

Research and Philosophical Paradigms Used by Information Science PhD Candidates

Kagiso Mabe

The Department of Information and Knowledge Management, College of Business and Economics, University of Johannesburg, Johannesburg, South Africa

kmabe@uj.ac.za

Abstract: Research output is essential to advancing knowledge management (KM). A key contributor to this output is the successful completion of doctoral studies, which also helps develop quality researchers. As such, this study aims to support current and incoming doctoral students in their quest to conduct high-end research by facilitating an understanding of research and philosophical paradigms most applicable to the South African context, with particular focus on the Western Cape region. This unique understanding becomes increasingly important in the KM field, as it is relevant across distinct industries, making its functioning context-specific. This complexity may pose challenges when conducting research, as emerging scholars may not understand the research and philosophical paradigms most appropriate to their studies. Consequently, this study aims to ease the burden on doctoral candidates by pointing them to previously applied research and philosophical paradigms used by Information Science (IS) doctoral candidates at three universities in South Africa that offer IS. While KM is only a part of what IS students learn, looking into the broader IS field offers advantages in gaining insight into the possibilities for KM-focused doctoral studies. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method was employed to determine the studies deemed relevant to fulfilling the study's objectives, as indicated in the established category sheet. 18 studies were subsequently included in the study for analysis. Content analysis was used to capture data relating to ontological positions and research paradigms from the thesis. Recurring categories were coded and compared to identify similarities and differences in the justifications for holding a specific position, thereby providing a robust perspective on research paradigms. Pragmatism was identified as the most prominent research paradigm, while relationism was the most widely held ontological position. Information Science research demonstrates philosophical pluralism and methodological flexibility. This adaptability enables the field to address complex, real-world problems. The study offers a comparative mapping of philosophical and methodological orientations, contributing to scholarly debate and guiding future research design in IS.

Keywords: Knowledge Management, Information Science, Philosophical Paradigms, Research Paradigms, Research Methodology

1. Introduction

Information Science (IS) is, by nature, a cross-cutting discipline that draws on domains including cognitive and computer science, communications, and library and information studies (Ugwu, Ekere and Onoh, 2021). Because IS is relevant across many industries, IS doctoral studies are influenced by diverse research and philosophical positions (Zhang et al., 2024). To appreciate the binding suppositions that inform inquiry, shape knowledge production, and influence methodological choices, researchers must engage in conversations about research and philosophical paradigms. This study offers a view into the paradigms utilised by South African IS doctoral students in the Western Cape region to identify patterns and justify applications.

Research and philosophical paradigms are informed by the assumptions about the nature of knowledge (epistemology) and reality (ontology) (Saliya, 2023). These paradigms shape a researcher's perspective on reality, the issues they seek to resolve, and how they go about resolving them. The most applied paradigms are positivism, interpretivism, and pragmatism (Ugwu et al., 2021). Careful consideration must be given to these paradigms, as they inform a study's design and its results. For example, interpretivists tend to focus more on qualitative methods to understand participants' unique experiences, whereas positivists are more interested in quantitative methods and hypothesis testing (Saliya, 2023).

As emerging scholars, doctoral candidates find themselves at a critical stage in developing their academic identities and research theories. In line with their life experiences, beliefs, and academic training, their paradigmatic choices are influenced by institutional norms, guidance from supervisors, and the wider academic community. Evaluating how students arrive at these paradigmatic choices and the influence of these choices on the production of contextually relevant knowledge is of growing importance in the IS field, where research objectives usually span human, technological, and organisational scopes (Omodan, 2024).

To ensure the coherence and validity of academic work, it is crucial to match research topics with appropriate paradigms and methods. Nevertheless, little empirical research has examined how IS PhD applicants in South Africa arrive at these conclusions and how closely their selections mirror broader disciplinary patterns.

Furthermore, it is increasingly crucial to investigate whether traditional paradigms remain sufficient or whether more adaptable, hybrid approaches are being adopted as the field struggles with big data, artificial intelligence, rapid technological change, and changing user behaviours (Connaway and Radford, 2021). As Niemand and Bwalya (2020) note, IS has expanded through conceptual borrowings from other disciplines, enriching its intellectual base. However, this expansion also creates complexity in philosophical positioning. This study responds by providing a structured analysis of 18 doctoral theses to uncover recurring paradigmatic and methodological patterns.

