen through the eyes of those with first-hand experience.

To capture and describe the experiences of science reporters accurately, to address the problem statement and reach the goals of this research project, the researcher elected to employ a phenomenological approach and a grounded theory approach. The researcher elaborates on the theoretical framework in chapter 3.

The researcher conducted lengthy, in-depth interviews with working science reporters in South Africa. Where necessary, supporting information was gathered from other key figures in the field of science communication and science journalism education.

While these approaches run the risk of subjectivity, the understanding of subjective experiences is precisely the goal of this qualitative study. The research design and methodology are outlined in chapter 4.

1.4 Research questions and research steps

This study endeavours to answer the following key research question: What is the current state of science journalism in South Africa?

Emanating from the main research question, the following general research questions may, hopefully, assist in further understanding of the current state of science journalism in South Africa:

- What are the participants’ personal opinions, perspectives and perceptions of the current state of science journalism in South Africa?

- What are the biggest challenges in reporting on science news and scientific research in South Africa?
- What are the themes in the participants' descriptions of their experiences in the field of science journalism in South Africa?
- What is the role and importance of industry organisations (such as the South African Science Journalists' Association) and tertiary education programmes (such as postgraduate studies in Science and Technology Journalism at Stellenbosch University) on the science journalism industry?
- How can science journalism be improved in South Africa according to the participants?

The researcher set up an interview guide before conducting the interviews (in person or using *Skype*). General, preparatory questions (as above) were sent to participants beforehand to indicate the main research questions but additional questions that emerged from the conversation were included. The researcher relied on the participants to guide her and made a concerted effort not to allow her own preconceived notions to cloud her objective research. She followed clear research steps:

- Conduct a detailed literature review of the field of study, namely science journalism in South Africa;
- Outline the theoretical framework;
- Establish and describe the research design and methodology;
- Identify the relevant participants to interview;
- Compose the general research questions and informed consent document;
- Conduct qualitative, semi-structured in-depth interviews with the selected participants;
- Transcribe the completed, recorded interviews;
- Analyse findings in terms of the research problem and research questions, and
- Write up the results and findings and draw conclusions.

1.5 Outline of chapters

To ensure that her research would be conducted correctly and on time, the researcher outlined her chapters as follows:

Chapter 1: Introduction

This chapter describes the researcher's motivation for the study, outlines the research problem and focus, and provides a brief overview of the literature on the subject. Furthermore, the problem statement, goals of the study, and research questions are introduced.

Chapter 2: Literature review

The researcher provides a detailed analysis of current research into the topic of science journalism in South Africa. The researcher also gives a snapshot of what is known about the current state of science journalism in South Africa. Because there is little research into the experiences of science journalists, the researcher collected both academic research and articles and reports published in the mass media to gain understanding.

Chapter 3: Theoretical framework

In this chapter, the researcher provides a detailed explanation of the theoretical framework of the study, namely the interpretive or phenomenological and grounded theory approaches. Phenomenology is a qualitative research approach employed to understand and interpret individuals' experiences (Creswell, 2007:59). The researcher focuses less on her own interpretations and more on the description of participants' experiences, through interviews with selected science journalists, science communicators and science writers.

Chapter 4: Research design and methodology

The researcher explains the qualitative research methodology employed in the study, namely qualitative, semi-structured, in-depth interviews with participants. This chapter details how the methodology relates to the research questions, the theoretical framework and the focus and goals of the study.

Chapter 5: Data, results and discussion

This chapter presents the data, analysis and results of the research. The results of the in-depth, semi-structured, qualitative interviews with South African science journalists are discussed. All data recorded is presented and can be requested from the researcher.

Chapter 6: Conclusion

This chapter returns to the questions and goals outlined in chapter 1. The researcher reviews the findings of the research and answers the research question. To conclude, she provides a statement about the current state of science journalism in South Africa according to those working in the field. Recommendations for future studies in this field are also provided.

1.6 Summary

The researcher hopes to provide valuable information about the current state of science journalism in South Africa against which future research can be conducted. The main aim is to provide a clear picture of the current state of science journalism in South Africa, according to those with experience. The research also provides insight into challenges faced by science journalists, science communicators and science writers in South Africa and ways to improve the science journalism field. In this introductory chapter, the researcher outlines her research and indicates how it will contribute to the body of research in the field of science journalism in South Africa. The following chapters take the discussion further.

Chapter 2: Literature review

“Science is literally a life-and-death news story” – John Seigenthaler (1997)

2.1 Introduction

The importance of science journalism in South Africa and the researcher’s personal interest in science journalism, as briefly discussed in chapter 1, provide the motivation for this study.

In the previous chapter, the researcher introduced the outline of the study, including the problem statement, focus and research questions.

Before academic research can be undertaken to answer the research questions, the researcher must conduct a review of the relevant literature in the field of study. A literature review is crucial to establish what has been done previously in the area of interest (Mouton, 2001:87). In any academic study, it is necessary to “start with a review of the existing scholarship or available body of knowledge to see how other scholars have investigated the research problem...” (Mouton, 2001:87).

The purpose of this literature review is to ensure that the researcher does not repeat previous studies, to investigate the most recent and authoritative theories, to research empirical findings and to identify valid and reliable means of measurement in the field of study. In addition, a literature review is used to define key concepts relevant to the area of interest (Mouton, 2001:87).

Preliminary research indicates that, at the time of undertaking this research, no academic research had been conducted purely on the experiences of science journalists concerning the current state of science journalism in South Africa.

However, articles have been published about the state of science journalism in the South African media, in mainstream newspapers, popular books, and on online platforms. In the interest of being thorough, the researcher also refers to these articles in her literature review.

While much has been written about science journalism in South Africa, little is known about the perceptions and opinions of science journalists in South Africa. For this reason, the

researcher deemed her research necessary to enhance the understanding of science journalism in South Africa.

2.2 Key concepts in this study

Before the researcher reviews the literature relevant to this study, it is important to define key concepts. The researcher defines the following concepts:

Science journalist:

As the title explains, a science journalist is a person with an education and background in journalism. Therefore, a science journalist would be a person engaged in journalism, specifically reporting news of a scientific nature (Summ & Volpers, 2015:776). Journalists are tasked with reporting the facts, in a balanced and fair manner, following a strict code of conduct while ensuring that they are responsible and accountable in their collection, creation and dissemination of media content (Ilbury, 2017:99-100).

Science communicator:

A science communicator, as the name suggests, is responsible for communicating scientific research, most often on behalf of an entity or institution. They convey concepts in science for the purpose of clarity (Ilbury, 2017:101). In addition, science communicators are tasked with understanding the audiences they wish to engage, to ensure that the message is transferred accurately. Often, science communication includes public relations work (Ilbury, 2017:101).

Science writer:

Ilbury (2017:100) defines a science writer as “someone who tells the story of science”. They are not necessarily journalists, employing journalistic principles and ethics, although journalists can be science writers. Science writers can also be scientists who wish to communicate their work to a broader audience. “In my opinion some of the best science writers are scientists who know how to tell a story” (Ilbury, 2017:100).

For the purposes of this study, the researcher defines a science writer as someone with scientific expertise on the one hand, and storytelling skills on the other. Furthermore, a science writer writes for a general audience, in language they can easily understand (Ilbury, 2017:100).

As will become clear later in this study, the three concepts outlined above are a bone of contention to many of the participants in this study. Proper, clear definitions of key concepts are necessary to avoid confusion and to understand the intricacies of science journalism in South Africa.

In the next section, the researcher explores the importance of science journalism globally.

2.3 The importance of science journalism globally

Before providing a description of the South African science journalism industry and before the researcher undertakes her own research, it is necessary to understand the global science journalism industry.

Science journalism is crucial to understand the world around us. Carl Sagan (cited in Hartz & Chappell, 1997: xi) contends, “If we were to back off from science and technology, we would in fact be condemning most of the human population on Earth to death.”

Nelkin (1995) observes in her study on science journalism in the United States, “Every one of us – whether a poet, janitor, or nuclear physicist – has to be able to think scientifically and to understand some science, to get through our lives.”

According to a survey conducted by the Pew Research Centre entitled *Science News and Information Today* (2017), 54 per cent of Americans get their science news from general news outlets. “Even the most active science news consumers regularly get science news from these general news outlets” (Pew Research Centre, 2017).

“Public debates about science-related policy issues – such as global climate change, vaccine requirements for children, genetically engineered foods, or developments in human gene editing – place continuous demands on the citizenry to stay abreast of scientific developments” (Pew Research Centre, 2017).

According to Blum, Knudson and Henig (2006: vii) it has never been more important for the public to be scientifically literate. Science, although relatively new, has opened up the world to unlimited knowledge and power. “The scientific approach to understanding nature and our place in it — a deceptively simple process of systematically testing one’s ideas against the verdict of experiment — has opened limitless prospects for inquiry” (Ferris cited in Blum, Knudson & Henig, 2006: v).

Yet, to those who do not understand science, the task can be daunting. To add to the confusion, the media are often considered a “dirty mirror” when held up to science. Bucchi (2004:108-109) describes the media as “an opaque lens unable adequately to reflect and filter scientific facts”.

According to Blum, Knudson and Henig (2006: vii), writing about science involves acting as translators between the scientific jargon of researchers and the short attention span of the public. They further argue that reporting on science alone is not enough. “The best reporting also discusses safeguarding the public from the risks of the new knowledge.”

Seigenthaler (cited in Hartz & Chappell, 1997: vii) laments the fact that people are more concerned with celebrity and entertainment news than science news, which he considers equally entertaining but not as salacious. “When celebrity fills every inch and second of news space and airtime, something else must be omitted, perhaps something the public needs.”

The good news, according to Blum, Knudson and Henig (2006: viii), is that scientists and the academic community in the US have recognised the importance of science communicating science to the media and the broader public. More than 50 institutions in the US offer science writing courses so that writers can become more knowledgeable and refined, but also more sceptical. According to Claassen (2011:352), this is not the case in South Africa.

In the next section, the researcher explores science literacy in South Africa.

2.4 Science literacy in South Africa

In an era of social media, fake news and overwhelming amounts of information available on the internet, it has become difficult for South African audiences to distinguish fact from fiction and real science from pseudoscience and quackery (Parker, 2017).

In a recent survey, measuring South Africans’ understanding of science and how they get information, it emerged that more than 40 per cent of respondents had “no interest in any area of science” (Parker, 2017).

However, this is not new. In the first study of public science literacy in this country, Pouris (1991:358-359) found “general ignorance” among the 1300 people questioned. Blankley and Arnold (2001:65), in a nationally representative survey, found that 30 per cent of South African

adults never studied mathematics at school, 50 per cent never studied biology and 55 per cent never studied physics and chemistry.

According to the World Economic Forum Global Competitiveness Report, South Africa is second to last (out of 144 countries) in terms of the quality of its mathematics and science education (Ilbury, 2012).

This impacts the general population's science literacy in a country where the percentage of people over the age of 20 who are regarded as functionally illiterate (education of grade seven or above) is under 14 per cent (Carroll, 2018) and roughly a quarter of the adult population is unemployed (Masutha, 2018).

Parker (2017) further found that few people were engaged in activities that could enhance their knowledge of science and technology. "Unless these gaps are bridged, South Africans will not see the value that science and technology adds to their daily lives. And the country will not be able to use the power of science to find innovative solutions to its problems."

According to Parker (2017), knowledge, technology and innovation aid in development and infrastructure. "But first, South Africa needs to get to the point of valuing and understanding the contribution science makes to daily life."

Claassen (2008) argues that most South Africans do not understand science's impact on their daily lives. "... Our socio-economic development goals will remain an unfulfilled dream until the standing of science within our society is elevated."

Ilbury (2017:71) says that science reporting is critical because health problems are becoming more prevalent. "If there's a more pressing reason for the coverage of science in the South African media, it's this: the very health of the nation is at stake."

Futhermore, South Africans are also susceptible to pseudoscience and quackery. "In the absence of critical thinking encouraged by science at school, superstition and a belief in spirits remain rooted in many traditional cultures..." (Ilbury, 2017:93). Most newspapers in South Africa publish astrology columns, the ultimate form of pseudoscience according to Ilbury and Claassen. "Any whiff of magic is carried quickly through communities willing to attach any measure of hope for a better life" (Ilbury, 2017:93). Pouris (1993:69), decades earlier, also

identified this in his research. “South Africans believe in astrology to a much greater extent than people in other countries.”

During the opening address of the 2017 Science Forum South Africa, former Communications Minister Mmamoloko Kubayi-Ngubane spoke about the importance of the media for communicating scientific developments to the South African public. “Journalism can play a greater and more meaningful role in ensuring that citizens have greater access to information and scientific discoveries and science in general” (*Cape Argus*, 2017).

Furthermore, she recognised the important role the government should play in the public understanding of science, as well as the need for government to support the media. She said the media and government have a joint responsibility to ensure that scientific information is made public. “If we allow a scientific information deficit to arise, we risk creating a new divide between those with access to scientific resources and those who have none” (*Cape Argus*, 2017).

In September 2014, the South African National Editors’ Forum (SANEF) hosted a science journalism colloquium at the University of Witwatersrand (Wits) in Johannesburg. One of the aims of the colloquium was to discuss the work by the Department of Science and Technology to “deepen and broaden” public awareness of science and technology.

In her capacity as Minister of Science and Technology at the time, Naledi Pandor addressed the gathering, “Good science journalism and reporting can be as important as science itself” (Pandor, 2014).

She went further by saying that it is essential to mobilise the broader South African public about science and its contribution to society. “Science is the business of all – including journalists. My aim is to make science part of the daily, popular South African discourse” (Pandor, 2014).

It is critical to understand science literacy in South Africa before exploring science journalism in South Africa. In the next section, the researcher focuses her attention on previous research conducted in the field of science journalism.

2.5 Science journalism in South Africa

According to James, science journalism in South African is in “deep waters” and in “pathetic shape” despite the importance of science journalism in developing countries. “Science journalism is the only way in which ordinary South Africans can keep abreast of the diverse array of science projects we have going on in our country...” (*Cape Times*, 2009).

Van Rooyen (2002) found that less than two per cent of editorial space in some of the country's top publications is dedicated to science news. Claassen (2011:352) found that only one South African newspaper employed a designated science editor with a team of specialist science reporters. In addition, he found that the formal structure, consisting of a science editor and designated science journalists, is “virtually absent” from the South African media (2011:363).

Brand (2008), Claassen (2011), De Beer & Steyn (2002), Prinsloo (2006) and Smallhorne (2017) lament the insufficiency of science journalism in South Africa. “The challenges and opportunities facing countries in the African continent, from climate change to energy to seed technology, are very much science-based, and yet there is a dearth of science journalism capacity in our newsrooms and media houses” (Smallhorne, 2017).

James argues that South Africa does not have much of a presence in science journalism. “Dedicated science writers are scarce. Science journalists learnt their science on their own, on the side, and piggybacked their stories on to other issues like health, the environment or, when it came to forensics, crime” (*Cape Times*, 2009).

During a media training workshop in preparation for the 2017 Science Forum South Africa, Franz Krüger said, “Unfortunately, what we have seen in South Africa is that the mainstream media because of financial pressures have really cut down on the investment in science writing. There are hardly any real specialist science writers and that is a real shame” (*IOL*, 2017). At a similar workshop in 2016, “members of the media heard that science was not sexy or sensational and therefore got no love in newsrooms” (*Pretoria News*, 2016).

Claassen (cited in Ilbury 2017:92) argues it is unfortunate that editors in South African newsrooms have replaced knowledge journalism with “the burning desire to feed the masses with information about celebrities and royalty, their sex lives, where they dined last night, and with whom”.

This situation is further aggravated by the fact that, at most media organisations, generalist journalists are charged with reporting on science news in addition to their ordinary workload (Levi, 2001:5). This contrasts with organised political, business, sports, culture and other news desks run by senior editors in specialised fields (Claassen, 2011:352).

Often, due to shrinking newsrooms and the need to save money in South Africa, junior journalists are employed to cover science news. Furthermore, editors are not always interested in science stories. “Science journalism is seen as a passion project, a side-project which journalists do not have time for because of the demands of the job” (Gallens, cited in Nkosi, 2016).

Additionally, with news relating to politics, crime, economic challenges and corruption in the South African media, science news often does not enjoy priority in newsrooms (Ilbury, 2012). “With such powerful drama and emotional issues so prevalent in the lives of South Africans, it’s easy to understand why science battles to find a foothold in newsrooms” (Ilbury, 2017:94).

