

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG



Teachers' experiences in fostering curiosity in the classroom to improve learning outcomes: A study of three independent secondary schools in KwaZulu Natal, South Africa

A dissertation submitted to the University of Witwatersrand for the degree of

MASTER OF EDUCATION (M Ed)

in the Faculty of Humanities

By

Name: Ashleigh Askew
Student Number: 2771301

Supervisor

Dr Peter Aloka

July, 2024

DECLARATION

I, *Ashleigh Askew*, do declare that this master's dissertation is my original work and I have appropriately cited any direct quotations and paraphrased ideas or content.



July, 2024

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the individuals and organizations that have supported me in completing my master's degree.

Firstly, I extend my thanks to Hilton College for investing time and resources into my professional development. I am grateful to work for an organisation that values personal and professional growth in its teachers and provides the space to pursue it.

I am also thankful to the three participating schools and 15 teachers who generously shared their time, energy, and expertise. The insights gained from our conversations have been invaluable, and I hope I have done justice to the knowledge they shared.

My appreciation goes to my supervisor, Dr Peter Aloka, for his academic expertise and guidance throughout this often-daunting process. His swift responses and clear direction kept me motivated and engaged throughout my dissertation.

I would like to acknowledge Vernon Solomon for helping me understand the importance of undertaking a master's degree for my growth. His belief in my ability and the value of my contribution gave me the courage to begin this journey.

I am especially grateful to the many young people who have entered my classroom over the past twenty years. They have taught me everything I know about being a good teacher.

Lastly, I extend my love and thanks to my family: my husband, Joe, and my children, Daniel and Maria. Thank you for your belief in me, unwavering support, and love. Your understanding and encouragement have allowed me to find the time and space to complete this work.

DEDICATION

This work is dedicated to my children: Daniel and Maria. May you always approach life and learning with a sense of curiosity and wonder.

ABSTRACT

Curious people view learning as central to their existence; curiosity helps them make sense of the world, motivates exploration and discovery, and drives problem-solving. Research on strategies to improve school performance has provided evidence of effective interventions in pedagogical practices, whole-school leadership approaches, financial and resource management, and community engagement. However, there is a significant research gap concerning teachers' beliefs and ideas about their teaching, particularly their conceptualisation of learner curiosity and how to harness it. Guided by two theories: Vygotsky's Sociocultural theory and the Information Gap Theory, this study explored teachers' beliefs about curiosity, how their conceptualisation of curiosity influences their pedagogical approaches, and the challenges they face in fostering a sense of curiosity in the classroom. Using a case study design within a qualitative framework, data was obtained from 15 teacher participants from 3 independent secondary schools in the Midlands area of KwaZulu Natal. The use of purposive sampling ensured that the participants represented a diverse range of subject disciplines and varied years of teaching experience. Semi-structured interviews were conducted to collect data, and the data was analyzed using thematic analysis.

The study findings indicated that teachers recognise curiosity as a powerful motivator for learning. The findings also indicated that teacher behaviours and beliefs significantly impact their approach to fostering curiosity and the way in which learners respond. Additionally, school structures, such as timetabling, influence teachers' ability to create curiosity-rich environments. In addition, teachers use various tools to cultivate curiosity, including stories, emotive material, novelty, unpredictability, relevant resources, authentic experiences, and collaboration opportunities. The study identified barriers to fostering curiosity, such as time constraints, fatigue, curriculum demands, and excessive academic and sporting commitments. Despite understanding curiosity's importance in engaging learners and improving outcomes, these barriers hinder its cultivation. The study concludes that, although there are instances of best practice where learners respond with curiosity and wonder, numerous obstacles prevent the establishment of a curiosity-rich culture in schools. It recommends that the Department of Education should prioritise professional development for teachers to equip them with the skills to foster greater curiosity, leading to more empowered and effective teaching.

Key terms: *teachers' experiences, curiosity, learning outcomes, independent, secondary schools*

TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENT	iii
DEDICATION.....	iv
ABSTRACT	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS AND ACRONYMS	xiii
CHAPTER ONE	1
1.0: INTRODUCTION.....	1
1.1: Introduction and Background of the Study	1
1.2: Problem Statement	5
1.3: Rationale of the Study.....	6
1.4: Aim of the Study.....	7
1.5: Research Questions:	7
1.6: Operational Definitions of Terms	7
1.7: Structure of the Dissertation.....	8
CHAPTER TWO	9
2.0: LITERATURE REVIEW	9
2.1: Introduction.....	9
2.2: Curiosity	9
2.3: Types of Curiosity.....	10
2.4: Teachers' understanding of curiosity in teaching and learning	11
2.5: Factors that influence teachers' adoption of curiosity in classrooms	13
2.6: Teachers' understanding of the importance of curiosity in improving learning outcomes.....	15
2.7: Ways in which teachers stimulate curiosity among learners.....	17
2.8: Challenges that teachers experience in the use of curiosity in classrooms	20
2.9: Conclusion of the Chapter	22
CHAPTER THREE.....	23
3.0: THEORETICAL FRAMEWORK.....	23
3.1: Introduction.....	23
3.2: Vygotsky's Sociocultural Theory	23
3.3: Information-Gap Theory.....	25
3.4: Justification of the Theoretical Framework of the Study	26
3.5: Conclusion of the Chapter	26

CHAPTER FOUR.....	28
4.0 : RESEARCH DESIGN AND METHODOLOGY	28
4.1 : Introduction.....	28
4.2 : Research Paradigm.....	28
4.2.1 : Ontology	28
4.2.2 : Epistemology	29
4.2.3 : Axiology	29
4.2.4 : Research Methodology	30
4.3 : Research Design	30
4.4 : Research Sampling	31
4.5 : Data Collection Methods.....	31
4.6 : Data Analysis	32
4.7 : Trustworthiness of Qualitative Data	33
4.7.1 : Credibility.....	33
4.7.2 : Transferability	34
4.7.3 : Dependability.....	34
4.7.4 : Confirmability	34
4.8 : Ethical Considerations	34
4.9 : Limitations of the Study	35
4.10 : Conclusion of the Chapter	35
CHAPTER FIVE.....	37
5.0 : FINDINGS OF THE STUDY	37
5.1 : Introduction.....	37
5.2 : Demographic information of participants.....	37
5.3 : Findings on how teachers understand curiosity in teaching and learning 38	
5.3.1: Theme 1: <i>Inquisitiveness beyond the boundaries of the classroom</i>	38
5.3.2 : Theme 2: <i>Driven by a desire for depth of understanding</i>	39
5.3.3 : Theme 3: <i>Self-motivation and autonomy over learning</i>	40
5.3.4 : Theme 4: <i>Desire to form connections and make sense of learning</i>	42
5.3.5 : Theme 5: <i>Questioning as a sign of curiosity</i>	42
5.4 : Findings on the factors that influence teachers' adoption of curiosity in the classroom	44
5.4.1 : Theme 1: Teacher-Related Factors	46
5.4.1.1 : Sub-theme 1: Teachers' pedagogical approach	46
5.4.1.2 : Sub-theme 2: Teachers' self-perception.....	48
5.4.1.3 : Sub-theme 3: Personal interests and experiences	49
5.4.2 : Theme 2: Learner-Related Factors	51

5.4.2.1 : Sub-theme 1: Learner engagement.....	51
5.4.2.2 : Sub-theme 2: Learners' sense of belonging in the classroom.....	52
5.4.2.3 : Sub-theme 3: Peer response to curiosity.....	53
5.4.3 : Theme 3: School-Related Factors	54
5.4.3.1 : Sub-theme 1: Organisational structures and systems	54
5.4.3.2 : Sub-theme 2: Curriculum requirements.....	55
5.4.3.3 : Sub-theme 3: The physical environment of the school and the availability of resources.....	58
5.4.3.4 : Sub-theme 4: Opportunities for professional development and the sharing of good practice.....	59
5.4.3.5 : Sub-theme 5: Opportunities to be curious outside of the classroom	61
5.4.4 : Theme 4: Community-Related Factors.....	62
5.4.4.1 : Sub-theme 1: Parenting styles and expectations.....	62
 5.5 : Findings on how teachers understand the importance of curiosity in improving learning outcomes.....	 63
Theme 1: Improved academic performance.....	64
Theme 2: Increased academic engagement	66
Theme 3: Increased autonomy over learning	68
Theme 4: Improved content retention	69
Theme 5: Higher emotional intelligence	70
 5.6 : Findings on ways in which teachers stimulate curiosity among learners	 71
Theme 1: Linking learning to stories and storytelling	71
Theme 2: The “wow factor” and heightened emotions.....	72
Theme 3: Novelty and Uncertainty	74
Theme 4: Relevant and authentic experiences	76
Theme 5: Clear Connections	79
Theme 6: Questioning.....	80
Theme 7: Providing opportunities for collaboration.....	83
Theme 8: Visual Stimulation	84
Theme 9: Providing time and space for open-ended exploration	85
Theme 10: The use of technology	87
 5.7 : Findings on barriers teachers experience in the use of curiosity in the classroom	 88
5.7.1 : Theme 1: Teacher-Related Barriers.....	90
5.7.1.1 : Sub-theme 1: <i>Inadequate time available for lesson planning</i>	90
5.7.1.2 : Sub-theme 2: <i>Teacher fatigue and over-extension</i>	91
5.7.1.3 : Sub-theme 3: <i>Teachers' Fear of the Unknown</i>	93

5.7.2 : Theme 2: Learner Related Barriers	95
5.7.2.1 : Sub-theme 1: <i>Learner fatigue and over-extension</i>	95
5.7.2.2 : Sub-theme 2: <i>Learner engagement and apathy</i>	96
5.7.2.3 : Sub-theme 3: <i>Results-orientated mindset</i>	98
5.7.3 : School-related barriers.....	99
5.7.3.1 : Sub-theme 1: <i>Curriculum demands and time constraints</i>	99
5.7.3.2 : Sub-theme 2: <i>Rigid assessment criteria</i>	101
5.7.3.3 : Sub-theme 3: <i>A diverse range of learner needs in classrooms</i>	102
CHAPTER SIX	105
6.0 : SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS	105
6.1 : Introduction	105
6.2 : Summary of Findings.....	105
6.2.1 : Teachers' understanding of curiosity in teaching and learning	105
6.2.2 : Factors influencing teachers' adoption of curiosity in the classroom	105
6.2.3 : Teachers' understanding of the importance of curiosity in the classroom.....	106
6.2.4 : How teachers stimulate curiosity among learners	107
6.2.5 : Barriers that teachers experience in the use of curiosity in the classroom....	109
6.3 : Discussion of Findings.....	110
6.3.1 : Teachers' understanding of curiosity in teaching and learning	110
6.3.2 : Factors influencing teachers' adoption of curiosity in the classroom	112
6.3.2.1 : Teacher-related factors.....	112
6.3.2.2 : Learner-related factors.....	113
6.3.2.3 : School-related factors	114
6.3.2.4 : Community-related factors	116
6.3.3 : Teachers' understanding of the importance of curiosity in the classroom.....	116
6.3.4 : How teachers stimulate curiosity among learners	118
6.3.5 : Barriers that teachers experience in the use of curiosity in the classroom....	120
6.3.5.1 : Teacher-related barriers.....	120
6.3.5.2 : Learner-related barriers	121
6.3.5.3 : School-related barriers.....	121
6.4 : Conclusion	122
6.5 : Recommendations	125
6.6 : Limitations of the Study	127
6.7 : Suggestions for Further Research	127
REFERENCES	128
APPENDICES	136

APPENDIX A: LETTER REQUESTING PERMISSION TO CONDUCT RESEARCH.	136
APPENDIX B: PARTICIPANTS' INFORMATION SHEET	138
APPENDIX C: CONSENT FOR TEACHER PARTICIPANTS	140
APPENDIX D: SEMI-STRUCTURED INTERVIEW SCHEDULE.....	141
APPENDIX E: ETHICAL CLEARANCE	142

LIST OF TABLES

	Page
Table 1: Demographic information of participants	37

LIST OF FIGURES

Figure 1:	Themes and sub-themes on factors that influence teachers' adoption of curiosity in the classroom	45
Figure 2:	Themes and sub-themes on barriers teachers experience in the use of curiosity in the classroom	89

LIST OF ABBREVIATIONS AND ACRONYMS

AI:	Artificial Intelligence
CAPS:	Curriculum and Assessment Policy Statement
CIC:	Curiosity in Classrooms
DfE:	Department for Education
DBE:	Department of Basic Education
DOE:	Department of Education
EQ:	Emotional Intelligence
GDP:	Gross Domestic Product
IEB:	Independent Examinations Board
KICD:	Kenya Institute of Curriculum Development
MKO:	More Knowledgeable Other
NCFfSE:	National Curriculum Framework for School Education
OBE:	Outcomes Based Education
OECD:	The Organization for Economic Co-operation and Development
SDGs:	Sustainable Development Goals
SES:	Socioeconomic Status
USA:	United States of America
ZDP:	Zone of Proximal Development

CHAPTER ONE

1.0: INTRODUCTION

This chapter presents the introduction and background of the study. In addition, it outlines the problem statement, the rationale and aim of the study and the research questions as well as provides an operational definition of key terms and the structure of the dissertation.

1.1: Introduction and Background of the Study

The purpose of education is to equip learners with knowledge, abilities and skills, while fostering creativity and critical thinking, encouraging the generation of novel ideas, and preparing them to embrace uncertainty (OECD, 2018). Hence, education systems worldwide continue to implement supportive mechanisms to bolster the achievement of learning outcomes among learners at various educational institutions and levels. These learning outcomes signify the progress of learners thus, enabling schools, parents, the Department of Education, and other stakeholders to assess the efficacy of school environments, learning programmes, and pedagogical approaches (Caspersen, Smeby & Aamodt, 2017). Moreover, learning outcomes enable government departments to make decisions about priorities in education policy, and school governing bodies and school leaders to decide on staffing and funding of intervention programmes. A school's success in achieving learning outcomes may influence parents' decisions about where their children attend school and most importantly, for this study, influence an individual teacher's pedagogical approach (Caspersen et al., 2017).

Much research has been done on interventions that lead to improved learning outcomes. However, what works in developed nations may differ from what is researched and prioritised in developing nations. This is unsurprising given the challenges that developing nations face in ensuring that children have access to education and that schools can meet basic human needs. Whilst developed nations can face difficulties with funding and resources, the focus on improving learner outcomes lies in developing professional capital amongst teachers: raising the profile of the profession, developing teacher agency, and providing opportunities for professional development (Hargreaves & Fullan, 2012). For example, Hargreaves and Fullan's (2021) study in the United States indicates that harnessing teachers' professional capital is essential in achieving good teaching and improving learner outcomes. Moreover, Allen, Pianta, Gregory, Mikami, and Lun's (2011) study in the USA argues that academic outcomes and positive teacher-learner relationships are directly correlated. Thus shows that learners who are motivated by and enthusiastic in their interactions with teachers are more likely to achieve higher academic outcomes than learners who are disengaged and disconnected from their teachers. It is evident that the individual teacher plays a crucial role in impacting the outcomes of learners thus interventions and strategies should focus on the development of teachers as professionals to improve learner outcomes.

In Germany, a study by Praetorius, Klieme, Herbert and Pinger (2018) describes a basic conceptual framework of teaching quality which is used to measure teacher performance in relation to learning outcomes. The three basic dimensions include classroom management, learner support and cognitive activation to determine instructional quality (Praetorius et al., 2018). Whilst the study identifies some limitations, namely: “operationalization, content-dependency, and comprehensiveness” (Praetorius et al., 2018, p.422), the use of the framework to evaluate instructional quality does provide reliable predictions of learner outcomes. A related study by Dorfner, Förtsch and Neuhaus (2018) in Germany, highlights the significance of cognitive activation in mediating the effect of both classroom management and the provision of a supportive environment. Thus, emphasising the importance of stimulating and maintaining learner interest in subject-specific content to facilitate deep learning. In another study in India, the 2017 report by CII-KPMG, recognises that whilst primary school enrolments in India have increased, learning outcomes remain a significant cause for concern. The report further argues that for learners to achieve good educational outcomes, teacher effectiveness must improve. Recruitment of quality teachers, teacher training, effective performance management structures and the use of technology to enhance learning are recommended to improve learning outcomes (CII-KPMG, 2017).

Achieving learning outcomes remains a significant issue for schools in countries in Africa. For example, Evans and Acosta's (2020) review of 145 empirical studies among several sub-Saharan African countries (namely Kenya, Uganda, Ethiopia, Ghana, Nigeria and Tanzania) reports that in as much as there is increased access to schools, this has not led to improvements in the quality of education received nor improvements in learner outcomes. According to Bold et al., (2017) and Adeniran et al., (2020), as cited in Evans and Acosta, (2020) a high number of learners continue to perform poorly in numeracy and literacy tests despite several years of schooling, which implies that learning outcomes have not been achieved. Moreover, Evans and Acosta's (2020) study further suggests that multi-faceted programmes are more effective in producing greater gains in education as are mother tongue instruction interventions and the elimination of school fees in both primary and secondary schooling thus increasing access to education.

The 2013 report by The Education Partnership Centre on learning outcomes in Nigeria conveys a bleak picture of the quality of education. Learners are failing to attend school, remain in school and when in school are not meeting learning outcomes. This is the result of poor teacher quality and significant teacher shortages and absenteeism (The Education Partnership Centre, 2013). A recent study by Sanfo and Malgoubri (2023) in Ethiopia considers the effect of the three basic dimensions of teacher quality (classroom management, student support and cognitive activation) in primary schools of varying socioeconomic status

(SES). The study further found that whilst all three factors positively affect learning outcomes, learners from high SES benefited from teachers who were better skilled in classroom management and cognitive activation techniques and were more likely to achieve learning outcomes, thus widening inequality in education. In Nigeria, a study by Ifeakor and Odo (2020) reported that the negligence of teachers' welfare affects their service. All stakeholders: school administrators, school heads, government and even society at large, impact the morale of teachers and a negative view of teachers can result in teachers failing to perform well in the classroom, thus impacting learner outcomes. In addition, Mphale and Mhlauli's (2014) study in Botswana found poor teacher morale, a lack of teaching resources and inadequate examination preparation as key factors in learning outcomes not being achieved. In Tanzania, Komba's (2017) study posits that one of the key factors influencing learning outcomes in Tanzania's public schools is accountability.

