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Title: Case Studies of Instructional Leadership for the Life Sciences in Two South African Schools

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Case Studies of Instructional Leadership for the Life Sciences in two South African Schools

by

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Submitted in fulfilment for the requirements of the degree

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DECLARATION

I, Thobile Perseverance Madonsela declare that the dissertation titled *Case Studies of Instructional Leadership for the Life Sciences in two South African Schools* which is submitted for the qualification of Master's in Education at the University of the Free State, is my own independent work.

All the references that I have used have been indicated and acknowledged by means of complete references.

.....

T. P. MADONSELA

.....

DATE

DEDICATION

I dedicate this dissertation to myself for the many nights of studying to complete this long academic journey. I fought against all odds, but succeeded in the end.

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To God Almighty. Father thank You for making it possible for me to complete this study.

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SUMMARY OF THE STUDY

Globally, learner-achievement was prioritised in the past to enhance school reform efforts. Consequently, this led to Instructional Leadership being viewed as the key strategy for improving the quality of teaching and learning as a long-term trajectory for whole-school school improvement. Although Instructional Leadership is seen as a critical component to effectively enhance teaching and learning in schools, studies in this area of education generally speak to the correlation between management, instruction, and learning; but they do not directly address subject-specific Instructional Leadership - hence, the significance of this study. In acknowledging that scholars in the area of educational leadership have not strongly linked their studies to particular school subjects, it was realised that the existence of instructional problems may be sidelined; hence, subject-specific Instructional Leadership need to be prioritised. Consequently, this study explored the area of Instructional Leadership for the Life Sciences as enacted in South African schools. Findings from this study revealed that Instructional Leadership played a crucial role in sustaining school improvement. In addition, the findings indicated that for subject-specific Instructional Leadership in schools to improve, instructional leaders need to be professionally developed to understand the concept of IL, the subject (Life Sciences), and the practices that promote effective teaching and learning of the subject.

Keywords: Instructional Leadership, Life Sciences, school community, science education, subject-specific instruction, whole-school development

ACRONYMS

ATP:	Annual Teaching Plans
CMF:	Curriculum Management Framework
DBE:	Department of Basic Education
DoE:	Department of Education
IL:	Instructional Leadership

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SECTION ONE

INTRODUCTION AND ORIENTATION

1.1 INTRODUCTION

The concept of Instructional Leadership and its impact on education has evolved from principals being managers and school administrators to becoming Instructional Leaders as their main responsibility. According to Bambi (2013), the concept of Instructional Leadership emerged in the 1970s as a strategic solution to boost school effectiveness and enhance academic performance. In the 1980s when research exposed the fact that principals were mere school administrators and managers who focused on curriculum and instruction, Instructional Leadership emerged as a move to promote the all-round effectiveness and efficiency of school leaders (Hallinger & Heck, 2010). However, for a decade there was a lull in Instructional Leadership studies, but then came an upsurge after 2005 (Gumus et al., 2018). It was after 2008 that there was a burgeoning interest in Instructional Leadership because it focused more on the accountability of principals to lead schools that prioritised learner-achievement (Leithwood, 2012; Hallinger, Wang, Chen & Liare, 2015; Costello, 2015; Gumus et al., 2018). Hallinger and Heck (2010) describe teaching as a formal education process that occurs in a classroom or other similar regulated context, while Mafuwane (2011) defines leadership as the process of persuading people to accomplish goals by demonstrating how to achieve them efficiently, in addition to inspiring individuals and groups to enhance their quality of performance through collaboration. These descriptions are akin to Instructional Leadership which requires the presence of a person who has the will, power, passion, astuteness, discerning powers, and capacity to influence others. In support, Bambi (2013) reiterates that Instructional Leadership is the capacity to influence, inspire, and assist people to pursue a common objective to successfully perform a specific job. This implies that instructional leaders should motivate people to work toward common goals if they wish to achieve successful outcomes. Furthermore, Instructional Leadership has been globally identified as being most effective to enhance learning outcomes that ultimately improve educational climates (Pustejovsky, Spillane, Heaton & Lewis, 2009; Hallinger & Walker, 2014).

Additionally, Rosnah et al. (2014) highlight Instructional Leadership as a critical component of building a learning organisation that advances its mission and vision. Hence, the teaching profession has the responsibility to effectively educate individuals at all levels through astute Instructional Leadership. Given its wide-ranging responsibility of achieving academic goals, objectives, and school progress, Instructional Leadership should simultaneously also advance the crucial aspect of sound educational administration (Hamad, Demissie & Darge, 2021). Thus, secondary school heads oversee the curricula, ensuring that the entire school day is managed effectively, and creating an environment that is conducive to quality teaching and learning. According to Hopkins (2001), the purpose of Instructional Leadership is to provide a variety of rich teaching-learning opportunities for both instructors and learners to foster whole-school development. This implies the necessity for professional growth workshops for principals and instructors to grasp modern trends in education such that learners achieve quality outcomes. This should also accelerate the strategic implementation of intervention programmes for the all-round advancement of the school community.

Recent empirical research by Maponya (2020) and Hou, Cui and Zhang (2019) identified Instructional Leadership as an approach that has been proven to support school success and the enhancement of learners' academic attainment. However, Harris and Jones (2015) caution that in order to attain best practice, policymakers and relevant role-players must also blend traditional leadership techniques with Instructional Leadership styles.

1.2 BACKGROUND OF THE STUDY

Instructional Leadership refers to practices that directly relate to teaching and learning such as observing learners in the classroom, availing resources, and arranging professional development sessions, among others. Its broad understanding includes being familiar with activities that directly or indirectly impact learning such as cultural change within a school or introducing flexible timetabling procedures (Leithwood, Harris & Hopkins, 2020). Since the organisational culture of the school is a crucial component which is interconnected to other aspects of the institution, it should be given due prominence as part of Instructional Leadership. According to Hoy and

Forsyth (1986) an organisation's culture includes its members' beliefs, values, and standards that affect both teachers' and learners' attitudes and work habits, which in turn determine the culture of teaching and learning in an organisation. A school with a strong commitment to a culture of quality teaching and learning will have an established functional organisational structure and relevant curricula that prioritises academic accomplishment while exhibiting teachers' professionalism.

Accordingly, leaders should consider these elements of Instructional Leadership as being essential to ensure that learners receive quality instruction during the effective delivery of the curriculum; as such, Instructional Leadership facilitates both learning and teaching (Townsend, 2019). Leadership for learning, pedagogical leadership, and learner-centred leadership are terms allocated to a certain kind of leadership. Therefore, Instructional Leadership is regarded as a broad concept that encompasses a variety of strategies employed by school administrators to realise the attainment of successful teaching-learning outcomes in classrooms.

School leaders' (subject heads, departmental heads, deputy principals, and the principal) instructional practices are directly related to the quality of teaching and learning which should yield high-level academic results. Most studies found a strong connection between Instructional Leadership and instructors' quality of instruction (Kabeta, Manchishi & Akakandelwa, 2015; Hallinger et al., 2018; Naz & Rashid, 2021). In other words, learners' learning is enhanced by sound and innovative Instructional Leadership practices (Townsend, 2019). Hence, Instructional Leadership favours learners' learning more than transformational leadership (Leithwood et al., 2020).

In support, international studies contend that Instructional Leadership plays a critical role in improving the quality of teaching and learning (Keefe & Jenkins, 2002; Goddard, Goddard, Kim & Miller, 2015; Hallinger, 2020). Further, Diamond and Spillane (2016) indicate that effective Instructional Leadership prioritises key school responsibilities such as teaching and learning processes, promoting the institution's mission and vision, as well as creating and sustaining a positive school atmosphere.

The primary focus of Instructional Leadership is to engage teachers in ways that promote, and support best practice as opposed to managerial tasks (Murphy, Neumerski, Goldring, Grissom & Porter, 2016). This ensures that effective instructional

leadership encourages teachers to align their relevant subject-matter to suitable teaching approaches so that learner-outcomes progresses to a higher level (Al Hosani, 2015; Cardno, Robson, Deo, Bassett & Howse, 2019). Teachers, as professionals who provide Instructional Leadership, especially those who are coached or mentored to enhance their professional development, are more likely to develop innovative pedagogical techniques to implement in their classrooms to enhance academic outcomes (Carraway & Young, 2015). By creating a school environment that stimulates teachers' and learners' work-performance, Instructional Leadership can directly contribute to learning by creating sound, functional, interesting, and innovative teaching-learning environments that engender whole-school improvement (Goddard et al., 2015).

Hallinger, Walker, Nguyen, Truong and Nguyen (2017) affirm that Instructional Leadership improves the quality of teaching and learning by ensuring that teachers are supported in their professional development, teaching practices, and resource management. Moreover, Robinson (2010) who conducted her study in New Zealand asked what type of leadership has the greatest impact on student learning? Learner-centred leadership had the greatest impact after comparing data from global studies. Scholars have conducted extensive research over the past several years that provide compelling evidence that Instructional Leadership is consistently associated with positive learning outcomes when compared to all other types of leadership styles across a wide range of contexts (Leithwood & Mascall, 2008; Hallinger et al., 2015; Timperley, Ell, Le Fevre & Twyford, 2020). Also, it was evident that through Instructional Leadership, a culture of accountability and collaboration to foster teachers' professional efficacy can be created (Bada, Ariffin & Nordin, 2020).

Further, when exploring the priorities of Instructional Leadership globally, studies conducted in England (Southworth, 2002; Bush & Middlewood, 2013; Day, Gu & Sammons, 2016) and Iran (Abdollahi & Karimii, 2013; Hallinger, Hosseingholizadeh, Hashemi & Kouhsari, 2018; Zeinabadi, Kouhsari & Gurr, 2020) found a correlation between exemplary Instructional Leadership and high learner-achievement. Historically, administrators were assumed to be responsible for school leadership, including Instructional Leadership (Abrahamsen & Hellekjaer, 2015). However, studies conducted among African nations, such as in South Africa (Mestry, Moonsamy-

Koopasammy & Schmidt, 2013) and Uganda (Galabawa & Nikundiwe, 2000), indicated that Instructional Leadership cultivates a spirit of dedication and tenacity in learners. This led to the harmonious cooperation between teachers and parents which improved learner-discipline and the general management of the school (Manaseh, 2016).

Specifically, to enhance the quality of teaching and learning, Instructional Leadership at South African schools should prioritise overseeing and guiding teachers. While ensuring that learners are disciplined and aware of their responsibilities. In addition, with a strong emphasis in ensuring all students are meeting high academic standards, particularly in the context of addressing educational disparities, instructional leaders in South Africa primarily use Instructional Leadership to improve learning outcomes for all students by identifying instructional challenges and assisting teachers in improving their practices. This frequently entails tracking student progress and encouraging a collaborative culture among teachers (Mestry, 2017)

Researchers such as Fleisch, Schoer, Roberts and Thornton (2016) explored a multidimensional Instructional Leadership strategy and discovered that Mathematics and Science test results significantly improved as a result of this. They pointed out that the establishment of teacher-development programmes, collaborative lesson-planning, and the availability of teaching-learning materials, all contributed to schools' improvement and expansion. It is therefore essential for instructional leaders to provide time, curricular guidance, and relevant resources to assist teachers in improving their teaching of science subjects, especially in the Life Sciences as it is an important subject that will equip learners with a foundation of scientific knowledge and ways of exploring the world (National Academies, 2019). It is an optional subject that is covered in South Africa's Further Education and Training phase (Grades 10–12). Darling-Hammond, Flook, Cook-Harvey, Barron and Osher (2020) agree that the provision of Instructional Leadership as a form of ongoing support and guidance leads to effective teaching and learning in the Sciences which cascades into better learner-achievement.

However, some research studies indicate that Instructional Leadership can be challenging in schools due to the anomalies associated with evaluating instruction,

promoting positive change, improving teachers' skills and knowledge, implementing research-based best practices, and meeting the needs of learners (Hallinger & Murphy, 2013; Wieczorek & Manard, 2018). According to current research conducted in the South Africa, Instructional Leadership in the Sciences is facing some challenges (Davidson, 2012; Malinga, 2016) since it is a complex responsibility in a multidisciplinary context such that instructional leaders may not have the requisite expertise in all the sub-disciplines (Malinga, Jita & Bada, 2021). In this regard, the lack of scientific knowledge may prove to be a challenge that hinders the provision of astute Instructional Leadership which obstructs teachers in navigating the ever-changing demands of the Science classroom (NRC, 2015; Jimerson & Fuentes, 2018; Lochmiller & Cunningham, 2019). While the role of Instructional Leadership in improving teaching and learning at institutions has been studied extensively, there is still a dearth of research on subject-specific Instructional Leadership. Thus, this proposed study emanated from an interest to explore and understand how subject-specific Instructional Leadership, especially for science subjects, is enacted in schools.

1.3 CONTEXT OF THE STUDY

Two high schools in Standerton within the Gert Sibande District were selected; one is a former Model C school that is ranked as quintile 4 to 5, which means that it is a fee-paying well-resourced school. The other is an African township school that is ranked as quintile 1 to 3 which means that it is an under-resourced. The quintiles are ranked from 1 to 5, with 1 being the poorest school and 5 being the most affluent. The schools ranked from quintiles 1 to 3 do not charge tuition fees and only receive funding from the Government. Schools in quintiles 4 to 5 are fee-paying, but receive some Government assistance (DBE, 2020). A former Model C school was selected because it has been performing well in the Life Sciences, it has resources such as practical equipment and overhead project for teaching and learning; the African township school was chosen because it was known previously for underperforming in the Life Sciences, but the results have since improved over the years. When it comes to resources the African township school has a limited amount of resources that makes learning Life Sciences a bit challenging. For instance, a laboratory was built but it is non-functional.

1.4 PROBLEM STATEMENT

Sub-standard Instructional Leadership in South African schools negatively affects teaching and learning processes (Chabalala & Naidoo, 2021). Also, Instructional Leadership for teaching and learning, specifically in science is under-researched, thus it negatively impacts on the possibilities of enhancing classroom pedagogy (McNeil et al., 2018). To be effective in teaching-learning situations, Instructional Leadership calls for the establishment of processes, tools, and a quality learning culture (Townsend, 2019). A close-to-the-classroom leadership practice is one that favours uplifting the standards of teaching and learning such that it provides teachers with psychological support, professional development, assessment guidelines of teachers' teaching, and buffering them from administrative-overload.