According to former *Eyewitness News* editor, Katy Katopodis, science news is often used as an “and finally” story at the end of a news bulletin to balance out the stories of violence, crime and politics in South Africa. “In our defence, because of the nature of our newsroom, it’s difficult to prioritise science stories” (cited in Ilbury, 2017:94).

According to Wild (2018), science news is also often not high on editors’ priority lists and is often the first to suffer from dwindling budgets. Shrinking newsrooms, time constraints and financial challenges often lead to science desks and specialist science journalists being “the first to go” (Harber cited in Ilbury, 2012).

According to Claassen, when science news is reported on, it is not treated equally to other news stories. “The status of science news reporting in the popular local media is reflected in the fact that although most of these media do report on science, it does not occur in a structured media environment where science editors are treated as equals to other editors in the news process” (2011: 352).

This is cause for major concern as Claassen contends, “South Africans desperately need scientific knowledge, that bright flame, if they are to progress and develop. Without it they risk being swallowed by the darkness of ignorance, superstition, and pseudoscience” (cited in Ilbury, 2012).

Furthermore, Claassen (2016) argues that the role the media can play in countering pseudoscience “should not be underestimated” but journalists’ ability to distinguish between science and pseudoscience requires urgent attention.

“The rather haphazard reporting of science by mostly scientifically illiterate journalists should be changed... in order to disseminate the results of science to the broader public” (Claassen, 2011: 363).

According to Wild, there is very little science journalism in South Africa, with only a few journalists covering subjects such as health, the environment and education (cited in Ilbury, 2017:98).

The shortage of experienced science journalists leads to the increased use of public relations material and press releases at news organisations. “As seasoned science journalists are cut from their desks, PR teams of research organisations and science-based companies are enjoying a more enthusiastic, and unquestioning, embracing of their press releases” (Ilbury, 2017:103).

According to Ilbury (2017:99), the coverage of science in the media has become the responsibility of a “tenacious band” of freelance science journalists. In her chapter on research design and methodology, the researcher focuses on the science journalists and communicators interviewed for her study.

One stop on the way to understanding the current state of science journalism in South Africa is to understand the relationship between scientists and journalists. In the following section, the researcher explores this relationship.

2.6 Bridging the gap between scientists and journalists

Almost a century ago, journalist Walter Lippmann emphasised the importance of the media in shaping the view of audiences. “Citizens... get most of their information from the media and the elites the media portray... the media wield significant influence over citizens’ perceptions, opinions and behaviour” (1922:18). The Economic and Social Research Council in the United Kingdom emphasises the importance of the media in communicating science, “There is no doubt that the media has an enormous impact on public perceptions” (1993:2).

The news media play an important role in informing the public and shaping public opinion because they mediate between experts and decision makers on the one hand and ordinary

people on the other (Pigliucci, 2010:89). Developments in science can help people make informed choices in many different aspects of their lives.

As Nelkin (1995:3) argues, scientists and researchers are not the only ones to benefit from having knowledge of science and following scientific developments. “Good reporting can enhance the public’s ability to evaluate science policy issues and the individual’s ability to make rational personal choices; poor reporting can mislead and disempower a public that is increasingly affected by science and technology and by decisions determined by technical expertise” (Nelkin, 1995:2).

In addition, a good relationship between scientists and journalists would be beneficial in increasing the public understanding of science (Bauer, 2008:119). Understanding science would help the public make informed consumer choices regarding social and economic issues and it would assist governments in their policies (Claassen, 2011:352-353).

The Economic and Social Research Council (1993:2) identified five reasons for improving science communication between scientists and the public through the media:

- Public accountability;
- Influencing policy makers;
- Stimulating funding;
- Encouraging collaboration;
- Giving scientists greater control over their research.

Claassen (2008) asserts that because scientists receive public funding, they have a duty to share their research with society at large (Claassen, 2008).

Wild (2017) writes, “Most new knowledge in South Africa comes from universities, but that is often where it stays. Bound tightly in academic jargon and kept within disciplines, exciting discoveries and new ways of seeing the world remain trapped in the ivory tower.” She contends that traditional news media no longer have the budget or human resources to cover the science coming out of tertiary education institutions. “This leaves the task of popularising science to scientists and postgraduate students.”

For these reasons, a sound relationship between scientists and journalists is required to ensure science news and scientific discoveries are communicated to the public accurately in an understandable manner, at the appropriate time. According to Claassen (2011: 353), the

understanding of science by journalists is vital to “break down the barriers of scientific jargon to describe the findings of scientists in simple, accessible terms”.

As Van Rooyen (2002:4) puts it, “In recent years the popularisation of science has, to a large extent, become the task of the journalist who depends on his or her communication with the scientist to provide relevant, accurate science news.”

However, Ilbury (2012) argues that one of the biggest challenges journalists face is getting face-to-face time with scientists who are usually protective of their research. Journalists, on the other hand, are inclined, by nature and training, to investigate and question their work.

Scientists are often wary of engaging the media because their work has been misrepresented or misquoted. “In a discipline that demands accuracy, and where character and credibility are essential, this is especially problematic” (Ilbury, 2017:98).

Furthermore, the South African media often neglect reporting on scientific discoveries: “... and when journalists do report on science, the quality of reporting is often open to criticism from the scientific community” (Claassen cited in Ilbury, 2017:92). Often, scientists want to see articles before they are published while journalists are under no obligation to allow this (Smit cited in Ilbury, 2017:104).

Lynne Smit, former president of the South African Science Journalists’ Association, criticises the attitude of some scientists towards the media, “They sometimes have an arrogant attitude that they are the holders of this great knowledge and that everyone else is going to misquote them” (cited in Ilbury, 2017:104).

In his 2011 study, Claassen conducted a survey to investigate the relationship between scientists and journalists in South Africa. As motivation for his study, Claassen quotes Nelkin (1995: vii) regarding the lack of communication between scientists and journalists. “Although we depend on the media for science news, there is little understanding of the relationships between scientists and journalists that lie behind the images of science conveyed in the press” (Claassen, 2011:352).

Claassen’s study was modelled according to a study conducted in the United States in the late 1990s (Hartz & Chappell, 1997). They found that there were benefits in a good-natured relationship between scientists and journalists. This would “ensure that scientific literacy

would be obtained by the public and to prevent the growth of pseudoscience” (cited in Claassen, 2011:352).

Many differences remain between science and journalism as Kathy Sawyer of the *Washington Post* explains, “Science is slow, patient, precise, careful, conservative and complicated. Journalism is hungry for headlines and drama, fast, short, very imprecise at times” (cited in Hartz & Chappell, 1997:14). However, Hartz and Chappell (1997:27) found some good news in their study. “A large majority of both scientists and journalists feel there is no fundamental reason why the process cannot be significantly improved.” Claassen reached a similar conclusion (Claassen, 2011:363).

Scientists and journalists agree that the South African public is ignorant about science, readily believing in pseudoscience and quackery as a solution to problems (Ilbury, 2017:93-94). This is not the only thing scientists and journalists agree on.

“If there is something South African scientists and journalists do agree on, it’s the continued need for the media to act as the intermediary between science and society. Science is, by its very nature, a highly diverse and specialised enterprise; and for a country like South Africa, with such a low level of scientific literacy, scientific research often seems completely otherworldly” (Ilbury, 2012).

Claassen (2016) calls on scientists to expose pseudoscience and quackery. “They should be far more outspoken against practices that endanger the lives of innocent people, acting as a united front to campaign against the scourge of quackery.”

In their book, *Worlds Apart*, Hartz and Chappell (1997: xiii) make the following suggestions for scientists and journalists to improve their relationship:

- Begin a dialogue to educate one another;
- The scientific community should train communicators and designate spokespeople;
- Journalists should improve their understanding of science and the peer review process;
- Researchers should provide plain language summaries of their work, and
- Science institutions should have websites that the media can use as a guide for information.

The researcher discusses each of these aspects in the results chapter of this study.

Before presenting the theoretical framework and research design employed to approach this study, the researcher explored some entities and opportunities already in place to improve science journalism in South Africa.

2.7 Advancing science journalism and science communication in South Africa

There are several associations and projects in South Africa aiming to bridge the gap between scientists and the media, to improve public understanding of science and to improve both journalists' understanding of science and scientists' understanding of writing for the popular media.

In this section, the researcher briefly describes the South African Science Journalists' Association (SASJA) as well as the Centre for Science and Technology Mass Communication (CENSCOM) and the postgraduate qualification in science and technology communication at the Department of Journalism at Stellenbosch University.

This is useful as background information in subsequent chapters when the researcher discusses the results of her interviews with science journalists, science communicators and science writers on the state of science journalism in South Africa.

2.7.1 The South African Science Journalists' Association

The South African Science Journalists' Association (SASJA) was established in 2008 as a professional association for reporters, writers, students, academics and communicators with an interest in science (World Federation of Science Journalists, 2015).

However, little is known about SASJA at first glance as its website has not been updated since December 2013. A brief description on the website of African Federation of Science Journalists (AFSJ) describes SASJA as "an association of science media professionals and aims to improve communication between the South African science community and general society and to support science media practitioners in South Africa".

According to the World Federation of Science Journalists' website, SASJA has approximately 40 members nationally, most of them freelance journalists based in Cape Town.

From SASJA's Facebook page, the researcher was able to ascertain that Mandi Smallhorne is the current president of SASJA (SASJA - South African Science Journalists' Association,

2018). An article on *The Media Online* (2014) announced that Smallhorne was elected the President of the AFSJ. In the article, it is stated that SASJA is a member of the World Federation of Science Journalists (WFSJ) as well as AFSJ.

Furthermore, SASJA is involved in the Africa Science Desk programme, along with AFSJ, which provides grants to science journalists to pursue science stories (World Federation of Science Journalists, 2017).

In her chapters on results and discussion of her study, the researcher elaborates much more on the role of SASJA in the South African science journalism industry.

2.7.2 The Centre for Science and Technology Mass Communication

The Centre for Science and Technology Mass Communication (CENSCOM) is an “interdisciplinary research, service, educational and training institution” of Stellenbosch University, located in the Department of Journalism in the Faculty of Arts and Social Sciences (CENSCOM, 2018).

Stellenbosch University is the only university in Africa to offer a postgraduate course in science and technology journalism. The specialisation field of science and technology journalism was established by Professor George Claassen in 1995. Claassen, the science journalism lecturer, is the director of CENSCOM that was established in 2016.

While not a participant in this study, Claassen is the supervisor of the research because, as Ilbury writes, “No accurate tale of science journalism in this country is possible without tapping into his research and opinion” (2012:67).

According to its website, CENSCOM has several objectives, including promoting science and technology mass communication skills in the media, analysing problems regarding science and technology mass communication skills in the media, supporting and developing skills through specific interventions such as short courses, seminars, conferences, workshops and research projects.

The organisation aims to “provide a stimulating and innovative platform for high level critical discussion and research”, as well as “enable the media-science interface in mass communication to ensure a free flow of information and freedom of expression regarding scientific research, policy, issues, controversies and news events” (CENSCOM, 2018).

Furthermore, CENSCOM aims to empower the public by promoting public understanding of science and technology and fostering awareness of the difference between science and pseudoscience.

CENSCOM works closely with the South African National Editors' Forum, the South African Department of Science and Technology, as well as SASJA, to provide training to science journalists in South Africa and on the African continent.

To this end, the Department of Journalism, in which CENSCOM is based, has since 2011, been hosting the regular workshop in Stellenbosch of Science meets the Media which aims to bridge the gap between scientists and journalists (CENSCOM, 2018). In November 2017, Stellenbosch University, through CENSCOM and the Centre for Evidence-based Health of Stellenbosch University's Faculty of Medicine and Health, hosted the first international summit to counter quackery, pseudoscience and fake news in healthcare (CENSCOM, 2018). Each year, CENSCOM offers bursaries for postgraduate students to specialise in the field of science and technology journalism and communication.

2.8 Summary

In this chapter, the researcher sets the scene for her own research by examining current research in the field of science journalism, as well as by providing an overview of the relevant literature in her field of the science journalism industry in South Africa. It has become clear that there are gaps in the literature that this researcher aims to fill with her work. A significant gap exists in the study of the personal experiences of science journalists and science communicators in South Africa. This chapter provides the foundation for this research project and guides the researcher in her own research. In chapter 3, the researcher outlines the theoretical framework for her research project.

Chapter 3: Theoretical framework

“We would be in a nasty position indeed if empirical science were the only kind of science possible.” – Edmund Husserl (1917)

3.1 Introduction

In this chapter, the researcher provides a discussion of the interpretive paradigm and phenomenology in social sciences research as the theoretical departure point in this study. To capture and describe the “lived experience” of science journalists, science communicators and science writers in South Africa adequately, the researcher deems the interpretive paradigm in social theory the most suitable theoretical approach as it encompasses phenomenology.

Firstly, the researcher describes the goals and values of theory in media studies before exploring the interpretive paradigm and phenomenology as a philosophical approach to her research. To provide adequate theoretical background, she outlines Burrell and Morgan’s (1979:1-20) model for analysing the nature of social science, describes the four sets of assumptions regarding the nature of social science as well as the assumptions about the nature of society. She briefly introduces the four sociological paradigms and then focuses on the interpretive paradigm and on phenomenology as an approach within this paradigm (Burrell & Morgan, 1979:21-35). The theoretical framework paves the way for the following chapter on research design and methodology, in which the researcher outlines the qualitative research methods selected for this study.

3.2 Theory in media studies

Before discussing theory in media studies and the theoretical framework selected for this study, the researcher considers the importance of the media in society.

According to Fourie (2007:113), the media are one of the most important structures in society as they place the public at large and media consumers in contact with other structures and institutions in our social world and, through the media, people learn about the world in which they live.

Essentially, we learn about the norms and values in society through the media (Fourie, 2007:113). Thus, as Croteau and Hoynes (2003:13) put it, “we must consider social relationships between media and the social world” to understand the media and their impact on our society”.

Theory is defined by (Wood 200:33) as “a human account of what something is, how it works, what it produces or causes to happen, and how that something can be changed, if necessary”. According to Fourie (2007:103) theory is used to “describe, interpret, understand, evaluate and predict a phenomenon”. In media studies, different theories can be used to understand the media and obtain different views about the same entity or phenomenon (Fourie, 2007:104).

In keeping with Fourie’s assertions about theory, this researcher sets out to achieve the following in her research:

- **Describing** the current state of science journalism in South Africa as accurately as possible;
- **Interpreting** the current state of science journalism in South Africa from different perspectives;
- **Evaluating** different options relating to the current state of science journalism in South Africa;
- **Predicting** possible outcomes relating to the future of science journalism in South Africa, based on the insights gathered (adapted from Fourie, 2007:104).

Some scholars also use theory to reform phenomena and change the *status quo* (Fourie, 2007:104). In this case, the researcher uses the data gathered to elucidate the current state of science journalism and to make certain predictions about the future of science journalism in South Africa. The aim of this study is not to change the *status quo* or to change the practices of science journalists and science communicators in the country but rather to make observations and recommendations based on the data collected.

3.3 The nature of social science

In sociology, a high value is placed on understanding the relationships between people and structures and institutions (Fourie, 2007:113). Because the aim of this study is to shed light on the current state of science journalism in South Africa, according to those with first-hand experience, the researcher has deemed it worthwhile to employ a sociological approach to her research. Burrell and Morgan (1979) outline the nature of social science, the four assumptions

about the nature of social science, assumptions about the nature of society, and provide four sociological paradigms useful in social science research. The researcher provides a brief overview of Burrell and Morgan's approaches and then focuses on the interpretive paradigm and phenomenology as these relate to her research.

3.3.1 Assumptions about to the nature of social science

In their research, Burrell and Morgan (1979:1-7) identify four sets of assumptions about the nature of social science. These assumptions relate to ontology, epistemology, human nature and methodology – also considered the “building blocks of theory” (Fourie, 2007:105).

Ontology refers to beliefs or assumptions about the nature of reality (Du Plooy, 2009:20). Burrell and Morgan (1979:3), within the subjective-objective dimension, describe the ontological debate as nominalism versus realism. Realism (sometimes called determinism), as an objectivist approach to social science, postulates that the social world comprises “empirical entities” and the social world exists outside human experience and appreciation, while the more liberal nominalist (sometimes called the humanist) approach does not recognise any real structure in the world and asserts that people are capable of thinking for themselves responsibly (Fourie, 2007:106).