In South Africa, learning outcomes remain an area of critical concern for teachers, parents, the Department of Education and other education stakeholders (van der Berg, Taylor, Gustafsson, Spaull, & Armstrong, 2011). The South African National Education Policy (1996) instructs that every person has the right to receive a basic education which contributes to the holistic personal development of learners. In addition to providing instruction, and developing skills and disciplines, schools must also foster independent and critical thought (National Education Policy Act 27 of 1996). Moreover, Jansen and Blank's (2014) study in South Africa argues that the ten key features of successful schools including established routines; extended learning time; teachers in all classes; high expectations; a culture of love and discipline; parental involvement; visible leadership; a culture of social entrepreneurship; principals who can manage the external environment and opportunities for students to achieve beyond school (Jansen & Blank, 2014, p. 128).

Previous research in South Africa has examined several personal, school and home-based factors for enhancing learning outcomes among learners. For example, the Department of Education, (1997b), indicates that the introduction of outcomes-based education (OBE) paved the way for greater parent involvement in education. In addition, Simweleba and Serpell (2020) reiterate that interventions that empower parents with knowledge and skills for greater involvement in their children's homework can be effective in improving the learners' performance in South Africa. Moreover, Raath and Hay's (2016) study in South Africa argues that teachers' self-efficacy and resilience help them handle difficult situations among learners in classrooms, enhancing learning outcomes. le Roux's (2021) study in South Africa reports that the introduction of a family-based literacy programme that improves home-school relationships provides opportunities for teachers to interact meaningfully with parents, and parents to become more confident in supporting their children, thus strengthening literacy

learning in the home. Taylor's (2019) study suggests that to improve teaching and learning in disadvantaged communities in South Africa, a structured programme, quality learning materials and ongoing on-site teacher support are needed. Similarly, Venter and Rambau (2011) found that children who are left without parental supervision, a prolific problem in disadvantaged South African communities, are more likely to experience low self-esteem, poor academic efficacy and are likely to develop high levels of depression.

From the above-reviewed studies, one aspect that has received little attention, yet is being utilised by teachers in classrooms and is necessary to enhance learning outcomes, is curiosity (Grossnickle Peterson, 2020). Curiosity is a key driver of human behaviour: the rapid learning that occurs in early childhood development stems from our desire to make sense of the world (Loewenstein, 1994). Moreover, von Stumm, Hell and Chamorro-Premuzic (2011) define curiosity as the learner's ability, and willingness, to recognise what they do not know and their need to know it, which drives them to seek answers and find solutions. In addition, it is the desire to know what you do not (Kidd & Hayden, 2015). Based on the above definition, it is evident that curiosity is sparked by a sense of novelty, an understanding that gaps in knowledge exist and a recognition that improved knowledge will improve one's outcomes and experiences. Moreover, individuals who show curiosity are more motivated to learn new information; they spend more effort mastering new content and can retain information for longer (Singh & Manjaly, 2022). In addition, learners are driven by the novel experiences they have both in and outside the classroom and it is this sense of wonder and desire to know more that drives their learning. In the present study, I defined curiosity as the desire to enthusiastically engage in learning opportunities to acquire new knowledge or skills. Effective teachers maximise this sense of curiosity, and as such, maximise learning opportunities. von Stumm's research recognises the opportunities that teachers have to inspire curiosity and create engaged and independent learners (von Stumm et al., 2011). For curiosity to occur, a person must recognise that there is a gap in their current knowledge and must feel that it is possible to close that gap. A curious person will take action to close the identified knowledge gap (Pekrun, 2019).

Based on the literature reviewed above, very little attention has been given to the study of curiosity in a South African context. An understanding of how teachers in South Africa adopt curiosity to enhance learning in classrooms is crucial to addressing research gaps in the literature. Therefore, the present study sought to explore teachers' experiences in fostering curiosity in the classroom to improve learning outcomes in three independent secondary schools in KwaZulu Natal, South Africa.

1.2: Problem Statement

The National Education Policy Act 27 of 1996 in South Africa states that all people should have access to lifelong learning (Department of Education, 1996). Learners who obtain a tertiary education are more likely to be meaningfully employed than those without any tertiary qualifications (OECD, 2019). The Department of Education Annual Report (2021/22) prioritises the preparation of learners for further studies and the world of work and highlights the importance of learners leaving education equipped and able to contribute meaningfully towards developing a fairer and more prosperous South Africa (Department of Basic Education, 2022).

However, the reality of education in South Africa remains a serious cause for concern (van der Berg, Taylor, Gustafsson, Spaull, & Armstrong, 2011). Education is characterised by poorly performing teachers and a lack of accountability as well as low expectations of learners and staff (Mouton, Louw & Strydom, 2012). The 2022 Reading Panel Background Report reveals that in 2021 only 27% of Grade 4s could read for meaning. Whilst the economic status of the country has a role to play in poor educational attainment, 65% of Grade 4 learners in Iran, a country with a similar GDP-per-capita, could read for meaning in 2016 compared with 22% of Grade 4s in South Africa. Similarly, in 2013, Grade 6 learners in Kenya and Swaziland performed better than Grade 6 learners in South Africa (Spaull, 2022). The 2021 Progress in International Reading Study showed that only 18% of South African Grade 4 learners could read for comprehension. Learners who did not reach the lowest benchmark are unable to locate explicit information in a text or reproduce the required information.

Whilst there is a scarcity of research that correlates literacy scores and curiosity in educational settings, seminal studies in curiosity have shown that individuals are most curious about information of which they have some existing knowledge and that curiosity increases as one becomes aware of a knowledge gap (Berlyne, 1954; Grossnickle, 2016; Loewenstein, 1994). Thus, highlighting the concern that where comprehension remains low, curiosity will be low.

Currently, both learners and teachers encounter several challenges, including low literacy levels, insufficient physical and human resources, and poor attendance. Often, teachers rely on outdated teaching practices, resulting in a lack of interest and curiosity from learners. Teachers need to be self-reflective and curious about their own teaching methods to instil a sense of curiosity in their students. They should consciously use resources, anecdotes, and activities to engage and motivate learners.

Previous studies have provided insights into the challenges faced by schools in South Africa (van der Berg et al., 2011; Mouton et al., 2012; Spaull, 2022). Research into strategies to improve school outcomes has yielded evidence of interventions relating to pedagogical

practices, whole-school leadership approaches, financial and resource management, and community engagement. However, there is a noticeable gap in available research concerning teachers' beliefs and ideas about their teaching, particularly their conceptualisation of learner curiosity and how to harness it. This gap is problematic because it does not provide teachers with the opportunity to explore their teaching methods and the reasons behind them. This study aimed to explore teachers' experiences in fostering curiosity in the classroom to improve learning outcomes in three independent secondary schools in KwaZulu Natal, South Africa.

1.3: Rationale of the Study

Previous studies have examined several personal, school-based and home-based factors that enhance learning in classrooms. However, very scanty literature is available on curiosity as utilised by teachers in classrooms. Nevertheless, the study of curiosity in the classroom is important as curiosity is a key factor in learner engagement and enthusiasm about education (Grossnickle Peterson, 2020). Curious people see learning as central to their existence: curiosity helps us to make sense of our world; motivates us to explore and discover and provides the impetus to solve problems.

Grade 8, the year in which learners start secondary school, provides teachers with the opportunity to capture learners' attention and enthusiasm in the classroom as they start to study individual disciplines in more depth. It is a year without external examinations and the assumption is that teachers can be more creative with the delivery of the curriculum. My experience of teaching in an independent all-boys school in KwaZulu Natal, confirms that whilst the learners are somewhat encouraged to be curious about their environment, the school's history, the people around them and their learning, this sense of curiosity is not always evident in the way that the learners approach their education. An assumption appears prevalent among the teaching community, suggesting that certain learners possess inherent curiosity, while others do not, treating this characteristic as fixed. My experience as a teacher has highlighted the importance of nurturing curiosity among Grade 8 learners and beyond, and I believe that incorporating strategies to foster curiosity can lead to more engaged and successful learning experiences.

The findings of this study are important and have implications for teachers, principals and school stakeholders. The findings from this study may provide individual teachers with evidence that supports not only the benefit of fostering curiosity in the classroom but also the importance of teachers examining the ideas they hold and how this impacts their practice. Moreover, the findings of the study may suggest interventions that involve a self-reflective approach and as such highlight the role of teachers in improving learner outcomes. Lastly, the findings would aid school leadership teams in developing professional development programmes aimed at equipping teachers with techniques that effectively stimulate curiosity,

ultimately leading to improved learning outcomes.

1.4: Aim of the Study:

The study aimed to explore teachers' experiences in fostering curiosity in the classroom to improve learning outcomes in three independent secondary schools in KwaZulu Natal, South Africa.

1.5: Research Questions:

The main question of this research was:

How do teachers' experiences in fostering curiosity in the classroom improve learning outcomes?

The specific research questions of this research were:

- (i) What are teachers' understanding of curiosity in teaching and learning?
- (ii) What factors influence teachers' adoption of curiosity in the classrooms?
- (iii) How do teachers understand the importance of curiosity in improving learning outcomes?
- (iv) In which ways do teachers stimulate curiosity among learners?
- (v) Which challenges do teachers experience in the use of curiosity in the classrooms?

1.6: Operational Definitions of Terms

For this research, the following operational definitions of terms were adopted:

Grade 8: In the South African context, grade 8 refers to the first level in secondary school. Thus, grade 8 learners are those in their first year of secondary school. Moreover, learners in grade 8 are usually between the ages of 13 and 15 years.

Secondary School: In the South African context, a secondary school or high school refers to the level of education just after finishing primary education where learners attend school from grade 8 to grade 12.

Learning Outcomes: This refers to the measurable progress learners have made because of the learning they have undertaken. Progress can relate to gains in skills, knowledge, attitudes and abilities (Caspersen et al., 2017). For this study, learning outcomes are the measurable and observable progress that learners achieve as a result of classroom teacher and teacher-implemented activities.

Interventions: this term relates to any focused and structured action, approach or strategy

implemented in a classroom or school setting that aims to improve learner outcomes. Interventions are planned and measurable. Interventions are planned and measurable and should target learners' motivation to learn (Pohl, 2020).

Curiosity: For the purpose of this study, curiosity refers to the desire and drive to enthusiastically engage in learning opportunities to acquire new knowledge or skills. For curiosity to occur, a person must recognise a gap in their current knowledge and feel that it is possible to close that gap. A curious person will take action to close the identified knowledge gap (Pekrun, 2019).

1.7: Structure of the Dissertation

This section offers a summary of each chapter in the dissertation.

Chapter One: *Introduction*

This chapter provides the introduction of the study including the background, problem statement, rationale and aim of the study as well as the research question. In addition, it provides operational definitions of terms.

Chapter Two: *Literature Review*

The Literature Review is presented in this chapter. The literature is divided into six sections: exploring definitions of curiosity; teachers' understanding of curiosity in teaching and learning; factors that influence teachers' adoption of curiosity in the classroom; teachers' understanding of the importance of curiosity in improving learning outcomes; ways in which teachers stimulate curiosity among learners and the challenges that teachers experience in the use of curiosity in the classroom.

Chapter Three: *Theoretical Framework of the Study*

This chapter presents the theoretical frameworks adopted for the study. The two theories namely, Vygotsky's Sociocultural Theory and the Information-gap theory have been discussed. The chapter also presents a justification of the theoretical framework of the study.

Chapter Four: *Research Design and Methodology*

This chapter presents the research paradigm including the epistemology, axiology, ontology and research methodology of the interpretivist paradigm. Furthermore, the research design, research sampling, data collection methods and data analysis are explored. The trustworthiness, credibility, transferability, dependability and confirmability of qualitative data are presented as well as the ethical considerations and limitations of the study.

Chapter Five: *Findings of the Study*

This chapter presents the findings of the study in line with the research questions of the study. In addition, the findings have been interpreted.

Chapter Six: *Summary of Findings, Discussions, Conclusions and Recommendations*

This chapter presents the summary of the findings, the discussion and the conclusion. Additionally, the chapter includes recommendations based on the findings of the study, limitations of the study and suggestions for further research.

CHAPTER TWO: LITERATURE REVIEW

2.0 : Introduction

This chapter presents a literature review of the study. The literature considers definitions of curiosity, types of curiosity, teachers' understanding of curiosity in teaching and learning and factors that influence teachers' adoption of curiosity in the classroom. In addition, it explores literature on teachers' understanding of the importance of curiosity in improving learning outcomes, ways in which teachers stimulate curiosity among learners and the challenges that teachers experience in the use of curiosity in the classroom. In addition, the research gaps have been identified.

2.1 : Curiosity

The study of curiosity has received much attention from pre-modern philosophers and early 20th-century psychologists. However, its definition remains elusive, often used interchangeably with interest, motivation, and wonder, leading to ambiguity in its usage (Grossnickle, 2016; Lamnina & Chase, 2019). For example, Loewenstein (1994) defined curiosity as "A form of cognitively induced deprivation that arises from the perception of a gap in knowledge or understanding" (Loewenstein, 1994, p. 75). According to Loewenstein, curiosity has key attributes, including its intensity, transience and association with impulsivity.

Loewenstein (1994) notes that Aristotle viewed curiosity as an intrinsically motivated desire for information. Moreover, Cicero described it as an innate love for learning - an intense passion devoid of practical gain. St. Augustine characterised curiosity as a "vain and curious longing for knowledge" (Loewenstein, 1994, p.76). From the definitions above, the key characteristics of curiosity are regarded as an impulsive drive, innate nature, and intensity. Curiosity is regarded to be significant in childhood development, educational achievement, and advancements in various fields such as sciences and the arts.

Curiosity develops in children at an early age. According to Kidd and Hayden (2015), early 20th-century philosopher and psychologist William James explored the development of curiosity, particularly in children. James posited that younger children are driven by the appeal of novel objects, but their curiosity later evolves into something more intellectual in nature. Moreover, Sigmund Freud associated curiosity with a "thirst for knowledge," linked to a component drive of the libido (Berlyne, 1954; Loewenstein, 1994). John Dewey distinguished between curiosity for ideas and curiosity for the environment. He studied the developmental aspects of children's curiosity in relation to education, tracing its progression across physical, social, and intellectual experiences (Grossnickle, 2016). Gestalt Psychologists proposed that

humans are driven by the need to make sense of their environments and as such “close the gaps” where information is missing (Berlyne, 1954). Similarly, reinforcement theorists, akin to Gestalt psychology, viewed curiosity as a mechanism to make sense of the environment and thereby avoid negative reinforcement (Berlyne, 1954). These perspectives contributed to the emergence and reinforcement of key ideas: curiosity as a driving force, the development of curiosity in children, the differentiation between physical and intellectual curiosity, and curiosity as a response to information gaps. However, despite these valuable insights, Berlyne recognised the limitations of these early theories. They failed to account for the characteristics of a curious individual or explain why certain inquiries hold more appeal than others.

2.2: Types of Curiosity

Berlyne (1954) distinguished between epistemic and perceptual curiosity. Epistemic curiosity is a desire to know and drives learning, understanding and research but perceptual curiosity is a response to stimuli that is novel, exciting or surprising and occurs because of a need to make sense of the environment. Thus, curiosity is viewed as being externally stimulated and occurring because of stimuli that cause conflict or incongruity. In addition to distinguishing between epistemic and perceptual curiosity, Berlyne drew distinctions between diversive and specific curiosity: the fleeting, transient desire for novelty and a more permanent type of curiosity for a specific topic or piece of information (Berlyne, 1954; Grossnickle, 2004; Litman, 2005; Loewenstein, 1994). Berlyne asserts that feelings of conflict triggered by contradictory, surprising or incongruous stimuli give rise to a drive to understand and make sense of unfamiliar information.

While Berlyne differentiated between epistemic and perceptual curiosity, as well as specific and diversive curiosity, Loewenstein (1994) expanded on the contrast between state and trait curiosity. This distinction holds particular importance in educational settings as it offers insights into how curiosity can be stimulated among learners. Trait curiosity refers to an enduring characteristic of individuals who respond with interest, wonder, and motivation to a wide range of stimuli (Grossnickle, 2004). According to Kang, Hsu and Camerer (2009, as cited in Kidd and Hayden, 2015), curiosity's core function is to facilitate learning. Consequently, learners with high trait curiosity are more receptive and motivated to acquire new knowledge. State curiosity, on the other hand, is of particular interest to educators as it can be influenced by environmental factors. Berlyne identified key variables that when present, lead to increased curiosity: uncertainty, surprisingness, novelty, and complexity. The presence of one or more of these variables creates a state of disequilibrium and activates the curiosity drive.

Litman (2005) defines curiosity as "a desire to know, to see, or to experience that motivates exploratory behaviour directed towards the acquisition of new information" (Litman, 2005, p.793). He further explains epistemic state curiosity by distinguishing between two types of curious individuals: those with interest-type curiosity (I-type) and those with deprivation-type curiosity (D-type). He positions curiosity as a pleasurable experience that serves as a reward. This reward can be derived either from acquiring new knowledge: an inherently pleasurable endeavour (I-type) or from a reduction in feelings of uncertainty (D-type). To motivate and cultivate curiosity in the classroom, teachers need to understand both types of curious individuals.

Curiosity is multi-dimensional (Grossnickle, 2016): it can be specific or diverse; epistemic or perceptive; and can be considered as either a consistent personality trait or a transient condition stimulated by the environment. It can arise from a desire to gain new knowledge or because of tension caused by an awareness of a knowledge gap.