Any school programme aimed at enhancing learners' learning must provide smart Instructional Leadership for it to be successful (Mokhele & Jita, 2012). Hence, it is crucial that judicious Instructional Leadership results in achieving high-quality outcomes in science education. However, time-consuming and demanding management administrative tasks, in addition to policy and curriculum implementation, frequently hinder the practice of Instructional Leadership in schools (Lee, 2015). Moreover, it is exacerbated by the lack of comprehending how Instructional Leadership should be perceived and practised to meet the school's various demands (Tuters, 2015; Townsend, 2019; Leithwood et al., 2020). In addition, broad research on Instructional Leadership in the South African context offers a generic rather than a subject-specific leadership approach (Plaatjies, 2019). For instance, Bhengu and Mkhize (2013) who studied the Instructional Leadership strategies of five Umbumbulu (KwaZulu-Natal, RSA) principals to demonstrate how these approaches enhance learner-performance, found that schools that were underperforming in standard DoE assessments, improved after the principals adopted instructional leadership practices which also improved the schools' National Senior Certificate (NSC) results. The study's findings also revealed the necessity to routinely oversee teachers' and learners' progress to improve educational standards, minimise disruptions to teaching and learning, set excellent examples as managers and leaders, and foster a healthy school environment to achieve high quality learner outcomes (Bhengu & Mkhize, 2013).

Ogina (2017) conducted a qualitative case study in Limpopo and Mpumalanga on principals' perceptions of their roles as instructional leaders which included considering their personal leadership skills, traits, and responsibilities - it revealed the positive connection between self-perception, traits, and leadership qualities. Lamentably, principals did not consider themselves as instructional leaders; this may indicate that they do not internalise their role as leaders or agents who enact responsibilities for the betterment of the school. It is imperative that they execute their leadership to enact quality processes that improve their image to portray best practice.

The responsibility for academic growth lies with school principals in South Africa, and globally. To better understand how principals support school improvement in the Northwest Province, Shava, Heystek, and Chasara (2021) conducted a qualitative study which concluded that sound leadership significantly influenced learners' academic progress. This implies that learners' academic success correlates with the school principal's sound Instructional Leadership performance. Moreover, the School Management Team (SMT) and the school principal lay the groundwork for effective teaching-learning processes in the classroom which lead to successful academic outcomes. In sum, it can be perceived that there is a migration from traditional leadership to a collaborative and democratic Instructional Leadership approach that engenders quality whole-school improvement (Shava et al., 2021).

Hence, this study dissected the phenomenon under investigation to contribute new knowledge concerning the practice of subject-specific Instructional Leadership for the Life Sciences in South African schools - an area that was under-researched.

1.5 SIGNIFICANCE OF THE STUDY

It is imperative for any scholarly study to exhibit value, relevance, and positive change to contribute to the body of knowledge on a specific topic that necessitates interrogation. A number of reasons prompted me to engage in this study. Firstly, there is a dearth of research on subject-specific Instructional Leadership in the South African context. Researchers have written extensively about Instructional Leadership but focused mainly on Instructional Leadership practices or the management of the curriculum and instruction (Hoadley, Christie & Ward, 2009; Msila, 2013; Mestry;

2017). Secondly, I have noted that some schools I have practised at during my teacher-training days have SMTs and principals who are not implementing Instructional Leadership strategies that encourage teachers to deliver quality teaching-learning practices in the Life Sciences. This ignited my academic interest to investigate how Instructional Leadership for the Life Sciences is constructed and enacted in schools.

Considering the above, this study was one of few that focused on subject-specific Instructional Leadership for the Life Sciences. Moreover, it is envisaged that the findings and recommendations will possibly contribute to best practice in schools, such that learners' performance in the Life Sciences is enhanced, not only in the selected high schools, but also in other high schools. Furthermore, improve the instructional practices of both instructional leaders and teachers. Lastly, the study anticipated contributing to policy-designing (or revision) on Instructional Leadership in general, but specifically on leadership in science education.

AIM AND OBJECTIVES

1.6.1 Aim

- The aim of this research was to understand how Instructional Leadership for the Life Sciences is constructed and enacted in two South African schools.

1.6.2 Objectives

- To investigate teachers' perspectives on Instructional Leadership for the Life Sciences in two South African schools; and
- To analyse practices and challenges that characterise Instructional Leadership for the Life Sciences in the two South African schools.

1.7 RESEARCH QUESTIONS

1.7.1 Main Research Question

- How is Instructional Leadership for the Life Sciences constructed and enacted in two South African schools?

1.7.2 Sub-questions

- What are teachers' perspectives on Instructional Leadership for the Life Sciences in two South African schools?
- What practices and challenges characterise Instructional Leadership for the Life Sciences in two South African schools?

1.8 CONCEPTUAL FRAMEWORK

This study was rooted in a conceptual framework derived from Robinson's (2010) leadership conceptual skills model which was supported by principles of leadership competencies pertaining to scientific Instructional Leadership that was developed by applying concepts and competencies to improve Science instruction (Peacock, 2014). In other words, this study was underpinned by a conceptual model of leadership capabilities contributing to Science Instructional Leadership (Peacock, 2014). The model is based on four inter-dependent leadership capabilities: Science leadership content knowledge, advocating of Science and Science instruction, creating a collegial learning environment, and negotiating context and solving problems.

The revised comprehensive curriculum that Science teachers are currently implementing will have a long-term impact on science education; hence, Instructional Leadership is a vital tool for teacher support. Accordingly, this study drew from a historical analysis of relevant literature, as well as from more recent research in science education in line with Instructional Leadership for Science. This model advocates the four capabilities (above) to address the direct and indirect impact on learner outcomes (Robinson, 2010 & 2011). The quality of instructional leaders' enactments regarding performance of their professional duties is dependent on their intrinsic and experiential capabilities. This conceptual framework was adopted to demonstrate the extent to which skills, knowledge, and personal traits are interconnected in the practical application of Instructional Leadership for science subjects. In addition, the model was chosen because it emphasises the important

leadership capabilities that focus on the major practices required for successful science Instructional Leadership which was what the study aimed to highlight.

1.9 RESEARCH METHODOLOGY

This research investigated how Instructional Leadership for the Life Sciences was enacted in schools. It adopted a qualitative case study research design. Also, since an interpretive paradigm promotes the understanding of social phenomena and people, it was appropriate for this study to understand the research problem under investigation through different lenses as people and their environment cannot be studied in the same way (Saunders et al., 2019).

1.10 RESEARCH DESIGN

The study was aligned to a case study research design which was characterised by an interest in individual cases rather than by a methodology inquiry (Hyett, Kenny & Dickson-Swift, 2014). Based on the researcher's intuition and observations of interactions in physical spaces, methods were selected by utilising naturally occurring sources of knowledge, including people. The researcher used multiple collection and analysis methods to build and understand the case based on emerging data and contextual aspects. This was based on the premise that qualitative case studies explore a contemporary bounded system (a case) or multiple bounded systems (cases) over time by integrating multiple sources of information to promote a rich and detailed collection of data.

1.11 POPULATION

Asiamah, Mensah and Oteng-Abayie (2017) define a research population as objects or group(s) of people the researcher wishes to investigate and understand. The population of this study included two principals, two Life Sciences departmental heads, four Life Sciences teachers - which constituted a total of eight participants. The researcher regarded all of them as the relevant people who would provide relevant and in-depth information to address the aim, objectives, and research questions of the study as they possessed the knowledge and experience concerning the subject under study.

1.11.1 SAMPLING AND SAMPLING METHOD

A research sample pertains to the selection of part of the population of interest in a study (Turner, 2021). The participants were purposively sampled as they were deemed to be suitable for this study. The principals were chosen because they have been in the leadership positions for more than eight years, while the departmental heads were chosen based on their teaching experience of the subject and their leadership positions in heading the subject. The teachers were selected because of their experience of teaching the subject daily. Crossman (2017) describes purposive sampling as a technique that selects suitable participants based on their knowledge of the population in line with the aim of the study. This convenient sampling method allowed the researcher to choose only the most suitable participants to address the research aim, objectives and research questions to elicit rich data.

1.11.2 RESEARCH SITE

According to Alvi (2016), a research site is a location where the study is conducted. The researcher conducted this study in two selected high schools in South Africa. The two schools were chosen because one of them had been performing well in the subject of the Life Sciences; the other school was chosen because it was known to be previously underperforming in the subject of the Life Sciences. For reasons of confidentiality (and ethics), the names and locations of the schools will remain anonymous.

1.12 DATA COLLECTION METHODS

Data was collected by conducting semi-structured interviews, observation, and document analysis:

1.12.1 Semi-structured Interviews

Semi-structured interviews enabled the researcher to gain an incisive understanding of how Instructional Leadership for the Life Sciences was construed and enacted in schools. Also, semi-structured interviews encouraged the participants to discuss, clarify, and elaborate on their responses (Tracy, 2020). The semi-structured interviews enabled the researcher to utilise open-ended questions to elicit an in-depth insight into

instructional leadership for the Life Sciences. The interviews were conducted on a one-on-one basis after school hours. The duration was approximately one hour each. The interviews were audio-recorded (with participants' consent) for transcription, verification, and authenticity purposes.

1.12.2 Observation

The method of observation (with consent) enabled the researcher to extract first-hand information from real-life classroom situations which were video-recorded for specifically noting participants' behaviour and interactions. Flick (2022) reiterates that an observation is a form of data collection technique where the researcher gathers first-hand data by observing people and places in their natural setting. Also, during the interviews, the researcher was able to observe and record the nonverbal cues while eliciting information from participants. The observing of participants in their natural settings took approximately two months. The principals were observed during staff meetings in their respective schools, the departmental heads as well as teachers were observed during departmental meetings. In total eight participants were observed, details of the observation sessions were recorded as text and regarded as the researcher's field notes.

1.12.3 Document Analysis

Documents offer valuable information for strengthening data analysis processes. This technique allowed the researcher to peruse relevant written communication, including internal and external school records on the topic under study (Boccagni & Schrooten, 2018). The researcher obtained consent from the two schools' principals and the District Office (DoE) to peruse documents regarding Instructional Leadership for the Life Sciences. These documents which verified information elicited from the interviews were gathered and used for only this study's purposes.

1.13 DATA ANALYSIS

The thematic analysis approach involves structuring and organising datasets into categories known as themes (Alhojailan, 2012). The information garnered through semi-structured interviews, observations, and document analysis was analysed thematically so that it could be grouped into themes (Scharp & Sanders, 2018). Verbatim responses from the interviews, notes from observations, the literature

review, and relevant information from school records were analysed and categorised thematically to strengthen the validity of the findings.

1.14 ETHICAL CONSIDERATIONS

There are various ethical procedures that a researcher must adhere to when conducting research. According to Creswell and Creswell (2018), ethical standards must be upheld at all stages of the research, particularly throughout the collection, reporting, and distribution of data processes. To conduct this research in the two selected high schools, I first requested approval from the University of the Free State (UFS) Ethics Committee and the Provincial Department of Basic Education (DBE) to commence with research processes and to gain access to these schools respectively. The letters of permission from Department of Basic Education (DBE), school principals, and the UFS Ethics Committee were included in the appendices.

I also sought permission from the principals of schools to conduct this research. All protocols were observed when I recruited the participants – these included voluntary consent (signed), transparency in all processes, cordiality, absence of risks, respect, prior provision of all finer details of the research to all participants, human rights, and the option to exit at any stage of the research process without being penalised in any way.

Confidentiality and anonymity were protected via the use of pseudonyms/codes. Participants were assured that all information (and identities) will not be divulged to anyone without consent (Esposito & Evans-Winters, 2021). Electronic information was stored in a password-protected file, while hardcopies were securely locked in the researcher's cabinet. Further, participants were informed about their right to peruse the final submission of the research report (on request), if they so desired.

1.15 DELIMITATIONS AND LIMITATIONS OF THE STUDY

1.15.1 DELIMITATIONS

Delimitations and limitations are boundaries of a study set consciously by researchers that limit the scope of a research project (Yin, 2014). The study was conducted only in two high schools in South Africa and focused primarily on Instructional Leadership in the Life Sciences in high schools, because the Life Sciences is only taught within the

Further and Education Training (FET) Phase. These delimitations acted as restrictions regarding the generalising of the results of the study to other broader contexts concerning the same topic.

1.15.2 LIMITATIONS

Limitations are potential problems that are frequently outside the researcher's control (Theofanidis & Fountouki, 2018). A time convenient for the participants was negotiated for conducting the interviews. Due to their reluctance of being recorded, some participants found it difficult to express themselves spontaneously. Also, some participants did not feel comfortable having someone from the 'outside' observe their instructional practice. These limitations were mitigated by the researcher advising the participants to be at ease as this research was not personal in any way, and that confidentiality was guaranteed. Further, the number of participants was limited as the researcher considered their level of expertise in Instructional Leadership regarding the Life Sciences. This sample size limited the scope of the results. Hence, the findings of this study may not necessarily reflect the general experiences of South African instructional leaders and Life Sciences teachers.

1.16 CLARIFICATION OF TERMS

According to Haseeb (2022), unfamiliar terms in research should be defined because in most cases readers have their own understanding of such terms. Therefore, defining these terms ensured that readers understood the concepts used in this study. The following terms were defined to help in understanding concepts used in the study:

1.16.1 Instructional Leadership (IL)

Leadership that promotes the development of teaching and learning (Townsend, 2019) is also referred to as pedagogical leadership, learning-focused leadership, leadership for learning, and learner-centred leadership.

1.16.2 Life Sciences

It is a broad study of living organisms such as animals, plants, and humans, as well as the processes involved in their lives (Kumar & Mina, 2019).

1.16.3 Instructional Leader

Instructional leaders are school personnel who promote effective teaching and learning by offering effective guidance and support to teachers. For this study, an instructional leader was also regarded as a member of the School Management Team (SMT) responsible for managing and overseeing teaching and learning.

1.17 OUTLINE OF THE DISSERTATION

Instead of conventional chapters, this dissertation was article-based and presented two potentially publishable articles.

The dissertation is divided into three sections: section 1 provided an overview of the study; section 2 presented two articles that will be submitted to journals for publication; and section 3 concludes the dissertation by demonstrating how each research question was addressed in the two articles. Both articles are formatted and referenced according to the requirements of a particular journal in which it will likely be accepted for publication. The following are the titles of the articles:

Article 1: Life Sciences teacher's perspectives of Instructional Leadership: A case study of two South African Schools.