According to Fourie (2007:107), **epistemology** refers to the “science of knowledge”. Burrell and Morgan (1979:5), within the subjective-objective dimension, describe the epistemological debate as positivism opposed to anti-positivism. Positivists in the social sciences believe in objective truth and employ the approaches and methods used to study the natural sciences (Fourie, 2007:107). Griffin (2003:366) criticises the positivist approach, “...the positivistic approach with its emphasis on empiricism and quantification is too narrowly focused on discovering cause and effect relationships” (as quoted in Fourie, 2007:124). Anti-positivism, on the other hand, opposes the search for laws in the social world and relies on studying the subjective experience (Fourie, 2007:107). “For the anti-positivist, the social world is essentially relativistic and can only be understood from the point of view of the individuals who are directly involved in the activities which are to be studied” (Burrell & Morgan, 1979:5).

Human nature deals with the relationship between human beings and their environment. “All social science... must be predicated on this type of assumption, since human life is essentially the subject and object of inquiry” (Burrell & Morgan: 1979:2). The human nature debate in the

subjective-objective dimension puts determinism at the one extreme and voluntarism at the other extreme. Voluntarists consider humans autonomous with free will while determinists argue that humans are determined by their situation or environment (Burrell & Morgan, 1979:6).

Each of the above building blocks impacts the **methodology** employed to obtain data about the social world studied. The methodological debate in the subjective-objective dimension, on the one hand identifies an ideographic approach to social science, meaning the social world is studied by acquiring first-hand knowledge of the subject. On the other hand, the nomothetic approach to social sciences emphasises “protocol and technique” and the “quantitative methods of the natural sciences” (Burrell & Morgan, 1979:6).

It is important to note that Fourie (2007:108-109) also considers purpose and focus as building blocks of theory, unlike Burrell and Morgan (1979). **Purpose** can be divided into two schools of thought, namely universalists and situationalists. The first aims to create universal laws about human behaviour, while the second rejects the idea that theory can only articulate rules describing patterns in human behaviour (Fourie, 2007:108). **Focus** is divided into behaviourism and humanism. Behaviourism focuses on observable behaviour, while humanism focuses on the meaning of behaviour, again asserting that humans have free will and the capacity to make choices and create meaning.

The assumptions about the nature of social science, and the extremes within each debate in the subjective-objective dimension, reflect two intellectual traditions that have dominated social science for centuries (Burrell & Morgan, 1979:7).

The first tradition is that of **sociological positivism**: “In essence this reflects the attempt to apply models and methods derived from the natural sciences to the study of human affairs” (Burrell & Morgan, 1979:7).

Secondly, the tradition of **German idealism**, which the researcher employs in her study, opposes sociological positivism. “In contrast to the natural sciences, it stresses the essentially subjective nature of human affairs, denying the utility and relevance of the models and methods of natural science to studies in this realm” (Burrell & Morgan, 1979:7).

3.3.2 Assumptions about the nature of society

In their work, Burrell and Morgan also make certain assumptions about the nature of society, known as the order-conflict debate. They propose to call the order-conflict debate “regulation and radical change” (1979:16).

Firstly, the **sociology of regulation** refers to the writing of those who wish “to provide explanations of society in terms which emphasise its underlying unity and cohesiveness” (1979:17). In the sociology of regulation, there has been debate between interpretive sociology (phenomenology for example) and functionalist approaches.

Secondly, **sociology of radical change** is concerned with finding “explanations for the radical change, deep-seated structural conflict, modes of domination and structural contradiction” that characterises modern society. In this case, there are divisions between proponents of objective views of society, on the one hand, and subjective views of society on the other hand (Burrell & Morgan, 1979:21).

3.3.3 Four sociological paradigms

Burrell and Morgan introduce **four sociological paradigms** sprouting out of the two key dimensions of analysis, (1979:23). In the interest of being comprehensive, the researcher describes each paradigm before detailing the interpretive paradigm she employs in her research.

By understanding each of these views, researchers can place themselves in a specific frame of reference as it relates to social theory, according to Burrell and Morgan (1979:24). “They offer alternative views of social reality, and to understand the nature of all four is to understand four different views of society” (Burrell & Morgan, 1979:25).

Firstly, the **functionalist paradigm** is concerned with applying the models and methods of the natural sciences to the study of human affairs. According to Burrell and Morgan (1979:26), proponents of functionalism “assume the social world is composed of relatively concrete empirical artifacts [*sic*] and relationships which can be identified, studied and measured through approaches derived from the natural sciences”. This approach is used to provide practical solutions to practical problems. According to Burrell and Morgan (1979:28), functionalism is considered “conservative and unable to provide explanations for social change”.

Secondly, the **interpretive paradigm** views the social world as a process created by the individuals involved (Burrell & Morgan, 1979:28). The interpretive paradigm in social science studies is “informed by a concern to understand the world as it is, to understand the fundamental nature of the social world at the level of subjective experience”. Put differently, the interpretive approach is used to understand the everyday world as experience by the participants in the study (1979: 31). The interpretive paradigm is a direct product of the German idealist tradition and rejects scientific methodology in favour of understanding behaviour (Burrell & Morgan, 1979).

Thirdly, the **radical humanist** paradigm is “committed to a view of society which emphasises the importance of overthrowing or transcending the limitations of existing social arrangements” (Burrell & Morgan, 1979:32). These limitations prevent true human fulfilment because “man is dominated by the ideological superstructures with which he interacts, and that these drive a cognitive wedge between himself and his true consciousness”.

Finally, the **radical structuralist** paradigm focuses on the structural relationships in the social world. They seek to provide explanations of relationships in the context of larger social formations. According to radical structuralists, society is characterised by political and economic conflicts which generate radical change (Burrell & Morgan, 1979:34).

It is important to consider that each paradigm views the world in a particular way.

“The four paradigms define fundamentally different perspectives for the analysis of social phenomena. They approach this endeavour from contrasting standpoints and generate quite different concepts and analytical tools” (Burrell & Morgan, 1979:23). The four paradigms are mutually exclusive, and one cannot operate in more than one paradigm at any given time.

By locating oneself in one of these four paradigms, “it provides a tool for mapping intellectual journeys in social theory” (Burrell & Morgan, 1979:24).

For the purposes of this study, the researcher selected the interpretive paradigm.

3.4 The case for employing the interpretive paradigm in social science research

Max Weber (as cited in Fourie, 2007:123) states that the “proper task of social investigation is the interpretative understanding of the meaning of social action”.

Interpretation and the understanding of human action, intentions and values are not observable when the scientific method is used. “The task of social research should rather be to understand a phenomenon contextually and to evaluate and consider various alternative understandings....” (2007:124).

Before exploring phenomenology and the researcher’s interpretive approach to her research, it is necessary to define the interpretive paradigm and describe its main characteristics.

“The influence of ‘subjectivist’ movements such as phenomenology, ethnomethodology and action theory, have [*sic*] tended to become much more attractive and more worthy of attention” (Burrell & Morgan, 1979:11).

The interpretive paradigm employs a subjective approach to the analysis of the social world (Burrell & Morgan, 1979:28). Researchers in the interpretive paradigm are concerned with understanding the “very basis and source of social reality” and are committed to understanding the world “as it is” (Burrell & Morgan, 1979:31). Twentieth century researchers such as Edmund Husserl and Alfred Schutz made major contributions towards establishing the interpretive paradigm as a “framework for social analysis” (Burrell & Morgan, 1979: 31).

According to Burrell and Morgan (1979:28), the interpretive paradigm tends to be nominalist, anti-positivist, voluntarist and ideographic in its approach to social science. It resides in the subjective and sociology of regulation dimensions outlined by Burrell and Morgan (1979:22).

Thus, as discussed earlier in this chapter, the interpretive paradigm (1) accepts social reality as relative and the social world helps individuals structure reality, (2) asserts that observing behaviour and studying experiences can help one understand the social world, (3) contends that humans have free will and are not determined by their environment and (4) research in the interpretive paradigm is focused on “getting inside” one’s subject and conducting a detailed inquiry into their background and lives (Burrell & Morgan, 1979:31).

According to Van Manen (1990), interpretive researchers are expected to take a leap “into the minds of the participants in order to view their experiences as data” and to fully grasp their human experience.

This paradigm has proved to be particularly useful in this study because the aim is to understand the experiences and perceptions of science journalists and science communicators in South Africa.

In this study, the researcher considers science journalism in South Africa as a “world” created by individual science journalists and those working in the science journalism and science communication industry. This world is not wholly created by science journalists and science communicators themselves as the environment in which they function, where science news is generally neglected by editors, has a definite influence on their day-to-day reporting of scientific developments.

Thus, the best way to gain an understanding of this industry is to explore the subjective experiences and opinions of those in the field.

Operating in this paradigm, the researcher intended to adopt the participants’ frame of reference rather than that of the researcher and “seeks explanation within the realm of individual consciousness and subjectivity” (Burrell & Morgan, 1979:28). To this end, the researcher views participants as “co-researchers” (Waters, 2017), offering their personal views and insights to contribute to the body of academic research into science journalism in South Africa.

In this study, the researcher delves into the subjective explanations, opinions and perspectives of science journalists and science communicators to gain insight into the current state of science journalism in South Africa.

3.5. Phenomenology in the interpretive paradigm

To draw meaningful conclusions about journalists’ experiences, perceptions and perspectives, the researcher conducts her study using a phenomenological approach.

The *Stanford Encyclopedia of Philosophy* defines phenomenology as the study of “conscious experience as experienced from the subjective or first-person point of view” (2013).

While phenomenology has been present in many guises for centuries, the term was originally coined by German philosopher Edmund Husserl. Through the works of Husserl, Martin Heidegger, Jean-Paul Sartre, Maurice Merleau-Ponty *et al.*, phenomenology has evolved into a philosophy, an approach and a research method employed to understand and interpret individuals’ experiences (Creswell, 2007:59).

According to Fourie (2007:146), Husserl asked the basic question: How is it possible to know what is real? His answer was that the only way was through experience. He suggested opening one's mind to gain new insights and understanding and letting go of any presuppositions (Fourie, 2007:146).

Simply put, phenomenology is a “descriptive approach to human experience” (Packer, 2010:150) with the aim to “describe a ‘lived experience’” (Waters, 2017:1).

In this study, the researcher uses a phenomenological approach to gain insight into the lived experiences of science journalists in South Africa, with the goal to understand the industry.

The aim of this study is not to prove hypotheses but rather to describe and interpret journalists' experiences (Hussey & Hussey, 1997:52). To this end, the researcher focuses less on her own interpretations and more on the description of participants' experiences.

The researcher is cognisant that the interpretive paradigm and a phenomenological approach are subjective. For the purposes of this study, however, understanding of journalists' subjective experiences is precisely the goal. This researcher considers phenomenology the most suitable vantage point to identify common themes in people's experiences. In this regard, the researcher agrees with Husserl's original view that reality is only to be understood through experiences and examining the experiences of others.

3.6 Summary

In this chapter, the researcher describes the theoretical framework and approach employed in this study. She makes the case for an interpretive paradigm as a roadmap for her research. Furthermore, she outlines phenomenology as an approach to her research. In the next chapter, the researcher outlines the qualitative research design and methodology employed in this study.

Chapter 4: Research design and methodology

“A phenomenological study is a study that attempts to understand peoples’ perceptions, perspectives, and understandings of a particular situation.”

– Paul Leedy and Jeanne Ormrod (2005)

4.1 Introduction

This chapter builds on the theoretical framework outlined in the previous chapter and introduces the methodology for the exploration and description of the state of science journalism in South Africa. In keeping with the theoretical framework, this study is qualitative by nature, with the focus on understanding and interpreting the experiences of the individuals studied. In this chapter, the researcher makes the case for employing qualitative or interpretive research methods as the most appropriate means of gaining insight into the experiences of science journalists and communicators in South Africa. A participant observation study was undertaken in keeping with the theoretical framework discussed in chapter three.

In this chapter, the researcher outlines the research design, unit of analysis, sampling, interview methods and interview guide employed in the research. The researcher lists the research questions and the participants interviewed and describes the ethical considerations in this study.

4.2 Quantitative compared to qualitative research methodologies

To make an informed decision about the most suitable methodology to employ, it is necessary to define and describe each of the two main approaches to research – namely quantitative and qualitative research approaches.

Firstly, the quantitative research approach, also known as empirical research or the positivist approach, is characterised by its rigidity and rejection of speculation. According to Du Plooy (2009:21), quantitative methods use the methods of natural science and “restrict themselves to data of experiences”.

Since the nineteenth century, social science researchers have used the same methods employed in natural science research to conduct their research. According to Du Plooy (2009:27), “it

became common practice to use statistical techniques to measure social realities” – in other words, laboratory experiments were conducted to acquire knowledge about human behaviour.

Wasserman argues that quantitative methods can become “elaborate, schematic systems that are forced down upon lived experience” (cited in De Beer, 2004:364).

In recent years, qualitative research methods have become more widely accepted and employed in social sciences such as sociology, anthropology and journalism (Leedy & Ormrod, 2005:133). While quantitative methods are useful when studying physical events, it is often more useful to study “real world” events by using qualitative methods. The qualitative research approach is regarded as more flexible than the quantitative research approach.

“Qualitative researchers believe that the researcher’s ability to interpret and make sense of what he or she sees is critical for understanding any social phenomenon” (Leedy & Ormrod, 2005:133). This approach deals with subjective insights into journalism as part of a bigger social world.

De Beer (2004:364) argues that the qualitative research approach is aimed at understanding the issue under investigation while Wasserman (cited in De Beer, 2004:364) warns that qualitative methods can lose sight of context more easily than quantitative methods. Some of the methods used in qualitative research include ethnography (field research), in-depth interviews and case studies.

Dominick and Wimmer (2003:5) argue that the difference between qualitative and quantitative research lies in the way in which questions are asked. Qualitative research employs a flexible approach (using open-ended questions) while quantitative research is more rigid (asking the respondent to select the correct or most relevant response from a list of responses provided by the researcher).

According to De Beer (2004:364), researchers do not have to choose between either one or the other approach to be considered scientific. He contends irrespective of the approach selected, researchers should strive to be scientifically critical, impartial and just. He argues for the correct application of each approach to avoid being “academically unsound”.

Creswell (2007:16) warns against comparing quantitative and qualitative research methods as qualitative research is a paradigm in its own right. “We must resist conservative attempts to

discredit qualitative inquiry by placing it back inside the box of positivism” (Denzin, Lincoln & Giardina, 2006:773).

In this study, the researcher has opted to conduct qualitative research to discover reality “through the eyes of people who experience it” (Du Plooy, 2009:30).

4.2.1 The case for interpretive research methodologies

Jensen and Jankowski (1991:44) define qualitative research as a “form of long-term first-hand observation conducted in close proximity to the phenomena under study. The research is, ideally, performed in a naturalistic setting with emphasis on everyday behaviour and is often descriptive in nature”.

According to Van Vuuren, Maree and De Beer (1998:415), “the qualitative researcher in the field of mass communication is concerned with *verstehen* (understanding) of the communicator and his communication actions as opposed to the positivistic quantification of human behaviour”.

Du Plooy (2009:88) contends that qualitative research is conducted when inadequate or no previous information exists in a specific field of study. As stated in chapters 1 and 2, little research at academic level has been conducted into the experiences of science journalists in South Africa, therefore an exploratory study could develop methods for future investigations and studies (Babbie 2010:92).

Furthermore, Babbie (2010:92) asserts that the most useful purposes of social research are exploration, description and explanation. The aims of this study are, firstly, to **explore** the experiences of science journalists in South Africa, secondly, to **describe** their experiences and opinions following in-depth interviews and, thirdly, to **explain** and provide insight into the state of science journalism in South Africa.

In this study, the researcher undertakes “careful and deliberate” social research to accurately describe the state of science journalism in South Africa (Babbie, 2010:93).

The researcher is aware that qualitative research methodologies are often criticised because of their subjective nature. For the purposes of this study, however, understanding of journalists’ subjective experiences is the aim.

4.2.2 Field research

Mouton (2001:98) calls fieldwork the “doing stage of research” when the researcher “leaves his or her study or computer and enters the real world in order to collect, select and analyse data” (Mouton, 2001:110).