2.3: Teachers' understanding of curiosity in teaching and learning

Curiosity is recognised as a powerful motivator of learning and a strong indicator of academic achievement (Amorim, Golz, Polega & Stewart, 2022; Wade & Kidd, 2019). Policy directives and curriculum frameworks governing teaching and learning acknowledge the significance of curiosity and include it in various ways within learning objectives (Dann, 2013). The Teachers' Standards in England (July 2011, Latest update December 2021) state that teachers must "promote a love of learning and intellectual curiosity" (DfE, 2011, p.11). Consequently, there is an expectation for teachers to stimulate a sense of curiosity among learners across all subjects. Dann (2013) refers to numerous curriculum areas that emphasise curiosity as an outcome. For instance, Mathematics encourages "a sense of enjoyment and curiosity about the subject," while English literature "opens up a treasure-house of wonder and joy for curious young minds." In a similar vein, Science is expected to create "a sense of excitement and curiosity about natural phenomena," and both Modern Foreign Languages and History use curiosity as a vehicle to explore their subjects (Dann, 2013, p.557).

Curiosity is highly valued as an attribute in young people, and it is recognised as an important aspect of a teacher's practice in the classroom. However, what remains unclear is how teachers stimulate this sense of curiosity in their learners. Policy directives and curriculum outlines often remain vague and provide little guidance on how to approach this matter. Additionally, curiosity is not featured in assessments, nor are there any means to measure it (Dann, 2013). India's National Curriculum Framework for School Education (2023) is a 628-page document that references curiosity 37 times. Both the trait of curiosity in learners and the state of curiosity-rich classroom environments are considered relevant and necessary.

The framework explicitly states that "curiosity and wonder are at the core of learning" and that "students must approach knowledge with curiosity and wonder" (p.26). In this context, teachers are encouraged to "develop the child's innate abilities and capacities of curiosity" (p.105) and "cultivate an environment that promotes natural curiosity" (p.234).

Unlike England's Teacher Standard's Framework (2011), this document provides rationale and suggestions for how this can be achieved. Children "have an innate sense of curiosity - they wonder, question, explore, try out, and discover to make sense of the world. By acting on their curiosity, they continue to discover and learn more" (NCFSE, 2023, p.68). Furthermore, it offers effective pedagogical approaches for achieving learning outcomes and emphasises that to learn something new children need to assimilate new knowledge to existing frameworks. Teachers are encouraged to:

structure and sequence the teaching of concepts appropriately, connect new concepts to students' existing experience and understanding, pose questions that challenge their existing understanding and make clear demonstrations that push their thinking beyond their existing understanding. All this, while ensuring their full participation in open discussions and hands-on activities. (p.69)

Moreover, they discourage the teaching of new knowledge in "disconnected chunks" (p.70) and encourage teaching learners to assimilate and apply knowledge to new and relevant situations.

In Indonesia, a quantitative study by Herwin and Nurhayati (2020) examined the attributes of curious learners. Their findings identified four key characteristics exhibited by curious learners: attentiveness, note-taking, inquisitiveness, and information comparison. Notably, curious learners demonstrate a tendency to actively engage with peers' contributions during lessons and to seek multiple explanations for phenomena.

Kenya's Basic Education Curriculum Framework (KICD, 2017) was developed to realise curriculum reforms. The proposed reforms aim to ensure that Kenyans become "engaged, empowered, and ethical citizens" (p.10). Recognising, leveraging, and developing learners' innate curiosity is considered an essential means of achieving this. Learners are encouraged to explore to "satisfy their curiosity" (p.31). Encouraging "curiosity and discussion among students" (p.61) and developing learner competencies in "reasoning, decision-making, reflective thinking, curiosity, and creativity" (p.117) are recognised as important aspects of education.

In South Africa, the National Education Policy (1996) recognises the promotion of "enquiry, research, and the advancement of knowledge" as a primary directive of education (National

Education Policy Act 27 of 1996, p.4). The Curriculum and Assessment Policy Statement (DoE, 2011) encourages "an active and critical approach to learning, rather than rote and uncritical learning of given truths" (p.9) and aims to produce learners who can "identify and solve problems and make decisions using critical and creative thinking" (p.10). Interestingly, while critical and creative thinking are referenced, and rote learning is discouraged, the South African Curriculum Framework does not make mention of the terms curious or curiosity.

From the reviewed literature above, it is evident that most government policies, stakeholders, and teachers all recognise the value of curiosity in learners and learning environments. However, minimal guidance exists on how curiosity can be fostered, particularly in the later stages of education. This is predominantly true in a South African context, and as such, a research gap exists to develop teachers' practical understanding of the best pedagogical approaches to encourage curiosity.

2.4: Factors that influence teachers' adoption of curiosity in classrooms

Literature indicates that there are crucial factors that could influence the adoption of curiosity by teachers in classrooms. A teacher's characteristics, pedagogical beliefs, and beliefs about curiosity all have an impact on the extent to which curiosity is prioritised in the learning process. Teacher beliefs and confidence in dealing with uncertainty also play a crucial role in adopting curiosity in the classroom. Oliveira and Lathrop (2022) and Jirout and Zumbrunn (2018), two qualitative studies conducted in the United States, assert that teachers must adopt a curiosity mindset themselves if they want their learners to approach learning with curiosity. By modelling comfort with uncertainty and mistakes, teachers contribute to creating environments where it is safe for learners to demonstrate curiosity. The whole school culture plays a crucial role in determining what is prioritised in a school and significantly impacts a teacher's pedagogical practices. The method of measuring progress and learning outcomes in schools also influences the adoption of curiosity. For instance, an excessive focus on rigidly assessing test scores and prioritising performance over deep understanding can influence teachers' decisions on how they deliver curriculum materials (Jirout & Zumbrunn, 2018).

Furthermore, in the United States, Grossnickle Peterson's (2020) review of curiosity in schools and classrooms reports that learners' demonstration of curiosity is also influenced by their beliefs about how their peers will react to curiosity. Furthermore, learners who believe in the malleability of their abilities are more inclined to exhibit engagement and curiosity. Cain (2019) provides a commentary on the impact of technology on learner curiosity in pharmacy education in the United States. The study findings indicated that although technology has

provided students with more opportunities to seek information, it has conditioned them to be content with merely finding answers.

Oliveira and Lathrop's (2022) study in the United States, proposes that learners' predispositions have an impact on their engagement and, consequently, their curiosity towards learning. Various factors, such as a learner's sense of belonging, connections with the school, teachers, and peers, as well as their connection with the learning topic, play a crucial role in influencing feelings of curiosity. These factors also affect a learner's ability to embrace uncertainty, unpredictability, and risk-taking, which are recognised aspects of curiosity. According to Johnson (2017) in a review published in Canada, teachers' beliefs in their ability to utilise effective teaching strategies and engage learners play a crucial role in shaping their classroom approaches. Furthermore, the availability of culturally and personally relevant resources also impacts the decisions teachers make regarding how they engage learners (Grossnickle Peterson, 2020). Having access to such resources can greatly influence the learning environment and foster curiosity among learners.

Rotgans and Schmidt's (2011) quantitative study in Singapore revealed that teachers who scored high in these three characteristics (social congruence, subject-matter expertise, and cognitive congruence) had a positive impact on learner curiosity. Notably, cognitive congruence emerged as the most significant factor affecting curiosity in the classroom. Such teachers can target lessons within the optimal "zone of curiosity" (Loewenstein, 1994) and act as the "more knowledgeable other" (Vygotsky, 1978) to guide learners' understanding. Rotgans and Schmidt emphasise that these factors are influential enough to prompt school hiring committees to consider these characteristics when appointing new staff.

Iwasaki, Moriguchi, and Sekiyama's (2023) quantitative study in Japan found that responsive parenting increased epistemic trait curiosity in early and middle childhood. However, no significant relationship was observed between parenting practices and epistemic trait curiosity in older children, likely due to their growing independence and the influence of school-related activities. Despite this, responsive parenting in older children was associated with greater parental involvement, which directly correlated with better academic outcomes.

In Pakistan, a quantitative inquiry led by Inayat and Ali (2020) examined how a teacher's perceived teaching style influences learner engagement and curiosity. The results indicate that when learners perceive support and involvement from their teacher, they exhibit heightened interest and curiosity in learning. A qualitative case study conducted in Indonesia by Sujarwo et al. (2021) revealed that collaboration between parents and schools offers significant benefits for learners, parents, and school communities. The study identified three crucial components of effective parental involvement: habituation, which encompasses

regular communication with the school and attendance at meetings; academic participation; and fostering the development of a healthy self-concept in children.

A qualitative study in South Africa by Reed, Davis and Nyabanyaba (2002) concludes that 'being more reflective leads to being a better teacher' (p. 270). Teachers who exhibited greater capacity for reflection, both in their planning and execution of lessons, delivered more engaging, logically connected, and well-structured learning experiences to their learners compared to those who demonstrated lower levels of reflective practice. A qualitative study conducted by West and Meier (2020) on foundation phase learning within the Tshwane-West District in South Africa revealed that both class size and infrastructure exert a significant impact on a teacher's capacity to foster a positive learning environment. Although the study did not directly relate to curiosity, teachers recognised instances of didactical neglect occurring due to overcrowded classrooms and poor infrastructure.

Despite several factors influencing curiosity, there is a scarcity of literature available that explores these factors and how they directly relate to curiosity, particularly in an African and South African context. Further research is needed to comprehend how teachers in these contexts understand the factors that affect the adoption of curiosity in the classroom.

2.5: Teachers' understanding of the importance of curiosity in improving learning outcomes

Previous literature indicates that there are numerous benefits of curiosity in classrooms. Curiosity motivates learning (Kidd & Hayden, 2015; Lamnina & Chase, 2019; Pluck & Johnson, 2011; Singh & Manjaly, 2022). According to Kidd and Hayden (2015), curiosity is critical for learning as it activates the learning systems in the brain. According to Jirout, Vitiello and Zuckerman (2018), curious children in the United States have better learning outcomes than less curious children. Teachers rate curious children as more competent, motivated, attentive, and persistent, as well as more likely to ask questions. They claim that curiosity increases a sense of autonomy and a desire to seek information independently, leading to depth of learning and greater retention.

Lamnina and Chase (2019) argue that learners high in trait curiosity score higher on intelligence tests and perform better at school. The quantitative study of 138 from five seventh-grade and five eighth-grade classes in a public school in New Jersey reported that high curiosity coupled with high effort is a more likely predictor of academic achievement than high intelligence alone. Grossnickle (2014), in a review published in the United States, contends that teachers and environments wield significant influence over curiosity. Not only can teachers affect state curiosity, but repeated exposure to curiosity-enhancing experiences can also affect trait curiosity. Cultivating curious learners should be its own goal, as curiosity not

only yields enhanced learning outcomes but also contributes to improved well-being, persistence, and a willingness to embrace new experiences.

In a qualitative study conducted in the United Kingdom, Pluck and Johnson (2011) concur that deeper processing of information occurs when learners think more deeply about the material they are curious about, thus enhancing learning outcomes. Similarly, in the United States, a quantitative study done by Lamnina and Chase (2019) supports the notion that learners who are motivated to seek information and fill knowledge gaps are more likely to learn than passive learners. Based on a mixed-methods study conducted with second-year Thai university students, Nakamura, Reinders and Darasawang (2022) contend that being curious encourages learners to gain new ideas and resolve intellectual problems, attributing numerous positive learning variables to curiosity. In India, a qualitative study done by Singh and Manjaly, (2022) reported that curiosity has been shown to improve learning levels as well as prevent learners from dropping out of school, both of which are a pressing concern. Moreover, the study reported that curiosity appears to be a powerful way of inculcating a motivation to learn. They suggest that curious learners experience higher motivation, making a greater effort to seek out and retain information.

In Nigeria, quantitative research by Abakpa, Abah and Agbo-Egwu (2018) reported that science curiosity scores and student performance indicated a weak negative relationship, suggesting an interplay of other important factors in the relationship between academic performance and science curiosity. They suggest that, in addition to considering the relationship between curiosity and academic achievement, it is necessary to consider factors such as students' individual experiences, personal competencies, and support systems.

Kibga, Gakuba, and Sentongo (2021) mixed-methods study in Tanzania revealed a gradual increase in learner curiosity over time due to the incorporation of hands-on activities. The study suggests that curious learners exhibited higher levels of motivation, confidence, interest, and enthusiasm in participating and completing tasks. In South Africa, a qualitative inquiry led by Sikhakhane, Govender, and Maphalala (2020) revealed a prevalence of teacher-centred methods, contributing to learner passivity.

From the reviewed literature above, it is evident that there is a scarcity of studies relating to teachers' understanding of curiosity about teaching and learning in a South African context thus creating a gap for research in this area. Moreover, some reviewed studies were quantitative in nature and lacked in-depth findings which could have been obtained from a

qualitative research paradigm. Therefore, the present study would address this research gap by adopting a qualitative research paradigm to provide in-depth results on the teachers' experiences in adopting curiosity in the classroom.

2.6 : Ways in which teachers stimulate curiosity among learners

Literature indicates that teachers stimulate curiosity among learners in several ways, however, they are limited in attaining the optimum level (Loewenstein, 1994; Pluck & Johnson, 2011; Grossnickle Peterson, 2020). For example, Loewenstein (1994) observed that while teachers possess considerable knowledge about effectively educating motivated students, their understanding of how to initially spark motivation remains relatively limited. Moreover, in a qualitative study done in the United Kingdom, Pluck and Johnson (2011) recognise the value of understanding how curiosity is stimulated in the classroom environment to enhance learning opportunities. State curiosity, characterised as a transient response to uncertainty, novelty, and awareness of knowledge gaps, can be effectively stimulated through environmental factors that encourage curiosity while minimising deterrents (Grossnickle Peterson, 2020). Grossnickle Peterson's review (2020) conducted in the United States reported that by exposing learners to subject-specific experiences designed to evoke curiosity, the enduring trait of curiosity can be enhanced thus leading to more engaged, critical and creative learners.

To investigate the connection between prior knowledge, curiosity, and learning outcomes, Wade and Kidd's (2019) quantitative study in the United States revealed that learners' curiosity peaks when they perceive themselves as close to discovering the answer. Considering these findings, teachers play a crucial role in directing learners' attention to both their existing knowledge and the gaps that persist within their knowledge base. By leveraging this understanding, educators can effectively guide learners toward a state of heightened curiosity, facilitating optimal learning experiences. Pluck and Johnson's (2011) study in the United States asserts that curiosity enhances learning by encouraging learners to engage in deep thinking rather than accepting information at face value, thereby promoting deeper processing and deeper learning. Regularly assessing learners' current understanding is also vital to ensure that knowledge gaps remain manageable while providing consistent feedback enables learners to gauge their current knowledge base, promoting metacognition—a key driver of curiosity, as highlighted by Wade and Kidd (2019).

A quantitative study conducted by Clark, Harbaugh and Seider (2019) in the United States revealed that adolescent curiosity can be enhanced by explicitly teaching learners how to question and allocating space within the curriculum for questioning. The findings of the study indicated that the intervention adopted cultivates abilities such as divergent thinking, convergent thinking, metacognition, and curiosity—all factors known to contribute to improved

learning outcomes.

Learners are encouraged to generate numerous questions about a given topic without judgment, editing, or answering any of the questions. The study findings indicate that when the intervention was well-implemented multiple times throughout the semester, learners exhibited increased curiosity toward the subject matter. Moreover, teaching questioning skills can lead to learners adopting this approach more consistently, strengthening trait curiosity and highlighting the malleable nature of curiosity, as affirmed by Grossnickle Peterson's review published in the United States (2020).

Another way to stimulate curiosity in learners is by generating a level of uncertainty in learning. If curiosity is piqued by unpredictability, ambiguity, missing information, or a lack of coherence then it stands to reason that introducing uncertainty into learning could lead to greater curiosity (Lamnina & Chase, 2019; Jirout et al., 2018). Moreover, Lamnina and Chase's (2019) quantitative study in the United States of America showed that all groups, including those with no uncertainty, expected uncertainty, and unexpected uncertainty, learnt the content equally well. However, the learners who experienced uncertainty, whether expected or unexpected, exhibited greater curiosity and transferability of knowledge. These findings suggest that introducing uncertainty in instruction can enhance curiosity and promote the transfer of knowledge. Learners who experience uncertainty exhibit a greater desire to explore and apply what they have learned. Moreover, when learners are prepared for uncertainty, it can mitigate negative feelings and create a more positive learning experience. Thus, Lamnina and Chase (2019) suggest that teachers can positively impact motivation, creativity, and curiosity by introducing elements of uncertainty in the classroom.

In the United States, a study by Jirout et al. (2018) proposes that teachers can stimulate curiosity by introducing optimal levels of uncertainty in learning experiences and helping learners become more comfortable with uncertainty. They suggest several strategies for teachers, such as modelling comfort with uncertainty, making connections between what learners know and do not know, encouraging the generation of alternative ideas, and providing scaffolding for effective information seeking. By embracing uncertainty and incorporating it into the learning process, teachers can foster curiosity and create an environment that promotes motivation, creativity, and deeper learning.

Another study by Jirout, Zumbunn, Evans, and Vitiello (2022) was initiated in the United States due to the scarcity of research on promoting curiosity in the classroom. By reviewing the literature on classroom curiosity and observing 35 elementary mathematics lessons, Jirout et al. developed the Curiosity in Classrooms (CIC) framework coding protocol. This protocol enables researchers to observe and code teaching practices that foster curiosity. They identified two categories of teacher actions: those that promote feelings of curiosity and those

that encourage curious behaviours. Feelings of curiosity can be effectively promoted by providing learners with opportunities to question and participate in lessons, modelling positive reactions to uncertainty, encouraging the generation of questions, reviewing known and unknown information, identifying connections, and encouraging alternative ideas. Curious behaviour can be encouraged by offering learners opportunities to explore ideas, materials, and questions, scaffolding information-seeking, and ensuring positive responses to questions, both verbal and non-verbal. Jirout et al. also note that avoiding uncertainty, responding negatively to uncertainty, and discouraging information-seeking behaviour can suppress curiosity.

Nakamura, Reinders and Darasawang's (2022) classroom-based mixed-methods study reported that learners exhibit curiosity when the content is relevant and useful to them, and the perceived value of the subject influences the level of curiosity they experience. Positive peer engagement has a positive impact on learner curiosity: hearing their peers' perspectives on a topic motivates learners to explore the material more deeply, underscoring the social nature of curiosity. Interestingly, while complexity and uncertainty are known to stimulate curiosity, the clarity and logical presentation of tasks and subject matter are also crucial. Unclear or illogically presented information can dampen learner curiosity.