Article 2: Characteristics of Instructional Leadership practices for the Life Sciences: An exploration of two South African Schools

SECTION 2: ARTICLES

ARTICLE ONE

Life Sciences Teachers' Perspectives on Instructional Leadership: A Case of Two South African Schools

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ABSTRACT: Student performance and achievement have always been at the centre of school reform efforts around the world. This led to Instructional Leadership being regarded as being key for improving teaching and learning processes. Although there is an inextricable connection between instruction and learning, it does not directly address subject-specific Instructional Leadership. Hence, this study investigated teachers' perspectives on Instructional Leadership for the subject of Life Sciences. By applying a qualitative case study approach, we interviewed high school principals, departmental heads, and teachers in two South African schools from the Gert Sibande District in the Mpumalanga Province. Thematic analysis was employed to analyse the collected data. Findings revealed differences in the conception and understanding of Instructional Leadership among teachers, departmental heads, and principals regarding the Life Sciences. Teachers only understood Instructional Leadership based on their job-descriptions. We recommend that based on the findings of this study, it is important that the knowledge of teachers, departmental heads and principals be extensively upgraded on subject-specific Instructional Leadership.

KEYWORDS: Academic achievement, Instructional Leadership, Life Sciences, supervision, transition

INTRODUCTION

The history of Instructional Leadership (IL) includes the principal's transition from manager and school administrator to Instructional Leader. To improve academic achievement and boost school effectiveness, Instructional Leadership evolved to accommodate the principal's 'new' role since the 1970s (Bambi, 2013). According to Hamad, Demissie and Darge (2021), Instructional Leadership is critical in also advancing sound educational administration. Thus, secondary school principals are

responsible for overseeing the curricula, ensuring that the entire school day is managed effectively, and creating an environment that is conducive to teaching and learning. Instructional Leadership focuses on prioritising learner-achievement and academic performance (Glickman et al., 2017). Moreover, Instructional Leadership has been associated with numerous positive school outcomes, including better teaching practices and increased learner-success (Shatzer, Caldarella & Hallam, 2014; Hallinger, Wang, Chen & Liare, 2015; Day, Gu & Sammons, 2016; Hou, Cui & Zhang, 2019). In other words, Instructional Leadership may be viewed as a powerful function involving supervision, evaluation, and monitoring of teaching resources in the promotion of quality teaching.

Being closely aligned to classroom management functions coupled with instructionally focused leadership skills, results in quality teaching-learning processes through the creation of organised and supportive learning environments (Alig-Mielcarek, 2003; Cruickshank, 2017; Le Fevre et al., 2019). Although Instructional Leadership can improve teachers' didactic techniques and learners' learning, it has been found that in African countries (Tanzania in particular) its adoption is seldom enacted (Lwaitama & Galabawa, 2008; World Bank, 2010). School leaders, including administrators are not being adequately trained for the fundamental responsibility of leading schools to advance best practice (Bambi, 2013). This implies that sub-standard Instructional Leadership may emanate from inadequate training. Although school administrators cannot be experts in all aspects of content-area teaching, a deficit understanding of what best practice entails in a particular content area may contribute to school leaders' obliviousness to the magnitude of instructional problems; thus, school leaders may be ill-equipped to provide effective support to teachers where and when the need arises (Fuentes & Jimerson, 2020). Specifically, many school leaders do not have expertise in science teaching (Spillane & Hopkins, 2013) as the subject presents a unique challenge to school leaders concerning the guidance and supervision of teachers (Sandholtz & Ringstaff, 2014). Additionally, there is a particular gap in subject-specific research especially relating to Instructional Leadership in the Life Sciences. To bridge this gap, this study explored how high school principals, departmental heads, and teachers define and understand Instructional Leadership, particularly in the Life Sciences.

LITERATURE REVIEW

School leaders play a critical role in reform efforts, yet their scientific knowledge is insufficient to support teachers (Fuentes & Jimerson, 2020; Klein et al., 2018; Lochmiller & Cunningham, 2019; McNeill et al., 2018). Instructional leaders often lack sufficient content knowledge in the sciences to be effective in their role of supervisors, mentors, and purveyors of subject content. School leaders' primary task involves Instructional Leadership, this may be challenging when leaders and teachers do not share common grades or content areas (Steele et al., 2015). As a result, they fail to monitor organisational routines regarding science teaching and learning (Hayton & Spillane, 2008). Further, teaching and learning in science poses a unique challenge to the elementary curriculum landscape because traditionally Elementary Phase teachers display low levels of self-efficacy in this subject.

In the United States of America, Instructional Leadership in elementary science has become important for the successful integration of the new science education agenda (Winn, 2016). However, despite calls highlighting the importance of Science, Technology, Engineering and Mathematics (STEM) education, research indicates that science is not prioritised in most elementary schools internationally (Spillane, 2005; Buczynski & Hansen, 2010; Ravitch, 2011). Hence, this impacts negatively on Instructional Leadership in the science teaching areas (Burch & Spillane, 2003).

In the South African public-school context, there are several challenges encountered in the teaching of the sciences. From empirical evidence, it was exposed that some science teachers are teaching different science subjects but are qualified only in one area. For example, a Natural Sciences (NS) specialist teacher in the Senior Phase may teach elementary science in the Foundation Phase (Ng et al., 2015). The NS lays the foundation for at least four high school subjects; namely, Life Sciences (LS), Physical Sciences (PS), Geography, and Agricultural Sciences in South African schools (Malinga, Jita & Bada, 2021). Research by Malinga and Jita (2020) indicates that departmental heads (DHs) as instructional leaders of NS not only experience difficulties in their normal day-to-day tasks, but also struggle to lead as they lack the necessary experience, qualifications, and competence to do so. Additionally, DHs assign underqualified teachers to teach NS but do not provide them with training and opportunities for professional growth. Consequently, teachers struggle to convey content material and subject skills to their learners (Ngema, 2016).

Scholars in science instruction contend that the quality of school leaders' Instructional Leadership determines a school's capacity to promote high-quality instructional practices for learners, supervision of teachers, and support for teachers' professional development (McNeill, Lowenhaupt & Cherbow, 2022; Yow et al., 2021; Yow & Letter, 2016). However, instructional leaders need to develop greater expertise in science subjects before they can support science teachers. Diamond and Spillane (2016) note that the knowledge and skills involving the delivery of subject content as leadership essentials empower leaders to better mentor teachers to enhance teaching-learning. The authors advanced that if leaders are knowledgeable about aspects of practice including pedagogies, content, and teaching-learning challenges, then Instructional Leadership trajectories for mathematics and science are likely to be positively influenced by subject-context factors.

Additionally, Instructional Leadership is vital in planning and creating resources that meet quality curriculum-delivery demands. Moreover, it is the instructional leaders' responsibility to encourage teachers to use instructional supervision to enhance teaching and learning (Kadir & Nimota, 2019). For instance, science DHs are responsible for planning and implementing science-related activities in their classes and schools. Since scientific education attempts to improve learners' intellect, character, talent, skills and potential, better preparation of future citizens is advanced (Makhubele, 2016). The management, administration, and supervision of science education must be conducted with vision, care, dedication, and effectiveness. For instructional leaders to achieve this, they should possess the following interrelated capabilities: ability to apply deep leadership content knowledge (LCK), solve complex problems, and build rapport and trust with teachers, learners, and parents (Robinson, 2010). Further, Instructional Leadership functions such as providing timely and meaningful feedback about learners' class assessments will more likely improve learner-performance, as well as teachers' teaching skills as they (teachers) will be aware of weaknesses in their teaching styles (Manaseh, 2016). Instructional Leadership's primary focus is classroom practice and managing teachers to promote and support best practice (Fuentes & Jimerson, 2020). Many classroom teachers are less confident in their ability to teach science; hence, the level of their efficacy exhibited in science classrooms necessitates Instructional Leaders' provision of high-quality supervision and support. Thus, it is expected of instructional leaders to be well-

informed and well-organised to focus on enhancing classroom practices that engender all-round school improvement (Lochmiller & Cunningham, 2019).

Although there is an abundance of research on science Instructional Leadership in general, but much less is known about Instructional Leadership in the Life Sciences. More needs to be known, understood, and documented about the role subject-specific Instructional Leadership plays in efforts to function as successful leaders who respond to teachers' challenges, specifically in the Life Sciences. Therefore, this study aimed to explore teachers' perspectives in Instructional Leadership for the Life Sciences in the two South African schools.

METHOD

Research Design

This study pursued a qualitative case study design to investigate the phenomenon under study within its real-life context, in this case, Instructional Leadership in schools. We chose this design because it allows for the provision of in-depth descriptions and explanations of how Instructional Leadership for the Life Sciences is constructed and enacted in schools. Moreover, individuals have different perspectives on Instructional Leadership depending on their experience, training, and professional background. Therefore, based on these aspects, Instructional Leadership is viewed from various perspectives. This qualitative case study design enabled us to expand our knowledge about participants' thoughts, feelings, and practices regarding Instructional Leadership (Busetto, Wick & Gumbinger, 2020).

Sampling and Population of the Research

The type of sampling selected entailed multi-stage non-probability sampling which considers quota and purpose. Quota sampling was employed because each school must have an equal representation of participants (principal, DH, & Life Sciences teachers). Eight participants in the study were purposively selected from the province of Mpumalanga; the sample included two principals, two department heads, and four Life Sciences teachers. The eight individuals were chosen using purposive sampling which was considered appropriate because of the relevant individuals from the

different schools. The participants were given pseudonyms, principals and departmental heads were chosen because they regularly engage in Instructional Leadership as members of the School Management Team (SMT) who are aware of how IL is practised in schools. In addition, the teachers were appropriately selected because they teach Life Sciences; therefore, they are knowledgeable about the enactment of Instructional Leadership regarding the subject. Moreover, it was the goal of the study to select information-rich cases that would allow for in-depth collection and analysis of data to provide incisive insight into the phenomenon (Polit & Beck, 2019).

Research Instrument

Semi-structured interviews, being the main instrument of data collection, consisted of open-ended questions. We asked the same set of pre-planned questions to each participant. The open-ended questions were adopted to get descriptive answers, using a language that participants could easily understand, and asking questions that were clear, positive, sensitive, and being as brief as possible. We listened attentively to the participants' answers and then used the probing method for clarity and elaboration based on what they said. The instrument was designed by the researcher based on the main research question. An interview protocol was developed to ensure that all participants were asked the same set of questions even though the interviews took place at different locations. The instrument was moderated by the supervisors and this ensured that interviews remained focused and consistent. The credibility of the interviews was ensured by not asking suggestive or leading questions, and by being impartial. All the participants were not coerced to provide the information by anybody, and we also requested them to authenticate the data and verify the findings before compiling the final report.

Procedures for data collection

Data was collected through semi-structured interviews which were suitable for gathering qualitative data primarily because they offer opportunities for conversation which helps to unravel complexities to expose new revelations (Marshall et al., 2015). Similarly, Katz (2015) asserts that employing semi-structured interviews as a strategy enables the interviewer to gather in-depth information on the issue through continuous probing. We chose this approach with the intention of better comprehending

Instructional Leadership for the Life Sciences in high schools. The interviews were conducted in English with some of the participants, while others preferred IsiZulu. This was accommodated to avoid communication barriers that might occur when using only one language. Furthermore, when new ideas surfaced during the interviews, the semi-structured format gave us the freedom to 'stray' from the list of prepared questions.

None of the participants were coerced to provide the information. To ensure transparency and to strengthen triangulation, we instituted member-checks to authenticate the data and verify the findings before compiling the final report. In this way, the credibility of the collected data was ensured. Examples of some of the interview questions are written below:

What is/ how do you define Instructional Leadership?

How does the principal orientate, mentor and support SMT members, especially on issues of Instructional Leadership?

Procedure of Research Data Analysis

The six steps of thematic analysis developed by Braun and Clarke (2006) were applied to analyse the collected data through semi-structured interviews. These six phases included familiarisation and generating codes, searching for themes, defining and labelling themes, and concluding the study (Braun & Clarke, 2006:77). Firstly, we started with familiarising ourselves with the data collected before transcribing. Secondly, we identified initial codes which are data aspects that seemed intriguing and significant. At this stage, codes were generated to describe how participants perceived Instructional Leadership for the Life Sciences. Thirdly, after coding the data, we searched for themes. In the fourth stage, we reviewed and confirmed the themes. We proceeded to name or label the themes together with a practical explanation that conveyed each theme's message. Lastly, to structure the analysis into a coherent whole, we presented vivid and persuasive extract instances connected to the themes, research questions, and relevant literature. As a result, thematic analysis was deemed relevant to the study because it enabled the researchers to classify the data in line with the study's aim, objectives, and research questions to provide appropriate interpretations of the results (Omodan, 2022:36).

RESULTS AND DISCUSSION

In the final data analysis process, Instructional Leadership was presented thematically. The thematic comparison, therefore, provided an aggregated summary of the principals', departmental heads', and teachers' responses.

The Instructional Leadership comparison began with the principals, followed by the departmental heads, and then the teachers.

Definition of Instructional Leadership: Comparison of Perspectives

Mrs De La Ray, the principal of school A perceived Instructional Leadership as a process that guarantees practices of effective teaching-learning methods in schools. Importantly, she viewed the elements of Instructional Leadership to include the leader acting as a model of knowledge, integrity, honesty, and fairness.

In contrast, Mr Shembe the principal of school B viewed Instructional Leadership as a way of giving instructions or guidance, but at the same time being a role model in education.

The principals had different understandings of Instructional Leadership, however they both understood that it has to do with the betterment of education in schools.

This is in line with Sibomama's (2022) findings which indicate that Instructional Leadership focuses on the actions of principals and other school administrators who should have a positive impact on the work of teachers and learner-achievement. Thaba-Nkadimene and Nkadimeng (2020) maintain that the principal holds a position of authority and is responsible for providing quality Instructional Leadership to ensure that teaching-learning is conducted as effectively as possible.

The departmental heads' understanding of Instructional Leadership provided insight into the characteristics and knowledge needed to be an instructional leader. Their definitions are discussed below:

Mr Daniel, the departmental head of school A mentioned:

Instructional Leadership is leadership that gives direction to the school to make the school operational. It is the kind of leadership that focuses on teaching which means prioritising instructional practices over managerial duties. Instructional Leadership for

Life Sciences promotes the mission of the department by focusing on learners' academic progress.

Mrs Khathi, the departmental head of school B, mentioned:

Instructional Leadership is concerned with DHs' monitoring of how teachers teach.

Mr Daniel seems to have a better understanding of what Instructional Leadership entails compared to Mrs Khathi.