Hobbs and Wright (2006:3) state in the *Sage Handbook of Fieldwork* that field research is done “outside the controlled settings of the library or laboratory”.

The *Sage Dictionary of Qualitative Inquiry* (2007:119) defines field research as “a generic designation for all forms of social science research that involve direct, first-hand observation in naturally occurring situations or events and that rely principally on techniques of participant observation and interviewing”.

As opposed to research conducted in controlled and semi-controlled environments, research done in a natural environment is regarded as research done in real life where the researcher is unable to control certain variables (Gray, 2009:166).

When a researcher undertakes field research, there are various roles she can assume, including that of an observer-as-participant. This includes interaction with those under observation, but the researcher does not become a participant in the group. She is the person conducting the research and the subjects are aware that they are being observed (Du Plooy, 2009:187). Methods to collect data include interviews, observation and keeping a research diary, and focus groups.

Another characteristic of field research is the fact that its interpretation can include “the voices of those being studied as well as that of the researcher” (Flick, 2006). The researcher should pay special attention to maintaining the balance between observing and participating.

According to Van der Waal “fieldwork makes you more aware of the complexity of social reality” and is often useful in broadening one’s knowledge (2003:158). Additionally, good interpersonal skills and an interest in other people are crucial for fieldwork in human sciences (Van der Waal, 2003:158), an aspect that enticed the researcher to use this approach.

4.2.3 Participant observation studies

Mouton (2005:148) defines participant observation studies as qualitative research aiming to “provide an in-depth description of a group of people”. These descriptions originate from the “life-worlds” of the participants and produce an insider perspective of the participants and their practices.

Participant observation studies provide in-depth insight into the subjects taking part in the research. Furthermore, the researcher establishes a rapport with the participants and can achieve high construct validity (Mouton, 2005:148).

The researcher is also able to collect primary or new data, thereby adding to the body of knowledge in science journalism studies in South Africa. “Fieldwork also has its place in everyday human interactions and well-known social situations, because it can generate knowledge and insight that would be difficult to find with another approach” (Van der Waal, 2003:158).

The researcher realises the areas of potential error as well as the limitations of conducting participant observation studies. Firstly, the means of measurement are not standard (Mouton, 2005:148). Secondly, the data and results obtained cannot be generalised as they depict the experiences of only a small number of people (Mouton, 2005:148).

Furthermore, data collection and analysis are time consuming, and sufficient time is crucial to conduct good-quality fieldwork (Van der Waal, 2003:157). In this case, each interview took approximately one hour, and all recorded interviews were transcribed, which resulted in about 20 hours’ research material.

To avoid potential bias, the researcher made a concerted effort not to allow her own preconceived notions to cloud her objectivity (Poggenpoel, 2003:150). To avoid the lack of rigour in data analysis that Mouton (2005:149) warned against, the researcher followed an interview guide and employed strict ethical considerations as discussed in the following sections.

4.3 Research design

The researcher elected to conduct lengthy interviews with a pre-selected sample of participants with the goal of understanding their perceptions, perspectives and their understanding of the science journalism industry in South Africa.

4.3.1 Unit of analysis and sampling

The term “unit of analysis” refers to the individual item described by the data collected (Priest, 2010:41). In this study, the unit of analysis is science journalism in South Africa. For descriptive purposes, the unit of analysis will, in certain cases, be divided into science journalists on the one hand and science communicators on the other.

For the in-depth interviews, purposive sampling was used because phenomenological researchers carefully select their sample of participants (Leedy & Ormrod, 2005:139). In this case, the science journalists selected possessed knowledge and information the researcher deemed suitable for the purpose of the study (Poggenpoel, 2003:150). Babbie (2010:193) argues that it is appropriate to select a sample on the “basis of knowledge of a population”. As Uys and Puttergill (2003:113) argue, purposive sampling is especially useful when the researcher wants to select unique participants to provide “special information” and when the researcher wishes to conduct “deep analysis” in the selected field of study.

The researcher conducted preliminary research to identify science journalists and science communicators with intimate knowledge of the South African science journalism industry. Along with her supervisor, Professor George Claassen, the researcher developed a list of suitable journalists and communicators.

In the selection process, the researcher also used snowball sampling as some participants identified more participants with the same basis of knowledge to take part in the study. This type of sampling assisted the researcher in gaining access to the population under investigation (Uys & Puttergill, 2003:113).

According to Leedy and Ormrod (2005: 139), a typical sample size for a study of this nature ranges between five and 25 participants. The population in this study consists of 20 science journalists, science communicators and science writers in South Africa.

The participants in the study are as follows¹:

Science journalist/communicator/writer	Reasons for selection²
Adele Baleta	Freelance science journalist and former science journalism lecturer at the University of Pretoria
Anina Mumm	Founder of <i>ScienceLink</i> , South Africa's first digital science communication start-up Co-founder of science journalism website <i>SciBraai</i>
Daryl Ilbury	Science journalist and author
Elise-Marie Steenkamp	Group manager: Communications at <i>Hortgro</i>
Elsabé Brits	Science journalist at <i>Media24 (Netwerk24)</i>
Engela Duvenhage	Co-founder of science journalism website <i>SciBraai</i>
Fanie van Rooyen	Former science journalist at <i>Beeld</i> , currently at <i>AgriConnect</i>
Katharine Child	Journalist at <i>TimesLive</i> Winner of the 2014 Profile Awards for science and technology journalism
Leonie Joubert	Freelance science writer and author
Linda Nordling	Editor at <i>Research Africa</i> and freelance science journalist
Lynne Smit	Former President of the South African Science Journalists' Association (SASJA)

¹ The order in which participants are listed here does not reflect in any way the order of the designations used as pseudonyms for participants in chapters 5 and 6.

² While Professor George Claassen of Stellenbosch University has made major contributions to the field of science journalism in South Africa and is a founding member of the South African Science Journalists' Association, the researcher deemed it a conflict of interests to interview Claassen, as he is also the supervisor of this study.

Mandi Smallhorne	President of the South African Science Journalists' Association (SASJA)
Marina Joubert	University of Stellenbosch science communication lecturer, science communicator, founder of <i>Southern Science</i> and founder of the Facebook group <i>Science Communication Africa</i>
Mia Malan	<i>Mail & Guardian</i> Health Editor Founding director and editor of the <i>Bhekisisa Centre for Health Journalism</i>
Munyaradzi Makoni	Freelance science journalist
Paul Kennedy	Science communicator at <i>ScienceLink</i> , South Africa's first digital science communication start-up, volunteer writer for <i>SciBraai</i>
Sarah Wild	Science journalist, author and former editor of the <i>Mail & Guardian</i> science desk
Sibusiso Biyela	Science communicator at <i>ScienceLink</i> , South Africa's first digital science communication start-up, volunteer writer for <i>SciBraai</i>
Tamar Kahn	Science journalist at <i>Business Day</i> and <i>Financial Mail</i>
Wiida Fourie-Basson	Media officer and science writer at Stellenbosch University's Science Faculty

Table 4.1 – Participants selected for this study

4.3.2 Qualitative in-depth interviews

By conducting qualitative, in-depth and semi-structured interviews with science journalists and science communicators in South Africa, the researcher ensures that meaning and understanding are brought to the study, thereby strengthening the validity and reliability of any findings. The

advantage of this type of interview is the volume of information provided by the participants (Leedy & Ormrod, 2005:146).

Poggenpoel (2003:148) argues that the greatest advantage of conducting interviews is the fact that further questions can be asked immediately to gain clarity. Furthermore, she regards interviews as “an especially effective method” to gather information, provided the researcher is well prepared and has good interpersonal skills (2003:150). Another advantage, according to Van der Waal, is the fact that “many people enjoy telling their life story or giving their opinions to an interested or empathic other person” (2003:156).

The researcher drew up a list of general research questions before conducting the in-depth interviews with science journalists and science communicators in person (or by using *Skype*). The interviews were based on a “set of topics” rather than on specific and standardised questions (Babbie, 2010:318).

A general description of the study and the research questions were sent to the journalists beforehand to indicate the direction of the study, but many additional questions emerged from the conversation. “The phenomenological interview is often a very unstructured one in which the researcher and participants work together to ‘arrive at the heart of the matter’” (Tesch, 1994:147, cited in Leedy & Ormrod, 2005:139).

When conducting semi-structured interviews, the researcher asks open-ended questions and follows up on information provided by the participants (Poggenpoel, 2003:148). “Experience has shown that a clearly formulated open-ended question works well in getting the participant to start talking and from then on the interviewer only has to follow the participant’s cues.” (Poggenpoel, 2003:148).

The interviews were as much dependent on the researcher as on the participants and the researcher relied on the participants to guide her to identify the most important aspects of their experiences. Poggenpoel (2003:143) suggests that the researcher becomes “an instrument for gathering information”, which is what the researcher sets out to achieve. The interviews resemble an informal conversation, with the participant sharing their perceptions, opinions and experiences and the researcher mostly listening. “The participant should be regarded as an expert in the topic of the research and the researcher should approach the participant from a position of self-effacing ignorance” (Poggenpoel, 2003:150).

Consequently, the researcher can gain an understanding of the experiences the journalists and communicators have had (Leedy & Ormrod, 2005:139).

As is clear in subsequent chapters, common themes have emerged from the science journalists' experiences that provide great insight into the field of study. As Leedy and Ormrod (2005:140) contend, the main goal is to provide a general snapshot of the science journalism and science communication industry as seen through the eyes of those who have first-hand experience.

The interview questions are based on the following general research questions:

- What are the journalists' personal opinions, perspectives and perceptions of the current state of science journalism in South Africa?
- What are the greatest challenges in reporting on science news and scientific research in South Africa?
- What role do other gatekeepers (such as news editors and editors) play in ensuring that science news is published?
- What are the themes in the journalists' descriptions of their experiences in the field of science journalism in South Africa?
- What is the role and importance of industry organisations (such as the South African Science Journalists' Association) and tertiary education programmes (such as an MA in Science and Technology Journalism at Stellenbosch University) in the science journalism industry?
- How can science journalism be improved in South Africa according to science journalists in the field?

4.3.3 Interview guide

In this section, the researcher outlines her interview strategy to achieve the main goal of her study: to provide a detailed and in-depth description of the state of science journalism in South Africa.

This guide served to identify the key areas, topics and themes to cover, and questions to ask. The focus throughout the interviews was on the participants – to tell their story in their way. The researcher used Harvard University's sociology department guidelines for qualitative interviews as a reference.

Firstly, the researcher identified her strategy to focus on the participants and their experiences and opinions. The participants studied held multiple perspectives and the researcher's goal was to explore those different views.

In preparation, the researcher conducted a pilot test of the interview to ensure that she was well versed in the questions she wanted answered. She developed probes to ensure that the participants provided detailed answers.

The questions were asked in a logical manner, with easier questions asked first. Difficult questions were approached later in the interview, once the researcher had established a good rapport with the participant. The researcher encouraged participants to be as honest and complete as possible and reassured them that there was no judgement or preconceived ideas on her part. The questions were as clear, easy and short as possible.

One question at a time was asked and participants were allowed time to think and to finish their responses before the next question was introduced. The researcher was guided by the responses of the participants and followed up new information with further questions to ensure detailed reflections.

Questions that elicited the longest responses from participants proved to be the most useful. The researcher made use of different types of question in her interviews, including direct, indirect, follow-up and specifying questions to obtain the participants' own views.

The researcher actively participated in the interviews while maintaining the focus on the research questions she wanted answered.

The researcher did not focus on a specific time frame for the interview as this could put pressure on the participants, leading to valuable responses left unsaid.

All interviews were recorded and transcribed to counter limitations of memory (Poggenpoel, 2003:150). The researcher was able to refer to the transcripts in her data analysis and others (such as her supervisor and external examiners) had access to the data during the assessment of the study (on request). Once she has completed her MA in Journalism, the recordings and transcripts will be erased.

4.4 Ethical considerations

As a student and researcher at Stellenbosch University, this researcher understands her responsibility towards the participants in this study. Mouton (2005:238-246) urges researchers to communicate as fully as possible the consequences of the research to those studied or interviewed. Therefore, this researcher applied for ethical clearance according to the university's ethical clearance policy. In this regard, the researcher explained to all participants exactly what her research entailed, that their participation was completely voluntary and that they could, at any point, opt out. Furthermore, the researcher explained that while their names would be listed as participants, their responses would not be attributed to them (to ensure they would be comfortable enough to be completely honest). Personal information such as cell phone numbers and email addresses would not be made public. As suggested by Mouton (2005:238-246), all those interviewed were presented with an informed consent form, giving the researcher permission to include them in her research.

4.5 Summary

This chapter provides an in-depth discussion of the research design and methodology. The design of this study is purely qualitative, in keeping with the theoretical framework described in chapter 3. The interpretive research method employed entails in-depth interviews with science journalists and science communicators active in the science journalism industry in South Africa. The sample has been selected purposefully in view of the specialised knowledge of the participants about science journalism. In the next chapter, the researcher presents the findings of the in-depth interviews with the participants.

Chapter 5: Presentation and discussion of findings

“Science journalism will survive, but not in the way we know, like 10 years ago. It will have to adapt and find innovative solutions to survive” – Participant H

5.1 Introduction

In this chapter, the researcher presents and discusses the findings of her research. She reconstructs the key findings of interviews with 20 science journalists, science communicators and science writers in South Africa. This chapter is based on the previous chapters including the literature review, theoretical framework and research design and methodology.

The aim of this chapter is to address the primary research question: What is the current state of science journalism in South Africa, according to industry insiders?

Furthermore, this chapter aims to provide answers to the general research questions set out in chapter 1.

The researcher starts by outlining the differences between science journalism, science communication and science writing, according to the participants. Initially, these were not included in the general research questions but because several participants classified these roles as separate with distinct differences, the researcher decided to include them in her findings.

Secondly, the researcher explores the current state of science journalism in South Africa, according to those with first-hand experience. This includes pertinent topics raised by the participants, reasons for their views, challenges in reporting on science in South Africa, as well as insights into the value of training in science journalism.

Thirdly, the researcher provides insight into the relationship between scientists and journalists, as perceived by science journalists, science communicators and science writers. She also explores the rise of science communication and its role in the science journalism industry in South Africa.

The researcher furthermore elaborates on multilingualism in science journalism. This section was not originally included in the general research questions, but the researcher was guided by the participants regarding pertinent issues in the field.

A section is dedicated to the debate around the South African Science Journalists' Association (SASJA).

Finally, the researcher includes suggestions and recommendations from the participants regarding the future of science journalism in South Africa. These include recommendations about funding, means of producing science news, as well as the inclusion of digital communication methods in science journalism.

5.2 Science journalism, science communication and science writing

As stated in the introduction to this chapter, the researcher did not originally include this section in the general research questions. However, following interviews with the participants, the researcher noticed a need to define and differentiate between science journalists, science communicators and science writers.

Of the participants in this study, nine considered themselves science journalists, 10 described themselves as science communicators and one as a science writer. Five science communicators indicated that they were also involved in science writing and science journalism.

According to Participant T (2018), the difference between the three descriptions mattered in South Africa. She said that the science journalism and communication industry “had conflated science journalism with science communication”. Participant I (2018) and Participant O (2018) indicated that a blurring of the lines between science journalists, science communicators and science writers posed risks for the integrity of science journalism in South Africa.

Participant T (2018) viewed the role of a science journalist as a “professional questions asker”. “There is nothing I can’t ask and nothing I can’t write. I think that is ultimately what being a journalist is” (Participant T, 2018).

Participant G (2018) argued that journalists were tasked with holding power to account. “Journalists are after the truth, they want to expose stories and they want change” (Participant K, 2018). According to Participant K (2018), who works as both a science communicator and a science journalist, science journalism was about objectivity and “telling stories that matter”.

However, because of strong competition and resistance from editors, management and media consumers, science journalists promoted science too. “You have to be an advocate, but that can’t be your primary role as a science journalist” (Participant G, 2018).

Participant O (2018) contended that journalists were no longer able to interrogate the motives behind science. “There are fewer science journalists doing actual journalism. By actual journalism, I mean journalism that doesn't presume that science is intrinsically good, that it wants to interrogate the process that wants to challenge what they've been told by government” (Participant O, 2018).

Participant O (2018) also lamented the fact that science journalists were expected to write positively about local science. “Science journalists, especially when they write about local science, should somehow be cheerleaders and I have a problem with that, I have a big problem with that” (Participant O, 2018).