Singh and Manjaly's (2022) study in India reported that teachers need to make explicit the value and relevance content has to real-world learning and learners' life goals. In addition, they should provide agency and autonomy by offering choice in learning opportunities and assignments, giving learners a voice, and reducing external means of evaluating learning. To foster curiosity in learning environments, teachers should provide culturally relevant curricula and allocate time and space for exploration and investigation. Valuing peer discussion and the learner's voice is essential (Grossnickle Peterson, 2020). Additionally, teachers need to gauge their learners' current level of knowledge to understand their prior knowledge and identify any knowledge gaps. Through effective questioning, teachers can draw learners' attention to these gaps (Wade & Kidd, 2019). Most importantly, teachers should feel comfortable modelling curiosity to their learners, embracing uncertainty, and verbalising their thought processes of inquiry (Engel, 2013; Jirout et al., 2018).

In selected African countries, Okolie, Igwe, Mong, Nwosu, Kanu and Ojemuyide's (2021) qualitative study in South Africa, Zambia, and Zimbabwe reported that learner-centered approaches, problem-based learning, and collaborative learning opportunities actively engage learners, facilitating the development of their critical thinking abilities. By integrating learning into real-life contexts, learners gain a deeper understanding of the world, while fostering dialogue among peers allows for the exchange of diverse perspectives. In South Africa, another qualitative study conducted by

Zenda (2017) advocates for teachers to employ a diverse range of teaching methods that foster creativity and encourage a sense of agency among learners. The findings underscore the significance of fostering discussions, promoting interaction, and fostering collaboration to effectively engage learners, stimulate their interest, and enhance their understanding.

From the reviewed literature above, it is evident that there are mixed results on the methods that teachers use to stimulate curiosity among learners in classrooms. Moreover, most of the studies were from public schools and very scanty information was available regarding independent schools in South Africa. This remains a significant research gap in the literature that the present study would fill. The present study would address this gap by providing rich data on how teachers stimulate curiosity amongst learners in an independent secondary school setting.

2.7: Challenges that teachers experience in the use of curiosity in classrooms

Literature on barriers that teachers experience exists but with mixed results in varied contexts. Despite the recognition of curiosity, along with motivation to learn, as more important than intelligence in predicting educational achievement (Pluck & Johnson, 2011), education systems do little to stimulate or harness learner curiosity. Jirout et al.'s (2018) study in the United States argues that curiosity poses a risk for teachers as it undermines progress towards rigid goals. In an education system that measures static knowledge and values factual recall, with a strong emphasis on test scores, it is unsurprising that both learners and teachers perceive uncertainty as highly risky. Pedagogical approaches that limit curiosity are characterised by teachers who discourage alternative problem-solving methods, perceive mistakes as negative, feel uncomfortable with uncertainty themselves, and overlook unexpected content or results. Additionally, poor classroom management, whether through a lack of control or excessive control, fails to allow space for creativity and curiosity (Engel, 2013).

Pascoe, Hetrick, and Parker's (2019) narrative review of studies from the United States, Canada and Europe concluded that heightened academic stress leads to poorer academic outcomes and more mental health issues. To counter these negative effects, the authors recommend that young people adopt stress-management strategies. In addition, Klusmann, Aldrup, Roloff, Lüdke and Hamre's (2022) quantitative study in Germany found that teacher exhaustion leads to reduced emotional support for learners and diminished organisational skills in lesson planning and delivery. These issues contribute to a decline in instructional quality. The findings underscore the crucial role of teacher well-being in fostering learner achievement and maintaining high educational standards.

Singh and Manjaly's (2022) study in India describes the conditions in government-funded

schools in India, which exhibit several similarities to disadvantaged South African schools. The findings of the study indicated that pedagogical styles, learning environments, assessments, and teacher-learner relationships all constrained curiosity. Moreover, Singh's (2021) study, also in India, indicates that teachers frequently chose to lecture their classes, often relying on writing on boards or dictating notes for learners to copy. The study further reported that overcrowded classes where teachers teach multiple grade levels at one time, present a significant barrier to creating learning environments that foster curiosity. These conditions make it challenging to assess prior knowledge and address knowledge gaps effectively.

Furthermore, teachers showed limited engagement with questioning, failed to identify or leverage knowledge gaps, and did not encourage active group work among learners. Challenges such as large class sizes, inadequate teaching facilities, and insufficient staffing contribute to the prevalence of teacher-centred methods (Singh, 2021). Moreover, the study reported a lack of meaningful feedback from teachers to learners. The feedback that is provided often comes in the form of high-stakes examinations, which tend to offer negative or minimal feedback. The reviewed studies by Singh (2021) and Singh and Manjaly (2022) in India are relevant to the present research because India and South Africa are both comparable countries in many aspects. For example, both are low-income countries and face similar education challenges, including under-resourced schools, inadequate facilities, crowded classrooms, insufficient teacher training programmes, high teacher absenteeism, and widespread illiteracy (Matsepe & Maluleke, 2019; Singh & Manjaly, 2022). Like Singh's (2021) report, the pedagogical style in these settings is teacher-centered, with the teacher dictating the pace of learning. Learners who fall behind quickly find it difficult to comprehend the subject matter, leading to a loss of focus and curiosity. The learning materials lack relevance, and lessons heavily rely on worksheets. Limited group activities are reported, depriving learners of opportunities to learn from their peers, which Grossnickle Peterson (2020) emphasises as crucial for stimulating curiosity.

In 2008, a reform to Malawi's primary school curricula shifted the focus towards active learner-centered classroom practices (Chiphiko & Shawa, 2014). The study findings indicated that barriers to the use of curiosity in classrooms included inadequate teaching and learning materials, large class sizes, and insufficient learning facilities (Matsepe & Maluleke, 2019). In addition, Chiphiko and Shawa (2014) reported that primary school teachers often struggle to stimulate interest and curiosity in learners. Moreover, the study reported that teachers had different ideas about this, and very few had experienced it in their education, leading to varying attitudes towards the value of learner-centered approaches.

Okolie et al. (2021) qualitative study across the Global South, revealed that locally trained

teachers frequently default to lecture-based methodologies and prioritise theoretical knowledge, potentially hindering the development of critical thinking skills among learners. This tendency stems from a lack of critical thinking skills among the teachers themselves as well as an insufficient understanding of what critical thinking entails. In their mixed-methods inquiry conducted in Tanzania, Kibga, Gakuba, and Sentongo (2021) revealed that teachers were reluctant to engage learners in the learning process, primarily due to concerns about disrupting the completion of schemes of work. Teachers perceived learner-centered methodologies as potentially time-consuming and doubted their effectiveness in adequately preparing learners for assessments. Additionally, participants cited a scarcity of appropriate learning resources essential for facilitating interactive learning experiences, along with inadequate teacher guidance regarding the use of instructional materials, as additional barriers to implementation.

In South Africa, a mixed-methods study conducted by Bontwini (2017) reports that the teaching of Natural Sciences in primary schools in the Eastern Cape is uninspiring and unlikely to encourage learners to develop an understanding or interest in sciences beyond compulsory schooling. The study describes lessons as often "boring and confusing" (p.19), with minimal connection to the authentic experiences of the learners. The dominant teaching style observed was lecture-based, relying on rote learning, and teachers demonstrated little to no reflection on pedagogical approaches and the impact on learning outcomes. Bontwini attributes learners' poor results to inadequate classroom teaching practices.

From the reviewed literature above, it is evident that there are few studies from international and regional perspectives on barriers to the adoption of curiosity in classrooms. This is despite teachers being expected to adopt the use of curiosity in their teaching in classrooms. Therefore, the findings obtained from the present study would fill in gaps in the literature by providing the perspective of teachers in the South African context.

2.8 : Conclusion of the Chapter

This chapter presented the literature review of the study. The literature examined curiosity, types of curiosity, teachers' understanding of curiosity in teaching and learning and factors that influence teachers' adoption of curiosity in classrooms. As well as teachers' understanding of the importance of curiosity in improving learning outcomes, ways in which teachers stimulate curiosity among learners and the challenges that teachers experience in the use of curiosity in classrooms. The next chapter, Chapter Three, presents the theoretical framework of the study.

CHAPTER THREE: THEORETICAL FRAMEWORK

3.0 : Introduction

This chapter presents the theoretical framework adopted for the study. This research is guided by two theories, namely, Vygotsky's Sociocultural Theory and the Information-gap theory. The justification of the theories in the present study is also discussed. The theories are discussed as follows:

3.1 : Vygotsky's Sociocultural Theory

The Sociocultural Theory was developed by Lev Vygotsky and it provides a framework for viewing human development and knowledge acquisition as a socially mediated process. He theorised that a child's cultural values, beliefs and problem-solving skills develop because of meaningful interactions with others who are more knowledgeable than themselves (McLeod, 2022; Powell & Kalina, 2009). Therefore, social interaction and collaboration are seen to be necessary for cognitive development and that social interaction precedes learning. According to Powell (2006), as cited in Powell and Kalina (2009), Vygotsky recognised the pivotal role of social interaction and language in learning. Vygotsky's contributions to educational theory are widely recognised, and his theories have significantly influenced curriculum design and pedagogical practices. Social constructivism theorises that social interaction profoundly influences cognitive development (Powell & Kalina, 2009).

Vygotsky perceived learning as a cumulative process, wherein new experiences and understanding are integrated into an existing framework. Thus, the theory argues that higher mental abilities could only develop through interaction with more advanced adults. Vygotsky recognised that social interaction is crucial to a child's curiosity and inclination to explore (McLeod, 2007). According to Jaramillo (1996), sociocultural theory acknowledges the significance of the group in the learning process and further emphasises that higher levels of cognition can only be attained through interactions with individuals who possess greater knowledge. Scott and Palincsar (2013) reiterate that learning occurs through interaction, negotiation, and collaboration, taking into account the broader social context in which learning takes place. Vygotsky believed that social interaction was essential for the development of higher mental functioning. Moreover, the theory argues that it is through active participation that learners internalise complex concepts, develop new strategies, and gain a profound understanding of their world and culture.

Vygotsky regarded language as a crucial social tool for shaping the minds of learners (Jaramillo, 1996) and recognises the role it plays in enhancing learning. Vygotsky's significant

contribution to the understanding of language use in learning lies in his differentiation between interpersonal dialogue and intrapersonal dialogue (Hyslop-Margison & Strobel, 2008). In a classroom setting, interpersonal dialogue (which Vygotsky believed precedes intrapersonal dialogue) encompasses the exchanges between the teacher and the class, the teacher and individual learners, as well as the dialogue among learners. This interpersonal dialogue enables learners to make sense of new content and internalise it. Intrapersonal dialogue takes place internally as learners apply new knowledge and engage in reasoning and problem-solving. In very young children, inner speech is verbally articulated, but as children develop cognitively, it transitions into thought (McLeod, 2022; Hyslop-Margison & Strobel, 2008). According to Powell and Kalina (2009), the more proficient teachers are in employing conversation, discussion, and inquiry, the more accomplished learners become in communicating and thinking.

According to Vygotsky, a child may develop, but not to their full potential, without interaction with others, specifically through interaction with more knowledgeable others (MKOs). A MKO refers to a person or a group of people who possess more knowledge than the learner regarding a particular subject. Typically, the MKO could be the teacher or peers who have mastered a specific activity or concept (Jaramillo, 1996; Powell & Kalina, 2009). Tasks that are too challenging for the learner to perform independently can be achieved with the support of an MKO. This support enables the learner to experience internalisation, mastery, and deeper understanding (Hyslop-Margison & Strobel, 2008). Transformation occurs as the learner assumes increasing responsibility for the activity. Scott and Palincsar (2013) suggest that Vygotsky's interest extended beyond the contributions of the MKO to the interaction, encompassing the learner's contribution and how this collaborative interaction shapes the broader cultural setting.

Another component of Vygotsky's theory of sociocultural development is the zone of proximal development (ZPD). Vygotsky defined the zone of proximal development as "the difference between the actual development level, as determined by individual problem-solving, and the level of potential development, as determined through problem-solving under adult guidance or collaboration with more knowledgeable peers" (Vygotsky, 1978, pp.131). The ZPD is activated when learners are actively engaged with concepts that slightly surpass their current skill and knowledge level. It is within this zone that learners are most receptive to guidance, and it is through collaboration with others, particularly with a more knowledgeable other (MKO), that the gap between their current abilities and mastery can be bridged (McLeod, 2022). Vygotsky distinguished between two levels of learning: the actual level, which refers to what learners can accomplish independently, and the potential level (ZPD), which reflects what learners can achieve with the assistance of an MKO. Vygotsky argued that the potential

level is a better indicator of a learner's cognitive development than measuring their ability based solely on what they can accomplish independently (Scott & Palincsar, 2013).

In the present study, Vygotsky's principle of the zone of proximal development was considered the main concept in this theoretical framework for investigating pedagogical practices that facilitate and nurture a sense of curiosity in learners. The next theory discussed is the information gap theory.

3.2: Information-Gap Theory

Loewenstein's (1994) information gap theory suggests that individuals are most curious about the topics of which they have some existing knowledge. If new information is too unlike that which we are familiar with, there will be no reference point on which to build and as such no conflict will occur and therefore no curiosity (Pluck and Johnson, 2011; Jirout et al., 2018; Lamnina & Chase, 2019). As such, Loewenstein's definition of curiosity is "a form of cognitively induced deprivation that results from a perception of a gap in one's knowledge" (Loewenstein, 1994, p.78). Curiosity, as described by Piaget, arises from cognitive disequilibrium experienced when a child tries to incorporate new information into their existing cognitive frameworks. Piaget identified an ideal level of discrepancy necessary for curiosity to manifest known as the moderate novelty principle (Grossnickle, 2016). If the level of discrepancy is too low, the child will show minimal effort and interest in assimilating new information. On the other hand, highly incongruous information would be avoided or disregarded as it deviates too significantly from their established cognitive structures. (Loewenstein, 1994).

Day's (1982) view of the zone of curiosity corroborates this notion, in that, information that is too easy or irrelevant fails to provide a reason for learners to engage and explore, leaving them without motivation and interest. On the other hand, information that is excessively challenging or removed from their existing knowledge base induces feelings of anxiety and prompts avoidance. By establishing unexpected, incongruous, or novel connections to prior knowledge, excitement follows, resulting in interest and stimulating further exploration (von Renesse & Ecke, 2016). Furthermore, Kang (2009, as cited by Grossnickle, 2016) identified a correlation between curiosity and confidence in knowledge. According to Kang, curiosity is at its lowest when confidence in one's abilities is either extremely low or extremely high. Conversely, the greatest levels of curiosity emerge when a person possesses moderate knowledge of a particular subject. This notion is supported by Litman (2005), who agrees that individuals are most curious when they are on the brink of understanding, suggesting that a certain level of knowledge is necessary for curiosity to arise.

According to the findings of Wade and Kidd (2019), a reciprocal relationship between curiosity and learning exists. Moreover, learners tend to exhibit the greatest curiosity about subjects

they believe they are on the verge of understanding. While learners existing knowledge objectively predicts their learning outcomes, it is their subjective perception of their knowledge that primarily influences their curiosity. Consequently, when learners possess partial knowledge of a particular subject, their curiosity is greatest. Curiosity occurs most prominently at an “intermediate stage of familiarity” (Berlyne, 1954). During this phase, individuals have pre-existing knowledge and the vocabulary to recognise and articulate what they do not know, along with an increased desire for competence. According to Wade and Kidd (2019), a partial understanding of a subject triggers curiosity, enhancing the learning process by placing one on the cusp of knowledge. As proficiency in a particular domain increase, awareness of missing information grows, consequently amplifying curiosity.

The information-gap theory will serve as a framework when examining practices that are adopted by teachers to promote state curiosity in the classroom.

3.3 : Justification of the Theoretical Framework of the Study

In this study, Vygotsky’s sociocultural theory is considered the main framework and supported by the Information Gap theory. Both Vygotsky’s Sociocultural Theory and the Information Gap Theory are important in informing the present study as they emphasise the significance of teachers in mediating the learning process. From Vygotsky’s Sociocultural theory, curiosity, and subsequently, understanding, is co-created in the space between learners and teachers. Understanding the social nature of learning and the role of the MKO in supporting learners’ progress is essential. Classrooms are inherently social environments where collaboration, discussion, and negotiation are integral to the learning process. These interactions guide learners in comprehending new experiences and integrating them into their existing frameworks. The zone of proximal development aligns closely with the information gap theory, wherein learners exhibit the highest level of curiosity towards content that they are on the verge of understanding but have not yet fully mastered. Teachers face the challenge of identifying the optimal place where interest is sparked, and learning occurs. The present study aimed to understand how teachers conceptualise curiosity, the factors influencing the adoption of curiosity-rich classrooms, and how curiosity is stimulated. The information gap theory and Vygotsky’s sociocultural theory provide complimentary roles and insights into the role teachers play in stimulating curiosity and the importance of understanding the social aspect of both curiosity and learning.

3.4 : Conclusion of the Chapter

This chapter presented the theoretical framework of the study. The two theories, Vygotsky’s Sociocultural Theory and the Information-gap theory have been discussed. The chapter also

presented detailed justifications for the application of the theories. The next chapter, Chapter Four, presents the research design and methodology adopted for the study.

CHAPTER FOUR

4.0 RESEARCH DESIGN AND METHODOLOGY

4.1 : Introduction

This chapter presents the research design and methodology of the study. It contains aspects such as the research paradigm, the research design, research sampling, data collection methods and data analysis. In addition, the trustworthiness of qualitative data, ethical considerations and limitations of the study are presented.