As Harris et al. (2017) point out, the crucial responsibility of instructional leaders is to articulate the school's vision, mission, and purpose. Similarly, Taole (2013) asserts that instructional leaders' responsibilities include goal-setting, curriculum management, teacher- evaluation, monitoring, and resource allocation. Additionally, instructional leaders must possess the necessary knowledge, abilities, and training in instructional leadership to execute these tasks. Moreover, Instructional Leadership facilitates the establishment and communication of a clear vision and goals for both teachers and learners, and it assists teachers through professional development, coaching, and mentoring (Robinson, Lloyd, & Rowe, 2008). Since the primary activities of education, teaching, and learning, are the priorities (Gawlik, 2018), sound Instructional Leadership is critical in schools. In other words, supporting teachers to improve learner-outcomes by focusing on the quality of teaching and learning is imperative. In defining Instructional Leadership teachers from the two schools articulated the following:

Ms Adele, a Life Sciences teacher in school A stated:

Instructional Leadership is solely based on DHs' responsibilities as they are the immediate support base on the ground.

In support, **Ms Lola** a Life Sciences teacher in school A indicated:

The principal of the school oversees curriculum and instruction which is Instructional Leadership. Under this style of school leadership, the principal collaborates with DHs and teachers to help develop best practice in the classroom.

Likewise, **Ms Sofia**, a Life Sciences teacher from school B mentioned:

Instructional Leadership is the type of leadership where leaders of the school support and monitor teachers ensuring that everyone in the school fulfils their role so that teaching and learning takes place effectively.

Mr Angel, a Life Sciences teacher from school B expressed the following opinion:

An Instructional Leader is when someone gives instructions and sees to it that these instructions are followed.

The teachers explained Instructional Leadership based on what is portrayed by their instructional leaders in their respective schools.

This speaks to the kind of leadership that principals demonstrate or delegate to promote learners' learning (Mestry, 2013). To effectively cooperate with other school leaders and foster a learning environment that enhances and supports learner-achievement, instructional leaders must adopt a functional and collaborative Instructional Leadership stance (Edmonton Public School, 2018). The notion held by educationalists that Instructional Leaders enhance teaching and learning by fostering better curriculum management is well-established (Kiat, Tan, Heng & Lim-Ratnam, 2017). Developing a supportive learning environment for learners, inspiring teachers, and judiciously allocating resources to improve teaching methodologies are all under the purview of instructional leaders. Thus, academic standards which encourage information-transference and abilities that learners should acquire in a subject at appropriate grade levels, are developed and maintained largely by Instructional Leaders (Shelton, 2010). However, to accomplish this, they need a thorough understanding of teaching, learning, and assessment, especially in the Life Sciences. Lastly, they should also actively encourage constructive interactions and behaviours between educators and learners (Hoy, Hoy & Davis, 2009).

Instructional Leadership practices

Fullan (2014) states that highlighting Instructional Leadership processes is the best thing a principal can do to guarantee the success of a school; for example, effective communication is necessary for quality Instructional Leadership (Whitaker, 1997).

Each participant stated that the instructional practices form part of Instructional Leadership in their school. They indicated the following:

Mrs De La Ray, the principal of school A mentioned:

Effective Instructional Leadership monitors teachers' programmes to guarantee the attainment of desired outcomes which leads to higher levels of learners' academic performance. Accordingly, Life Sciences teachers are motivated to provide the necessary tools for instruction, being flexible regarding instructional time, and giving timely feedback to teachers.

Mr Shembe, the principal of school B added:

As an instructional leader, I ensure that during meetings I emphasise the enhancement of teaching and learning at the school.

The principals promote instructional practices that improve teaching and learning, such as making teachers and learners to be mindful of the teaching time.

According to Boyce and Bower (2018), Instructional Leadership involves the principal and teachers enabling a healthy connection and developing a supportive school environment that foster fairness, communication, trust, transparency, dependability, honesty, and competency. Whitaker (1997) contends that a principal's duties require that they be carried out in the classroom, not in an office. It is impossible for a principal to truly understand the school unless he/she steps outside the office.

Mr Daniel, the departmental head of school A indicated:

As an instructional leader, one must monitor and evaluate the teaching and learning in one's department which leads to better classroom instruction and higher learner-performance.

Mrs Khathi, the departmental head of school B stated:

Instructional Leadership is concerned with DHs' monitoring of how teachers teach. Also, DHs ensure that time is sacred, and instructional practices must be adhered to.

The departmental heads mentioned as part of their instructional practices they monitor if teaching and learning are taking pace in the classrooms.

According to Goddard, Goddard, Kim and Miller (2015), Instructional Leadership practices of leaders and teachers in schools increase learner-achievement by

improving the quality of teaching and learning in the school. The active presence of Instructional Leadership in a school lead to structures of support which contribute to creating a strong teaching-learning culture with a shared focus on learners' learning goals.

Moreover, developing and regularly communicating a clear vision and mission of the school to all role-players are important tasks of an Instructional Leader. Du Plessis (2013) states that principals are required to build a visionary plan for improving learner-achievement, and teachers are expected to apply it consistently in their classrooms.

In this regard, the Life Sciences teacher **Ms Lola** from school A stated:

This kind of leadership involves articulating a clear vision for teachers and learners to set goals.

Ms Adele, a Life Sciences teacher from school A explained:

The DHs' responsibilities are to assist with planning, motivating, and supporting teachers to achieve instructional goals. In addition, Instructional Leadership facilitates a two-way communication that allows for improvement in teaching and learning in the Life Sciences.

Ms Sofia, a Life Sciences teacher from school B indicated:

Leaders of the school support and monitor teachers ensuring that teaching and learning take place effectively.

However, **Mr Angel** a Life Sciences teacher from school B disagreed:

The only time I see Instructional Leadership in action is when we are given orders by the DH to do certain duties.

The teachers mentioned the instructional practices that are being practiced by their instructional leaders' every day in their respective schools.

According to Timperley Ell, Le Fevre, and Twyford (2020), effective instructional leaders monitor and respond to learners' progress, evaluate curriculum, and ensure a supportive learning environment. Similarly, Bush and Glover (2013) agree that instructional leaders are supposed to supervise the curriculum throughout the entire

school and assess learner- achievement by examining the outcomes of exams and internal continuous assessments. Additionally, Yuki (2010) maintains that Instructional Leaders can forge a common vision, set the tone for the school, interact with stakeholders, resolve disagreements, and circumvent problems or obstacles that obstruct their ability to lead educationally. The importance of the Instructional Leader's duty is more than just management and administration as emphasised by Hallinger and Murphy (1985); it is expected of principals to be instrumental in the creation of quality educational standards to enhance the learner success rate because school leaders should be astute monitors and evaluators of the curriculum and instruction (Jenkins & Pfeifer, 2012). Mestry (2017) elaborates that instructional leaders are in charge of creating a supportive learning environment, motivating staff and learners, and judiciously allocating resources to advance optimal instructional methods.

Explanation of teachers' perspectives on Instructional Leadership

This section addresses teachers' perspectives on Instructional Leadership regarding the Life Sciences in two South African schools.

Mrs De La Ray, the school principal of school A responded:

I view Instructional Leadership as a process that guarantees that there are effective teaching methods in schools. Furthermore, it monitors teachers' programmes.

Le Fevre, Timperley, Twyford, and Ell (2019) highlight the close relationship between Instructional Leadership and enhancing learners' learning. The motivation and core function of Instructional Leadership is the improvement of instruction to enhance academic performance to create a functional school.

Mr Shembe, the principal of school B stated:

I understand Instructional Leadership as a way of giving orders.

Mr Shembe displayed traditional methods of being the principal and Instructional Leader as he only gave orders. According to Tuitoek, Yambo and Adhanja (2015), such school principals do not allow for collaborative participation in decision-making. They expect others to follow their instructions without questioning, and they make task-oriented decisions on their own. This leadership style hinders group participation and disregards the knowledge, skills, and creativity of teachers. Consequently, teachers

have less faith in their institution when principals exhibit authoritarian behaviours (Kars & Inandi, 2018). This can also be detrimental since it stifles originality and creativity because leaders believe they are always correct, while teachers become demotivated and feel unworthy (Rahbi, Khalid & Khan, 2017).

Mr. Daniel, the departmental head of school A mentioned

Instructional Leadership in the Life Sciences department means prioritising instructional time over managerial duties. I also monitor and evaluate teaching-learning which helps promote learners' success.

Mrs Khathi, the departmental head of school B articulated:

I perceive Instructional Leadership as Leadership that focuses on monitoring teaching and learning solely.

Further, Hao (2016) maintains that Instructional Leadership deals with the activities that influence teaching and learning such as assessment, teaching practices, and curriculum supervision. This is in line with the findings of Murphy et al. (2016) which suggest that Instructional Leadership entails primarily focusing on classroom practice over managerial duties; this involves interacting with teachers in a way that encourages and supports quality teaching and learning. Moreover, Instructional Leaders should oversee the school's curriculum, establish a healthy school climate, and follow the mission and vision of the institution. According to Heck and Hallinger (2014), principals have the power to enhance teaching and learning in classrooms. In other words, the principal's role as an Instructional Leader is to ensure that teachers receive the relevant support, they need to ensure effective teaching and learning in the classrooms to attain best practice standards. Lee, Walker and Chui (2012) confirm that Instructional Leadership is a multifaceted function that centres on providing teachers with assistance to ensure that they are teaching qualitatively.

Ms Adele and Ms Lola, Life Sciences teachers of school A, and Ms Sofia a Life Sciences teacher at school B indicated:

We perceive Instructional Leadership to be based on the support and monitoring we receive from the instructional leaders.

Initiating and contributing to the planning, designing, administering, and analysing of the effectiveness of the curriculum are critical roles for Instructional Leaders (Weber, 1996). Also, examining the instructional programme on an ongoing basis motivates teachers to meet the needs of the learners (Hallinger & Heck, 2010).

Contrary to what was perceived by other participants, Mr Angel, a Life Sciences teacher from school B indicated:

I have never witnessed Instructional Leadership in my school as mostly we are ordered to do certain things. That's not how Instructional Leadership works.

Sisman (2016) states that school principals' Instructional Leadership is recognised as the skills they (leaders) possess to motivate others to support better learner-achievement in the classroom. These skills encompass the following five areas: articulating and conveying the goals of the school; overseeing the teaching process and instructional programmes; evaluating the teaching process; providing assistance to teachers; and ensuring a safe and secure learning environment. Mestry (2017) adds that principals are vital in guaranteeing the maintenance of academic standards, including the knowledge and abilities that learners must acquire for each topic and grade. In other words, as an educational leader, the principal is in charge of overseeing the delivery of the curriculum; this implies that Instructional Leaders must be au fait with all aspects of curricula.

Instructional Leadership of school principals has been acknowledged as the abilities that principals demonstrate or enable others to demonstrate to promote high-levels of learner- accomplishment in schools. These abilities include defining and communicating school objectives and managing instructional programmes. As such, principals of schools must prioritise the use of effective teaching methods for sound curriculum delivery which are at the forefront of a school's daily operation (Mestry, 2017). Robinson (2011) maintains that astute Instructional Leadership enhances learner-achievement by encouraging innovative teaching-learning strategies that are geared to meet international benchmarks. As a result, teachers view principals as effective Instructional Leaders when they provide the necessary resources and motivation required to uplift the quality of teaching-learning processes (Sibomama, 2022).

The results indicated that participants generally understood that Instructional Leadership involved guiding teachers to achieve better teaching and learning outcomes. However, the findings of this study demonstrated that participants from school A understood the concept of Instructional Leadership better than participants from school B. This was due to teachers from school B not knowing much about Instructional Leadership as they did not have a common understanding of the concept of Instructional Leadership. This led to teachers understanding the concept based on what their instructional leaders portrayed at school.

Regarding curriculum and instructional practices, Instructional Leadership is often understood to be a strong, directive style of leadership. The institution's effectiveness (or ineffectiveness), particularly in teaching and learning, is a result of its instructional leaders' influence (Hallinger & Murphy, 1985). However, the lack of knowledge and the skill gaps make the implementation of Instructional Leadership challenging. Being an Instructional Leader involves engaging with teachers on issues of pedagogy by analysing *what*, *when*, and *how* it is enacted, and how learning is assessed (Brazer & Bauer, 2013; Leithwood et al., 2010). Moreover, it implies the acquisition of thorough understanding of instructional practices that apply to all grade levels including knowledge of content areas and coaching skills to facilitate instructionally-focused conversations (Carraway & Young, 2015; Desimone & Park, 2017; Hattie, 2012). Therefore, this study sought to investigate teachers' perspectives on Instructional Leadership for the Life Sciences in two South African schools, which focused on the perceptions of school principals, departmental heads (Life Sciences), and teachers.

CONCLUSION AND SUGGESTION

Conclusion

The findings of this study revealed that only one school principal understood clearly that Instructional Leadership promotes teaching and learning, and that it primarily entailed the implementation of effective teaching-learning methods that enhance learners' academic performance. Conversely, findings also revealed that some principals consider Instructional Leadership as giving orders to create an awareness of the necessity to improve teaching and learning standards. Also, since it is the responsibility of the departmental heads to monitor and evaluate teaching and learning

and to safeguard instructional time, they viewed Instructional Leadership as a process that promotes the school's functionality.

The quality of teaching and learning in the classroom is at the centre of Instructional Leadership which is crucial for improving learner-outcomes. Based on the findings and practices that characterise Instructional Leadership in the two schools, there is the need to create and share teaching-learning best practice strategies, in addition to teachers being provided with sufficient relevant resources, support, and guidance to achieve the vision and mission of the school to achieve enhanced instructional practices.

Additionally, it is also important to note that the gathered evidence in this study indicates that Life Sciences teachers from the two schools see Instructional Leadership as a way for school principals to collaborate with other instructional leaders to monitor, evaluate, support, and motivate teachers. Lastly, since one Life Sciences teacher from school B considered Instructional Leadership to be giving out orders to teachers, the researchers established that teachers understand the concept of Instructional Leadership based on the roles and functions performed by their principals and departmental heads.

RECOMMENDATIONS

The findings of the study address the paucity of knowledge on teachers' perspectives regarding subject-specific Instructional Leadership in South African schools. As such, policymakers should develop guidelines to improve the quality of Instructional Leadership in schools on subject-specific Instructional Leadership. Also, intensive training and networking with 'model' school principals will engender a better quality of Instructional Leadership without which schools may slide into dysfunctionality.

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ARTICLE TWO

Characterised Instructional Leadership practices for the Life Sciences: An exploration of two South African schools

ABSTRACT: This study aimed to examine Instructional Leadership practices in the Life Sciences in two South African high schools. Through an exploratory case study design, eight stakeholders comprising of two principals, two departmental heads, and four Life Sciences teachers were selected to participate in this study. Data was collected through semi-structured interviews, observations, and document analysis. The study found that well-resourced schools employed structured monitoring tools like the Curriculum Management Framework (CMF), weekly file checks, regular classroom visits, and support for teachers through professional development opportunities, resource provision, and fostering a conducive working environment for Life Sciences

instruction. The study's implication was to exhibit how a well-resourced school practiced Instructional Leadership as compared to an under-resourced school.