In contrast, Participant T (2018) argued that science communicators were limited to communicating only positive information as they were paid by clients.

The reasons for practising science communication, according to Participant K (2018), are different. While it is also a means of storytelling, the focus is mainly on the positive elements of the story and the communicator is paid by a client, so “you basically can’t be objective”. According to Participant B (2018), in science communication, “the science is the story” and it can be used to lead journalists to potential news stories by filtering out what is interesting and newsworthy. “Good science communication should bring people to science news” (Participant B, 2018).

According to Participant I (2018), the term “science writer” allowed more space for opinion and advocacy. “I don’t want to call myself a science communicator as this is interpreted as a PR function. I am not operating in the hard news space, so to call myself a science journalist is also a bit inaccurate. That’s why I prefer the label science writer” (Participant I, 2018).

According to Participant B (2018), while there are differences in the priorities of science journalists, science communicators and science writers, “that doesn’t mean they cannot be complementary to each other”.

Table 5.1 outlines the participants' views of science journalism, science communication and science writing:

<p>Science journalists</p> <ul style="list-style-type: none"> • Work in the hard news industry (Participant I, 2018) • Professional "question asker" (Participant T, 2018) • Objective and after the truth (Participant K, 2018) • Hold power to account (Participant G, 2018) • Should be allowed to interrogate the scientific process (Participant O, 2018) • Do not simply believe what they are told (Participant O, 2018) • Should not be expected to only report positively on science (Participant O, 2018)
<p>Science communication</p> <ul style="list-style-type: none"> • Often considered public relations work (Participant I, 2018) • Paid by clients to communicate (Participant K, 2018) • Expected to highlight only the positive aspects of the science stories they promote (Participant K, 2018) • "Science is the story" (Participant K, 2018) • Can lead to science news stories for journalists (Participant B, 2018)
<p>Science writing</p> <ul style="list-style-type: none"> • Allows for more opinion and advocacy (Participant I, 2018)

Table 5.1 – Differences between science journalists, science communicators and science writers

In chapter 6, the conclusion to this study, the researcher works towards defining each of the three terms.

5.3 The current state of science journalism according to industry insiders

In this section, the researcher presents the perceptions and opinions of the participants regarding the current state of science journalism in South Africa. While the topic is very broad, certain themes have emerged from the interviews with the participants and, where necessary, the researcher provides examples the participants mentioned in their responses. The researcher also includes in this section the views of the participants regarding training in science journalism (and the value of a qualification in science journalism).

According to the data collected, eight of the participants worked on a freelance basis while 12 were permanently employed. Of those, five were permanently employed by media organisations, while three were employed by research institutions and universities. The remaining participants were self-employed. Two participants indicated that they wrote almost exclusively for international publications.

Of those interviewed, five expressed positive sentiments regarding the state of science journalism in South Africa, while seven considered the situation to be dire. The remaining eight participants had both positive and negative sentiments towards different aspects of the situation.

Many participants based their sentiments about the current state of science journalism in South Africa on the broader journalism industry – both locally and globally (Participant A & Participant H, 2018). Participant G (2018) argued that the “complete shift in the media landscape” and the “impact of social media on the broader media paradigm” had greatly affected mainstream media. Participant H (2018) agreed. “This is nothing new. We know because of digitisation that there is a lot of pressure on traditional media” (Participant H, 2018). Participant H (2018) said it was not that “science doesn’t sell”, it was that “nothing sells anymore”. “I think that's the crux, the media ecosystem has changed fundamentally with people that don't want to pay for this anymore, no news, not just science news. They don't want to pay for any news anymore and it is sad, and it is terrible” (Participant H, 2018).

Participant C (2018) indicated that science journalism in South Africa had always struggled and argued that there was an overexaggerated sense of negativity towards science journalism. “I don’t think the situation is better or worse than it was 10 years ago.... Everyone in journalism struggles” (Participant C, 2018). She postulated that the situation in science journalism reflected the general South African situation regarding journalism. “There is no smooth sailing, not with anything” (Participant C, 2018).

Participant A said that the state of science journalism was “depressing” and it “feels like a losing battle” while Participant G (2018) said science journalism in South Africa was “on its last legs” and Participant D (2018) said the situation was “really bad”. In addition, Participant P (2018) said the current state of science journalism was “sad”. Participant T (2018) said the science journalism industry had “totally imploded”. Participant B (2018) said science news was

an “incredibly difficult sell” and often became a “passion project”. Participant J (2018) called science journalism a “Cinderella beat” and a “luxury” for newsrooms.

Furthermore, Participant I (2018) contended that political, economic and sport reporting was seen as the “adult beats”. “Environment and science are often seen as optional extras” (Participant I, 2018) even though, according to Participant F (2018), science journalism was a “hugely complicated beat”.

Participant G (2018) summed up the negative perception of the situation, “In the last five years, I’ve seen a significant slide in the output and the presence of really good journalists in this country.”

Participant E (2018) said that science journalism had been in a “perilous condition” since the early 2000s and she felt that this was “ingrained” in the minds of those in the industry. “People can say science journalism is in trouble and all that, but I’m not sure it was ever in any other position” (Participant E, 2018).

Participant I (2018) said the challenges in science journalism were the same “that we’ve been moaning about for years”. According to Participant G (2018), “science is a nice to have for any kind of large media organisation, but it is not essential”, which means it is always the first to be cut due to a lack of funding. According to Participant J (2018), a newspaper was “not made or broken on whether or not there’s a science reporter”.

Participant B (2018): “The issue is that most people think there has to be a change in the mindset of readers, it is not really the readers who have that power, it’s newsrooms, and it’s for editors to see the value in science stories.”

Participant I (2018) said she was reading fewer and fewer South African daily newspapers “because the quality is so poor, and the science and environmental beat is so underrepresented in many of these newspapers”. In addition, Participant N (2018) considered the science news in South Africa “one dimensional”.

According to Participant L (2018) “most people think that science journalism is difficult or it’s for super intelligent people. The moment you say science, they completely switch off”. This has led to a lack of interest in science journalism as well as the non-realisation of opportunities in science journalism in South Africa (Participant L, 2018). Furthermore, Participant H (2018)

referred to the “dumbing down of society”. “People are more interested in the name of the royal baby than whether there's a big problem with climate change” (Participant H, 2018).

Participant L (2018) observed that there were very few science journalists in South Africa and few publications were keen to take on science stories. “We all know there are only a handful of dedicated science journalists in South Africa and that is a huge problem” (Participant F, 2018). Participant J (2018) agreed. Because newsrooms are spread thinner and there is “a loss of warm bodies in newsrooms”, few people regularly write about science (Participant J, 2018).

According to Participant Q (2018), the science journalism industry in South Africa is under-resourced. “There are not enough people who have the skills they need to write about science and they don't have the confidence they need to do it.” Participant P (2018) lamented the lack of skills in newsrooms. “You will even in some cases find there is no one on the health beat anymore and that used to be one of the last havens of the science journalist.” The challenges outlined have led to “an environment that is very fertile for pseudoscience” (Participant G, 2018).

Participant H (2018) said because newsrooms were so under pressure and did not have the staff complement, science news stories often became the responsibility of “mainstream journalists”. According to Participant D (2018) and Participant O (2018), media organisations did not have the resources or interest to invest in science reporters. “It's an issue of resources rather than not having people who can do it. I mean we've got excellent journalists, also excellent science journalists in this country. Unfortunately, newsrooms are not investing” (Participant O, 2018).

Participant A (2018) said that dedicated science journalists in newsrooms were crucial to ensure that the relationship between scientists and journalists was improved because dedicated science journalists “come to the table with knowledge”.

Participant H (2018) said that several top science journalists had left newsrooms to pursue other career paths with more money and more freedom. “They are basically moving to institutional communication on science” (Participant H, 2018). Participant K (2018) agreed. “Almost every science journalist that I know has either given up on being a journalist entirely or is doing a combination of journalism and communication” (Participant K, 2018). Because there is little or no money for dedicated science journalism, according to Participant K (2018), “at some point as a journalist if you're underpaid and you're overworked, you're going to get disheartened, you're going to lose that passion and excitement”.

Not all participants shared the negative perception of science journalism in South Africa, however. While Participant H (2018) was concerned about the quantity and quality of science journalism, “it’s not as if it’s dead”. She said journalists and scientists often criticised science journalism in the mainstream media without being active media consumers.

Participant R (2018), while not outright positive, was “cautiously optimistic” about science journalism in South Africa while Participant E (2018) indicated that the situation was not as “bad” as some made it out to be. Participant R (2018) said the country was entering “an exciting phase in science journalism” as people were beginning to see the value of science journalism as a specialist field. “Over the past 10 years, it has really been receiving the necessary recognition as a specialist beat in the media” (Participant R, 2018). Participant G (2018): “I really do believe there are a desire and an interest among media consumers for science that affects them.”

Participant M (2018) did not believe that science journalism in South Africa was in a dire state. In her experience, South Africa had more access to resources than other African countries. “I get irritated with studies that just all come up with science journalism is in a dire state” (Participant M, 2018). Participant F (2018) said that the state of science journalism was not so dire if one considered that not all science news stories were appropriate for the mainstream media. “There are other places where that information can go and there is such a lot of things happening on the internet and it is just fantastic. In that sense there's a lot of science journalism, science writing, science communication out there” (Participant F, 2018).

In the next section, the researcher describes the experiences of the participants regarding the coverage of science news in South Africa.

Table 5.2 shows the challenges in science journalism outlined by the participants in this study:

Resource challenges

- The industry is underresourced (Participant Q, 2018)
- No appetite to pay for science stories (Participant P, 2018)
- No budget for a science writer or science journalist (Participant I, 2018)

Challenges on the scientists' side

- Lack of access to scientists (Participant N, 2018)
- Slow to respond to journalists (Participant S, 2018)
- Lack of training to deal with the media (Participant S, 2018)

Challenges in the newsroom

- Not getting column inches in newspapers because “science doesn't sell” (Participant G, 2018)
- Science journalism is viewed as an optional extra (Participant I, 2018)
- Lack of scientific training for senior newsroom staff (Participant B, 2018)
- Newsrooms don't see the value of science journalists (Participant I, 2018)
- Generalist journalists are tasked with writing about science news (Participant Q, 2018)
- It is easier to find articles “off the wires or the net” (Participant Q, 2018)
- Lack of young specialist science journalists (Participant A, 2018)
- Juniorisation of the newsroom (Participant M, 2018)
- Social media and the “tabloidisation” of science (Participant G, 2018)
- Lack of storytelling skills among journalists (Participant M, 2018)
- Lack of science journalism in local languages (Participant N, 2018)
- Lack of knowledge of the scientific method and scientific processes (Participant N, 2018)

External challenges

- Strong traditional beliefs and cultural inertia (Participant G, 2018)

Table 5.2 – Challenges in science journalism according to participants

5.3.1 Coverage of science in South Africa

Participant C (2018) believed high-profile science announcements in the country, such as the *Square Kilometre Array* (SKA) and the discovery of *Homo naledi*, did get “good media coverage”. She said those criticising newsrooms were armchair critics who were no longer in touch with the science journalism industry in South Africa. “What we achieve with the number of people we have now, as compared to 15 years ago, is remarkable” (Participant C, 2018).

Participant G (2018) said news reports on accurate and “pure science” had moved towards lifestyle articles and the so-called “tabloidisation” of science. “The moment you bring in lifestyle, you are bringing in components... not only such as health... but also beauty, and then you start doing other things like horoscopes and other things which fall under pseudoscience” (Participant G, 2018). This misrepresentation of scientific research could be “incredibly dangerous” according to Participant G (2018), as it could result in something similar to the anti-vaccination drive. Participant F (2018) agreed. “You can get it spectacularly wrong and you don’t want to do that” (Participant F, 2018).

Participant A said people underestimated how much science journalism was needed in the media industry. “We still need science desks and science journalism. There are a few gems glistening on islands but no real push for solid evidence-based journalism. This is a dangerous situation especially in the climate of fake news we have today” (Participant A, 2018). Participant R agreed that fake news was putting pressure on scientists to provide peer-reviewed research on reputable platforms (2018).

Participant C was expected to deliver three to four stories every day. In the past, she could spend weeks on science news articles but with the advent of online news platforms, deadlines became increasingly limiting (2018). While she still made time for science news stories, no one took over her beat when she was sick or on leave. “I think it’s my passion for science and to get the message out there that has kept me going for so long” (Participant C, 2018).

Participant D (2018) has lost interest in science journalism because science news stories are not popular on the media organisation’s website. Her employers track the traffic on the website and account to advertisers regarding the user numbers and the views generated on the website. She recently wrote about the listeriosis outbreak in South Africa and the only story that did well in terms of generating traffic on the website, was a breaking news article about Enterprise products being contaminated. “The incentive to write about health and science, once the

breaking news is finished, is quite low because if one of our measures is how many people read it and you want readers so that you can keep your job... why on earth would I write something people are not going to read?" (Participant D, 2018). Because of the fast-paced nature of online news, Participant D believed that the demand from the media was greater than science could provide (2018). "You would need a new breakthrough every day or every hour, but science does not provide that. It does not discover a cure for cancer today and a cure for HIV tomorrow" (Participant D, 2018).

According to Participant M (2018), the single most important skill that specialist science journalists required was is "excellent storytelling skills" as well as the ability to break complex science down into an "absorbable form". "I would not like to read any science story, honestly, of health or whichever subject that is perfectly accurate but is boring" (Participant M, 2018).

Participant N (2018) said science news articles should be relevant to people's lives. "I sometimes think we should not think of it as science journalism.... Almost any story can have a science angle" (Participant N, 2018). Participant M (2018) agreed that science news stories should have scientific facts staggered throughout the article.

Furthermore, Participant M (2018) said people would be interested in stories that were presented in a manner that was relevant to them. Furthermore, she argued that stories were not packaged correctly, which was why there was a perception that media consumers were not interested in science. "The South African audience is not scientists reading the newspaper. If you can't present it in such way that a normal person would be interested in it, then I don't think you can demand that people read it" (Participant M, 2018).

Participant C agreed. "It is very easy to write something that is not understandable. The art is to write articles so that a normal person can understand them but in a way that satisfies the scientist too" (Participant C, 2018). It is also much easier for a journalist to write about something when they understand it, according to Participant C (2018). "There is no such thing as a stupid question. Keep asking questions until you understand. If you understand it, you can write about it" (Participant C, 2018).

In the next section, the researcher outlines the participants' perceptions of the value of tertiary education in science journalism and science communication.

5.3.2 Postgraduate studies in science journalism

As mentioned in the literature review of this study, Stellenbosch University offers postgraduate programmes in science and technology communication. The researcher asked participants about their thoughts about such programmes.

Only a quarter of the 20 participants indicated that they had completed a postgraduate programme in science journalism in South Africa. Three participants studied science journalism and communication abroad at postgraduate level. Six participants indicated that they had completed postgraduate programmes, but not in the specific fields of science journalism or science communication.

Participant S (2018) held the opinion that postgraduate studies in science journalism and science communication were undervalued. “I think if you truly want to immerse yourself in something, it is important to study it. It doesn’t necessarily make you a massive expert in the field, but it helps you think about the issues” (Participant S, 2018). Participant F (2018) believed that “not enough people” were undertaking postgraduate studies in science journalism and communication and argued that it should be included in all journalism studies programmes. “It’s very important. Science and technology for the development of Africa and South Africa is crucial” (Participant F, 2018).

Participant D (2018) said critical thinking skills lectures for journalists would be useful because “we don’t know how to analyse science and basically don’t have a bullsh*t detector”. She argued that similar training should be offered to editors and media managers as they decided which stories were ultimately published (Participant D, 2018).

Participant E (2018), who had completed a postgraduate degree in science journalism, said the qualification was valuable in her career and in her relationship with scientists. “When I tell someone I have a postgraduate degree in science journalism, it’s as if they relax. It’s as if you place yourself on the same level as the scientist” (Participant E, 2018).

According to Participant P (2018), studying further was valuable but was not a requirement. “I always think that studying further is valuable... but the cattle thrust of actually working is where you will learn”. Participant A (2018), who completed a postgraduate degree in science journalism, said that while such a qualification was not critical, it made broadening one’s networks easier and provided a broadened perception of the scientific method and the research

process. Participant E (2018) agreed. “When you write a thesis yourself, you understand what a scientist goes through and you understand the scientific process. You end up having more insight” (Participant E, 2018).