4.2 : Research Paradigm

A research paradigm represents a shared set of beliefs and ideas that guide thinking and data interpretation (Kivunja & Kuyini, 2017). This research aligns itself with the Interpretivist Paradigm, which seeks to comprehend and describe the human experience. Interpretivism emphasises the significance of context, time, and the individual in interpreting individual and group realities. It aims to understand human nature, acknowledging its subjectivity and recognising that there are multiple constructed realities, with truth being context-dependent (Wagner, Kawulich & Garner, 2012). The Interpretivist Paradigm is relevant in this study as it assists in understanding how teachers conceptualise curiosity, its impact, and the challenges they face. This paradigm offers deep insights into phenomena by examining teachers' values, attitudes, perceptions, and perspectives within their natural settings. By focusing on a specific group of teachers in a particular context, the interpretivist approach provides an in-depth understanding of a narrow area, rather than making broad generalisations about a wider population. This approach is valuable for this study because the data collected from the perceived realities of these teachers in a unique setting will enable teachers and school leaders in similar environments to draw informed conclusions and implement appropriate interventions based on the findings (Sikhakhane, Govender, Maphalala, 2020).

A research paradigm has four components namely, epistemology, axiology, ontology and methodology. These are discussed as follows:

4.2.1 : Ontology

Ontology concerns a researcher's beliefs about the nature of reality and how it is constructed (Rehman & Alharti, 2016). Interpretivists maintain that reality is constructed by individuals within dynamic social environments, leading to the existence of multiple realities. These realities are unique to each individual, shaped by specific times, locations, and contexts, and thus cannot be generalised. According to Rehman and Alharti (2016), truth and reality are created by individuals, and therefore cannot be objectively discovered by the researcher.

Interpretivists acknowledge that individual and shared group realities can coexist, this is particularly true in settings like schools. In a school environment, teachers construct their realities based on their values, perspectives, and experiences. Therefore, an interpretivist ontology is relevant to this study because while teachers in similar settings might arrive at shared truths, much of their experience remains subjective. The researcher's role is to explore, understand, and document the reality as experienced by each teacher. From this data, themes can be identified which leads to the creation theory (Rehman & Alharti, 2016).

4.2.2 : Epistemology

Epistemology examines how researchers acquire knowledge, what counts as knowledge, and how it can be communicated (Kivunja & Kuyini, 2017). A researcher's ontological beliefs shape their epistemological understanding; thus, this study adopted a subjective epistemology based on the belief in multiple social realities that must be understood within their contexts (Wagner, Kawulich, & Garner, 2012). As Wagner, Kawulich, and Garner (2012) note, truth is "culture bound [and] historically and context dependent" (p. 56). A subjective epistemology requires researchers to acknowledge their thought processes and derive meaning through interactions with participants. Interpretivists hold that "truth lies within the human experiences" (Wagner, Kawulich, & Garner, 2012, p. 56). This epistemological approach is well-suited to this study, as teachers have varying understandings of curiosity and different classroom methodologies. The study aimed to explore, understand, and report on teachers' experiences in their specific contexts, necessitating an understanding of each teacher's individual and subjective experiences. However, using an interpretivist epistemology allowed for the study to identify connections within "communities' stories and belief systems" to establish legitimate knowledge (Wagner, Kawulich, & Garner, 2012, p. 56).

4.2.3 : Axiology

Axiology addresses the values inherent in the research process and those of the researcher (McGregor, 2011). Researchers must identify their beliefs about what is true and determine how to present their findings in a manner that upholds the integrity of their chosen ontological and epistemological frameworks (Kivunja & Kuyini, 2017). In the context of an interpretivist approach, researchers must acknowledge their own values and understand how these values may shape and inform their research. This approach assumes that reality is individually constructed and that knowledge is inherently subjective. Consequently, researchers must recognise their own values and biases that could influence the neutrality of their findings (Wagner, Kawulich, & Garner, 2012). A balanced axiology is essential for this study, which means acknowledging that the research outcomes reflect the researcher's values. To ensure credibility, trustworthiness, and reliability, researchers must recognise and report their own

values and biases (Kivunja & Kuyini, 2017). Since this study aimed to understand curiosity and how teachers foster it, it is vital to acknowledge the researcher's beliefs about this topic of study and the potential limitations and biases these beliefs may introduce.

4.2.4 : Research Methodology

This study utilised a qualitative research methodology. Qualitative researchers aim to comprehend how individuals interpret their experiences, construct their worlds, and attribute meaning to those experiences (Chilisa & Kawulich, 2012). Stahl and King (2020) emphasised that qualitative research provides process-based, narrated, storied data that is closely related to the human experience. The qualitative research methodology is relevant in this study because this study's objective is to make sense of a teacher's experience within their specific context and understand the meaning they attribute to these experiences. Therefore, in adopting qualitative research methodology, conducting semi-structured interviews enabled the researcher to gather rich descriptions of the experiences and remain flexible throughout the research process, allowing her to adapt to changing conditions as needed.

4.3 : Research Design

This study employed a multiple case study research design. Gustafsson (2017) in Cresswell's (2013, p. 97) defines the case study method as that which "explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information... and reports a case description and case themes." By utilising multiple case studies, the researcher can present diverse perspectives of a phenomenon. Additionally, Tomaszewski, Zarestky and Gonzalez (2020) assert that case studies enable researchers to explore contemporary experiences in authentic contexts, emphasising the interconnection between these variables. Case studies are bounded systems, defined by time, space, and activity. Through a bounded system encompassing multiple sources and various types of evidence, researchers can examine the full complexities of an experience. According to Green and David (1984, p. 75), multiple case studies provide the researcher with a strategy for "generalizing to a target population of cases from the results of a purposefully selected sample of cases." This study adopted a multiple case study design, gathering and analysing data from fifteen (15) teachers across three (3) independent schools in KwaZulu Natal, South Africa. This research design was appropriate for this study because it aims to produce reports encompassing case descriptions and recurring case themes in similar school contexts.

4.4 : Research Sampling

The study focused on three independent schools in KwaZulu Natal, South Africa. I chose to focus on independent schools as this established a certain degree of uniformity in terms of resource availability, class sizes, and assessment regulations. Given the scarcity of literature regarding teachers' conceptualisation of curiosity in both state education as well as within the independent sector, exploring this topic within independent schools will yield preliminary insights that can prove useful in comprehending this phenomenon.

The study involved the participation of fifteen teachers (15), with five teachers (5) from each school. These participants possessed relevant teacher training and accreditation, ensuring they were representative of the teaching body of each school. This representation included a mix of male and female teachers, diverse subject disciplines and varying years of teaching experience ranging from one year to thirty years. The average number of years of experience was 12.93. To ensure that participants had these specific characteristics, I used purposive sampling. This provided the study with rich and diverse data. However, there was some degree of convenience sampling within the specific criteria given participants' willingness and availability to participate.

Mason (2010) emphasises that the sample size should align with the project's aims and that a sample size of between 10 and 30 participants is considered appropriate for a qualitative study. Since qualitative research aims to understand the meaning and is not intended to establish generalised hypotheses, a relatively small sample size is often adequate. Mason further explains that qualitative research is labour-intensive, making a large sample size both time-consuming and counter-productive. Once saturation is achieved, gathering additional data does not contribute anything new to the results. Romeny, Batchelder and Weller (1986), as cited by Guest, Bunce and Johnson (2006), argued that small samples can offer comprehensive and accurate information within a specific context, provided the participants possess a certain degree of expertise in their field. Furthermore, they emphasised that qualitative research aims to comprehend common perceptions and make sense of experiences. As such, conducting twelve interviews with a group of homogenous participants would be sufficient to gather the necessary data. This study elected to include fifteen participants to ensure that saturation is achieved.

4.5 : Data Collection Methods

This study utilised semi-structured interviews for data collection. According to Ruslin, Mashuri, Rasak, Alhabsyi and Syam (2022), an interview is an exchange of ideas and experiences between two people with a shared interest in a specific theme or topic. The researcher's role is

to guide the conversation. Thus, Ruslin et al., (2022) add that semi-structured interviews are particularly valuable for qualitative research, as they “allow[s] for researchers to acquire in-depth information and evidence from interviewees while considering the focus of the study” (Ruslin et al., 2022). According to Guest et al. (2006), one should assume a degree of structure within an interview by asking a similar set of questions, but this approach also allows for flexibility and adaptability. It enables researchers to adjust their questions during interviews while still maintaining the study's direction and focus. Guest et al. (2006) further point out that a relatively homogenous group, such as qualified secondary school teachers teaching in the independent sector, will share some common experiences, which can reveal important insights about the phenomenon under study (Guest et al., 2006). Fifteen participants were interviewed individually and in person and with the participants' permission. Each interview lasted approximately 50 minutes and consisted of five core questions aligned with the specific research inquiries of this study. I explored participants' responses to core questions with follow-up questions to seek clarity or further details. The interviews were recorded via audio recording, transcribed, and subsequently analysed. The use of audio recordings assured the precision of the transcribed data and afforded me the ability to revisit the interviews, thereby facilitating a more thorough analysis.

4.6 : Data Analysis

For this study, thematic analysis, which involves identifying recurring patterns as themes, was adopted (Lochmiller, 2021). Richie and Spencer (1994), as cited by Ruslin et al. (2022, p. 27), state that “defining, categorising, theorizing, explaining, exploring, and mapping is fundamental to the analyst’s role.” According to Braun and Clarke (2006), thematic analysis provides the researcher with flexibility in organising and describing the data in rich detail. They emphasise the importance of “constantly moving back and forth between the entire data set, the coded extracts of data that you are analyzing, and the analysis of the data that you are producing” (Braun & Clarke, 2006, p. 86).

Ruslin et al. (2022), along with Braun and Clarke (2006), identify six stages of thematic analysis. The first step involves understanding and becoming familiar with the raw data by transcribing and reading it while noticing emerging patterns. Drever (2006), as cited by Ruslin et al. (2022), suggests including comments or symbols in the transcription to indicate these nuances. The second step involved generating codes and systematically applying them to all aspects of the data set. This process is crucial for organising data in a meaningful way. In this research, open coding was used, allowing the researcher to develop codes as they analysed the data. Data that was relevant and captured something significant about the research question was coded accordingly (Maguire & Delahunt, 2017). In the third step, the researcher searched for patterns in the data to identify themes. These patterns were used to categorise

the coded data into relevant themes, revealing meaningful connections that provide insights into the research question. Step four involved reviewing the themes and creating a thematic map. This process included revising and refining themes to ensure they accurately represent the study's findings (Braun & Clarke, 2006). It is crucial that the themes are coherent and distinct from one another, and that the data associated with each theme supports the overall research questions. This step helped confirm the relevance and appropriateness of the identified themes for effectively reporting the study's results (Maguire & Delahunt, 2017). The fifth step involved defining and naming the themes, as well as identifying sub-themes within the main themes. Braun and Clarke (2006) describe this stage as the point where researchers "identify the essence of what each theme is about" (p. 92). The sixth step involved presenting the findings and results in the report. The researcher must integrate the data to effectively convey the findings in a manner that addresses the research question (Peel, 2020). Throughout the data analysis process, it is essential to employ peer review of coding and summaries as this ensures coding reliability and addresses individual biases in interpretation (Guest, MacQueen & Namey, 2014).

I incorporated these steps into the data analysis process for this study. Utilising codes that correspond to the core areas of my study, I applied them to the data, thereby enabling the identification of themes within these key areas.

4.7 : Trustworthiness of Qualitative Data

For research to hold merit, it must be both believable and truthful (Stahl & King, 2020). Trustworthiness is a crucial aspect guiding qualitative research practice, as emphasised by Mertler (2017), who highlights the importance of accuracy and believability of the data. Ensuring readers' and future researchers' confidence in the study involves demonstrating the careful collection, collation, interpretation, and presentation of the data. To establish trustworthiness, Lincoln and Guba (1985) propose four criteria: credibility, transferability, dependability, and confirmability (Stahl & King, 2020).

4.7.1 : Credibility

Credibility, the first criterion, demands that the researcher shows the findings correspond with truth or reality. This means that the results should be believable from the participants' perspective. To enhance credibility, multiple sources of information or various approaches should be employed to reveal repeated patterns within the findings (Guba, 1981; Mertler, 2017; Stahl & King, 2020). This study provided transcripts to participants to verify and offer feedback about the data they provided. Additionally, peer debriefing, involving an impartial peer to assess research procedures and findings, will contribute to the credibility of the study. Throughout the research, a reflexive practice of self-analysis was applied, ensuring the

researcher questioned findings, and responses, and challenged biases.

4.7.2 : Transferability

Transferability, or generalisability, is achieved using thick description, which involves providing comprehensive details about the context, time, participants, and setting. As stated by Guba (1981, p.81), "If the thick descriptions demonstrate an essential similarity between two contexts, then it is reasonable to suppose that tentative findings of Context A are also likely to hold in Context B." Although qualitative research does not aim for generalisation to other settings, a rich and detailed portrayal of the context and experiences enables potential application to similar situations (Mertler, 2017; Stahl & King, 2020).

4.7.3 : Dependability

Dependability refers to the consistency of the research process and findings. To ensure stability over time, the researcher should describe any changes in the setting and how they impact the study's approach (Mertler, 2017). Guba (1981) introduces the concept of trackable variance, which involves recognising and explaining changes in approaches or interpretations. Making all explanations and raw data available to future readers and researchers is essential to establish trust in the study's consistency.

4.7.4 : Confirmability

Confirmability, the final criterion, pertains to establishing the neutrality and objectivity of the data. This involves ensuring that the data presents an objective view of reality and is not influenced by the researcher's bias, perceptions, or imagination (Guba, 1981). To ensure confirmability, this study produced an audit trail detailing each phase of the data analysis process.

4.8 : Ethical Considerations

According to Mertler (2017), research ethics involves the moral component of research, which is particularly important when the research involves human beings. Thus, researchers must consider how participants are treated, the level of honesty and openness they are provided with, and how results are reported. In this study, several ethical considerations were considered.

First, ethical clearance was sought from the University of Witwatersrand Ethics Research Committee. Once permission was granted, the principals of three independent secondary schools were contacted to request permission to approach volunteer practitioners from the selected schools. Prospective participants received information about the study's purpose through email and were provided with evidence of the researchers' registration and ethical clearance certification. Initial contact with participants was made via email, followed by

telephone communication to arrange suitable interview times. Participants were informed about the voluntary nature of their participation in this research project and were asked to sign consent forms for the interviews to be recorded and transcribed. To ensure confidentiality, the names of schools and participants are not included in the report or data collection. Given that the interviews were conducted face-to-face, I assigned numbers to participants when transcribing and reporting on data. Data access is strictly managed so that only the researcher and the supervisor have access to the relevant data. This study adheres to the principles of beneficence, ensuring that participants are treated with respect and safeguarded against any form of exploitation. The objective of this study was to provide benefits to participants, other teacher practitioners, and learners by offering insights into curiosity and its influence on learning outcomes. Additionally, any references to external ideas or works that are not the researcher's own are appropriately acknowledged through in-text citations and corresponding references.

4.9 : Limitations of the Study

One of the limitations of this study pertains to the impact of time constraints, as the information included in the study will be constrained by what can be accessed and read, as well as the number of interviews that can be conducted within a given period. Moreover, the availability of participants and the time pressures they may face could influence the information they share for the study. To address these limitations, I took measures to ensure that interview times were convenient for the participants, allowing sufficient time to thoroughly explore the phenomenon of curiosity. Additionally, I aimed to create a comfortable and supportive environment during the interviews to help participants feel at ease and encouraged to share their experiences openly.

Ruslin et al. (2022) identified several key factors that can potentially limit a study's outcomes. One such factor is the researcher's reliance on participants to openly share their thoughts and ideas without withholding judgments. To mitigate this limitation, Ruslin et al. (2022) suggest using open-ended questions, as they allow participants to carefully consider their responses, enabling the researcher to thoroughly explore the ideas shared. Moreover, researchers must be aware of their own biases and preconceptions. Again, the use of open-ended questions is recommended, as they provide more flexibility in collecting data that can both extend and challenge the researcher's preconceived notions.

4.10 : Conclusion of the Chapter

This chapter looked at the research design and methodology of the study. The chapter contained the research paradigm, research design, research sampling, data collection

methods and data analysis were also explored in this chapter. Lastly, the trustworthiness, credibility, transferability, dependability and confirmability of qualitative data were presented as well as the ethical considerations and limitations of the study. The next chapter, Chapter Five, presents the findings of the study.

CHAPTER FIVE

5.0: FINDINGS OF THE STUDY

5.1: Introduction

This chapter presents the findings of the study that stemmed from the analysis of the semi-structured interviews conducted with the teacher participants, including teachers' understanding of curiosity in teaching and learning; factors that influence teachers' adoption of curiosity in the classrooms; teachers' understanding of the importance of curiosity in improving learning outcomes; how teachers stimulate curiosity among learners, and finally, the challenges that teachers experience in the use of curiosity in the classrooms.

5.2 : Demographic information of participants

The study comprised fifteen high school teachers from three selected independent schools in the Midlands in the province of KwaZulu Natal in South Africa. The study included male and female teachers with teaching experience ranging from 1 to 30 years. The demographic information of participants is presented in the table 1 below:

Table 1: *Demographic information of participants*

Participant	Gender	Years of Experience	Subject Discipline
1	Female	1	English
2	Female	20	Geography
3	Male	30	Physical Science
4	Male	13	Economics
5	Male	10	Mathematics
6	Female	1	Physical Science
7	Female	16	History
8	Female	21	isiZulu
9	Female	6	isiZulu and Drama
10	Female	9	English
11	Female	7	Mathematics
12	Female	16	Mathematics
13	Male	15	Life Science
14	Male	8	Media Studies
15	Female	21	English

The data on the demographic profile of teachers interviewed in Table 1, revealed that teachers

representing a range of subject disciplines were interviewed. Ten female teachers and five male teachers participated in the study, an indication that gender representation was adhered to in the sampling of participants. Two first-year teachers and four teachers with twenty or more years of experience were interviewed, an indication that teachers with varied teaching experiences were sampled to participate in the study.

5.3 : Findings on how teachers understand curiosity in teaching and learning

This study explored teachers' conceptualisation of curiosity in the context of the classroom. The findings suggest that teachers share a common understanding of curiosity as a powerful motivator for learning. In addition, the findings show specific behaviours and attitudes that curious learners exhibit. The themes that emerged are as follows: an inquisitiveness that extends beyond the boundaries of the classroom; curiosity as a desire for depth of understanding; self-motivation and a sense of autonomy over learning; a desire to form connections of concepts and make sense of learning; questioning as a sign of curiosity and teachers' difficulties in defining curiosity as a concept.