KEYWORDS: Departmental Heads, Instructional Leadership, instructional practices, Life Sciences, science education

Introduction

The role of school leaders in supporting and understanding science instruction practices is a subject of debate among scholars (McNeil et al., 2018; Ismail et al., 2018; Lowenhaupt & McNeill., 2019). Instructional Leaders have been identified as key players in initiating instructional reforms and supporting changes to enhance classroom instruction (Lanier et al., 2009). However, from literature, little is known about principals' and departmental heads' capacities to support teachers' learning pertaining to science instruction practices as described in the Next Generation Science Standards (NGSS), Curriculum Assessment Policy Statement (CAPS), and other curricula matters (Lochmiller & Cunningham, 2019; Malinga & Jita, 2016; McNeil et al., 2018). Given instructional leaders' limited science backgrounds and the competing demands on their time, these may hinder their efforts to support teachers of the Life Sciences. To understand various aspects of the discipline of science, in-depth knowledge is a prerequisite to effectively enact instructional leadership, in addition to providing appropriate feedback and remediation to enhance the quality of teaching-learning (Malinga & Jita, 2016; Tsakeni et al., 2020). The provision of much-needed support for teachers to develop an understanding of science practices will facilitate the application of appropriate and creative instructional strategies to attain best practice in the Life Sciences.

Although teachers may differ about what constitutes quality science instruction because some prioritise content knowledge over the integration of science practices (experimenting, simulating, inquiring, argumentation), the urgency to develop principals and departmental heads to effectively supervise science instruction that reflects recent reform efforts and supports systemic change in science education is imperative (Bellibas et al., 2021; Lowenhaupt & McNeill, 2019; Malinga & Jita, 2016). Literature has exposed limitations in instructional leaders such as the lack of expertise in science which questions not only their knowledge but also their understanding of

high-quality science instruction (Ismail et al., 2018; Onuma, 2016). Similarly, reports of teachers not being adequately supported by SMTs to integrate modern trends in science instruction could influence learning outcomes and general academic achievement (McNeill et al., 2018; Osman & Mukuna, 2013; Yow et al., 2021). This barrier implies that school and District leadership may not be prepared to institute necessary instructional reforms through one-on-one guidance and professional development workshops. When instructional leaders focus on general pedagogic principles when monitoring science instruction, it may negatively impact science teaching and learning as 'one size does not fit all'. Literature indicates that this results from giving limited attention to science instruction practices, missed opportunities for feedback and remediation, inadequate understanding of the quality of science practices, and misalignment between the intended goals of the curriculum and instructional practices (McNeill et al., 2018; Peacock & Melville, 2019).

Previous studies on instructional leadership (IL) included mathematics and science (Yow & Lotter, 2016; Yow et al., 2021), content knowledge and IL (Lochmiller & Cunningham, 2019; Stein & Nelson 2003), IL for science (Cherbow et al., 2020; Hallinger et al., 2020; Peacock, 2014; Peacock & Melville, 2019), and IL capacity-building (McNeill et al., 2022; Nnebedum & Akinfolarin, 2017; Onuma, 2016; Osman & Mukuna, 2013), amongst others. These studies were limited in scope and context regarding IL and science. At senior secondary level, science is taught as different disciplines (e.g. Life Sciences, Chemistry, Mathematics, Biology, and Physical Sciences) which should align with specific professional training methods for teachers and instructional leaders. These sub-divisions of the sciences are referred to as science with different curriculum, content and instructional practices. The Life Sciences is guided by its prescribed curriculum and instructional practices which require tailored IL support. According to PISA reports, there is globally the need for improvement in all aspects of science (Organisation for Economic Co-operation and Development, 2019a, and 2019b, 2021) to meet the growing demand for expertise in Science, Technology, Engineering and Mathematics (STEM). In the context of this study, learners' achievement in the Life Sciences remains under par for more than a decade. More recently, the DBE diagnostic report for the Life Sciences during the past five years confirms that this pattern still persists (Figure 1 below). Hence, this study

sought to explore characterised Instructional Leadership for the Life Sciences in two South African schools.

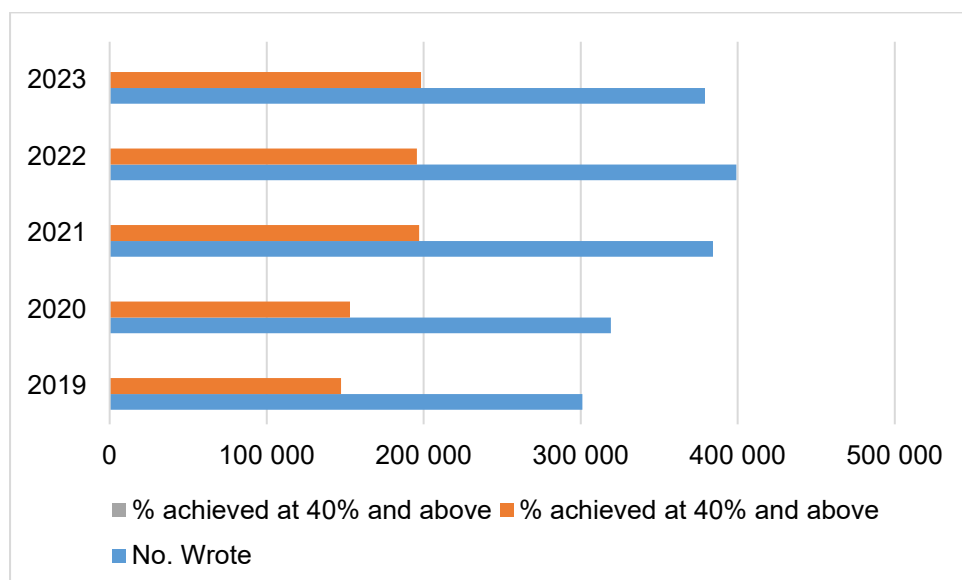


Figure 1: Enrolment and achievement in the Life Sciences

Figure 1 above depicts the enrolment and achievement of learners in National Senior Certificate Examinations from 2019 to 2023 in the Life Sciences. It can be deduced that learner-performance was concerning. This situation calls for urgent intervention and re-evaluation into the preparation of learners for the NSC Examination from Grades 10-12, which includes the effectiveness of the instructional leadership support for teachers of the Life Sciences.

Literature Review

Instructional Leadership is crucial in planning and creating resources that meet the needs of curriculum delivery. It is the instructional leaders' responsibility to encourage teachers to leverage instructional supervision to enhance teaching and learning standards (Jibolakadir et al., 2018). It is the responsibility of the heads of science departments to structure and organise science-related activities for learners. The goal is to sensitise teachers on the school's vision regarding the quality of teaching-learning through instructional leadership practices so that teachers promote the achievement of higher academic learning outcomes (Malinga & Jita, 2016). In this regard, instructional leaders should support their teachers in improving the NSC results by utilising a range of innovative methods and managerial skills (Cherbow et al., 2020;

McNeill et al., 2018; McNeill et al., 2022). For instance, one of the primary responsibilities of an instructional leader is to reduce obstacles that prevent teachers from effectively teaching science to produce the desired results which entail providing the necessary educational tools that enhances science results (Lowenhaupt et al., 2021). Since science education improves learners' intellect, creative-thinking, and problem-solving skills ILs should prioritise guiding science teachers towards best practice to attain better academic results.

The in-depth understanding of scientific education should be ILs' top priority in order to escalate ongoing progress to impact on classroom teaching and management (Lochmiller & Cunningham, 2019). Since many school administrators lack the knowledge of science education (Spillane & Hopkins, 2013) and its classroom practices (McNeill, Lowenhaupt, Cherbow et al., 2022), science subjects present unique challenges to school leaders as they find it difficult to supervise and guide teachers (Sandholtz & Ringstaff, 2014). In the United States of America (US) Instructional Leadership in elementary science is receiving its deserved attention for successful integration into a new science education curriculum (Winn, 2016). In the South African public-school context, departmental heads (DHs) as instructional leaders of Natural Sciences (NS) not only experience difficulties in their normal day-to-day tasks, but also struggle to lead as NS leaders because they lack the necessary credentials and competence to do so (Malinga & Jita, 2020; Ngema, 2016).

Additionally, DHs often assign inexperienced teachers to teach NS due to the limited number of available science teachers. To exacerbate the situation, they do not provide them with the necessary training in science as well as opportunities for professional growth. This has adverse effects on learners' performance in the Physical Sciences in the Senior Phase of high school (Malinga & Jita, 2020). Ngema (2016) explains how unqualified and/or inexperienced teachers lack the understanding of the sciences but teach science subjects - this results in learners' underperformance because of the absence of instructional support from school leaders. In congruence, the study by Adeniran (2020) emphasised the need for instructional support for both experienced and inexperienced teachers of science to guide them, especially in the use of laboratory apparatus. Instructional leaders are obliged to avail the required support to science educators for all aspects of science education. Du Plessis and Mestry (2019) highlight the need to support under-qualified and inexperienced science teachers to

engage learners in laboratory sessions to better understand concepts in science. Teachers without appropriate knowledge and skills in science instruction and support are likely to find it difficult to use various methods of instruction and resources available at school to assist in the implementation of science curriculum.

Also, learner underperformance in the Life Sciences can be attributed to a limited number of trained teachers, unqualified teachers, as well as the inability of IL to adequately support such teachers (Dhurumraj & Broadhurst, 2023; Maduna, 2022). Teachers expect DHs to attend classroom teaching sessions to advise them, conduct demonstration lessons, offer models and directions, and use data from observation to enhance teachers' efficacy in the classroom (Robinson & Timperley, 2007). Moreover, policymakers and practitioners require science DHs to be knowledgeable about the subject to upskill teachers to execute primary science tasks, as well as to oversee teaching (Angelle & DeHart, 2011; Malinga & Jita, 2016). For learners to receive effective instruction their teachers must possess the necessary competencies which may not have been entirely mastered in their tertiary training; hence, they require on-the-job support and ongoing professional growth workshops (Stein & Nelson, 2003). For instance, engaging in a cycle of observing, sharing feedback, and learning new approaches on teaching science can help both teachers and leaders to improve science instruction which remains the duty of instructional leaders and science teachers (Akram et al., 2017; Lowenhaupt et al., 2021). However, these responsibilities are generally neglected by instructional leaders - a gap which necessitates exploration.

Conceptual Framework

The study was grounded in the conceptual framework aligned to capabilities to effect astute Instructional Leadership in the Life Sciences (Peacock, 2014). The conceptual framework comprises of four major components which are indicated in figure 2 below:

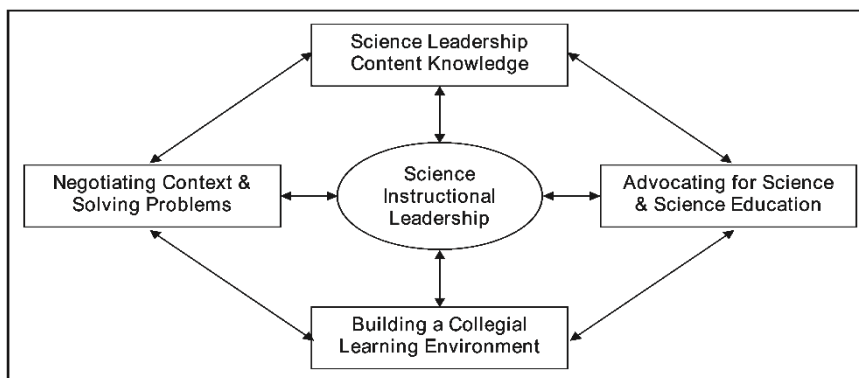


Figure 2: A conceptual model of leadership capabilities contributing to science Instructional Leadership (Peacock, 2014)

The ability of the instructional leader to demonstrate an in-depth understanding of content knowledge in science is the first component positioned in the above framework (Stein & Nelson, 2003). The second component is the leader's drive to advocate for science and science education imperatives (National Research Council, 2015). The third component is building a collegial learning environment (Hallinger, 2005), while the fourth component is the ability to negotiate context and solve problems (Bybee, 2010). This research focuses on all four components. By utilising the conceptual framework in this study, we were able to determine whether the participants had knowledge about Life Sciences, if the instructional leaders were promoting science teaching through instructional practices.

Study Context

Two high schools in Standerton within the Gert Sibande District (RSA) were purposively selected since they offered Life Sciences as a subject, in addition to representing various contexts - for example, one is in an urban area and falls within the 4 - 5 quintile ranking of schools. It is a fee-paying school, and well-resourced with sound infrastructure. It has a science laboratory, computer centre with internet connectivity, a well-equipped science laboratory, and a library. In addition, it has been producing excellent results in the Life Sciences.

The second school is non-fee paying, situated in an African township, and is classified as quintile 3. The school embarks on numerous fundraising initiatives to supplement its resources. The physical infrastructure of the school is well-maintained, but the science laboratory remains non-functional. Although the school is under-resourced,

the results for Life Sciences have improved over the years. This selection was preferred to explore a range of contexts and understandings of how Instructional Leadership is practised in natural settings, as well as to identify if there were differences in Instructional Leadership practices that have contributed to the performance of learners in the selected schools.

METHODOLOGY

A qualitative case study design was employed to investigate the phenomenon in its real context. This study sought to make-sense of Instructional Leadership by providing in-depth descriptions of how Instructional Leadership is practised in schools. The study also aimed to provide an understanding of the phenomenon by discussing practices that shed light on the intricacies of Instructional Leadership, and by asking participants probing questions about their own lived-experiences at the interview sessions (Yin, 2018; Pearson et al., 2015).

Sampling

The participants were selected purposively which was justified because the focus was on participants who possessed relevant and rich information regarding the phenomenon under investigation. Hence, principals were purposively selected, together with departmental heads because of their experiences in the leadership positions, while teachers who taught Life Sciences in Grades 10-12 were selected as 'on the ground' professionals who had a wealth of first-hand knowledge about the subject and the kind of Instructional Leadership practiced in their schools.

Data Collection

Data was collected through semi-structured interviews, observations, and document analysis:

Semi-structured interviews

These were conducted as the primary data collection method which involved participants answering open-ended questions that allowed for clarification and elaboration of responses. Each time a one-on-one interview was conducted, participants were provided beforehand with a brief explanation of its purpose.