However, participant T did not believe that a postgraduate qualification would assist in getting a job. Participant M (2018) agreed. “I don’t think doing a thesis on science journalism is necessarily going to equip you with skills to report on science, but it is going to equip the field with research.”

Participant T (2018): “In my honest opinion, I don’t think a postgraduate study in journalism will help you survive in a very difficult landscape.” Participant J (2018) agreed that a postgraduate qualification was not a requirement in the industry. “If you care about it (science journalism), and you care about what you produce, you will learn on the job (Participant J, 2018).

Participant O (2018) was troubled by the push for science communication and science journalism training without understanding basic realities of the industry, such as “the collapse of the news industry”. “I think there are some serious hard truths that need to be looked at before we say let’s plough lots of money into creating and training science journalists and science communicators. Who are they going to work for? Who are they going to communicate to? Who are they going to write for as journalists if nobody is prioritising that?”

According to Participant G (2018), those interested in studying science journalism would need to adapt to the changing media landscape. “If you want to study science journalism because you think that you are going to a mainstream title, then you are going to be disappointed unless you are willing to fight tooth and nail” (Participant G, 2018).

According to Participant Q (2018) and Participant L (2018), the future of science journalism in South Africa should include training for journalists and other key role players in newsrooms. According to Participant I (2018), education in science journalism was vital to the future of science journalism. “I think it's critical that tertiary institutions come on board in this regard. Any journalism school needs to have a course in science journalism if possible.” This would increase the number of scientifically literate people in newsrooms. “I mean, we've been talking about the ‘juniorisation’.... I don't think that's changing and you can't expect a reporter with one year’s experience to be engaging with very complicated science” (Participant I, 2018). Participant M (2018) argued for the mentoring of science journalists. However, this training

method was time consuming and costly. “Creating a journalist like that does not happen in three months, it happens over a year or two. You also need the money then to help the person to apply those skills” (Participant M, 2018).

In the following section, the researcher briefly mentions two participants’ comments about women in science journalism.

5.3.3 Women in science journalism

While the topic of women in science journalism was brought up by only two participants, the researcher deemed it worthwhile to mention their spontaneous contributions. Because this was not a specific research question in this study, the researcher did not pursue the question. This could be explored in future academic studies in science journalism. In the following section, the researcher explores the participants’ perceptions of the relationship between scientists and journalists. Of the 20 participants in this study, 15 were female.

Participant G (2018) said that most science journalists in South Africa were women. “...for me it speaks volumes about how the notion that science is for boys and not for girls is just utterly ridiculous”.

For Participant O (2018), the support of women science journalists was very important at one point in her career and indicated that social media were useful when looking for support. “...in terms of being a professional, that belongs to some kind of minority, be it women in a male-dominated job...” (2018:14).

5.4 The relationship between scientists and journalists

One of the general research questions asked participants to elaborate on their views regarding the relationship between scientists and journalists. In this section, the researcher identifies both the positive and negative aspects of the relationship as well as the rise of science communication to bridge the gap between scientists and journalists.

5.4.1 Perceptions of the participants regarding the relationship between scientists and journalists

The participants in this study all had mixed feelings about the relationship between scientists and journalists.

Participant D (2018) said the relationship between scientists and journalists was “non-existent”, while Participant N (2018) indicated that she had never had an experience where there was not a gap between scientists and journalists. Participant R (2018) described the relationship between scientists and journalists as “tense”, while Participant B (2018) commented that there was a general “lack of trust between the two”. “There is a tension between scientists and journalists in terms of the different roles and functions and there is this perception that one is always failing the other” (Participant I, 2018).

Participant F (2018) commented that very few journalists had good personal relationships with scientists, a process that often took years. Participant D (2018) said that while a good relationship between a scientist and a journalist was possible, it was very rare.

On the other hand, Participant H (2018) said the relationship was often better than people thought. “The relationship between scientists and journalist is one of those things that traditionally people think there is a lot of stress, a lot of stress and a lot of strains, but I think those are stereotypes that we need to move behind us” (Participant H, 2018).

Participant L (2018) indicated that there had been a change in the relationship between scientists and journalists over the past decade. “Now, researchers and scientists are more receptive to journalists who write about science” (Participant L, 2018).

5.4.2 Challenges in the relationship between scientists and journalists

According to Participant Q (2018) the challenges in fostering relationships between scientists and journalists were two-fold. On the one hand, scientists were suspicious of journalists and reluctant to talk about their work to the media. Furthermore, scientists were often frustrated with journalists who did not understand their work properly (Participant I, 2018). On the other hand, journalists often did not know which questions to ask. “Journalists might get frustrated with the scientist because they go into too much detail and are slow to reply. Scientists can also be inaccessible, both emotionally and in terms of their work” (Participant I, 2018).

Participant D (2018) was cynical and negative about journalists’ relationships with scientists and indicated that scientists should be the ones contacting the media and taking the responsibility to communicate their work. “I really don’t see the point of bothering about science if scientists don’t even talk to us, answer emails or share research....”

According to Participant B (2018), the problem was the fact that “most scientists don't understand how the media works and most journalists don't understand how research or the science field works”.

Furthermore, Participant D said that scientists were often unwilling to engage the media (2018). “The media are just not on scientists' wavelength. We've got to be very proactive and consistently contacting them which there isn't a lot of incentive to do because if people don't read the stuff and we are overworked, under-staffed and under-resourced, why are we going to keep kind of knocking on scientists' door, for what?” (Participant D, 2018).

Participant Q (2018) argued that scientists could be arrogant and hide behind their jobs without explaining their work simply. “Very often they don't know how to communicate. If you can't explain what you're doing to your grandmother, then you should not be doing it.”

Participant G (2018) warned against “rock star scientists” in the media, although they were useful in communicating science and encouraging discussions. “What we don't need are scientists who want the focus to be on themselves. It's not about them, it's about the science” (Participant G, 2018).

Science communicators were often frustrated because journalists used their press releases without questioning and interrogating the contents (Participant Q, 2018). “What should happen is that we should provide the science journalist with the story and they should then interrogate the subject and bring in some extra voices and do what science journalists are supposed to do but then nine out of 10 cases, they don't” (Participant Q, 2018). According to Participant F (2018), the use of press releases as they were, was a “general problem” and “we all experience it”. Participant H (2018) called this phenomenon “churnalism”. Press releases, written by former science journalists working as science communicators at institutions, were being reprinted as news stories because there was “not enough time or enough hands in the newsroom to redo it”.

The biggest problem in this regard is that the “critical journalistic lens” is lost (Participant H, 2018). “There is not enough capacity in our journalism rooms anymore to really do critical, investigative, reflective science journalism and that's a concern” (Participant H, 2018).

5.4.3 Improving the relationship between scientists and journalists

Participant H interviewed 30 scientists as part of her PhD research. “I got this impression that they valued and appreciated the media and they wanted to work more with the media” (Participant H, 2018). While some fears and concerns remained, scientists realised the value of communicating their work to the public and accounting for public money (Participant H, 2018). “The scientists are really motivated to engage with society and they see the mass media as a very important part of that”. Participant R said scientists and researchers had a duty to inform the public of their work as it was often funded using public money (2018). “In the South African climate of corruption this is even more important. They should be able to show what they did with sponsors’ money” (Participant R, 2018).

“For me there is hope but definitely challenges as well” (Participant H, 2018). Some of these challenges included junior, inexperienced and disinterested journalists. “At the same time, they said that they feel insulted when a journalist shows up and is clearly not interested, just there to do a story, hasn’t got a clue what their work is about” (Participant H, 2018).

Participant D (2018) went further, “Journalists want a headline, you want something that people are going to click on. You don’t care about the quality of the study, the abstract, where it was published, the journal, anything.”

Because of this, Participant J (2018) thought that science communicators “should be spoon-feeding journalists”. “I think they could do a little more to make sure the message they want to get out there is reflected accurately” (Participant J, 2018). To do this, they needed the support of scientists, however (Participant D, 2018).

Participant N (2018) argued that it was the role of the scientist to make sure they communicated clearly and ensured understanding on the part of the journalist, while the journalist was responsible for listening properly and asking questions where necessary.

According to Participant C (2018), scientists were protective of their work and a good relationship between a scientist and a journalist could set the scientist at ease. “The thing with scientists is that they don’t want to look like fools among their peers. So, your job (as a science journalist/communicator) is to not make them look like a fool” (Participant C, 2018).

Participant T (2018) said the relationship between scientists and journalists worked when scientists realised that the journalist could offer skills the scientist did not have and vice versa.

Participant I (2018) and Participant C (2018) recommended that journalists foster personal relationships with scientists to build a reputation and to overcome tense relationships. “Over the years you establish your reputation as a science writer. You build these relationships, people learn to trust you after a while and you find ways to work around the fact that you and the scientist are operating according to slightly different rules” (Participant I, 2018).

According to Participant M (2018) and Participant Q (2018), journalists could build their relationship with scientists by allowing them to check their quotes for an article – not the entire article. Participant R (2018) agreed. “It’s not a matter of wanting to rewrite the copy, it’s a matter of checking that the hard facts are correct” (Participant R, 2018).

Table 5.3 shows the reasons for scientists’ scepticism towards the media as well as benefits of a good relationship with the media, according to participants:

Reasons for scientists’ scepticism towards the media
<ul style="list-style-type: none"> • Journalists get the science wrong (Participant B, 2018) • Journalists demand immediate answers (Participant K, 2018) • Speaking to the media is outside their comfort zone (Participant K, 2018) • Researchers are often denied an opportunity to check the facts before publication (Participant B, 2018) • Scientists do not want to be embarrassed in front of their peers by incorrect reporting (Participant B, 2018)
Benefits for scientists to speak to the media
<ul style="list-style-type: none"> • The media can make their researcher accessible to a wider, lay audience (Participant K, 2018) • Publication can lead to opportunities for new funding and collaboration (Participant K, 2018) • The scientists become experts and are often called on by the media to provide insights (Participant K, 2018) • Publication of their work in the media can bring them closer to policy decisions and to making a difference (Participant K, 2018)

Table 5.3 – Scientists’ scepticism towards the media and benefits of speaking to the media

In the next section, the researcher explores the rise of science communication in South Africa according to the participants.

5.4.4 The rise of science communication

Because of the tense relationship between scientists and journalists, the researcher focuses on the role of science communicators in facilitating the relationship and bridging the gap between scientists and journalists.

The researcher interviewed 10 science communicators in this study. Five of the participants considered themselves as “wearing more than one hat”.

Because newsrooms are under-resourced, science communication is becoming increasingly important (Participant O, 2018). “It's becoming a more and more important way for science institutions to get their work out there” (Participant O, 2018).

According to Participant E (2018), science communication had developed substantially over the past 10 years and science communicators could identify gaps in the media’s coverage of science to ensure their stories were published. “I think the state of science communication is very good although there are many more stories that could be told” (Participant E, 2018).

Participant H (2018) observed that, in South Africa, “institutional communication is becoming more and more sophisticated while the science journalism itself is battling to survive” (Participant H, 2018).

Participant B (2018) held the opinion that “in South Africa, the situation isn't bad for science communication at all”. Participant L said the relationship between scientists and journalists had improved because “science communication is taken seriously” (2018).

Participant A (2018) considered science communication to be “vital” in bridging the gap between scientists and journalists. According to Participant C (2018), science journalists, science communicators and scientists were a “three-way team”. Participant K (2018) viewed the relationship as a chain, with links between science journalists, science communicators and scientists. “If you have a break in that chain somewhere, you are going to lose the ability to get important stories out to the public” (Participant K, 2018).

Participant G (2018) agreed and said that science communicators had “a key role to play in helping science come alive.... They play a key role in working hand-in-hand with science and journalism, breaking down the barriers around science” (Participant G, 2018).

Participant D (2018) said that science communicators had a dual role of making sure that the science was not “too scienc-ey” and that news reports were not too sensational.

Participant B (2018) added that science communicators were probably the closest some scientists came to interacting with the media. “So, the role of a science communicator... would be to familiarise scientists with how the communication of science works and how the media works.”

Participant Q (2018) said science communicators were trusted more by scientists because there was an opportunity for the communicator to build a relationship with the scientists and “soften them up”.

According to Participant R (2018), science communication should be included in a scientist’s strategy from the beginning. “People make the mistake of seeing science communication as an afterthought... it should be part of the planning right from the start” (Participant R, 2018).

In the next section, the researcher briefly addresses multilingualism in science journalism and science communication.

5.5 Multilingualism in science journalism

Like section 5.2., this section was not initially included as a general research question. When several participants mentioned the role of science journalists and science communicators in science literacy in South Africa, the effects of traditional beliefs on science journalism as well as the need for multilingualism in science reporting, the researcher deemed it worthwhile to mention it in her study. However, further studies remain to be conducted in this field.

Participant B is currently the only person in the country to write science news in *isiZulu* (2018) and is well known in the science journalism and science communication industry in South Africa. He contributes *isiZulu* science news reports to the *SciBraai* platform, in a special section entitled *Shisa Sayensi* (2018). “The concept of *SciBraai* is we want people around a braai, talking about science. Imagine if more people were doing that in their own language” (Participant B, 2018).

Participant B (2018) believed that science news in indigenous languages should be part of the future of science journalism. “Talking about science in *isiZulu*, and other indigenous languages, should be something people don’t think about, it should just be part of the lexicon (Participant B, 2018).

Furthermore, communicating science news in indigenous languages not only assists people in understanding the science better but also preserves the language. “It’s not just for science’s sake. It’s also for the language’s sake – to keep it relevant for future generations” (Participant B, 2018). Once a language is considered to have no use, it dies out (Participant B, 2018).

Even if some people were “suspicious” of science due to traditional beliefs, Participant B believed that they should be able to debate these issues in their own languages (2018). “I mean, if there are people who have trouble with science, I want them to have trouble with science in their own language. I want to have a hand in making people better suited to understand science news.”

Participant A believed that writing about science news in indigenous languages was “vitaly important” but also challenging because, in many cases, scientific terms did not exist (Participant A & Participant B, 2018). Participant F (2018) commented that it was a “huge challenge” to create terms for scientific concepts.

Furthermore, Participant A (2018) said in South Africa it was essential to coexist with indigenous knowledge systems. Participant H (2018) said scientists and traditional knowledge systems should find ways to work together. “In South Africa, we’ve got traditional healers and indigenous knowledge systems and some of these are very valued by the community....” While some of the beliefs were potentially dangerous, the media could play an important role in communicating these dangers to the public, according to Participant H (2018).

Participant C indicated that she wrote purely in Afrikaans. “In many instances I have wished that my articles are published in English or another language because they would definitely reach more people” (Participant C, 2018). However, she says the fact that their online publication only offered Afrikaans news was what made it unique. “I think in a way we have opened science and science journalism up to a large number of Afrikaans-speaking people” (Participant C, 2018). Participant H (2018) said that it was a pity that Participant C wrote only in Afrikaans. “That means that her work is not actually read by a large part of a society...” (Participant H, 2018).

In the next section, the researcher focuses on the South African Science Journalists' Association.

5.6 The South African Science Journalists' Association

One theme that emerged strongly from the interviews was the role of the South African Science Journalists' Association (SASJA) in the science journalism and science communication industry. Because this question has elicited very strong opinions and responses, the researcher elaborates on the central issues (positive and negative) as well as suggestions and recommendations from the participants regarding this industry organisation.

While the researcher was unable to access a full list of members from SASJA, despite several attempts, 13 participants indicated that they were members of the organisation. In the interest of being comprehensive, six participants indicated that they were not members of SASJA. One participant was unsure of the status of his/her membership. The most common reasons for participants not being members of SASJA are a) a lack of time and b) they were not convinced that membership would add value to their careers (Participant R & Participant K, 2018). Furthermore, all participants indicated they had knowledge of the organisation.

5.6.1 Importance and role of SASJA

According to Participant P (2018), SASJA had never had more than 50 members and had seen membership figures as low as 35 since its establishment in 2008.

SASJA's primary role is to provide a support system for likeminded individuals, according to Participant P (2018): "...it's sharing information, supporting each other, being aware that it's a very tiny group of people who need each other... you need to work together to ensure that the country understands the value of science journalism". Participant L (2018) and Participant E (2018) believed that science journalism was "very lonely", which was why SASJA was important.