5.3.1 : Theme 1: *Inquisitiveness beyond the boundaries of the classroom*

Participants have a shared understanding of how curiosity manifests in learners, citing specific behaviours as indicators of curiosity. One such way is when learners display an inquisitiveness about their learning that goes beyond the confines of the curriculum. Watson (2015) states that the "inquisitive person is characteristically motivated to engage in good questioning" and notes that inquisitiveness is "a fundamentally motivating intellectual virtue" (p.273). Most participants reported that curiosity is about learners being inquisitive beyond the boundaries of the classroom, in which they desire to know more about certain concepts learnt. The seven participants cited used the word 'more' ten times in their responses indicating a common understanding that curiosity results in learners extending themselves further to supplement their learning. Teacher responses from interview data regarding this theme are reported below:

"I find that my more curious boys are the ones who prompt more questions; who want to be extended; who aren't necessarily satisfied with just the bare minimum." (Participant 1)

"I think a hankering to learn more and to investigate and to know more about something" (Participant 2)

"Curiosity is to have an interest - a real interest in something that you want to discover - you want to find out more – you're given a little information but actually you want more than that. Greater depth of insight." (Participant 3)

"The position of being interested in something and wanting to know more –I

would put it that simply.” (Participant 4)

*“... this desire to know more and obvious interest in what they're doing.”
(Participant 10)*

“Inquisitiveness...that innate feeling or emotion that one gets when they want to pursue more – to understand more.” (Participant 13)

*“I think the initial response would be one of wonder - we engage their attention - and then they might leave your classroom thinking about it, wondering about it, perhaps wanting to know more about it. Maybe asking questions - either back in your classroom or of one another or reading up about it. Wanting to know more about it than just that tiny little tidbit.”
(Participant 15)*

From the interview excerpts, it is evident that the participants identified curiosity as a desire or drive to seek more, experience more and know more. This extends beyond the requirements of the curriculum. Therefore, curious learners are those who ask questions, investigate, and seek further explanations beyond what is necessary to complete a task.

5.3.2 : Theme 2: Driven by a desire for depth of understanding

According to participants, curious learners are driven by a desire for insight and a depth of understanding. Deep learning enables learners to apply what has been learnt to other contexts as well as reflect, adjust, and challenge knowledge gained (Solvik & Glenna, 2022). Participants associate a desire for ‘deeper detail’, to ‘take things further’, to do a ‘deep dive’ and ‘digging deeper’ as behaviours that demonstrate curiosity in learners. Interview excerpts from seven of the fifteen participants are as follows:

“I think they will be asking questions; they're the ones who will be asking questions, wanting to know more; maybe wanting to go into deeper detail about things. Kids who are possibly doing some extra work and extra reading and researching and investigating. They act excited to come into your classroom and enjoy your subject.” (Participant 2)

“A curious learner is someone who given the opportunity will take things further. Somebody when he's allowed to do something, doesn't do it in a minimalist way. They want to explore –see that what they're doing is not just to appease the teacher and get the mark - it's because they've got this desire to find out more.” (Participant 3)

“When it comes to the definition of curiosity, it's where you've got certain information or you learn about a particular concept and you just want to dive

deep into understanding what the concept is about: does it have other connections, does it have other spheres which it can extend to? Curiosity is really about you trying to have a deeper understanding and wanting to know about a particular concept.” (Participant 5)

I think in the classroom it's probably a student who's not just accepting something procedurally ... it's the student who wants to understand why something is the way that it is rather than just OK teach me the rules and I'll follow the rules. Those who aren't just about “Is this for marks” and show an interest and desire to learn rather than just know for an exam.” (Participant 11)

“I would say it's wanting to know more about something; not just having information and knowing the information but digging deeper and being able to look at something deeply and more in-depth and explore the boundaries of that topic.” (Participant 12)

“Curiosity - I think it would be wanting to know, learn or understand more about something - anything – any element - so it sparks that interest which would make you want to learn, read understand, and know more about something.” (Participant 15)

Based on the interview excerpts presented above, it is evident that curious learners wish to move beyond basic knowledge towards a holistic understanding of a topic. Curious learners wish to move beyond the basics of understanding and explore ideas further. In addition, learners seeking depth of understanding wish to establish and understand connections in their learning and explore how the topic relates to other subjects, thus suggesting an element of transfer of knowledge.

5.3.3 : Theme 3: Self-motivation and autonomy over learning

Like early philosophers, Aristotle and Cicero (Loewenstein, 1994, p.74), participants understand curiosity as something innate and intrinsic. Curious learners are driven by understanding and knowledge as opposed to extrinsic factors like examinations, results or teacher approval. Self-motivation, defined as the intrinsic drive that initiates and sustains goal-oriented behaviours and results (Schunk & Di Benedetto, 2021), along with learner autonomy, described as the capacity and willingness to self-direct one's learning journey (Almusharraf, 2020), are traits commonly observed in curious learners. Most participants report that curious learners independently seek out learning opportunities. While these learners are motivated to

perform well academically, participants note that their desire to understand surpasses any extrinsic rewards. The participants stated:

"To be interested in the world around you. But I think what comes with that is this autonomous and self-generated interest in the world; it isn't something expected of you." (Participant 1)

"They want to walk through the door of your classroom – they want to come into your subject. You can see there is an intent to listen, participate, and ask questions. Asking "Sir, this is not on the topic but.." Actually, they see the link between what I'm teaching them and what is in the physical world around them." (Participant 3)

"I think it is an interest in what you want to do and what you want to learn. I'm only curious about things that I'm interested in so I'm assuming in terms of defining curiosity it's an interest and finding out more information about the thing you're interested in." (Participant 6)

"I've been thinking about that a little bit and I think for me it's a desire to explore new ideas and investigate things not necessarily with an end in mind but because it's more of a desire to learn almost for learning's sake. Sometimes it'll have a direct outcome; it'll relate directly to something but sometimes it's just interesting - I wonder why?" (Participant 11)

"... nonverbal cues can demonstrate curiosity. You've got those students who hang around and look at things in a laboratory - we've got stuffed animal bits or jars of all sorts of animals and skeletons and all that in the laboratory - you find a student whose lesson hasn't started -so it's in between actually - on the other side of actual formal teaching - that you might find the curiosity being demonstrated." (Participant 12)

"I think curiosity - to acquire knowledge and to sustain your knowledge of something, then you must find it out for yourself – you can't just be told it." (Participant 15)

From the interview excerpts above, it can be argued that teachers identified that curious learners have a sense of autonomy over their learning and make decisions to develop their understanding. Therefore, it can be indicated that the participants want to play an active role in their learning, thus finding out information for themselves as opposed to being given information. Thus, it can be concluded that learning environments must provide learners with opportunities to become interested and explore learning beyond textbooks and lessons.

5.3.4 : Theme 4: *Desire to form connections and make sense of learning*

The participants of the study argued that for curiosity to occur, learners must see the relevance of what they are learning and understand the significance of the subject in the living world. Learners must make sense not only of the content of a subject but more importantly, why that subject matters. Below are some of the participant's responses in this regard:

"I want each of them to have the desire to know more and better understand science beyond just the science in the textbook. To understand the world around them. I want them to see that what we're doing has relevance to their world and I want them to be curious about finding out more about – what makes this world tick and what's behind it all." (Participant 3)

"I believe that a subject like mathematics lends itself right there where you are initially given the concept – there are various parts of it and as you get to know more of it you realise it is much bigger than just a subject – it has other connections to other topics, and other subjects. It can apply to other problems as well." (Participant 5)

"I think when they can see economics in their own life - the manifestation of the theory - we're talking about, there's a light bulb moment - this is real." (Participant 4)

"The most common one, obviously kids especially with maths and anxiety around maths, and even just the performance expectations - it's a lot of "Is this for marks?" Those kinds of questions - not based on the content - Just what is the method; what is the recipe that we can do so that we can get this right? Whereas some classes I've taught with obviously highflyers or sometimes not necessarily high flyers but kids that are just passionate about the subject, they will ask why does this work. Why is this important? Why is this relevant? Those kinds of questions. The difference between how and why." (Participant 12)

From the interview results above, it is evident that participants believe that curiosity occurs when learners can identify connections between what they are learning in the classroom and the world around them. Therefore, it can be concluded that connections to other subjects, knowledge and lived experiences allow learners to make sense of their learning and to see it as something organic and applicable to their lives, thus fueling further curiosity.

5.3.5: Theme 5: Questioning as a sign of curiosity

According to Koutstall, Kendrick and Gonzalez-Brito (2022), questioning is a clear indicator of curiosity; by asking a question it is evident that learners have identified a gap in their knowledge. By asking quality questions, learners are active in seeking missing information thus leading to greater understanding and retention. Participants of the study noted questioning as a clear indication of learner curiosity. Some of the interview excerpts from the participants are reported below:

"If they're asking questions then I assume that they're curious." (Participant 4)

"Initially, they will ask questions like: Why? How? When will this be used again? Students like that show curiosity." (Participant 5)

"...very engaged. Lots of questions. Just very engaged with a questioning mind and want to know more." (Participant 7)

"Why am I here? What am I going to do? What is going to happen after this? Why do I do this? Will I gain anything or learn anything? There is a link between curiosity and expectation." (Participant 8)

"I would say it's probably around asking different questions, but I think that also sometimes the more they're comfortable with grappling with something that they're struggling with rather than just going I don't know how to do this, I need help - tell me the answer." (Participant 11)

"Definitely, lots of questions, hanging back and making sure that they're getting things right, and that they're doing more on top of that; that they're going away and looking at things beyond what we've done in the classroom and coming back with interesting information that they maybe have read up about or learned about. Telling me about discussions that they've had with people. They want to know more and to understand more about things." (Participant 12)

"Asking questions and just being around when they don't have to be." (Participant 14)

From the interview excerpts above, it is evident that most participants highlight questions aimed at understanding information and gaining insight, whereas other participants do not make this distinction. It remains unclear whether the questions posed by the latter group pertain to task completion or are geared towards enhancing learning itself. Despite the widespread recognition among teachers that questioning serves as a clear manifestation of

curiosity, there appears to be a gap in explicitly instructing learners on the art of posing quality questions. Thus, it can be concluded that questioning empowers learners to independently navigate their learning, engage with complex concepts, and attain deeper comprehension of the material being taught. Thus, teachers must create an environment within classrooms that fosters questioning. Moreover, teachers should equip learners with the requisite skills and vocabulary to formulate quality questions.

5.4 : Findings on the factors that influence teachers' adoption of curiosity in the classroom

The study explores the factors influencing teachers' adoption of curiosity within the classroom across three selected independent schools. Analysis of interview data reveals several key factors shaping a culture of curiosity within these schools. The major themes and sub-themes on the factors influencing teachers' adoption of curiosity in the classroom are the teacher-related factors (sub-themes: *teachers' pedagogical approach, self-perception, personal interests and experiences*); the learner-related factors (sub-themes: *learner engagement, sense of belonging, peer response to curiosity*); school-related factors (sub-themes: *school structures and systems, curriculum requirements, attainment scores vs deep learning, the physical environment and the availability of resources, opportunities for professional development and the sharing of good practice, opportunities to be curious outside of the classroom*); the community-related factors (sub-theme: *parenting style and expectations*). The themes and sub-themes on factors that influence teachers' adoption of curiosity in the classroom are presented in Figure 1 below.

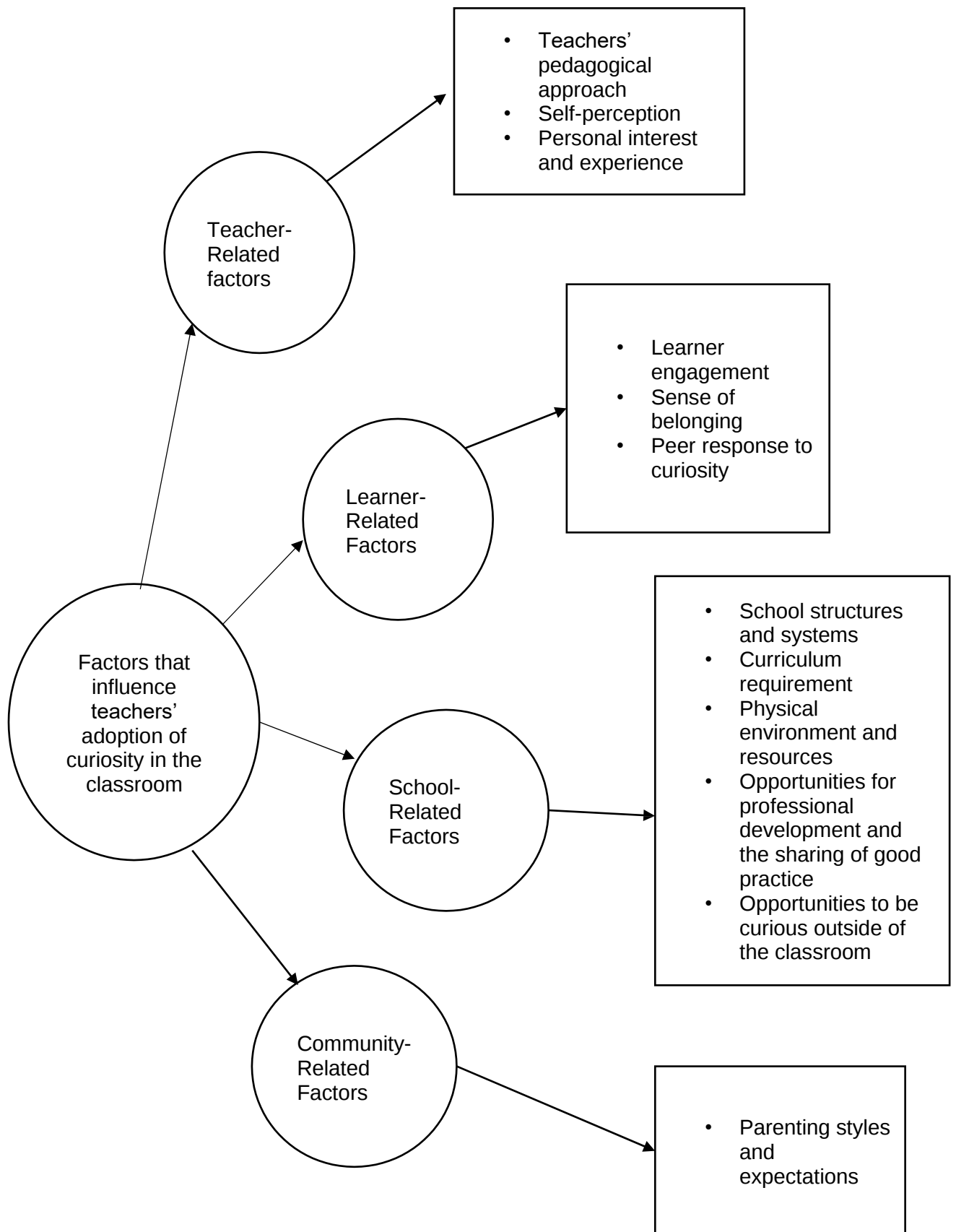


Figure 1: Themes and sub-themes on factors that influence teachers' adoption of curiosity in the classroom (Source: Analysed Primary data, 2024)

The main themes and sub-themes are presented and discussed as follows:

5.4.1 : Theme 1: Teacher-Related Factors

Teachers play a vital role in engaging, enthusing, and guiding learners. (Allen Pianta, Gregory & Mikami, 2011). Thus teacher-related factors, the beliefs and behaviours of individual teachers, are a crucial factor in determining positive academic outcomes. The study findings indicated that teachers have an appreciation for the fundamental role of teachers in fostering curiosity within the classroom. The findings revealed three significant teacher-related factors namely, the teachers' pedagogical approaches, their self-perception, and their personal interests and experiences. These sub-themes on teacher-related factors are discussed below.

5.4.1.1 : Sub-theme 1: Teachers' pedagogical approach

A teacher's pedagogical approach comprises many facets, including methods of learner engagement, content delivery, assessment strategies, classroom culture, and behaviour management techniques (Ko & Sammons, 2013). These factors play a crucial role in determining whether a classroom environment fosters curiosity among learners and encourages them to engage with curiosity. The study's findings reveal several significant characteristics and approaches highlighted by participants as essential in cultivating curiosity. The interview excerpts from participants on teachers' pedagogical approach are presented as follows:

"I often find that when boys see a teacher being vulnerable, it opens the door for them also to be vulnerable..." (Participant 1)

"I'm quite a calm person; I don't get flustered that easily. I try to make my classroom a calm environment so students know that they shouldn't be shouting and noisy and loud and that kind of thing." (Participant 2)

"For me, there's a lot about human connection. I make a lot of jokes because I want to be like we're on the same page here. On a course I did there was the 'joint construction of knowledge' but the idea is - neither of us knows anything - how do we build together to a theory? I like the idea of it being collaborative. I am going through the process with them." (Participant 4)

"I will start creating that little bit of curiosity in the classroom because I am already curious. If there are sets of questions that I have prepared, I will try not to solve the problems myself before the guys do it themselves – I will do it with them in real-time. It helps because it places me almost at the same level as the students. I am seeing it for the first time and am engaging with

the same thinking process as the students are thinking through.” (Participant 5)

“Funny, and unpredictable. I’m so unpredictable – I look at the kids I have now. I always look at my kids and my approach is always different and I change content and style based on the class in front of me...” (Participant 8)

“I’m loud and I dance, I’m vibrant and energetic. I love teaching literature and key themes and real-life situations.” (Participant 9)

I do think that there's no doubt that someone who is more authoritarian, and students battle to speak to them, might stifle curiosity. Teachers feel they need to cover x amount of work, and then test that work because that's an indication of a job done. If I've covered this, I might not have time, or the inclination, or the desire to allow for the space for curiosity to be fostered in the classroom. Those types of teaching methodologies and approaches won't be helpful. Teachers that welcome questioning, that welcome challenges, that welcome changes in the direction of their learning that aren't necessarily in the curriculum.” (Participant 13)

“I think if I can convey my interest in a way that seems genuine to the students, they are more likely to be interested in it, with me. I think, whether it's the adrenaline spike from a teacher coming and popping their head over your shoulder or perhaps when you're modelling your own curiosity. I also try to ask questions that deal with the subject as they view it. Almost to engage with them on their level.” (Participant 14)

“You have to be very intentional about it – it's easier to just deliver the information. I walk around all the time, ask everybody a question, and get them to do a whole variety of activities. Take out a pen, you must write this down. Talk to the person next to you or turn to the person behind you - to keep them engaged. But if I'm tired, then I just deliver the content which is a pity.” (Participant 15)

From the interview data presented above, the findings suggest that classroom management shapes the curiosity learners may exhibit towards a subject. Thus, a calm, welcoming and safe environment promotes learner engagement and thus curiosity. On the other hand, the findings also indicate that some teachers warned against the stifling effects of an overly authoritarian teaching style, which can discourage learners from posing questions and,

consequently, dampen their curiosity. Additionally, the findings indicate that teachers who express openness, authenticity, and a willingness to show vulnerability foster a learning environment where students feel empowered to express interest, inquire freely, and take risks in their learning. Moreover, other teachers identified the role of humour in creating a learning atmosphere filled with enjoyment, thereby enhancing the learners' engagement and pleasure in the classroom. Modelling inquiry and knowledge construction by working through problems or tasks with learners is another effective approach used to foster a greater sense of curiosity in the classroom.