Participants were asked pre-planned open-ended questions according to a questionnaire schedule. The open-ended questions were intended to elicit descriptive answers by using a language that participants could understand, and by asking questions that were clear, unambiguous, and concise. All responses were audio-recorded (with permission) for verbatim transcription which promoted triangulation and authenticity. The open-ended questions allowed participants to freely express their opinions and articulate their experiences regarding Instructional Leadership for the Life Sciences.

Observations

Observation is a significant data collection method since it provides a close-up view of the dynamics and behaviours in various contexts of a phenomenon (Nieuwenhuis, 2016). The purpose of observations was to corroborate the data elicited from the interviews and document analysis processes (Fetters & Rubinstein, 2019). Observations were conducted before and after the interview sessions, and during school visits on predetermined dates as negotiated with the principals, DHs and teachers. These observations included attending staff meetings, departmental meetings, and in-service workshops. The researcher was able to focus on the participants during such meetings by observing the participants engagement and reactions to issues that were being discussed. Observations were intended to elicit further information on how Instructional Leadership was enacted in schools. In each school, the observation protocol was observed. These observations were conducted to examine actual behaviour and study people who were reticent to express their thoughts verbally at interviews (Creswell & Baez, 2020).

Document Analysis

Document analysis involves perusing different types of documents including books, articles, policies, and institutional reports (Patton, 2015). Hence, the schools' relevant documents were perused for details pertinent to the study's aim, objectives, and research questions. The rationale for applying document analysis in this study was to provide a detailed and authentic description of how Instructional Leadership was constructed at the schools beyond the biases of the participants. Hence, document analysis augmented information collected from interviews and observations. The following documents were analysed: minutes of departmental and staff meetings,

workshop manuals, records of monitoring and supporting teachers, and subject performance improvement plans

Data Analysis

Data collected for this study through semi-structured interviews, observations and document analysis were analysed by applying the Thematic Analysis (TA) approach which is described by Braun and Clarke (2006) as a method for identifying, analysing, organising, and reporting themes within datasets. The themes were predetermined by the conceptual framework in line with the research questions and literature. Themes were categorised into six stages: familiarising oneself with the data, creating initial codes, looking for themes, reviewing themes, defining and labelling themes, and preparing the report. Firstly, the familiarisation with the data collected was done before verbatim transcribing. Secondly, the identification of initial codes was performed which were data aspects that were intriguing and significant. At this stage, codes were generated to describe how participants perceived Instructional Leadership for the Life Sciences. Thirdly, after coding the data, the search for themes was conducted. Fourthly, the themes were reviewed and confirmed. Fifthly, naming the themes together with a brief explanation of each was executed. Lastly, to structure the analysis into a coherent whole, a vivid presentation involving salient extracts were connected to the themes, aim, objectives, research questions, and relevant literature. Thus, thematic analysis was chosen as it enabled the study to make-sense of common meanings or experiences of the construction and enactment of Instructional Leadership practices for the Life Sciences. The transcriptions were reviewed after coding, followed by grouping the codes into logical themes.

Ethical Considerations

This study obtained ethical clearance (number UFS-HSD 2022/1933123) to indicate that it was approved by the Research Committee of the University of the Free State. Also, permission to conduct the study in the selected schools was granted by the Department of Education (DoE) and the principals of the schools. Further, participants were provided with consent forms to read, understand, and sign (if in agreement). This meant that research participants were given the opportunity to ask clarifying questions pertaining to details of the research to make an informed decision regarding their participation in this study (De Vos et al., 2011). Privacy and confidentiality were

protected by not revealing the participants' real names by assigning pseudonyms. All collected information was securely stored in password-protected e-files in the researcher's laptop.

FINDINGS AND DISCUSSION

The study sought to investigate practices that characterise Instructional Leadership for the Life Sciences in two selected schools. Because large volumes of data were generated from multiple interviews, observations and document analysis, it became imperative to organise data thematically. From the theme, *Instructional Leadership practices for the Life Sciences*, two subthemes emerged: monitoring of teaching and learning and supporting teachers and evaluating teaching and learning.

Monitoring of teaching and learning for principals

Mrs Tracy the principal of school A suggested that science teaching and learning should be monitored by evaluating teaching-learning processes and by checking teachers' files once a week. Teachers' files should reflect the annual teaching plan (ATP) to structure daily lessons which should consist of informal and formal assessments with mark sheets pertaining to continuous assessments.

Mr Frank school B's principal monitored teachers' portfolios, made brief comments, and periodically conducted informal classroom visits as they were important to ensure that teachers were actually doing what they were guided to do. Also, he visited classes on a term basis and made suggestions based on what he knew as an experienced teacher. Further, the feedback of principal B had positive effects on motivation, self-esteem, and the promotion of efficacy of teachers.

Instructional leaders used a variety of strategies and management principles to support their teaching staff towards the improvement of teaching and learning outcomes (McNeill et al., 2018; McNeill et al., 2022). It was evident from the principals who were interviewed that the kind of leadership support they provided were not sufficiently effective for improving science instruction. In this regard, the study of Lowenhaupt and McNeill (2019) and Hallinger et al. (2020) avail a road map to assist Instructional Leadership practices geared towards improving science teachers' knowledge and skills. However, principals only provide general leadership support to

all teachers and not particular to science instructors; thus assuming that all teachers are instructional experts who need no special monitoring and support.

Support for teaching and learning of science by principals

This is what the principals had to say regarding the support they provide for science teaching and learning:

Mrs Tracy the principal of school A supports the teaching and learning of Life Sciences by creating a positive environment. This included the provision of on-going professional development opportunities for teachers and appreciating teachers' industriousness. The priority has always been to create and sustain a learning community for all such that teachers believe in their capabilities, feel respected by colleagues, and genuinely show care for learners.

Mr Frank the principal of school B mentioned that since he did not have a science background, he supported his teachers by ensuring that the DHs hold regular meetings and submit minutes. Furthermore, sometimes he attends grade and subject meetings to solve challenges that DHs and teachers were facing.

According to Adeniran (2020) there is a need for instructional support for both experienced and inexperienced teachers of science to enhance science teaching. This support remains the responsibility of principals and DHs. School A principal provided professional development support, a positive school environment, and an appreciation of teachers, unlike school B. While the study of Hallinger et al. (2016) documented gender differences in instructional leadership, it remains unclear whether the resources available at school A were tools of support or the caring nature of the female instructional leader. While science knowledge and practice are generally expected of ILs, the data collected for this study did not establish whether these were apparent in instructional leaders' employment package.

Monitoring of teaching and learning for DH

Mr Luke the DH of school A promotes science teaching and learning through monitoring the work of teachers by applying the Curriculum Management Framework (CMF) tool which indicates whether everything is proceeding according to plan. Also, he utilised the monitoring tool to check learners' activity books to ascertain if learners

were being taught the prescribed content. Lastly, **Mr Luke** conducted formal and informal class visits to monitor lesson delivery.

Similarly, **Mrs Steve** the DH of school B walked along the school corridors to ensure that learners were in their classrooms busy with instructional tasks. She also conducted classroom visits to check if teachers were following the ATP. Mrs Steve conducted term appraisals by recording notes which assisted in providing feedback to teachers. The random class visits ascertained whether teachers were thoroughly prepared to deliver interesting lessons, not just when she conducted formal visits.

It is the duty of instructional leaders to engage in a cycle of observation, sharing feedback on teaching science, and help both teachers and leaders on how to improve science instruction (Akram et al., 2017). School A appeared to be familiar with the use of the CMF, and close monitoring of teachers - unlike school B which demonstrated 'corridor parade' as a form of monitoring and support. Moreover, it was revealed that well-resourced schools were inclined to implement science support better than those with fewer resources. Hence, it is imperative for instructional leaders to use a variety of strategies and management competencies to support their teachers to improve science teaching-learning outcomes as indicated in the studies of McNeill et al. (2022).

Support for teaching and learning in the Life Sciences

The DH of school A, **Mr Luke** mentioned that at the commencement of each term, teachers in his department are given a management plan which included due dates for tasks, testing, moderation, and analysis of learners' results. Also, his open-door policy ensured that his department was smoothly managed such that his subordinates were free to speak to him about any concerns. Overall, he stated that his leadership style offered relevant and sound support to Life Sciences teachers by introducing innovative strategies, and assisting teachers who were struggling with using technology to make lessons interesting. Additionally, he supported his co-workers by encouraging them to attend workshops on content-delivery during cluster meetings. Since educational methods are ever-evolving, workshops are beneficial for exposing teachers to innovative trends in the Life Sciences.

Mrs Steve the DH of school B supports her colleagues by speaking to them informally to check if they were facing any challenges regarding subject-content, learner-attendance, and learner-discipline; if there were any problems, she would intervene timeously. Such informal collegial conversations promote reflection such that it encourages teachers to become committed to their professional practice. Further, after she conducted class visits, she provided constructive feedback to teachers informally during day-to-day interactions. The feedback focused on the improvement of instruction, and encouragement to attend workshops such that novice teachers grow in the profession.

Departmental heads are expected by policy to provide practitioners with new knowledge of the subject, and the expertise in teaching it (Angelle & DeHart, 2011; Malinga & Jita, 2016). This means that any type of support for science instruction, should lead to a deep understanding of the subject to effectively institute Instructional Leadership and to provide constructive and timeous feedback to teachers (Tsakeni et al., 2020). It is evident that the DH of school A had an understanding of the subject as he was able to assist his teachers with information on topics which they found difficult to teach, introduce teaching strategies that he assumed will be effective, and trained teachers to operate the interactive projectors, smart boards and virtual labs to make lessons interesting. However, the DH of school B lacked the understanding of the subject, and she doesn't seem to have any idea of the strategies she could implement to minimise curriculum delivery problems to promote effective teaching and learning in the Life Sciences.

Mr Luke had a deeper understanding of the subject and he understood the dynamics of instructional practices to ensure effective teaching and learning in the Life Sciences. Lamentably, **Mrs Steve** seemed to have little knowledge of what the subject entails aside from her duties as the departmental head which presented a challenge for her. On the other hand, **Mr Luke** appeared to have established a learning and supportive working environment; he works collaboratively with his teachers and has the advantage of easily accessing technology. In contrast, school B had a lack of resources - the science laboratory was non-functional. Furthermore, **Mrs Steve** was assigned to oversee a subject that she was not qualified for, nor had she the passion for it. Literature suggests that school leaders who create effective teaching-learning environments are ILs who are experts in areas such as subject knowledge,

pedagogical instruction, evaluation, team working with teachers, and providing resources to support teaching and learning (Stein & Nelson, 2003; Lochmiller & Cunningham, 2019)

Monitoring of teaching and learning

Ms Andy, a Life Sciences teacher in school A, mentioned that her DH supports science teaching and learning by using the monitoring tool and by perusing the written work of learners to ascertain if teachers were adhering to the prescribed guidelines on learner-activities. Further, the DH monitors the attendance of learners, checks that teachers are not behind schedule, gives teachers extra time to catch-up if they are behind with content-delivery, and assists teachers if they are struggling with teaching a certain topic. Also, **Ms Andy** mentioned that the DH is responsible for supervising her work. She added that this supervision ensured that Life Sciences teachers produce good results.

Similarly, **Ms Gail** a Life Sciences teacher at school A stated that the DH was the one responsible for supervising her work. Every fortnight he asked for learners' activity books to ascertain whether learners understood the subject content. The DH utilised the monitoring tool to check content coverage, checked period registers regarding the attendance of learners, and whether teachers conformed to instructional time guidelines.

Seobi and Wood (2016) emphasise that the focus of the instructional leader is to control, coordinate and supervise all teaching and learning activities. Leithwood (2016) adds that effective DH leadership practices entail communicating the department's vision and goals, ensuring professional development, and modelling values and practices. The DH of school A appeared to be hands-on regarding monitoring and supervising the curriculum. He checked whether the content being taught was aligned to the ATP, and monitored the period registers to ensure that both teachers and learners respect instructional time.

As observed in school A, **Mr Luke** monitored teaching and learning by using the CMF to check learners' books to ascertain whether they are being taught according to the annual teaching plan (ATP).

The perusal of documents revealed that the reporting tool to measure teachers' accountability included reporting the non-submission of marks on time. They had to state the reasons if they had not submitted marks on time. The way forward in terms of ensuring the timeous submission of marks in the future was discussed. This was done to ensure that teachers understand that there is accountability for non-submission of marks on due dates.

Support for science teaching and learning

Ms Andy, a Life Sciences teacher from school A, indicated that her DH does help teachers when dealing with troublesome learners – they do not step in to assist by calling in the parents of such learners. Also, the school principal provided every staff member with adequate relevant resources needed to enhance teaching and learning processes. The Life Sciences teachers were advantaged in that their principal was also teaching Life Sciences; she (the principal) was always aware of what teachers needed so she tried to provide the necessary resources.

Further, **Ms Andy** further stated that the principal also supported the Life Sciences department by donating materials for experiments from her farm. Moreover, Ms Andy and the DH are Grade 12 Life Sciences DoE markers but involved in different papers at the marking centre. During Grade 12 revision the DH and Mrs Andy teamwork - this was part of the support Ms Andy received from her DH.

Ms Gail, a Life Sciences teacher at school A, indicated that if there was a problem, the DH would just sit her down and discuss the matter until they collaboratively found solutions. If equipment for experiments was inadequate, the DH would intervene expeditiously to ensure that they were made available to all. Additionally, the DH assisted with learner-support, course design, content design, lesson delivery, networking, assessment, and evaluation. Furthermore, Ms Gail mentioned that the support she received from the DH was inspiring because it was in the best interest of learners.

Since a high level of academic achievement in the Life Sciences significantly depends on the direct transfer of information, teachers need to enhance their instructional practices by delivering interesting lessons. However, teachers can only do all of this if they receive the necessary supervision and support. Hallinger et al. (2016) assert that Instructional Leadership can contribute to learner-achievement by enhancing the

supervision of instructional programmes and providing appropriate instructional support and coordination for staff development. In school A, the Life Sciences teachers were privileged because the instructional leaders were hands-on in providing support and instructional resources. In addition, the DH assisted in providing support and resources for learners who were underperforming, thus ensuring that teachers were not only relying on textbooks to teach Life Sciences, but also indulging in laboratory sessions to improve learners' understanding of aspects being taught in the Life Sciences (Du Plessis & Mestry, 2019).

Monitoring and supervision of teaching and learning

Mr Dove, a Life Sciences teacher at school B, mentioned that the teaching and learning of the Life Sciences was monitored through checking teachers' planning of lessons and how they conducted assessments. The DH supervised teachers' work, supervised ATPs fortnightly, and attended cluster meetings regularly for teacher-development. The DH conducted formal class visits once in a term as per schedule where the teacher was made aware to thoroughly prepare for all aspects of teaching the subject. Thereafter post-classroom observation feedback was provided.