This study aimed to evaluate the research and philosophical paradigms employed in doctoral studies, with the intention of mapping the terrain of completed and published IS doctoral studies. The results of the study can contribute to graduate training programmes and advance understanding of how emerging researchers view and conduct IS research, thereby informing future IS research. The study seeks to lay a foundation for future IS scholars to reflect on their methodological choices and to be philosophically conscious.

1.1 Aim and Objectives

This study aimed to identify philosophical and methodological orientations in selected doctoral theses in Information Science. The specific objectives were:

1. To identify the dominant ontological positions in the selected theses.
2. To identify the dominant research paradigms in the selected theses.
3. To assess how these philosophical positions influence methodological choices.

2. Literature Review

When Thomas Kuhn coined the term “paradigm” in 1962, he defined it as a philosophical manner of thinking (Ugwu et al., 2021; Kivunja and Kuyini, 2017). Paradigms are also referred to as worldviews (Mwita, 2022) and are sets of principles (Turyahikayo, 2021) that inform action (Creswell, 2009). These paradigms are made up of epistemologies and ontologies (Ugwu et al., 2021; Rehman and Alharthi, 2016; Creswell, 2009). Research and philosophical paradigms impact the types of studies researchers tackle (Turyahikayo, 2021), as informed by their expertise, life experiences and previously completed research (Creswell, 2009). However, Mwita (2022) correctly states that distinct research problems are resolved through applying appropriate research designs. In developing these well-rounded research designs, researchers must understand the main philosophical assumptions that inform their inquiry (Gannon, Taheri and Azer, 2022).

Research paradigms are generally moulded by how a researcher sees the world, thereby shaping the questions they ask about it. These questions then inform how researchers want to behave in this world (Kivunja and Kuyini, 2017) and guide the selection of the required research methods (Gannon et al., 2022). A researcher’s expertise, ontology (being), and epistemology (knowing) (Aliyu et al., 2015) inform the formulation of specific research questions and designs, as well as the selection of appropriate methods to fulfil the research objective. Every paradigm has norms that researchers must understand (Kivunja and Kuyini, 2017). Once these norms are understood, researchers can make appropriate methodological decisions to address their research questions and how the results of their study should be understood (Ugwu et al., 2021).

The selection of a paradigm impacts a study’s justification, expectations, purpose (Ugwu et al., 2021) and its execution (Kivunja and Kuyini, 2017). While philosophical ideas are usually embryonic in research (Creswell, 2009), failing to consider and articulate a research paradigm diligently leads to studies with weak motivations for selecting a research method (Ugwu et al., 2021). Given the foregoing, the author of this study took it upon himself to assess the different paradigms, grasp their implications, and facilitate an improved approach to tackling PhD studies in IS.

2.1 Understanding Ontology and Ontological Positions

Ontology is primarily concerned with phenomena that researchers believe they can study (Ugwu et al., 2021) based on their perceptions of what is real (Rehman and Alharthi, 2016). Ontology is also understood as the comprehension of the different ways the world functions, which informs the principles of life and what can be studied about the world (Gannon et al., 2022). Ontological positions help examine the nature of phenomena (Ugwu et al., 2021) to reveal what is not known about them or to confirm what is assumed (Kivunja and Kuyini, 2017).

Researchers debate what is real and whether reality is a subjective construct or whether humans have no impact on what is real (Kivunja and Kuyini, 2017). This contention led to the formation of ontological positions, which are based on researchers' arguments about reality (Gannon et al., 2022). Ontology is crucial for determining the nuances of reality and thus for isolating the phenomena under investigation. Once isolated, investigation may begin (Ugwu et al., 2021).

The available ontological positions are realism, empiricism, relativism, non-singular reality and relationism. Realists contend that only a singular reality exists, meaning people cannot influence what is understood as real. The implication of this position is the belief that the world can be studied apart from humans, yielding objective truths about phenomena (Ugwu et al., 2021). This position is therefore popular among positivists (Kivunja and Kuyini, 2017) who also aim to obtain objective study results (Gannon et al., 2022) and believe reality cannot be influenced by human experience (Turyahikayo, 2021). Similarly, relationism is aligned with the lens of objectivity. In this case, however, the emphasis is on hypothesis testing and inference-making, aligning it with post-positivism (Gannon et al., 2022).