Participant A (2018) agreed that there was value in a network of likeminded people. "It provides a network worldwide which means more opportunity for journalists and provides an opportunity to keep science journalism globally on the agenda."

Additionally, SASJA is the only means to access the World Federation of Science Journalists (WFSJ) (Participant Q & Participant E, 2018). The current SASJA President, Mandi Smallhorne, represents SASJA and the African continent on the WFSJ.

Participant C (2018) was positive about SASJA, “I think SASJA is a fantastic organisation and we struggled a lot to get it going... I am very proud that we have made it for over 10 years.”

However, not all participants agreed about the value and importance of the association. According to Participant F (2018) SASJA was “really struggling and hanging by a thread most of the time”. Participant D (2018) said she did not know what the point of SASJA was. “I don’t know what they do, and I think they’re just a bunch of friends and I think they don’t play a useful role at all, which is why I didn’t want to pay to join” (Participant D, 2018). Participant J (2018) agreed: “Right now, it offers me no real value at all which is probably why I’m being blunt. It hasn’t offered me anything of value for a long time.”

Table 5.4 outlines the participants’ thoughts about the roles of SASJA:

Role of the South African Science Journalists’ Association
<ul style="list-style-type: none"> • “Guardians of responsible reporting of science” (Participant G, 2018) • Important to “improve the understanding of science journalism and science communication” (Participant Q, 2018) • To link members to an international network of science journalists - the World Federation of Science Journalists (Participant O & Participant E, 2018) • To “maintain the visibility of science news across all media” (Participant L, 2018) • To extend opportunities (Participant O & Participant E, 2018) • To meet with other entities such as the South African Department of Science and Technology (Participant P, 2018) • To secure funding and grants (Participant P, 2018)

Table 5.4 – Role of the South African Science Journalists’ Association

In the next section, the researcher discusses the challenges the association faces according to the participants in this study.

5.6.2 Participants' perceptions regarding the challenges faced by SASJA

One of the challenges mentioned by the participants was the fact that the organisation was run by volunteers, who had limited time available, and inadequate funding. "They work in extremely difficult circumstances... it really takes strong people to carry it forward" (Participant A, 2018). Participant I (2018) said that it was a "huge ask" to expect volunteers to be the only driving force behind the association. Participant N (2018), who served on the board of SASJA, perceived the organisation as disorganised because it was run by volunteers. "So, it is only as good as the people running it and it was always good people running it, but I think they are busy people" (Participant N, 2018). Furthermore, Participant L (2018) indicated that requests for information on the association's Google Group often went unanswered. "Sometimes you don't even get a response... some people just look at it" (Participant L, 2018).

Almost all participants mentioned the strife in SASJA about the inclusion of science communicators and science writers in addition to science journalists. "The underlying animosity between pure science journalists and science communicators is still alive and well and thriving every now and again" (Participant F, 2018).

Participant B indicated that he had joined the association to become part of a science journalist community but found that very few members were "bona fide" science journalists (Participant B, 2018). Participant B and Journalist J believed this was because few people in South Africa could earn a living as a "pure" science journalist. "Many people do have to wear more hats" (Participant J, 2018).

Participant I (2018) felt that this debate was a "waste of time", while Participant F (2018) labelled it "very, very, very unpleasant". Participant O used to be a member of SASJA but said the organisation was "very fractured" and not a "very constructive space" because of internal disagreements. "At the moment my impression is that SASJA is not a very supportive welcoming space. It seems that you have to kind of pick sides, which is also not great" (Participant O, 2018).

According to Participant I (2018), if only science journalists could be part of the South African Science Journalists' Association, there would only be a handful of people qualified to join. Participant E (2018) and Participant H (2018) said there was a global tendency to include science journalists and science communicators in associations such as SASJA. "For me, it's a

matter of cooperation. At the end of the day it's about science and conversations around science, no matter who the members are" (Participant E, 2018).

Participant C said the science journalism industry in South Africa was too small and that the organisation could not cater for only a handful of science journalists (2018). "I think it would be the worst thing if SASJA became too exclusive" (Participant C, 2018).

Participant I (2018) said that a lot of energy was spent on fights within the association, rather than furthering the causes it stood for. "I don't have the bandwidth or the energy to put aside to have these kinds of industry organisational bickering fights" (Participant I, 2018). Participant P (2018) agreed. "If we want the skills of science journalism to survive the next decade, we have to stop fighting about it." Participant C (2018) said that it was critical for members to leave their "petty nonsense" because all members of SASJA cared about science.

According to Participant E (2018), the science communicators in the association helped the journalists "more than they are willing to admit". Participant F (2018) argued that science communicators were the ones keeping the association going.

To solve the internal disagreements, several participants suggested that SASJA change its name to avoid confusion about its representation (Participant H, 2018). "Ninety per cent of the people in SASJA are science communicators" (Participant H, 2018). Therefore, it was suggested that the organisation change its name to the Science Journalist and Communication Association (Participant I, 2018).

Another suggestion by Participant J (2018) was to rename the association the South African Science Communication Organisation. "I don't think its name actually reflects what it is" (Participant J, 2018). Participant Q (2018) proposed that the association should gather "science media practitioners" as the organisation does not only cater for science journalists.

Participant T (2018) blamed SASJA for not "fighting for journalism" and recommended that the organisation share more information about opportunities, funding and grants with its members. "There are other markets, there is appetite for science elsewhere, but we are never told that we can look for that and instead we are an organisation that curates science journalism... telling you the industry is dead anyway." Participant F (2018) said that because the organisation was so small, "it never had the critical mass to really have an impact".

Participant L (2018) suggested that SASJA provide training programmes for their members as a means of adding value. However, Participant L said that members could do more too. “They are not doing enough and when I say they, I think we are not doing enough. I should also be playing a role” (Participant L, 2018).

In the next section, the researcher outlines participants’ ideas for the future of science journalism in the country.

5.7 The future of science journalism in South Africa

This study would not be complete without including participants’ views about the future of science journalism in South Africa. While this by no means provides a concrete roadmap for the way forward, the researcher has deemed it worthwhile to include the views of those with first-hand experience. This section is also useful for exploring opportunities for further academic studies in science journalism in South Africa.

Participant P (2018) said the future of science journalism would be different from the current situation as described in this study. “No journalism is going to happen the way it used to happen. It’s important for us to put our heads together and brainstorm a future so that we have one” (Participant P, 2018).

Participant J (2018) said the future of science journalism was dependent on the future of the wider journalism industry in South Africa. “What I see is an erosion of beat reporters, certainly across newspapers, which does not bode well for science reporting and it doesn’t bode well for the quality of coverage of science” (Participant J, 2018).

According to Journalist E (2018), scientific research in South Africa would be reported internationally in future and not necessarily in South African publications because these publications paid poorly. “It’s not worth the journalists’ time and effort, but it’s a pity because South Africans won’t read about these things” (Participant E, 2018).

Participant G (2018) agreed. He sees a fundamental shift in the entire media industry. “I think we need to realise the fact that the role of mainstream news media is being diluted and there’s an opportunity here for scientists, more and more, to take the role of science communication and actually step up” (Participant G, 2018).

Participant L (2018) said there needed to be a deliberate effort to ensure that publications carry science stories. “There’s nothing that we do that does not include science... but people rarely see that.” Participant L (2018) believes the future lies in science journalism because the role of science in people’s daily lives would continue to grow. Participant P (2018): “What I think is really tragic is that we are entering an era, we are already in it, where science journalism is going to become crucial.”

Participant H (2018) agreed that, because of the way the world was changing in terms of climate change, the environment, water crises and health problems, science communicators and science writers will be in demand. “We need more people that are building bridges between science and society because the challenges are just going to demand that we have those people that can bridge the science and society gap more and more in future” (Participant H, 2018).

Science news will not be prevalent in mainstream media, according to Participant D (2018). “Unless it’s like a big breaking story, like South Africa has done the first such and such transplant or found the first cure for this unless there’s like a major breakthrough or a major controversy like listeriosis” (Participant D, 2018).

5.7.1 Sustainable funding models

According to Participant H, the internet and social media websites have created a culture of not paying for content (2018). However, sustainable funding models are necessary if science news content is to be provided free of charge (Participant H, 2018).

Many participants, such as Participant M and Participant P, raised the need for sustainable funding models for science journalism in South Africa.

Among the suggestions for generating funding are donor funding, crowd funding and grant funding such as those provided by the Africa Science Desk.

5.7.2 Donor and crowd funding

Participant P (2018) argues that **donor funding** would be prevalent in the future of science journalism funding.

According to Participant M (2018), the Bhekisisa Centre for Health Journalism at *Mail & Guardian* is completely donor funded and it is the largest desk at the newspaper. “I think the

first thing is you make sure that you find donors with similar objectives to you” (Participant M, 2018). Furthermore, declaring donor funding is essential, according to Participant M (2018). “You make it publicly available so that people know exactly where you get your funding from” (Participant M, 2018).

Participant H (2018) said the funding model used by the Bhekisisa Centre for Health Journalism seemed to work “very well”. “So, if that is the only option, that is at least the way to build expertise inside of journalism and get a lot of good science journalism out” (Participant H, 2018).

Participant D (2018) postulated that the future of science journalism would include smaller websites and blogs funded by donors.

According to Participant H (2018), scientists could build up a following on social media and thus create other opportunities for funding, such as **crowd funding**. “The scientists who are innovative, creative and willing and keen to engage can use social media to get a following and to build up interest” (Participant H, 2018). “I’ve seen some very interesting examples of projects... where scientists use crowd funding platforms to raise money for their research and they are raising significant amounts of money there and it does not involve the mass media, the traditional mass media” (Participant H, 2018).

Participant P (2018) argued for a combination of funding models. “I think what we might end up with is a cocktail of funding which also includes public subscriptions.”

5.7.2.1 Africa Science Desk grants

Africa Science Desk is a two-year project implemented by the African Academy of Sciences in partnership with the African Federation of Science Journalists and SASJA through the support of the Bill & Melinda Gates Foundation. The focus of the programme is to “reinforce and build” science journalism in Kenya, Nigeria, Senegal and South Africa (Africa Science Desk, 2017).

Journalists are invited to pitch their story ideas and those accepted will be funded to produce TV documentaries, short web videos, explainers, short or long-form investigative reports and data stories.

Participant T (2018) praised the grants provided by the Africa Science Desk. “That’s the way to do it... people don’t have money anymore to do that kind of journalism in South Africa.” Participant K (2018) agreed. “I think that is really one of the good sources for funding science journalism in South Africa at the moment.”

5.7.3 Models of science journalism

Many participants suggested different models for the future of science journalism in South Africa. One of the suggestions was the creation of a science newswire or a science news hub. Another suggestion focused on digital and social media science communication strategies.

5.7.3.1 Science newswire/hub

Participant N (2018) is one of the co-founders of *SciBraai*. In the future, the website’s founders want *SciBraai* to become the “home of science journalism in South Africa” and a household name in the country (Participant N, 2018).

They have a vision to pay science journalists to write about science news in multiple languages using multimedia storytelling across different platforms (Participant N, 2018). These news stories are then distributed to partner newsrooms for free to be repurposed as required. “We want to get funding in order to create the sort of science journalism hub and then those stories should be syndicated to hub partners across the country” (Participant N, 2018). Journalists would be free to do pure journalism and would not need to resort to science communication to make ends meet, according to Participant N (2018).

Furthermore, they aim to create a newsroom with a regular content production schedule, digital content production and training programmes for journalists and scientists. “In the next five to 10 years, we hope to build a sustainable newsroom that has sustainable funding and working on ways to essentially become self-sustaining...” (Participant N, 2018). Participant K (2018), a contributor to *SciBraai*, sees the future of the platform similar to the likes of *Daily Maverick* and *Ground Up*, where news stories are generated and distributed to mainstream media as credible. “So, it’s a way to get around the unwillingness of mainstream media to pay for science. If you give them a good science story, they will publish it” (Participant K, 2018).

They aim to target local and community journalism platforms as well as the *South African Broadcasting Corporation* and newspapers such as *Daily Sun*. “I would consider my mission mostly complete if I have a regular *SciBraai* feature in the *Daily Sun*” (Participant N, 2018).

Participant T (2018): “What would be required is to create a science news agency where newspapers got the content for free, but you were able to generate editorial independent content written by freelance journalists who were paid fairly.” Participant O (2018) agreed that there was space for a high-quality vehicle for science news in South Africa. “I probably think there is a space still in this country for a kind of science news wire, an organisation that writes independent science news articles that newspapers then could buy and use” (Participant O, 2018).

Science communicators can also play an important role in this regard. “The science communicator can play a role, to get their scientists to write for a platform like that and to introduce them to it, to convince them and prepare them for media opportunities” (Participant H, 2018).

5.7.3.2 Digital communication strategies and methods

Participant G (2018) urged scientists to become involved in social media and blogs or to write for *The Conversation*, a platform providing news from the academic and research community (The Conversation Africa, 2018). He argued that scientists should familiarise themselves with the disciplines of journalism in order to write for the general public about their own research. “You are kind of reinventing science journalism where you are getting scientists who are writing, and they understand the key components of the disciplines of science journalism” (Participant G, 2018). Participant H (2018) agreed that *The Conversation* was an “interesting phenomenon”. “They are in a way possibly building the bridge between what happens inside the academic environment and the mass media because the media can pick up stories and use them for free. I think that's an interesting model and it seems to be doing really well” (Participant H, 2018).

According to Participant N (2018), multimedia storytelling and data visualisation as a means of making complex scientific concepts accessible to the public, were missing from science journalism in South Africa. Participant G (2018) raised the importance of data journalism to reconfigure and re-energise science. “Any science journalist who wants to be relevant in future has to understand data journalism. They must be able to work across multiple platforms” (Participant G, 2018).

Participant P (2018) sees the future of science journalism as more appealing in terms of audio and video – such as podcasts. “It’s not going to look like chunks of text. It’s going to be much more interesting.”

Participant E (2018) argued that science journalism and science communication would become much more web-based in future. “It is a cheaper way of explaining science to people... to host a website is very cheap.” According to Participant E (2018), there will be more science communicators in future but, in her opinion, this is not where the problem lies. “A large part of the change lies in how journalism is changing and how journalism is presented in South Africa”. Because of the possible increase in science communicators, Participant E (2018) postulated that research institutions would do more of their own web-based and social media communication. Participant C (2018) was “not at all negative” towards the fact that science journalism was moving into a digital and multimedia space. “We are moving in the same direction as the rest of the world” (Participant C, 2018). “There are opportunities for those who are willing to shift and be agile in the shifting media landscape” (Participant G, 2018).

According to Participant H (2018), if science journalism is not adapted, “then it will become a bit like a dinosaur”.

Participant S (2017) conducted his MA Journalism thesis on science news on social media. He identified a massive appetite for science and technology information on social media (2018). “In that sense, in the global context, I am very positive. I think a lot is happening in science journalism and social media is a big part of that.” He further found that more could be done in South Africa and that scientists were not using social media to their full potential. “You are actually committing an injustice because especially Twitter is a rich platform to start conversations and build networks” (Participant S, 2018). Furthermore, scientists should not ignore social media because of ignorance because “this is where most people get their news” (Participant S, 2018).

However, even in the age of social media, science journalists will be crucial in future because they understand the legal and ethical components of reporting (Participant G, 2018). “What has happened with social media is you have given a voice to people who are actually unqualified to be involved in the media... they don’t have the discipline, but their voices have been given equal value in the minds of the consumer” (Participant G, 2018).

One also runs the risk of creating an “echo chamber” (Participant G, 2018). “That is one of the biggest dangers of social media. It’s developing this whole echo chamber where you just entrench people’s beliefs” (Participant G, 2018).

5.8 Summary

In this chapter, the researcher provided the findings and results of her interviews with 20 science journalists, science communicators and science writers. She outlined the main themes identified by the participants when considering the current state of science journalism in South Africa.

Chapter 6 provides the conclusion to this study. The researcher also makes recommendations for further academic studies in the field of science journalism in South Africa.

Chapter 6: Discussion of findings and conclusion

“If science journalism is not adapted, it will become a bit like a dinosaur” – Participant H

6.1 Introduction

In the previous chapter, the researcher presented the findings of her interviews with 20 participants in the science journalism, science communication and science writing industry in South Africa. She focused on the current state of science journalism to answer the central research question of this study, namely: What is the current state of science journalism in South Africa?