Ms Zoliswa, a Life Sciences teacher in school B, indicated that her DH promoted the teaching and learning of Life Sciences by scrutinising her lesson plans for the week against the annual teaching plan to ensure that she was on track, that learners were tasked with the prescribed number of activities, and that there was evidence of remedial work. She also checked learners' books, in addition to pre-moderating and moderating School Based Assessment (SBA) tasks to ensure quality. The DH also supervised all subjects in the science department. This overload of work made it impossible for frequent supervision or regular class monitoring, but it at least they occurred once or twice a year.

As noted by scholars, many school leaders have a limited understanding of science practices (McNeill et al, Lowenhaupt, Cherbow et al., 2022); hence, this subject presents a challenge to them as they find it challenging to effectively guide and supervise teachers (Sandholtz & Ringstaff, 2014). Thus, when an instructional leader focuses on general pedagogy when monitoring and observing science instruction and use of materials, it may have a negative impact. These include limited understanding of the quality of practices and misalignment between intended goals of the curriculum

and instructional practices (McNeill et al., 2018; Peacock & Melville, 2019). In school B, the DH only monitors teaching and learning because it is part of her duty as a DH. The teachers did indicate that their DH only peruses through the relevant documents, and checks if the dates correspond with the ATP; however, she had no idea if the teachers were teaching the correct subject-content. Moreover, the class visits that were conducted were mere formalities as they focused more on general teaching and classroom management, not on the teaching of Life Sciences specifically. McNeill, Lowenhaupt and Katsh-singer (2018) bemoan that many ILs lack the background in science so they may be unsure how to provide science-specific support and feedback to teachers. **Mrs Steve** was one of those ILs who focused more on content-neutral approaches such as classroom management (Lowenhaupt & McNeill, 2019).

Lastly, during document analyses it was found that the pre- and post-moderation templates were utilised by **Mrs Steve** to check the standard of SBA tasks.

Support for science teaching and learning

Both **Mr Dove** and **Ms Zoliswa** mentioned that they did not receive adequate support from their DH; hence, they resorted to networking with other teachers. Also disappointing was the fact that they received minimal support from the principal as he was swamped with his own paperwork. This has led to **Mr Dove** somewhat assuming the role of being a subject head by attending to textbook issues, ensuring that teachers were correctly utilising teaching aids, seeing to it that papers were set on time, and that the timetable for school holiday classes was drafted beforehand. However, during subject meetings the DH did not offer feedback but provided room for reflection.

Mr Dove further stated that there was uncertainty about Instructional Leadership in his department. It was very difficult to see evidence of Instructional Leadership in the Life Sciences department as it was led by a DH who was not an expert; hence, he could not effectively monitor and provide support to both teachers and learners. Moreover, poor communication strategies by the DH impeded progress - sometimes decisions were made without consulting the teachers.

Ms Zoliswa lamented that teaching Life Sciences was challenging especially in a local school with few resources. This made lesson delivery challenging as learners became uninterested in the subject. However, teachers improvised to ensure that learners understood basic concepts.

According to literature, teachers not being adequately supported to deliver best practice were in danger of producing sub-par learning outcomes and achievement (McNeill et al., 2018; Osman & Mukuna, 2013; Yow et al., 2021). This implies that poor learner performance in the Life Sciences can also be attributed to the inability of instructional leaders to adequately support teachers (Dhurumraj & Broadhurst, 2023; Maduna, 2023). It was evident that in school B the teachers did not receive adequate support from their DH since she did not have a Life Sciences background as she only monitored teachers' work by following general procedures. Also, she could not gauge if teachers were behind with content delivery. Further, during departmental meetings **Mrs Steve** displayed a lack of knowledge of the subject, but she knew more about the administrative duties of a DH. Hence, the senior science teacher dominated the meetings by informing teachers about what was expected of them. This confirmed the findings of Sandholtz and Ringstaff (2014) that leaders who are not experts in science find it difficult to supervise and support science instruction.

In sum, the findings revealed essential Instructional Leadership practices (negative and positive) for the Life Sciences in the respective schools. Each school's Instructional Leadership style generally ensured effective teaching and learning in the Life Sciences. Both school A and B had similar instructional practices even though the instructional leaders enacted them differently. However, there were differences in some of the practices as each instructional leader and teacher at the school had his/her own understanding of constructing and enacting Instructional Leadership for the Life Sciences based on the school's environment, resources and learners' needs.

Conclusion

In this article a narrative of the practices that characterise Instructional Leadership for the Life Sciences was presented. This study underscored the critical role of instructional leaders [principals and department heads] in shaping the teaching and learning environment for the Life Sciences. Both schools demonstrated efforts in monitoring teaching and learning, supporting teachers, and evaluating instructional practices, although with varying approaches and effectiveness. In a well-resourced school, structured monitoring tools and frequent classroom visits to ensure alignment with the curriculum requirements, in addition to fostering a supportive environment that included professional development opportunities and resource provision, were

evident. This hands-on approach contributed positively to teacher-motivation and learner outcomes. Conversely, the under-resourced school exhibited a less structured approach with occasional informal visits, and a reliance on general leadership practices rather than tailored support for science instruction. The absence of a Life Sciences specialist among instructional leaders and fewer resources hindered effective instructional support, thus impacting teacher-development and learner-engagement in the Life Sciences. Furthermore, leaders with a thorough knowledge of the Life Sciences facilitated targeted support and innovative teaching strategies, unlike those without the expertise. This study concluded that effective instructional leadership in the Life Sciences necessitates not only administrative oversight, but also subject-specific expertise and support mechanisms to promote a nurturing environment conducive for continuous professional growth and better learner outcomes.

Recommendations

Based on the findings on Instructional Leadership practices in the Life Sciences at the two schools, this study recommends specialised ongoing professional development programmes. This may include workshops, seminars, and mentoring programmes aimed at improving subject knowledge and instructional strategies among leaders. Subject-specific support structures are encouraged to devise clear frameworks for monitoring and supporting Life Sciences teachers that go beyond general administrative oversight. Collaboration and networking should be promoted among instructional leaders and teachers within the Life Sciences department. Also, adequate provision of resources specifically for Life Sciences education, including laboratory equipment, instructional materials, and technology could also foster effective teaching and learning, and by extension instructional leadership. Continuous evaluation and feedback are encouraged to assess the impact of instructional leadership practices on teaching quality and learner outcomes in the Life Sciences.

Future research should explore how the above suggestions translate into long-term academic achievements and learner-engagement in Life Sciences education. According to this study's findings, school administrators should use Instructional Leadership techniques and strive towards becoming subject-matter experts in the Life Sciences to serve effectively as the subject's instructional leaders.

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SECTION 3: DISCUSSION, CONCLUSION AND IMPLICATIONS

3.1 DISCUSSION OF RESULTS

In the final section of this article-based dissertation, the results of the study are summarised to indicate how and which research questions were addressed through the findings. The results on the perspectives on Instructional Leadership are addressed first, followed by the practices that characterise Instructional Leadership for the Life Sciences.

3.2 Life Sciences teachers' perspectives on Instructional Leadership (First research question)

The results in article 1 indicate that the principals of the two schools understood Instructional Leadership (IL) differently. One principal viewed this type of leadership as a way of promoting effective teaching, while the other understood it as instructing subordinates. On the other hand, the departmental heads' understanding of Instructional Leadership for the Life Sciences provided insights on the characteristics needed for being an instructional leader. Departmental heads perceive Instructional Leadership as prioritising teaching-learning and monitoring. These findings were congruent to Harris et al. (2017) who confirmed that Instructional Leadership involves motivating teachers to enhance their teaching skills to achieve international benchmarks.

Additionally, the findings revealed how Life Sciences teachers perceive Instructional Leadership. They viewed IL as the type of leadership where leaders have responsible roles that promote effective teaching and learning. These roles, among others, include overseeing and monitoring the curriculum, encouraging collaboration amongst staff members, providing support to teachers, delegation, and giving instructions. Moreover, IL encourages feedback to make informed decisions to improve teaching-learning standards. Accordingly, Bafadal et al. (2018) found that leadership is an influencer of teachers' performance.

Emanating from the findings, it was apparent that instructional leaders' and teachers' practices demonstrated astute guidance and support from instructional leaders. The principals mentioned that as part of the instructional duties, they were responsible for monitoring, motivation, timeous feedback, and improving the quality of teaching-learning. Furthermore, the departmental heads and teachers highlighted that monitoring, evaluating teaching and learning, and protecting instructional time are all the responsibilities associated with Instructional Leadership. However, some findings revealed that instructional leaders perceived that giving orders was a way of practising Instructional Leadership. Brolund (2016) and Heck and Hallinger (2014) noted that competent instructional leaders' emphasised instruction because they acknowledged it as being a great influencer to inspire learners to achieve quality outcomes which can be attained by driving the instructional programme to focus on assessing learner-progress and supporting teachers (Hallinger, 2018). Thus, instructional leaders need to support teachers to make informed decisions about how to meet the needs of learners. For instructional leaders to attain this goal, they need to possess in-depth

knowledge about curricular content and pedagogy. As noted from the findings, instructional leaders of school A were more knowledgeable about the subject (Life Sciences); hence, they understood and enacted instructional practices that led to improving the quality of teaching and learning, unlike instructional leaders of school B.

3.3 Practices that characterise Instructional Leadership for the Life Sciences (Research question two)

The findings from the second article regarding the practices of Instructional Leadership for the Life Sciences revealed that school principals were actively involved in monitoring teaching and learning by checking teachers' files to ascertain if the assessment activities assigned to learners were in line with the prescribed Annual Teaching Plan (ATP). Also, in terms of providing support, the principal of school A created a conducive working environment, provided teachers with professional development opportunities, and ensured that teachers feel respected and appreciated for their work. Leithwood and Louis (2011) emphasise that fundamental leadership behaviours include providing direction, encouraging staff professionalism, fostering an inclusive workplace culture, and overseeing the educational programme to escalate learner-performance. Regrettably, the principal of school B, due to the lack of knowledge of the Life Sciences subject, only provided support to teachers by attending grade and subject meetings.

The departmental heads (DHs), as instructional leaders, were also expected to perform instructional duties. The DH of school A monitored teaching and learning by using the curriculum framework to check if everything was going according to plan by using the monitoring tool to evaluate learners' written work in books, in addition to conducting class visits to ascertain if teachers were teaching the prescribed content. In contrast, the departmental head of school B monitored teaching and learning by walking the school corridors, conducting class visits, and using the ATP to check tasks in learners' books. The findings of the study are in line with literature that affirms that teaching and learning in schools must be thoroughly planned, supervised, stimulated, monitored, and evaluated by school leaders (Hallinger, Walker, Nguyen, Truong & Nguyen, 2017; Shaked et al., 2018). In addition, school administrators should examine both informal and formal classroom activities, and then promptly provide teachers with feedback on their pedagogical approaches and classroom management techniques.

Moreover, they must ensure that instructional time and schedules are not disturbed; if unplanned interruptions do occur, it is their duty as instructional leaders to have backup plans in place to compensate for lost time (Weber, 1987).

Additionally, the findings revealed that the departmental head of school A supported the Life Sciences teachers by introducing new strategies to teaching the subject, including providing teachers with an assessment plan for the rest of the year so that they can be aware of all the important dates. Also, they helped teachers who were struggling with certain topics by encouraging them to attend workshops so that they can develop as professional science teachers. In addition, The DH from school A has an open-door policy which made it easier for teachers to consult with him to pick his deep understanding of the subject. Importantly, he works cohesively with his teachers; for example, after conducting class visits, he provides teachers with timeous and constructive feedback.

On the other hand, the DH of school B lacked understanding of the subject as she only provided support as a general duty of being a departmental head. She engaged with teachers regarding problems they were facing and conducted class visits to report on what she observed during lesson-time. Disappointingly, the lack of resources to enhance teaching and learning in the Life Sciences was not a priority of the DH.

The findings indicated that the instructional leaders of school A monitored teaching and learning by using the monitoring tool to check content coverage and learners' books, in addition to using period registers to check if both learners and teachers respected instructional time. Moreover, the departmental head helps teachers when they encounter problems with learners or the curriculum. Furthermore, the teachers are supported by receiving the necessary resources needed for teaching and learning. Also, during revision time the departmental head steps in to assist. This highlights the need for instructional leaders to develop and support a rigorous curriculum system that accepts no excuses for failure. This suggests that when leaders receive appropriate training prior to being appointed, they will be able to influence teachers positively. Thus, instructional leaders should demonstrate sound subject knowledge, commitment, and accountability while prioritising instructional needs, which includes visiting classrooms frequently, providing meaningful feedback to teachers and

learners, and fostering curricular coherence and innovations that link to goals aligned to learning tasks and assessments (Baldanza, 2018).

The teachers from school B indicated that their teaching was monitored through their planning of lessons, reporting on the ATP every fortnightly, conducting formal class visits, and moderation of school-based assessment tasks. Regrettably, teachers received minimal support since their instructional leaders did not understand the subject and were reluctant to effectively handle the issue of the lack of resources in the school which made the teaching and learning of Life Sciences to be difficult. As a result, they network with other teachers from different schools to get the assistance they need.

Instructional leaders must be subject-content experts and mentors to other teachers so that the quality of teaching and learning improves. The degree of leadership's content knowledge, as well as subject leaders' views and perceptions, influence the level of competency in Instructional Leadership. The importance of content knowledge cannot be overemphasised as instructional leaders' previous science knowledge, pedagogical knowledge, and subject matter knowledge play an important role in the successful implementation of the science curriculum. Instructional leaders should ensure that teachers incorporate learners' prior knowledge as part of the science lesson-delivery, in addition to applying appropriate approaches when implementing instructional strategies (Nouri, Saberi, McComas & Mohammadi, 2021).

3.4 CONCLUSIONS

For Instructional Leadership to be successful in schools, leaders should also be professionals who are knowledgeable and familiar with the subject-content for them to successfully monitor and support their teachers in their department. Moreover, it is easier for teachers to become experts in their jobs if they receive effective support and guidance from knowledgeable and skilled instructional leaders. Additionally, to teach the subject of Life Sciences, one must first understand its purpose, structures, and content within and outside the subject discipline. This resonates with McNeill, Lowenhaupt and Lowell's (2022) notion that once teachers have a wide command of the subject matter then they will know when and how to include additional and appropriate equipment for experiments to encourage classroom participation to improve the results in the science subject.