5.4.1.2 : Sub-theme 2: Teachers' self-perception

A teacher's self-perception, shaped by their beliefs and attitudes towards their profession and classroom role, is influenced by various factors including their personal experiences, the societal value assigned to their profession, interactions with learners, directives from school leaders, and expectations from other stakeholders like parents (Makovec, 2018). From the interview excerpts, the findings suggest that a teacher's understanding of their role and their values significantly affect their classroom approach, which in turn impacts the learning experience of the learners. The interview excerpts below further underscore the importance of teachers' self-perception in fostering curiosity within the classroom setting:

"As (school name) teachers, maybe all teachers, you're under pressure to perform at a high level – there's this expectation – I think we put a lot of pressure on ourselves. We have to be careful that that doesn't impact our behaviour or how we come across inside the classroom. If I just walk in and say 'Get out your books, where were we last time ..' There will be no interest and no curiosity. (Participant 3)

"I have always been a curious person – I have always wanted to know stuff. Having a curious nature of wanting to know more, mainly in the field of maths and science and technology, is something that I think helps with the job that I have with teaching guys maths. Therefore, in the way that I get to teach the boys because of my curious nature, I am always trying to figure out what is the best way of teaching this topic / what is the best way of asking that question." (Participant 5)

"When you work in a place where you are trusted to do something, you find yourself just doing it without any hassle. Comparing myself from when I first came here, I would say that I'm a pro!" (Participant 8)

“My teaching style – I am curious myself. Coming from a deep rural area, I always ask things like how are you, and how did you grow up especially if it is related to what we are doing. So, my personality does influence curiosity.”
(Participant 9)

“I like experimenting and trying different things and I do believe that teachers are lifelong learners so there's always room for improvement.” (Participant 10)

“I like to think that I'm a fairly curious person and do things to expand my general knowledge because it's something that I'm interested in or because I think it's important to understand. So hopefully I find ways to more effectively translate that into a classroom environment.” (Participant 11)

“I think that I'm somebody who always likes to experiment and change – a lot of people like to do the same work again – I like a lot of difference and change, I'm not scared of that. I like to talk to others to find out how they do it - could I do it better? This is not working for me – everybody's bored... When I'm under pressure, then I just deliver the content.” (Participant 15)

From the interview excerpts, the concept of viewing oneself as a lifelong learner also emerged prominently from the discussions, as some teachers emphasised the significance of ongoing learning, reflection, and experimentation, seeing their profession as ever-evolving rather than static. This stance is crucial for modelling curiosity to learners and encouraging them to perceive learning as a continuous process. The findings also underscore the critical role of teachers in capturing learners' attention, sparking their excitement, and making learning a memorable experience. Teachers understand that their approach to teaching a subject and the enthusiasm they convey for their discipline significantly influence learners' experience and perception of the subject. Thus, the findings of the study underscore the importance of school leaders and other stakeholders in acknowledging teachers as competent professionals, capable of autonomously managing their classrooms and making informed decisions about their teaching practices.

5.4.1.3 : Sub-theme 3: Personal interests and experiences

Teachers' interests and experiences influence their approach to delivering the curriculum. The findings suggest that interest and experience inform the examples, analogies, and anecdotes teachers select to explain concepts and can affect the emphasis placed on different curriculum areas. According to the participants interviewed, a teacher's own interests and experiences not only shape their curiosity towards various facets of the curriculum but also impact how

learners respond to these elements. The responses offered by teachers on this theme are detailed below:

"I suppose there are certain sections that I relate to and I'm more curious about myself and that would probably impact my ability to engage the students and get them feeling enthusiastic and curious about a particular section. I think it comes down to whether that particular section is a favourite of mine, and I've got a particular interest in that - that I think is going to influence my level of enthusiasm and how I try to get the kids engaged and curious and thinking about things. I think bringing in real-life examples that I've experienced - so situations from my travels or whatever and trying to bring that in and relate my real-life experiences to try and develop curiosity within the students - relevance - making it relevant." (Participant 2)

"I think they feed off my excitement. Where it's political economy and we're looking at inequality in South Africa or labour market topics - I feel quite strongly about that, so I can go on these rants. I think yes but I think I'm quite lucky that I do enjoy the whole syllabus - there are a few sections which I can't stand - I treat them differently as in these are hoops we have to jump - very much this is what you need to be able to do to pass the exam." (Participant 4)

"I am very passionate about certain things. There are some things I don't like teaching and some things I could teach all the time. In terms of planning, if you are passionate about it, you plan thoroughly and can come up with ideas more easily. Whereas if you're not, ... I had to do conversational Zulu for grades 6 and 7 and because there were no assessments, I felt all the time when I went there, I was drained." (Participant 9)

The interview results presented above highlight the impact of teacher interest on the enthusiasm they demonstrate towards different facets of the curriculum. Teachers are energised and enthused by sections of the curriculum that resonate with their personal interests and experiences, leading them to create stimulating lessons centered around these topics. Thus, it can be argued that while experience and interest undoubtedly contribute to a positive pedagogical approach and learner enthusiasm, teachers should exercise caution against overlooking curriculum areas that could be valuable to learners, both in terms of academic outcomes and in fostering learner engagement.

5.4.2 : Theme 2: Learner-Related Factors

Learners are active participants in their learning, engaging both individually and collectively to shape various aspects of the learning environment. Their involvement influences pedagogical strategies, teacher-learner dynamics, academic outcomes, and peer relationships, all of which are important in fostering curiosity within the classroom. The interview excerpts on the learner-related factors highlight the following sub-themes: learner engagement, a sense of belonging, and peer reactions to curiosity, which are discussed below.

5.4.2.1 : Sub-theme 1: Learner engagement

Learner engagement, along with their responses to the teacher, subject matter, peers, and their overall contribution to the classroom atmosphere, shapes teachers' strategies for cultivating curiosity. Key findings include variations in interest areas among learners, tendencies towards passivity, and the necessity for diverse and interactive activities. The findings gained from participant responses in the interview data are detailed below:

“They have a different passion for the subject and a different level of excitement for the subject. Sometimes, I find that your top guys just want to get the marks, they are not interested in the concept or you have your top guys who are trying to understand how this calculus works - because now they’ve started reading somewhere that calculus is fundamental to all mathematics and how much further they get into researching the possibilities and what they can do with calculus fosters that.” (Participant 5)

“In a subject like physics, you’ll become disinterested quickly because you get frustrated that you don’t understand - it becomes difficult if I’m just talking because you’re not practising and without practising for the subject physics you are not going to get it.” (Participant 6)

“I think that if you just provide all the content and information, it doesn’t stimulate any curiosity- so there has to be some discussion and I try to keep it amongst themselves so then you have everybody engaged; a question to talk about; perhaps a little bit more movement. I think boys need diverse and more activities - they have to be more involved. I was amazed at how much boys enjoy a large sheet of paper and coloured pens. I never thought that they would enjoy that. They liked the movement of it and that discussion and the activity - so I think that works well. Instead of trying to tell them everything rather say - Act one - draw something - use colour - talk about it amongst yourselves - have a pictorial representation.” (Participant 15)

From the interview results above, it can be argued that learners exhibit varying levels of enthusiasm towards their learning experiences, as expected. However, this variability presents a challenge for teachers, as noted by a teacher who emphasised the importance of engaging the entire class effectively. In addition, a teacher raised concerns about learner frustration, particularly when grappling with challenging concepts, underscoring the necessity of maintaining learner engagement beyond passive listening. Therefore, the findings underscore the importance of adopting diverse and active teaching strategies to ensure the continued engagement of all learners.

5.4.2.2 : Sub-theme 2: Learners' sense of belonging in the classroom

Belonging in the classroom is characterised by a sense of individual acknowledgement, acceptance, and inclusion (du Toit-Brits, 2022). Teachers play a crucial role in cultivating this sense of belonging by nurturing relationships with and among their students and by implementing teaching methods that encourage active participation and contribution from all learners (Keyes, 2019). The teachers interviewed emphasised the significance of learner belonging as a determinant of their willingness to engage in learning, ask questions, and seek additional learning opportunities, thereby shaping their curiosity towards a subject. Participants reported the following:

"If they're feeling comfortable; I think it allows them to feel more comfortable about asking questions. So trying to make the students feel relaxed in my classroom and open so that they can actually ask questions and not feel ashamed to ask questions or embarrassed. I try to make it an environment where each boy feels comfortable; making kids feel that every question is an important question; it's not making people feel like they're asking a stupid question. It makes them feel comfortable that they can ask anything." (Participant 2)

"On a Monday morning – my classes know – quick whip around the class – team results from Saturday. It takes two minutes but they like it. They like it because it means I'm connecting with them. That I'm showing an interest in their world. Then they're more likely to show an interest in the world that I'm representing which is Science. More and more I'm learning in teaching, I know it's obvious, you need to be interested in your pupils, and more and more that's a goal for me – to get to know them a little bit better." (Participant 3)

"I don't want them coming up to the board and getting it wrong and then feeling bad – that's the positive of being at this school as the girls are all

friends – they don't feel shy; they are happy to get it wrong in front of each other; they're happy to for each other to help.” (Participant 6)

“Relationships do help and I show interest in the girls – I'll ask them questions - just foster that interest, the trust and hopefully it leads to curiosity.” (Participant 10)

From the interview excerpts, it can be argued that, when learners feel relaxed and comfortable in the classroom, they are more inclined to participate actively by asking questions and offering answers. They perceive the environment as conducive to taking risks, where their contributions are valued. Thus, the findings demonstrate how cultivating sincere personal connections can serve as a catalyst for nurturing curiosity within the classroom.

5.4.2.3 : Sub-theme 3: Peer response to curiosity

Peer relationships are very important to young people. How peers react to a learner's participation in the classroom can significantly influence their future engagement in learning. Teachers need to cultivate a classroom culture where peers support each other's contributions and respond positively. Nevertheless, as highlighted by the excerpts below, achieving this remains a challenge, and negative peer responses can hinder learner curiosity.

“There can still be a stigma of being vulnerable isn't cool. Caring too much, you know, that's not the done thing. And you see it, you see boys who are trying, and they get a reputation of being a try-hard. I have a guy who listens intently but he has never participated in my class...That fear of saying something wrong and then being deemed stupid.” (Participant 1)

“Maybe just the general work ethic or the lack of it at the school doesn't lend itself to fostering curiosity. It's seen as it's not cool to be curious, to ask questions, to do well and to want to research and do extra work.” (Participant 2)

“I think you do get those social groups where it's not cool to try and then you get the high achieving social groups – like that A-level group last year - they got social capital from getting good marks and being interested and trying to get into top universities. Then you'll have other groups where that's not the case – in that, they just don't try as hard.” (Participant 4)

From the interview excerpts, teacher participants underscored the negative impact of peer responses on learner curiosity. The stigma around effort and diligence in class may deter learners from openly expressing their curiosity. One teacher noted that streaming, where

learners are grouped based on academic performance, can positively affect curiosity, namely in top-achieving classes. However, he failed to consider the potential negative impact on lower-performing classes, where there may be less modelling of curiosity and interest, thus adversely affecting academic outcomes. Teachers need to create classroom environments where learning and academic achievement are valued, peers encourage one another to ask questions and display interest.

5.4.3 : Theme 3: School-Related Factors

Schools are intricate environments characterised by many interconnected factors that shape the teaching and learning processes, ultimately impacting the cultivation of curiosity within the classroom. Among these factors, the physical infrastructure of the school, its policies and procedures, the leadership framework, class sizes, timetabling, and the organisation of the school day, as well as the adherence to curriculum and assessment standards, all exert significant influence on pedagogical approaches and learner engagement. Extracts from interviews with teacher participants highlighted five notable school-related factors: the organisational structures and systems within the school, curriculum requirements, the physical environment of the school and the availability of resources, opportunities for professional development and the sharing of good practice, and finally, opportunities to be curious outside of the classroom. These sub-themes are discussed below.

5.4.3.1 : Sub-theme 1: Organisational structures and systems

Schools inherently operate within structured frameworks, relying on timetables, bells, and the careful following of schedules. Participants noted that the duration of lessons, the time of day when lessons occur, and the number of lessons per day impact the cultivation of curiosity within the classroom. Excerpts from participant interviews discuss these points:

“Maybe the time that they have in our classrooms. Maybe if they had more time, there might be more opportunities to be curious. Whilst we are rushing to get through a section in a 45-minute lesson, if we had an hour, we don't need to rush and it will allow us to go deeper and go off on slightly different avenues rather than rushing.” (Participant 2)

“You want to cash in when you've got earlier lessons and I am aware of the weather. I know if I've got period 5/6, expect less, do less. Don't expect curiosity and a real desire to learn late in the day. Early in the day is better. Late, especially on warm days. I will give a test in period 6 because I would consider it a waste of good teaching time to give a test earlier in the day.” (Participant 3)

“When kids are in the habit of being shepherded from one class to the next to the next - and it's like forget about the math stuff, now we're talking about Afrikaans and now you got to be curious about Afrikaans - it's quite hard to switch your attention and your curiosity.” (Participant 14)

Based on the interview excerpts, it is apparent that both the duration and frequency of lessons within a school day can influence learner curiosity. Short lessons can restrict opportunities for a deep exploration of ideas. Moreover, the transition between classes throughout the academic day can impede learner engagement. Constantly shifting focus can compromise the depth of understanding and concentration. In addition, teachers need to consider the timing of lessons, leveraging earlier lessons where learner focus and engagement are higher for in-depth exploration and reserving later ones for procedural tasks.

Participants 1 and 4 highlight the lack of ‘downtime’ for learners as a factor that influences curiosity. This is particularly relevant in a boarding school context where learners' schedules are regulated throughout the day, leaving little time for relaxation and boredom.

“There is an association of downtime with messing around in a boarding environment and so to mitigate messing around, they take away downtime and so then, your entire life you are doing something - the entire time. So, then you do your music, then you do your sport, then you do academics and then it just goes and goes. I think that curiosity might be dulled because sometimes curiosity comes when you're bored and you become interested in things when you're bored because there's nothing else to do. I think that we don't allow our boys enough downtime to just be bored.” (Participant 1)

“The volume – the fact that they are supposed to be doing something all the time. They don't have much time to think – what about this – not to say that they necessarily would, but some boys would think about things and come back with questions about XYZ. I think they are less likely to do that because – if you look at their day – when are they going to have that thought?” (Participant 4)

The interview results above suggest that the demanding schedules commonly found in boarding schools leave little space for boredom, a state that often catalyzes learners to explore new interests and explore topics of curiosity. The findings underscore the notion that overly regimented school structures can impede the development of learner curiosity.

5.4.3.2 : Sub-theme 2: Curriculum requirements

The three independent schools participating in this study operate under the Curriculum Assessment Policy Statement (CAPs) as outlined by the Department of Education. Each institution administers Grade 12 examinations through the Independent Examination Board (IEB), with one school offering students the choice to follow an international curriculum during Grades 11 and 12. While recognising the autonomy afforded to independent schools, particularly in junior grades (Grades 8 and 9), to adapt and enrich the curriculum, participants expressed a sense of being burdened by the volume of work in the senior grades, especially Grades 11 and 12. They conveyed a feeling of constraint, noting the challenge of stimulating curiosity and exploration among learners while under pressure to cover the extensive syllabus, summarised by Participant 12's remark on the need to just "churn out" the syllabus. Participants reported the following:

"We're very regimented in what we have to do and the syllabus is very tightly packed and there's this sense that you've got to move on – there's never enough time. Time to explore and experiment and develop your curiosity and take your curiosity further doesn't exist in Science. We are restricted by the constraints of the curriculum and externally we're also told that compared to other subjects it's very full and very demanding. More time would buy you opportunities to experiment more, and demonstrations." (Participant 3)

"We have to get through a certain amount and I'm just afraid that we're not - and that's on me but this is my first-year teaching so I don't know how much time we need for each section. I don't want to give up one of my lessons for a practical where we could be learning something that we going to be writing an exam on." (Participant 6)

In Grade 11, you have to start the matric syllabus so that you will finish the matric syllabus. There are a lot of assessments in matric. There are lots of poems, orals, drama and literature. You have to read with them in class so that they will understand. That takes time. You have all these portfolio assessments that you need to do. (Participant 8)

I think I think the curriculum and the assessment requirements do to some extent stifle curiosity because at the end of the day - particularly as you get into the senior seniors - you are to a fairly large extent - teaching to an exam. To get them over the line at the end of an exam. And it's busy – I know that it's not unique to Maths. There's a lot to get through and limited time in the classroom. So, you do unfortunately spend a lot of time just getting through

stuff. (Participant 11)

“Unfortunately, because we are so time-restrained, especially in Maths, where we have to get through the syllabus because they have to write the exam, I find that by the time we're getting into matric, it's just about getting the syllabus churned out. With my subject, there's a lot of practice that has to go in behind the scenes and on their own, and so it tends to be a time-consuming subject.” (Participant 12)

The interview excerpts above indicate that teachers feel burdened by the scope of the syllabus and the number of portfolio tasks that are required. This strain not only hampers their ability to deliver lessons creatively but also limits the time available for practical instruction. These findings collectively suggest that the dense workload in the senior grades acts as a barrier to creating a learning environment that nurtures curiosity, with the prioritisation of examinations and results taking precedence.