In this chapter, the researcher discusses the findings and analyses the information gathered. Furthermore, she deals with the general research questions as set out in chapter 1:

- What are the participants’ personal opinions, perspectives and perceptions of the current state of science journalism in South Africa?
- What are the greatest challenges in reporting about science news and scientific research in South Africa?
- What is the current state of the relationship between scientists and journalists and what is the role of science communicators?
- What is the role and importance of industry organisations (such as the South African Science Journalists’ Association) and tertiary education programmes (such as postgraduate studies in Science and Technology Journalism at Stellenbosch University) in the science journalism industry?
- How can science journalism be improved in South Africa according to science journalists in the field?

6.2 Defining science journalism, science communication and science writing

As indicated in chapter 5, this section was added because some of the participants mentioned the differences between science journalists, science communicators and science writers in their interviews. Following their thoughts about the differences between science journalists, science communicators and science writers, the researcher defines each as follows:

- **Science journalist:** someone working in the hard news industry, who strives to write accurately, objectively and independently from pressure and interest groups in science and other fields about science news, using a critical journalistic lens to interrogate the field of science and hold power to account.
- **Science communicator:** someone paid by a research or scientific institution or client to communicate and promote the scientific research conducted by the organisation. This often entails public relations and liaising with the media to ensure coverage of said research.
- **Science writer:** a person who writes about scientific research for a specific purpose or to create awareness. This often entails sharing their opinion and advocating a cause, such as the fight against climate change.

In the next section, the researcher discusses the participants' personal opinions, perspectives and perceptions of the current state of science journalism in South Africa.

6.3 Participants' personal opinions, perspectives and perceptions of the current state of science journalism in South Africa

From the previous chapter, it is clear that each participant holds his or her own perceptions and opinions relating to the current state of science journalism in South Africa. It became clear that participants held both positive and negative perceptions of the science journalism industry in South Africa. Furthermore, it was difficult to ignore the strong emotional attachment many participants had to their opinions of the industry.

Many participants based their opinions of the current state of science journalism on the state of the broader media landscape in South Africa. Participants indicated that traditional media were under pressure owing to a) unwillingness to pay for media content and b) the advent of digitisation and social media. Furthermore, one participant indicated that science did not sell in South Africa because nothing sold anymore. Participants blamed the general crisis in the South African media industry for the state of the science journalism beat. It became clear that the science journalism industry in South Africa was very small, with only a handful of specialist science journalists left in newsrooms.

Negative perceptions about the state of science journalism were common among participants, with many believing that the science journalism industry as we knew it was on the verge of collapse. Many participants indicated that science journalists were moving to science

communication owing to the financial constraints faced by science journalists and the media industry at large.

Participants complained about the decline in the quantity and quality of science news reports in South Africa and blamed this on lack of resources (financial and skills), lack of support on the part of senior editorial staff and media organisations, strained relationships between scientists and the media, as well as the tabloidisation of science and the prevalence of pseudoscience. Furthermore, junior and generalist reporters were often tasked with covering science news although they did not have the skills nor the confidence to cover the science properly. Dedicated science journalists were lauded by the participants as they were able to cover science news with the necessary storytelling skills and scientific understanding.

The researcher focuses on the challenges in the science journalism industry in the next section.

While many participants shared their negative perceptions of the current state of the science journalism industry in South Africa, some remained positive, saying that the industry was not dead. Participants argued that science journalism was receiving more recognition now than in the past and that high-profile science news stories in South Africa did indeed receive good media coverage. For example, *National Geographic* featured the discovery of *Homo naledi* on its front page.

Participants argued that the need for science journalism in South Africa was underestimated, especially in a climate of fake news. Reporters with a well-functioning baloney detector were crucial to ensuring that reliable science news reports reached the public (Sagan, 1996).

Participants indicated that there was a general sentiment that science journalism was always in a dire state, while this was not the case in South Africa. Participants indicated that the country was entering an exciting new phase in science journalism and that opportunities abounded for those in search of new challenges. The researcher elaborates on the future of science journalism in South Africa later in this chapter.

Participants indicated that not all science news of importance was reported in the mainstream media and that detractors of science journalism should include coverage generated by specialist publications before deciding whether the state of the industry was dire or not. Participants also suggested that those criticising science journalism in South Africa should become more active consumers of science news rather than armchair critics.

6.3.1 Challenges in reporting about science news and scientific research in South Africa

As briefly outlined in the previous section, participants raised the following challenges in the science journalism industry:

- The industry is under-resourced regarding skills (young, inexperienced, generalist journalists, lack of storytelling skills, lack of understanding of science and scientists);
- There is a lack of budget and investment on the part of media organisations;
- There is no appetite to pay for or publish science news articles;
- The relationship between scientists and journalists is complex;
- Newsroom staff lack training in the scientific process and the scientific method;
- There is tabloidisation of science;
- There are strong traditional belief systems.

Firstly, the participants strongly criticised the news industry in South Africa for not seeing the value in science journalism and for viewing it as an optional extra rather than as a legitimate and necessary beat on its own. Furthermore, most participants disagreed with the notion that “science doesn’t sell”.

The participants critiqued the lack of budget available for a) specialised science journalists and b) training for junior journalists and senior editorial staff. This created an environment conducive to pseudoscience. According to some participants, the country had excellent science journalists. The problem, however, was not a lack of good science journalists, rather a lack of investment in and promotion of science journalism. This became clear when the researcher learnt that several participants had won awards for their science news reporting. For example, one participant’s science column in a community newspaper won him Columnist of the Year some years ago (Participant B, 2018). One participant was announced the overall winner of the 2014 Profile Awards for science and technology (Participant D, 2018). Three other participants in this study were runners-up in this competition, while two participants in this study received special commendations (*BizCommunity*, 2014). Another participant won the Technology and Innovation Award at the CNN MultiChoice African Journalist Awards in 2015 (Participant T, 2018).

Further challenges included the fact that digital communication methods and social media had created opportunities for pseudoscience to flourish. According to one participant, social media

and online platforms had given a voice to those unqualified to be involved in the media. This further emphasised the importance of science journalists in upholding journalistic standards and ethics.

Some of the participants agreed that science and traditional beliefs could be balanced in South Africa. One of the solutions offered in this regard included reporting on science news in indigenous languages. This researcher believes the work of Sibusiso Biyela and Shisa Sayensi on the *SciBraai* platform will provide a roadmap for the future of multilingual science journalism. Furthermore, this researcher believes that science news reported in indigenous languages would greatly assist in improving the public understanding of science. An added benefit would be the development and increased use of these languages in daily life in South Africa.

Owing to the challenges and concerns mentioned above, it is hardly surprising that the current science journalism industry is a complex space. However, as discussed in section 6.6, there are opportunities for those interested in a career in science journalism in South Africa.

In the next section, the researcher discusses the current state of the relationship between scientists and journalists in South Africa. She also discusses participants' suggestions to improve this relationship.

6.4 Current state of the relationship between scientists and journalists and the role of science communicators

Most participants had mixed feelings about the current state of the relationship between scientists and journalists in South Africa. Many pointed out the tension and the wide gap between scientists and journalists. A general perception among the participants was that the one side was always failing the other. This happened because scientists and journalists had different priorities and worked in different ways. While scientific research took years to complete, journalism was often fast-paced, demanding responses from scientists at the drop of a hat.

Furthermore, scientists are often frustrated by journalists who are disinterested and inexperienced while journalists often perceive scientists to be inaccessible, slow to respond and arrogant regarding their work. According to the participants, journalists should avoid making scientists look like fools among their peers by getting the science wrong while scientists should explain their work simply to those interested in writing about it.

Many participants indicated that scientists should try to build relationships with journalists and vice versa. However, it often takes years to build trust between the two parties. The participants also contended that scientists would be more likely to interact and share their work with well-known and trusted science journalists.

As also mentioned in the previous section, some participants indicated that the perceived tension between scientists and journalists was a stereotype that people needed to move past. One of the participants indicated her research showed that scientists recognised the value of the media and were motivated to engage with society through the media.

According to the participants, the benefits of scientists engaging with the media included access to a larger audience, media coverage that could lead to funding and collaboration opportunities and the fact that they came closer to policy decisions if they were regularly quoted in the media.

In the next section, the researcher focuses on how to improve the relationship between scientists and journalists.

6.4.1 Improving the relationship between scientists and journalists

The participants suggested ways to improve the relationship between scientists and journalists in future in this country. They indicated that because scientists had a duty to communicate their work to the public, because they were often funded through public money, a solid relationship between scientists and journalists was crucial.

Almost all participants indicated that science communicators were instrumental in fostering the relationship between scientists and journalists. According to the participants, science communication has developed substantially in recent years. Many participants saw scientists, science journalists and science communicators as a team, working together to ensure the public understanding of science.

Platforms such as *The Conversation* have offered scientists a taste of the journalism industry and have allowed them to take part in the communication process.

Science communicators bridge the gap between scientists and journalists by assisting scientists in communicating their research clearly and simply and set the scientist at ease with the prospect of a media interview. Often science communicators are the closest scientists come to interacting with the media. Science communicators play a critical role in training scientists

regarding the media and they could build a relationship of trust with the scientists over time, something journalists often do not have time for, according to the participants. They further ensure that journalists are put in touch with the most suitable scientist and can help clarify complex science by liaising with the scientist on the journalists' behalf. Science communicators can also ensure that scientists develop their communication strategy early in the research process, and not as an afterthought.

Many participants argued that science journalists should allow scientists to check the facts in an article before it was published to ensure absolute correctness. Science communicators can also assist in this regard – on the one hand by explaining to the scientist that they cannot change the story, and on the other hand assisting the journalist in making the news report as accurate as possible.

The researcher argues that solid relationships and open channels of communication between scientists and journalists, with the involvement of science communicators, are crucial to increase and improve science news coverage in South Africa, but also to aid in the public understanding of science. Science communicators have a critical role to play in this relationship. Considering the changing South African media landscape, science communication will become much more important in future, according to the researcher.

6.5 Role and importance of industry organisations and tertiary education programmes

In this section, the researcher discusses the role and importance of the South African Science Journalists' Association (SASJA) before discussing the participants' views of the value of postgraduate training programmes in science journalism in South Africa.

6.5.1 South African Science Journalists' Association

As became clear in chapter 5, the participants all held strong opinions regarding the current state of SASJA as well as its role and importance in the science journalism industry in South Africa. While not all participants held negative sentiments toward the association, it was clear that most of the participants were fed up with the debate over whether science communicators were allowed to join the organisation. The participants believed this debate was a waste of time and drew the attention away from the important issues the association should be dealing with.

While SASJA remains a small organisation, with limited resources, the researcher believes it is a valuable organisation in the South African situation. Firstly, the association provides access to the World Federation of Science Journalists (WFSJ) and their activities and events. Secondly, the association offers networking opportunities for members, which is useful considering the increased number of freelancers in the country.

This researcher believes the association should act as the guardians of responsible science reporting and assist in improving science journalism in the country's newsrooms. Furthermore, it is essential that SASJA maintain the visibility of science news in South Africa and liaise with entities such as the Department of Science and Technology and the South African National Editors' Forum.

Finally, the researcher agrees with the views of some participants that the organisation should change its name to represent its identity and membership composition. This would also avoid disappointment on the part of prospective members, who believe they are joining a purely journalistic association.

6.5.2 Postgraduate studies in science journalism and communication

Although not all participants considered a postgraduate programme in science journalism worthwhile, many participants expressed positive sentiments regarding the value of such programmes. Participants indicated that it assisted in understanding the research process as well as the scientific method and added to the body of academic research in South Africa.

Many participants considered postgraduate programmes in science journalism undervalued and called for more universities to offer a science journalism course as part of journalism studies. Participants argued that many journalists and senior editorial staff lacked critical thinking skills and would welcome training in this regard.

Furthermore, postgraduate programmes in science journalism could further assist in building relationships with scientists and researchers as they have similar academic experience.

Some participants did not consider postgraduate studies in science journalism a requirement as they believed working and learning on the job was the best way to achieve success.

At the risk of being biased, the researcher will not elaborate extensively on the value of postgraduate studies in science journalism and communication. Because she is a postgraduate

science journalism student at Stellenbosch University, the researcher deems it a worthwhile programme.

6.6 Suggestions for the future of science journalism in South Africa

While this section is by no means a concrete roadmap for the future of the science journalism and science communication industry in South Africa, the researcher deems it worthwhile to share the expectations and predictions of those with experience in the field.

Many participants believed the future of the science journalism industry was dependent on the future of the broader media landscape in South Africa and globally. The participants in this study deemed science important in the everyday lives of people and indicated that science journalism and science communication would become more important in future because of climate changes and the increasing occurrence of natural disasters such as drought. All people are affected by science and the participants argued that science and technology reporting would only become more important in future.

Most participants agreed that the current science journalism industry would have to adapt its methods to include more digital and social media communication. As one participant put it, science journalism should avoid becoming a dinosaur (Participant H, 2018).

On the one hand, participants suggested that scientists familiarise themselves with the principles of journalism, so they could publish their own science news articles on platforms such as *The Conversation*. This would take some pressure off science journalists.

On the other hand, the science journalism and science communication industry will have to embrace multimedia storytelling, data journalism and data visualisation as a means to explain science to a digitally-savvy public. Visual contents, web-based communication, social media contents and podcasts, as opposed to long, complicated pieces of text, will ensure that science journalism moves in the same direction as the rest of the global media industry. Participants deemed it crucial for science journalists to be agile, versatile and keen to adapt for science journalism to survive in South Africa. The researcher believes that digital, visual and social media communication is the way forward for the journalism industry in South Africa.

Furthermore, some participants suggested the establishment of a science newswire or science news hub to disseminate reliable, free science news articles to partner organisations. A science newswire or platform like *SciBraai* would work well to communicate science news to

audiences and the public at large. This would provide opportunities for science journalists to change the way they present their work and for science communicators to increase their footprint in the industry.

In addition, the participants suggested different funding models to ensure a sustainable future for science journalism in South Africa. Many suggested donor funding, while crowd-funding and grants, such as those offered by Africa Science Desk, were also mentioned as possible means of generating funds. Provided the funding and sponsors were declared, the participants considered these methods the most appropriate for the future of science journalism.

Finally, as mentioned earlier in this chapter, science journalists should embrace reporting on science in various indigenous South African languages. As stated earlier, the researcher supports a future of multilingualism in science journalism.

6.7 Conclusion

The main purpose of this study was to research the current state of science journalism in South Africa, according to those with experience in the field. For this purpose, the researcher asked participants in this study about their opinions and perceptions regarding the current state of science journalism, challenges in the field of science journalism, the relationship between scientists and journalists, the role of science communication, the value of postgraduate studies in science journalism, the importance and value of the South African Science Journalists' Association and the future of science journalism in South Africa. The research found that there were both positive and negative sentiments on the part of the participants regarding the state of science journalism in South Africa.

These findings were investigated using the interpretive paradigm and phenomenological approach in social theory as theoretical framework. The researcher deemed this theoretical approach the most appropriate to study the "lived experience" of science journalists and science communicators in South Africa.

The researcher employed qualitative or interpretive research methods and undertook a participant observation study, which she considered the most appropriate means of gaining insight into the experiences of science journalists and communicators in South Africa. Through qualitative, in-depth and semi-structured interviews with the 20 participants, the researcher was

able to establish the current state of science journalism in South Africa, according to industry insiders.

6.8 Contributions, limitations and recommendations

It is hoped that this study will contribute to the body of academic research in journalism studies, specifically science journalism, in South Africa. Furthermore, the researcher hopes that this study will inspire further studies in science journalism. This study contributes concrete knowledge regarding the personal experiences and perceptions of science journalists, science communicators and science writers in South Africa and can aid in improving science journalism in the country.

Regarding the limitations of this study, the researcher is cognisant of the fact that the information provided by the participants paints a subjective picture of the science journalism industry in South Africa. However, understanding the participants' subjective experiences and perceptions was precisely the goal of this research. The researcher strived to maintain her academic distance throughout this study to avoid potential bias.

Finally, as regards recommendations for future studies, it is clear that the debate about the South African Science Journalists' Institute is a complex issue, warranting further research. As mentioned in chapter 5, the researcher would deem it worthwhile to study women in science journalism as well as multilingualism in science journalism. A comparative study involving the science journalism industry of another African country, as compared to South Africa, could also be recommended for future research.

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