Furthermore, instructional leaders and teachers need to grasp the content they teach in divergent ways. Understanding of the purpose of particular sections in the syllabus is crucial. Hence, it is important that subject leaders as part of the SMT, serve as the key source of support for both learners and subject teachers, especially when addressing issues related to teaching-learning in the classroom (Ghavifekr & Ibrahim, 2014). Since science DHs are responsible for planning and implementing science-related activities in their classes and schools, it is expected of them to possess wide science knowledge to effectively lead and support subject departments, in this case, the Life Sciences. The findings also indicated that one cannot separate Instructional Leadership perspectives from instructional practices. Once instructional leaders and teachers incisively understand the concept of Instructional Leadership, then they will be able to execute best practice to improve teaching and learning.

3.5 IMPLICATIONS

The study's conclusions might be especially significant for instructional leaders as they reflect on their practices and the difficulties they encounter when assisting with teaching and learning in the Life Sciences. The results may also encourage prospective instructional leaders to reflect deeply on the practice of providing support for teachers to improve instruction. Furthermore, the results can help the DBE re-evaluate the standards for selecting instructional leaders in schools.

The study recommends that the DBE should ensure that all instructional leaders receive appropriate training in Instructional Leadership. If done before they assume their new responsibilities as instructional leaders, then it can be beneficial and effective. Also, instructional leaders should assume personal accountability for bettering their leadership abilities. Moreover, a clear departmental vision centred on high learner-achievement and quality teaching should be established and communicated through instructional leaders to their subordinates.

In addition, instructional leaders should oversee the management of school resources and guarantee that teachers have access to all necessary materials. Instructional leaders must also ensure that teachers can compartmentalise the curriculum, establishing meaningful learning objectives, and monitoring and supporting learners. Hence, schools must appoint department heads who have expertise in a particular subject, like the Life Sciences.

Also, instructional leaders should ensure that best practices are implemented in the classroom by coaching or mentoring subject teachers as part of their support and development programme. Importantly, Instructional Leadership in schools should guide and enact the enhancing of the learning environment, including improving the infrastructure for science disciplines. Moreover, the monitoring and supervision of the curriculum should be conducted to evaluate the effectiveness of teaching and learning, and the provision of guidance and encouragement. This will consistently improve the quality of teaching in the Life Sciences.

Laying the foundation for teachers to reach their full potential at work is the responsibility of school principals. Teachers need to feel valued and comfortable in their work environment by providing a healthy work environment to engender a sense of belongingness. In this regard, teachers can feel at ease in their environment when instructional leaders are responsible, innovative, transparent, ethical, creative, good listeners, and maintain an open-door policy.

3.6 LIMITATIONS

The first limitation was that some participants were reluctant to participate in the study, so the researcher explained to them that there was no need to be anxious as their names would not be mentioned anywhere as anonymity processes were in place. The researcher also assured them that the questions were not difficult because they thought the interview questions would be difficult to respond to.

Another limitation was the participants did not understand the concept of Instructional Leadership; they provided vague answers to the questions. The researcher had to explain to them what Instructional Leadership was by providing examples. This led to my going back to the field to collect data after the researcher had tried to make them familiar with the concept of Instructional Leadership for the second time. It was demotivating, but eventually they did understand what the research questions required. Lastly, since this study dealt with a small sample of only two schools, generalisation to other areas was not possible.

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APPENDICES

APPENDIX A: INTERVIEW PROTOCOL

INTERVIEW QUESTIONS PROTOCOL FOR PRINCIPALS

My name is Thobile Madonsela, a master's student at the University of the Free State. I am currently working on a research thesis in the area of Instructional Leadership. The topic of my thesis is *Case studies of Instructional Leadership for the Life Sciences in two South African Schools*. You are kindly invited to participate in an interview.

The interview questions:

1. Introductory remarks - The researcher introduces herself and asks the principals to introduce themselves, and give background about their qualifications and experience.
2. Let us talk about how the principal orientates, mentors and supports SMT members, especially on issues of Instructional Leadership.
3. How often do you hold formal or informal meetings with the SMT? What do these meetings entail? Describe an example of such a meeting you had recently.
4. As an instructional leader, how do you characterise your efforts in supporting teachers? Give an example.
5. Do you have any science background?

6. How do you know when you recognise effective teaching specifically in the Life Sciences teaching? Give an example of recent life sciences lesson you observed that you thought was well delivered.
7. In your view, how can Instructional Leadership for the Life Sciences be improved in schools?
8. Do DHs at this school orientate/induct novice Life Sciences teachers in teaching and learning practices? Explain?
9. How do you perceive DHs' supervisory activities on instruction? Are you satisfied with this? Explain.

INTERVIEW QUESTIONS PROTOCOL FOR HODs

My name is Thobile Madonsela, a master's student at the University of the Free State. I am currently working on a research thesis in the area of Instructional Leadership. The topic of my thesis is *Case studies of Instructional Leadership for the Life Sciences in two South African Schools*. You are kindly invited to participate in an interview.

The interview questions:

1. Introductory remarks - The researcher introduces herself and asks the DH to introduce himself/herself, by giving background information about their qualifications and experience.
2. What is your role as the head of the department? When did you commence enacting this role?
3. What type of science background do you have?
4. Describe your role - what you do as a DH?

If not already mentioned, then answer the following: Do you hold regular departmental meetings? What do these meetings entail? Give an example of a recent meeting you held to help me understand your role specifically.

5. What other activities do you perform as a DH? Provide an example to help me understand your role.

6. What systems are in place for monitoring teachers' planning and preparation? Describe how the system works. Are these systems effective? Why do you say so?
7. How much influence do you have making instructional decisions affecting your department? Give me an example to demonstrate how this occurs.
8. Do you conduct class visits to observe teaching? If so, what do you do during these visits, and how often? Describe a recent visit.
9. After observation, do you help teachers improve their effectiveness in the teaching of Life Sciences? Describe an example to demonstrate this.
10. How do you coordinate the instructional programme at the school for Life Sciences?

Probe: How do you work with teachers across grade levels?

11. How do you prioritise Instructional Leadership among all other duties you are responsible for? Provide an example.
12. How will you describe your efforts in supporting Life Sciences teachers?
13. What do you think makes the teaching of Life Sciences effective at this school?

Probe: What have you as DH done to contribute to this effective teaching of Life Sciences at your school?

14. Anything else you think I should know that we have not discussed which makes your leadership of the Life Sciences teaching effective?

INTERVIEW QUESTIONS PROTOCOL FOR TEACHERS

My name is Thobile Madonsela, a master's student at the University of the Free State. I am currently working on a research thesis in the area of Instructional Leadership. The topic of my thesis is *Case studies of Instructional Leadership for the Life Sciences in two South African Schools*. You are kindly invited to participate in an interview.

The interview questions:

1. Introductory remarks - The researcher introduces herself and asks the Life Sciences teacher to introduce himself/herself, and provide background information including their qualifications and experience.
2. Describe your role as a Life Sciences teacher at this school. Do you think you and the other teachers are doing a good job? Why do you say so?
3. Who supervises your work as a teacher? How is your teaching supervised? Give me an example about how this happens, and describe the role of the supervisor.
4. Do they (supervisors) frequently come to classes to observe? Probe how the teacher perceives the supervisor's role in enhancing instruction.
5. What else do your leaders do to support your teaching of the Life Sciences at this school? Give an example of recent event that supported your work as a Life Sciences Teacher.
6. If not already mentioned: how often do you have departmental meetings?
7. Who is responsible for arranging and conducting departmental meetings, and what happens? Provide some details of the last meeting you had as a department.
8. How does the principal promote a school climate that is conducive to the teaching and learning of the Life Sciences?
9. Does the principal promote the professional growth of teachers? Substantiate.
10. How effective is the principal in overseeing the instructional programme? Explain by providing an example.
11. How easy or difficult it is to access help that you need regarding the teaching and learning of Life Sciences from the principal?
12. How would you rate the instructional support you receive from the school principal?

Now let us focus on your DH:

13. How does the DH promote a school climate that is conducive to the teaching and learning of the Life Sciences?
14. Does the DH promote the professional growth of teachers? Explain.

15. How effective is the DH in overseeing the instructional programme? Explain with examples.
16. How easy or difficult it is to access the help that you need with the teaching and learning of Life Sciences from the DH?
17. How would you characterise the instructional support you receive from the DH?
18. Is there anyone else you think who is helpful at this school in making the teaching of the Life Science more effective?
19. Follow-up: If so, please tell me about this person and their role.
20. Give me an example of how this person helps to make your teaching of Life Sciences more effective.
21. Is there any person or anything outside of the school that helps to make your teaching of Life Sciences more effective? [May be subject advisors, cluster leaders, other teachers in neighbouring schools ... and probe as necessary to get example of how they play this role].

APPENDIX B: OBSERVATION PROTOCOL

Date..... Setting.....

Time.....

Nature of activity (Staff and/or departmental meeting or workshop)
.....

Participant(s) (Principal, DH, teacher, or any other person).....

Purpose of the activity.....

Leadership roles (who was leading, how, why?)

Major activities discussed or planned by the principal, DHs, or teachers
.....

Interesting issues noted during the visit

APPENDIX C: DOCUMENT ANALYSIS PROTOCOL

<i>Document</i>	<i>General emerging data</i>
Minutes of staff meeting	
Details of SMT structure	
Minutes of a departmental meeting	
Records of mentoring/coaching teachers	
Classroom observation tool/report	
Workshop manuals	
IQMS implementation plan	
Staff professional development reports	

APPENDIX D: CONSENT FORM

CONSENT TO PARTICIPATE IN THE STUDY

I, (participant's full name), confirm that the person requiring my consent to participate in this research has explained to me about the nature, procedure, potential benefits, and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions, so I am prepared to participate in the study. I understand that my participation in this study is purely voluntary and that I am free to withdraw at any stage without being penalised in any way. I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/ or conference proceedings. I also agree to the audio-recording of my responses during the data collection processes.

I have received and signed the informed consent form.

Full Name of Participant.....

Signature of Participant.....Date.....

Full Name(s) of Researcher(s).....

APPENDIX E: LEKWA WEST CIRCUIT APPROVAL LETTER



Shananga Building, Government Boulevard, Riverside Park, Mpumalanga Province
Private Bag 911341, Mbombela, 1200
Tel: 013 766 5562/5115, Toll Free Line: 0800 203 116

Litiko la Tefundiselo, Umyango we Fundo

Departement van Onderwys

Ndizawiso ya Dyondzo

MS MADONSELA T.P
UNIVERSITY OF THE FREE STATE
Tel: 061 038 6926
E-mail: perseverancemadonsela@gmail.com

RE: "CASE STUDIES OF INSTRUCTIONAL LEADERSHIP FOR THE LIFE SCIENCES IN TWO SOUTH AFRICAN SCHOOLS, WITHIN MPUMALANGA GERT SIBANDE DISTRICT."

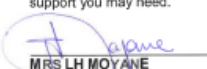
Your application to conduct research study was received and is therefore acknowledged. The title of your research project reads: "Case Studies of Instructional Leadership for the Life Sciences in two South African Schools, Within Mpumalanga Gert Sibande District."

I trust that the aims and the objectives of the study will benefit the whole department especially the beneficiaries. Your request is approved subject to you observing the provisions of the departmental research policy which is available in the department website. You are requested to adhere to your university's research ethics as spelt out in your research ethics.

In terms of the research policy, data or any research activity can be conducted after school hours as per appointment with affected participants. You are also requested to share your findings with the relevant sections of the department so that we may consider implementing your findings if that will be in the best interest of the department. To this effect, your final approved research report (both soft and hard copy) should be submitted to the department so that your recommendations could be implemented. You may be required to prepare a presentation and present at the departments' annual research dialogue.

For more information kindly liaise with the department's research unit @ 013 766 5015/5124 Or c.mashanga@mpumalanga.gov.za

The department wishes you well in this important project and pledges to give you the necessary support you may need.


MRS LH MOYANE
HEAD: EDUCATION

25 / 05 / 2023
DATE



APPENDIX F: ETHICS STATEMENT



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

06-Jun-2023

Dear Ms Thobile Madonsela

Application Approved

Research Project Title:

Case studies of Instructional Leadership for the Life Sciences in two South African Schools

Ethical Clearance number:

UFS-HSD2022/1933/23

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

Adri
Du
Plessis

Digitally signed
by Adri Du Plessis
Date: 2023.06.12
09:15:00 +02'00'

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APPENDIX G: LANGUAGE EDITING

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PROFESSIONAL LANGUAGE EDITING SERVICES

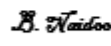



Brian Naidoo (BA Hons. in English; BA Hons in TESOL; BED Hons.
 BA- English major; UDE [English]; UCT Cert. in Legal &
 Business Writing; UCT Cert. in Copy-Editing; MA Coursework in Research
 UFS. Assessor Cert. UFS; Umalusi Evaluator of Schools.

**SPECIALISING IN THE LANGUAGE EDITING OF THESES, DISSERTATIONS,
 JOURNAL ARTICLES, PROPOSALS, BOOKS, POLICIES AND PUBLICATIONS**

CERTIFICATE FOR EDITING A DRAFT MASTER'S DISSERTATION IN EDUCATION
 Case Studies of Instructional Leadership for the Life Sciences in two South African Schools

THOBILE PERSEVERANCE MADONSELA
 UNIVERSITY OF THE FREE STATE



08/10/2024

TO WHOM IT MAY CONCERN

This certificate confirms that the above-mentioned student submitted her draft master's dissertation to me for language-editing, which included correcting in-text citations and the list of references. This was duly edited and returned to the student. I make no claim as to the accuracy of the research content. The text, as edited by me, is grammatically correct. After completion of the language editing, the student has the option to accept or reject suggestions/changes prior to re-submission to the supervisor. The editor is not accountable for any additional content and changes that may have been executed post-editing.



Brian Naidoo
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Membership number: NA2001
Membership year: March 2024 to February 2025
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THANK YOU FOR YOUR SUPPORT

APPENDIX H: PLAGIARISM REPORT

DISSERTATION PLAGIARISM REPORT2.docx			
ORIGINALITY REPORT			
9%	5%	5%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
1	Submitted to University of the Free State Student Paper	1%	
2	digitalcommons.latech.edu Internet Source	1%	
3	theeducationhub.org.nz Internet Source	<1%	
4	ir.uiowa.edu Internet Source	<1%	
5	www.researchgate.net Internet Source	<1%	
6	White, Carena Ann. "Differences of American Indian Students' Academic Performance Between Schools: A Causal Comparative Study", Grand Canyon University, 2021 Publication	<1%	
7	Shah, Zarna Nipul. "Role of School Administrators as Instructional Leaders in Assisting Teachers to Close Achievement Gaps: Administrators' and Teachers' Perception", Kean University, 2023	<1%	