In contrast, relativists argue that reality is a subjective construct, shaped by context and personal experience, making it relative to individual perspectives (Ugwu et al., 2021). Empiricists fall within the relativist worldview as they, too, believe that reality is formed by individual experiences (Gannon et al., 2022). The main difference is that empiricists argue that learning can only occur through personal experience (Chakravartty, 2004). Both are, however, often utilised by interpretivists. Pragmatists, on the other hand, associate more with the non-singular reality ontological position, which argues that reality can be understood in a plethora of ways (Ugwu et al., 2021). The key distinction between this position and relativism is that relativists primarily rely on qualitative methods. By contrast, non-singular realists hold that research problems should inform the instruments adopted to capture objective or subjective truths most effectively.

3. Research Design and Methods

From a paradigmatic standpoint, this study adopted pragmatism due to the practical implications of the results. The findings are intended to inform how doctoral candidates should approach their research methodology sections and to explain the contextual nuances of methodological choices based on the gathered data (Kumar, 2019). For this reason, inductive reasoning was applied. Deductive logic was also adopted to showcase the prevalence of the research and philosophical paradigms that doctoral researchers from the Western Cape apply.

A systematic literature review (SLR) was adopted for this study, with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol used to guide the selection of articles that met the study's requirements. With the SLR as the only research strategy, the study followed a qualitative monomethod approach, using only secondary data (Saunders, Lewis and Thornhill, 2023; Creswell and Creswell, 2017). This methodological selection was guided by the research aim, which sought to understand the prevalent philosophical and research paradigms employed by doctoral candidates. To do this, an analysis of previously published doctoral theses was conducted. The SLR approach works in this regard, as it enables a transparent and holistic review of existing literature while also minimising researcher bias (Williams et al., 2021).

Using an SLR approach coupled with the PRISMA protocol enhances a study's reproducibility, as biases are managed through the provision of category sheets (see Table 1) that detail predefined criteria (Ammirato et al., 2023). Data were collected purposively from open-access institutional repositories of the University of the Western Cape (UWC), the University of Cape Town (UCT), and Stellenbosch University (SU). The UWC and UCT were selected because they are listed on the Library and Information Association of South Africa (LIASA) website (https://www.liasa.org.za/page/formal_studies) as universities offering Library and Information Science (LIS) degrees in the Western Cape. Stellenbosch University was included based on the researcher's anecdotal experience, working with the Department of Information and Knowledge Management (IKM). While a thorough check was conducted to verify that no other universities in the Western Cape offer IKM, it is possible that some were erroneously excluded from the sample due to limited visibility, particularly on the LIASA website.

The search strategy was for the researcher to type the word "info" after selecting search by type 'theses/dissertations' in each institutional repository's search bar, to ensure all documents from any degree or academic department that included the term "info" were pulled up. This meant that results on degrees such as information systems were also pulled in. To begin the PRISMA process, the researcher opened all documents to screen for duplicates using study titles and to determine the degree or department under which a study was completed. A total of 33 documents were screened, including 18 from UWC, 12 from SU, and 3 from UCT. The

links used for the results are listed in Table 1. No duplicates were found, while four documents were identified as written information systems and socio-informatics degrees, and another was not open-access material and thus could not be screened. Another criterion for inclusion was that studies had to be written in English; one study was written in Afrikaans and was subsequently excluded from further analysis. This meant that after screening, six documents were excluded, leaving 27 reports eligible for retrieval.

Table 1: Category Sheet.

Definition of Underlying Variable:	Research Paradigm: A research paradigm is shaped by the lens through which a researcher views the world, which impacts how they want to conduct research and the questions they ask about the world (Gannon et al., 2022). A research paradigm is made up of a researcher's conception of the world they live in, how they live in it and desire to live in it or behave in it (Kivunja and Kuyini, 2017). Philosophical paradigm: A Philosophical paradigm is defined as a philosophical approach to thinking (Ugwu et al., 2021; Kivunja and Kuyini, 2017). Understanding the elements that make up a paradigm is essential as they constitute the basic beliefs, principles, suppositions and norms found in each paradigm (Kivunja and Kuyini, 2017). As such, researchers are required to identify their research paradigms, so they are able to easily select the appropriate research designs, strategies, and methodologies to fulfil the needs of the studies they undertake (Ugwu et al., 2021).
Subject of Category:	Ontology includes: - In simple terms, ontology refers to what a researcher believes can be studied (Ugwu et al., 2021), the answer to which is based on what they perceive is real (Rehman and Alharthi, 2016). Gannon understands ontology to be the distinct ways of comprehending how things work, leading to the generation of assumptions about the world (Gannon et al., 2022). - Ontological positions include realism, relationism, relativism, empiricism, and non-singular.
Timeline:	07 February 2025 – 14 February 2025
Research Question:	What are the most frequently applied research and philosophical paradigms in IS/IKM PhD studies?
Search String:	"info" – typed into repository search bar after selecting search by type 'theses/dissertation'
Sources:	Stellenbosch University institutional repository – 12 results https://scholar.sun.ac.za/collections/5b5d9ac3-91c1-4fc5-aea4-a160f58b2905 University of Western Cape institutional repository – 18 results https://uwcscholar.uwc.ac.za/collections/260d97a2-ae0f-4d30-8847-4d8a28ca1a8b University of Cape Town institutional repository – 3 results https://open.uct.ac.za/browse/department?scope=54eb0a16-4729-412a-8839-554727ee22f5&value=Department%20of%20Knowledge%20and%20Information%20Stewardship&dbbm.return=3
Eligibility Criteria:	Content: Doctoral (PhD Studies) Content: Must contain philosophical and research paradigms Language: English Publication Date: 10 year interval (2016-2025): post 4IR coining. Download available: Yes

The researcher successfully downloaded these studies and began assessing them for eligibility. For a study to be eligible, it had to be published after the coining of the term "4IR" by Schwab in 2015 (over the last 10 years), as the researcher operated under the assumption that IS research approaches may be impacted by the technology age and therefore created a need to assess the most recent doctoral studies that would cater for the needs of upcoming scholars. Nine studies published outside the identified timeframe were excluded, leaving 18 eligible for content analysis. The results of the PRISMA process are summarised in Figure 1.

PRISMA FLOW DIAGRAM FOR SYSTEMATIC REVIEW

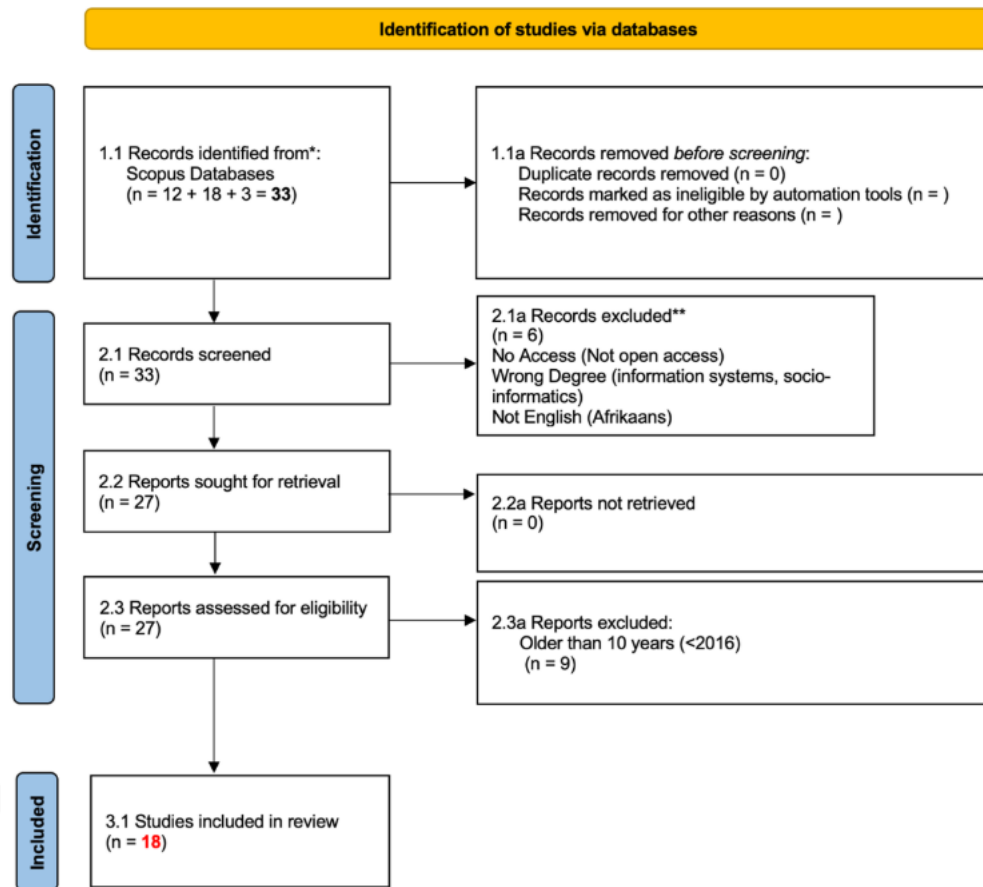


Figure 1: PRISMA flow diagram results

The eligible studies underwent content analysis, where research and philosophical paradigm decisions and justifications were captured in an Excel spreadsheet to enable colour coding. This coding enabled the researcher to determine prevalence deductively. The justifications enabled the author to understand why the doctoral candidates made these methodological choices inductively. While thematic analysis may have been an option for similar monomethod studies, it was not for this study, given the requirement for uniqueness in doctoral studies. A cross-sectional time horizon was adopted, as data were gathered over a week from 07 February 2025 to 14 February. A period during which the elements of the PRISMA protocol were worked through.

Ethical clearance for the study was obtained from the School of Consumer Intelligence and Information Systems (SCiIS) and the College of Business and Economics Research Ethics Committee (CBEREC). The ethical clearance code is 2025SCiIS008. The research relied exclusively on publicly available secondary data, requiring no direct contact with human subjects or the collection of sensitive information. To enhance the quality and readability of this study, Grammarly was used to refine grammar.

4. Presentation of Results

Following the analysis, it was determined that four paradigms were utilised by PhD candidates in the Western Cape, namely: pragmatism, positivism, post-positivism, and interpretivism. Pragmatism was the most common research paradigm, applied in 38.89% (7) of studies. Positivism, post-positivism, and interpretivism were each employed in 22.22% (4) of studies. It is imperative to note that both interpretivism and positivism were employed in Ntshuntshe-Matshaya's (2021) study. This note is crucial to preventing confusion, as it may seem that 19 studies were included in the data collection phase, whereas only 18 were. Concerning ontologies, the relational ontology led the way, used 50% of the time. Relativism came in second place, applied in 44.44% of the studies. The rest of the order was empiricism (22.22%), non-singular reality (16.67%), and critical realism (11.11%). The dominance of pragmatism, relationism and relativism reflects a preference for

approaches that balance theoretical grounding with real-world applicability. Table 2 presents study results, while Figures 2 and 3 show prevalence.

Table 2: Presentation of results.

DocID	Author	Study Title	Research Paradigm	Ontological Position
1	Chawinga, WD	Research data management in public universities in Malawi	Pragmatism	Non-singular
2	Henry, MS	The use of enterprise social networks for social support within virtual teams	Post positivism	Critical realism and Contextualist
3	Shear, CJ	Modelling knowledge security: knowledge security as a knowledge management problem	Interpretivism	Relativism
4	Van Wyk, CJ	Creating access to oral indigenous knowledge for research and development through the implementation of the national recordal system	Constructivism	Relational and Empiricism
5	Gandiwa, T	The use of information and communication technologies for accessing HIV and AIDS information by healthcare professionals in Zimbabwe	Interpretivism	Relativism
6	Momotl, NG	A model to foster the use of records for evidence-based decision-making by senior managers in western cape governmental bodies, South Africa.	Positivism	Realism
7	Langdown, N	South African gender-based violence researchers' awareness and usage of bibliometrics and altmetrics in the context of open access scholarly publishing	Pragmatism	Relational and Empiricism
8	Olajide, O	The role of school libraries in supporting an inquiry based approach for teaching and learning science subjects in senior secondary schools in Ekiti State, Nigeria	Pragmatism	Empiricism
9	Ililonga, S	The role of the public library towards a knowledge economy of Namibia	Post-positivism	Reductionism and Relational
10	Mfengu, AY	Developing a holistic framework for assessing research impact in South African higher education institutions, using a research-intensive university as a case study	Pragmatism	Relational and Relativism
DocID	Author	Study Title	Research Paradigm	Ontological Position
11	White, E	Scholarly communication guidance as a core service of an academic library to doctoral students: a case study of Kwame Nkrumah University of Science and Technology	Pragmatism	Non-singular
12	Kanyengo, CW	Knowledge production practices in higher institutions of learning in Zambia: A case of the University of Zambia	Pragmatism	Relational and Relativism
13	Ntshunshu-Matshaya, PP	Investigating the relevance of quality measurement indicators for South African higher education libraries	Constructivism and positivism	Relational and Relativism

DocID	Author	Study Title	Research Paradigm	Ontological Position
14	Muhambe BH	Information behaviour of African immigrants living in Cape Town, South Africa	Pragmatism	Non-singular
15	Mabweazara, RM	The 21st century academic library: The case of three state universities in Zimbabwe	Post-positivism	Empiricism
16	Joshua, D	Establishing a library portal for integrated e-resources at Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria.	Positivism	Relationism and Relativism
17	Dzandza, PE	Use and management of information systems in academic libraries in Ghana	Post-positivism	Relationism and Relativism
18	Cornelissen, LA	Social Network Cognition: An Empirical Investigation Of Network Accuracy and Social Position	Positivism	Relationism

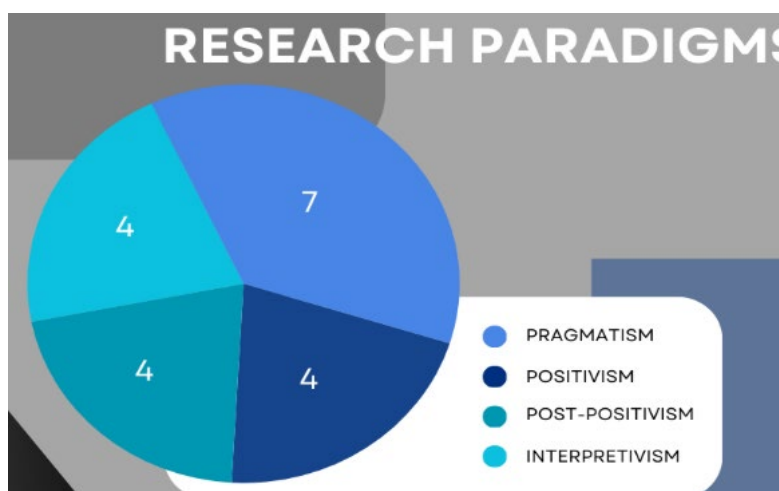


Figure 2: Paradigms by the number of applications.

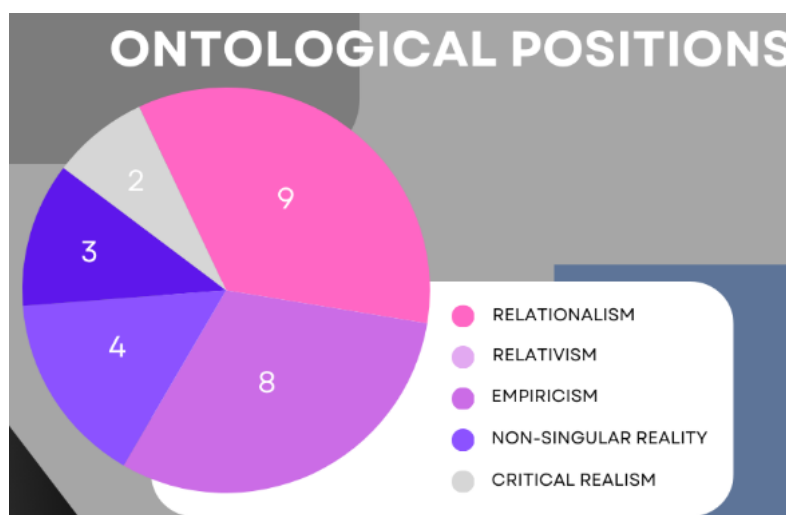


Figure 3: Ontological positions by the number of applications.

5. Discussion

The prominence of pragmatism suggests that IS research often prioritises methodological flexibility and real-world applicability over strict adherence to a single approach. This aligns with the field's interdisciplinary nature, which requires responsiveness to diverse research contexts (Niemand and Bwalya, 2020). For instance, researchers' stance on the need to utilise pragmatism was the freedom to use any research methods

to satisfy study objectives. Langdown (2020) asserted that the aim was not to find the absolute truth but to catalyse human problem resolution.

The ontologies associated with studies that employed pragmatism were relationism and non-singular reality, in which researchers either tested hypotheses or contended that reality can be comprehended through a multiplicity of ways (Ugwu et al., 2021). White (2019) sought to understand reality through semi-structured interviews, document analysis, and a bibliometric survey to assess scholarly communication guidance as a primary service to PhD students. Similarly, Langdown (2020) utilised bibliometric analysis to test the measurement of traditional and alternative metrics.

While positivism and post-positivism share similar traits, they are utilised for varying reasons as seen in the PhD studies. The literature states that post-positivism takes a more humanistic perspective than positivism, aiming to comprehend causality (Gannon et al., 2022), whereas positivists argue that context is irrelevant (Turyahikayo, 2021). What was interesting, however, was that some of these doctoral researchers applied critical realism (seeking objective truths) (Ugwu et al., 2021) and relationism (testing causality) when using both positivism and post-positivism. Ntshuntshe-Matshaya (2021) also utilised a combination of positivism and interpretivism to compare qualitative and quantitative data for validity testing. This indicates that agreement on research design principles is not universal, given that authors merge paradigms and ontologies as they see fit. Nonetheless, the coexistence of positivism and interpretivism indicates an embrace of methodological pluralism, enabling researchers to capture both measurable outcomes and nuanced human experiences.

As expected, interpretivism was closely associated with relativism, which holds that truth is subjective and context-dependent (Ugwu et al., 2021). Empiricism was closely associated with interpretivism, pragmatism, and post-positivism. This connection to post-positivism reemphasises the difference between the positivist and post-positivist approaches, in which the latter considers context. Mabweazara (2018) applied an empiricist approach within the post-positivist paradigm to determine the requirements of a 21st-century academic library for satisfying the expectations of students and academics. This application is fitting, given that empiricists argue that learning can only occur through experience (Chakravartty, 2004), an argument also made by pragmatists (Smith, 2021). Therefore, participants can then share knowledge based on their experiences.

6. Conclusion

This study examined the research and philosophical paradigms used in 18 doctoral theses in IS. The results reveal both a diversity of philosophical orientations and recurring patterns that collectively reflect the discipline's adaptive, content-sensitive nature. From a paradigmatic standpoint, pragmatism emerged as most commonly utilised to enable methodological flexibility and facilitate the development of practical solutions rather than strict philosophical adherence. Ontologically, relationism was the most widely applied, followed closely by relativism.

The critical realist perspective, found in studies by Momoti (2021) and Henry (2023), combines an acknowledgement of observable realities with recognition of the influence of structural and contextual factors, as Henry utilised post-positivism. Interpretivism contributed unique perspectives, particularly in culturally specific or socially embedded research contexts. Positivist and interpretivist orientations also coexisted, with the former prioritising measurement, objectivity, and statistical rigour. In contrast, the interpretivist approach focused on understanding subjective experiences and co-constructing meaning with participants.

Taken together, the findings highlight several defining characteristics of IS research within this sample. Firstly, the field exhibits philosophical pluralism, with researchers selecting paradigms and ontological stances based on the demands of the research problem rather than allegiance to a single paradigm. Secondly, methodological flexibility is a hallmark, with mixed-methods and sequential designs used to maximise both validity and applicability.

The implications of these findings are significant. For the academic community, they underscore the value of maintaining openness to diverse philosophical and methodological approaches, especially in a field as interdisciplinary as IS. Ultimately, this study confirms that IS is a field characterised by adaptability and the requirement to bridge theory and practice. Its researchers operate at the intersection of technological, social, and cultural domains, drawing from multiple philosophical traditions to address complex, evolving challenges. This philosophical agility is not merely a reflection of the field's diversity. However, a

strategic strength that enables IS to remain responsive to emerging information environments, shifting societal needs, and evolving industry priorities. By balancing rigour with relevance and innovation, IS continues to produce scholarship that is not only theoretically informed but also practically impactful. With a limitation of the study being only focusing on Universities in the Western Cape, future studies can examine doctoral studies published at South African universities outside the Western Cape offering IS degrees to broaden understanding of the research and philosophical approaches most used by doctoral IS candidates.

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