Despite the restrictions encountered in the senior grades, participants highlighted several positive facets of the curriculum, notably the freedom granted in the junior grades. This flexibility enables teachers to customise learning experiences in ways that engage learners. Participant 7 stated that:

“We're very lucky as we are given free rein in the junior grades to choose whatever topics we want to do so that's helped with curiosity. We're not restricted. We've tried to look at topics through a skills-based approach: what skills do we want them to gain and then we find a topic that we think will interest them.” (Participant 7)

This suggests that enthusiasm and interest are fostered by identifying essential skills for development and selecting topics based on learners' interests. Participant 12 emphasised the prioritisation of problem-solving and inquiry-based learning activities in the junior grades, thereby nurturing a keen interest in the subject matter.

There's more space, there's more scope in the lower grades to be able to do out-the-box type of things – to have them do some problem solving where we're not standing up and teaching them, where they can figure things out themselves.” (Participant 12)

One school has developed an alternative optional programme for Grade 9 learners as described by Participant 13 below:

“From the Future Fit Programme, we've shown that doing something transdisciplinary and thematic fosters more curiosity than doing something

subject-specific. I think there might be a reason for students feeling - I don't want to ask this because it's not strictly science - it's not life sciences. I think transdisciplinary school-based structures that promote transdisciplinary work will generate curiosity.” (Participant 13)

Based on the excerpt above, a transdisciplinary approach to curriculum delivery can enhance curiosity by offering learners a wider perspective beyond subject-specific confines. This method encourages questioning and enables learners to draw connections across different areas of knowledge, thereby enriching their learning experience. Thus, it can be concluded that approaches such as transdisciplinary learning, problem-solving activities, and integrating topics of interest through a skills-based framework are instrumental in amplifying learner curiosity.

5.4.3.3 : Sub-theme 3: *The physical environment of the school and the availability of resources*

The three independent schools involved in this study are notably well-resourced, a fact acknowledged by the participants who recognised the impact of the physical environment and the availability of resources. From the interview excerpts, two key findings regarding the cultivation of curiosity were discerned: the importance of intentional utilisation of the available resources and the necessity for classrooms to be not only purpose-designed but also welcoming. Excerpts from the interviews obtained from participants are reported as follows:

“My classroom is a lecture theatre style which can become very lecture-like - in terms of university level. Although we are preparing them for that, we're not there yet so we do a lot of sitting on the grass sitting in front of the class. In terms of the physical classroom, I think it's the teacher's job to use that – it's just time.” (Participant 6)

“I think the physical environment definitely comes into it. My classroom is a prep classroom so it is quite dire really and I do think that the environment does play into it. It's very bland and the desks are scratched and the chairs are written on. When I started, I hit the ground running but I do think things like that are important to me. To mix it up and have posters up on the wall - that relate to things that aren't necessarily in the curriculum. Maybe it's only one student who has a look at it and comments on it and that's okay. To mix it up a bit and change things so it's not the same thing day after day.” (Participant 11)

“A boy coming in to see skeletons and snake jars will stimulate and foster some curiosity in some students.” (Participant 13)

Based on the interview excerpt above it is evident that the physical environment of the classroom influences both the style of teaching adopted as well as the learners' responses to lessons. A teacher who teaches in a lecture-style venue finds herself inclined towards a lecture-centric approach due to the physical setup. Despite recognising the important role of a welcoming and engaging classroom environment, teachers report time constraints hampering their ability to fully optimise their spaces. Moreover, intriguing objects or visuals can foster curiosity among learners. Thus, underscoring the importance of classroom spaces being adaptable to accommodate various teaching methods and designed to captivate learners' attention, fostering a sense of wonder and engagement.

Participant 6 highlights the importance of being intentional in utilising available resources; this is echoed by Participant 12, who describes the resources available to them:

"I think in terms of the environment that we have here at the school, I think we have a lot of opportunities to do things differently as well. We have places like the centre we're sitting in where we can come and do something different. For instance, we can say we are doing volumes and surface areas, and we can come and bring them to the Lego and build the shapes. They can start developing their own shapes and working out their own things. I like the idea of having something tactile to work with so we'll cut out the shapes and make the box and then they have to work out the dimensions and things and write it on there so they've got a physical product that they can do. We have the resources in that way in the school." (Participant 12)

The interview excerpt above underscores the importance of creative, purpose-built spaces in facilitating tactile and exploratory learning experiences for learners. Such environments not only aid in comprehending abstract concepts but also foster deep understanding. Nonetheless, despite having access to resources and innovative spaces, teachers may sometimes fail to capitalise on these opportunities due to time constraints or other factors, such as being new to the environment.

5.4.3.4 : Sub-theme 4: Opportunities for professional development and the sharing of good practice

Professional development takes various forms, as evidenced through interviews with participating teachers: extended courses, seminars, online programmes, staff meetings, and collegial conversations. It provides teachers with the space, knowledge, and tools necessary

for reflecting on and refining instructional methods, all with the goal of enhancing learner outcomes. The interview excerpts showcased in this section of the findings emphasise the significance teachers attribute to professional development. They also illustrate how opportunities for learning and self-reflection on pedagogical approaches shape their endeavours to foster curiosity in the classroom.

“We have a Maths meeting every week. The one week is used for admin and the other week we focus on understanding other parts of our curriculum and how we get the students to understand the work. So we would start first from a teacher's perspective: for example, here's a topic of trigonometry - how would you guys teach this? That's what our head of department is quite good at. What do you think are the five key points that we should get our students excited about? What do they need to know? How can we get them to research even further by themselves? How do we prompt them to have a deeper understanding of the concepts that we have? I think that is part of the things that we do as a school that are important.” (Participant 5)

The excerpt above suggests that the sharing of best practices within both departmental and broader subject communities can significantly benefit pedagogical practice. Engaging in discussions concerning subject content and pedagogical approaches provides teachers with ongoing informal opportunities for professional growth, as exemplified by their involvement in platforms like the WhatsApp group mentioned.

Participants 7 and 8 have gained significant value from an online professional development programme that their school has subscribed to. Interview excerpts reflecting on this process are below:

“Purple ZA - It's an online programme that has topics like mastering technology in your classroom and so much useful information and then each topic has chapters that you have to write a quiz on each time. There are also things on fostering curiosity, Google Classroom, Teams classroom, digitising your classroom, putting your texts online - amazing, amazing programme and it's South African based. All staff are given an hour a week for us to work on it and then in your free time as well. We've got amazing ideas from this programme.” (Participant 7)

“With Purple ZA, I've learnt what other teachers are doing. I only started to use technology here, for the past 16 years it was just a pen and a book. Now it has changed a lot since I came here. I've learned of all these other tools. I am a different teacher from 2017 when I started here.” (Participant 8)

The findings above indicate that the programme has several benefits, including enhancing teachers' capacity to integrate technological tools in their teaching, raising awareness about fostering curiosity among learners and exposing teachers to alternative pedagogical approaches. Notably, the school demonstrates a commitment to teacher learning by allocating dedicated weekly time for engagement with the programme. Effective professional development programmes can have a profound influence on teachers' efficacy and practice.

5.4.3.5 : Sub-theme 5: Opportunities to be curious outside of the classroom

Learning does not only occur in the classroom and several participants noted the important role that extracurricular activities play in fostering learner curiosity. Whilst these activities can sometimes impact teaching time, some participants reported that the benefit of exposing learners to a range of experiences far outweighs the time lost in the classroom. Interview excerpts are as follows:

“Instilling curiosity isn't confined to the classroom. All the other things that keep the learners so busy outside of the classroom also have massive value. In some ways, those are probably things that more naturally instil curiosity. Opportunities to have guest speakers coming to talk. The senior boys have a programme for the top boys in each grade to attend some sort of talk twice a term in the evening. Some of the cultural activities around public speaking and debating, toastmasters all those things I think are incredibly valuable. There's always that tension in terms of saying that we lose time in the classroom - which is true - but when you look holistically I think the value outweighs the loss of teaching time.” (Participant 11)

“I think there are so many opportunities for these kids to get involved in different aspects of the school. They try to make a lot of opportunities for them to get off campus and go and do different things: they have a diving society; they have a barista society; they have a film appreciation society; a first aid society... I mean pretty much you're going to find something that you're interested in.” (Participant 12)

“Structures of extracurricular and extramural are massive in our independent schools – your outdoor education – is huge – because it's place-based education - there are going to be questions that will be asked that are genuine -from a place of curiosity. Sport, and culture all add to that in the classroom.” (Participant 13)

The study findings above showed that teachers not only encourage curiosity within their subject area but also encourage learners to be curious about the world around them. Thus, teachers aim for learners to explore diverse interests beyond academics, fostering personal growth. Authentic hands-on experiences play a valuable role in nurturing genuine curiosity and providing opportunities for inquiry both within and beyond the classroom.

5.4.4 : Theme 4: Community-Related Factors

The broader school community incorporates various stakeholders, including the board of governors, parents, alumni, community leaders, and neighbouring schools. These groups have considerable influence over the school's culture and ethos. Participants in this study acknowledged the important role parents play in shaping learners' values, approaches to learning, and interest in the world. Their responses on parenting styles and expectations, collected from interview excerpts, are outlined below.

5.4.4.1 : Sub-theme 1: *Parenting styles and expectations*

The findings indicate that a crucial factor influencing learners' curiosity is their family background. Learners whose parents foster open discussion, nurture an interest in the world, and encourage questioning are more likely to exhibit similar behaviours in the classroom. The findings indicated that parents who 'help them find solutions' (Participant 2), 'are interested and talk to the kids' (Participant 4) and who 'engage and talk about current affairs' (Participant 10) instil in their children an appreciation for learning and the practice of inquiry and knowledge construction. As per the insights shared by teacher participants, these values directly impact how learners approach the learning process within the classroom. The interview excerpts on this theme are stated below:

"I think a lot has to do with the upbringing and their background - whether it's being stimulated at home. If they ask a question to their parents and it is just shut down or if the parents are involved in helping them to find solutions or the answers to problems." (Participant 2)

"What affects their response - almost always is the family - like if they have those discussions at home then they're going to be curious about it in the classroom. If they don't that's almost a 100% predictor. If the parents are interested and talking to the kids, the kids will be interested. That's that's a major thing." (Participant 4)

"We can only do so much and it's up to them - whether they come from a household that has meals together and speaks and is engaging and talks about current affairs. I think that does give the child the edge where they are

comfortable around others and talking about ideas and have general knowledge. I guess it does depend on the child and the environment in which the child grew up and whether they have been exposed to the world.”

(Participant 10)

The above excerpts highlight the negative effect of excessive parental pressure on young people. A teacher notes that this pressure can stem from family tradition, where there is a legacy to uphold in a specific school, or from being the first in the family to attend an ‘elite’ institution. Interestingly, this pressure is reported to inhibit learners’ curiosity, as they often feel pressured to prioritise subjects aligned with business interests rather than pursue their passions freely. Consequently, they may suppress their interest in exploring areas they are passionate about. The interview excerpts in support of this theme are presented below:

“Some boys have the weight the world put onto their shoulders by their parents ... or boys who are maybe the first to come to a school like this, have their own pressures that are put on them. So maybe this can deter curiosity in that boys tend to, and this is also having worked in the art department, boys tend to silence or mute any kind of desire to just throw themselves into something that they’re passionate about because they’re nervous that that will detract from the real subjects: maths, science, accounting, economics and the end goal which is to run the business or be the next millionaire.”

(Participant 1)

“There are a lot of parents who are of the view that you just have to teach their child what they need to know to get their A. Don’t do anything to create a sideline. Not everybody gets the fact that your education is a whole lot more than just marks.” (Participant 11)

From the interview excerpts above, it is evident that enrichment activities, not directly tied to curriculum requirements, are often perceived as a ‘sideline’ with little value attributed to them. However, it’s these enrichment-type activities that provide opportunities for learners to make connections and observe abstract concepts in action. Parenting styles and expectations can exert both positive and negative effects on learner curiosity. When learners are exposed to rich discussions and genuine interest at home, their curiosity is nurtured. Conversely, excessive and rigid parental expectations regarding their child’s performance can have damaging consequences, stifling the natural curiosity of the learner.

5.5: Findings on how teachers understand the importance of curiosity in improving learning outcomes

The study also examined how teachers understand the importance of curiosity in improving learning outcomes. Learning outcomes are the knowledge, skills, abilities, attitudes and understanding that learners have gained as a result of engaging in the learning process (Adam, 2004 as cited in Dias, 2018). Thematic analysis of the role that curiosity plays in enhancing learning outcomes was performed on the interview data. From the findings, 5 themes are reported: improved academic performance, increased academic engagement, improved content retention, increased autonomy over learning and higher emotional intelligence. The themes are discussed as follows:

Theme 1: *Improved academic performance*

The study's findings suggest a correlation between learners' curiosity and their academic performance. Improved academic performance, characterised by the mastery of taught content and skills, is assessed through learners' performance in measurable assessments and tasks. This study reveals a notable pattern: an increased curiosity in a subject area boosts academic performance. Participants have observed that heightened curiosity is directly linked to superior academic results, as evidenced by "better marks" (Participant 2), "better results" (Participant 5), and "improved learning outcomes" (Participant 13). The following interview excerpts comment further on this positive relationship between curiosity and academic success:

"I feel that if students are curious and are interested then it does lead to better outcomes for them. If I think about the IEB exams and in particular the essay, one of the assessment criteria is looking at relevant examples and case studies. When the boys have experienced something, often they're able to bring that experience into their answers and that's a positive thing. And that will give them better marks." (Participant 2)

"Curious guys tend to do a little bit better. If you have more understanding of the topic you will tend to do a little bit better because by being more curious about what the subject is about, you'll tend to acquire more tools that will help you with being successful in assessments. The nature of assessments is the more you know of the topic or the deeper your conceptual understanding of the topic; the more you'll be able to provide solutions in the assessments and that will lead you to have higher marks. If you are always curious about how the concept fits into the bigger scheme of things or what it is that the concept is trying to teach you, the more you know the more you

are likely to be able to understand and do better and provide better solutions in the questions that are being asked in assessments. That's what we want to encourage our students to do, to just know a little bit more about the concepts we are teaching them and that will lead them to better results."
(Participant 5)

According to the excerpts above, curiosity is associated with lived experiences, suggesting that when learners have first-hand experience with a concept, it enriches their understanding and subsequently enhances their ability to integrate their experiences into their responses, leading to improved academic results. One teacher connects curiosity with a deeper comprehension and the acquisition of 'tools' that facilitate assessment performance. Moreover, he highlights that curiosity fosters a deeper conceptual understanding of a subject, enabling learners to grapple with a variety of problems and offer multiple solutions.

Although all the teachers interviewed agreed that heightened curiosity leads to better academic performance, they acknowledged the absence of quantitative data to substantiate this belief. The excerpt below references the Future Fit Programme implemented at one of the participating schools, where curiosity, transdisciplinary learning, and authentic experiences are central to the instructional approach. Due to the programme's recent implementation, numerical data to support the assertion that curiosity directly enhances learning outcomes was not yet available.

"Massively it improves - without a doubt. We will assess these boys in grades 10/11/12 who took Future Fit - I will do whatever analysis I can on their results and their learning and if that's how we're measuring learning outcomes, which currently we are, then we will do that analysis. I do not doubt that it would have helped them. I'm pretty convinced - but I will have to chat later - that something like the Future Fit would improve learning outcomes." (Participant 13)

Excerpts from Participants 4 and 12 below support the positive correlation between curiosity and academic performance, however, they recognise other factors that can influence a learner's academic performance despite displaying interest in a subject.

"If you've got two boys of equal academic ability: one's curious and one's not. The curious one will almost certainly do better but it's not the only determinant. In Economics, there's not a lot of actual Maths, if you don't catch mathematical concepts, then it becomes hard because so much of what you're doing is trying to quantify things and see the relationship between variables. That's a certain style of thinking. Certain boys don't seem

to be able to do it which we should be teaching I suppose. If they don't read well - if they can't do English comprehension properly, they can struggle. Certain skills are prerequisites to doing well. So no matter how interested you are, if you can't do those things you can struggle.” (Participant 4)

“Based on my personal experience of my studies, when I'm interested in something, I learn better, I remember more and I understand. I'm more interested in asking more questions about it and going deeper into it. I think that it has to. I can't imagine a kid who is super curious and super interested in stuff, not doing well. I think that kids do have barriers that prevent them from - a kid who knows a lot about something may not necessarily be able to put that on paper. I would be interested to see the data on that.”
(Participant 12)

According to the findings, several factors can restrict a learner's capacity to demonstrate their knowledge of and interest in a subject. For example, learners facing barriers to learning may find it difficult, despite their interest and understanding, to articulate their knowledge effectively in writing, thereby affecting their academic achievements. Hence, although learners may be interested in a subject, various factors may prevent them from expressing that interest in class, assignments or assessments. Teachers must ensure that they offer learners diverse avenues to demonstrate their interest.

Theme 2: Increased academic engagement

The study's findings indicate a strong link between curiosity and academic engagement. Academic engagement is defined as the level and intensity to which learners participate in and apply themselves to their learning and the value that they attach to learning experiences (Alrashidi, Phan, & Ngu, 2016). According to participants, learning activities specifically designed to pique interest led to heightened engagement among learners. Incorporating games, creative activities, and relevant texts into lessons fosters heightened learner enthusiasm, a keen desire to actively engage in class, and a notable increase in academic involvement. Participants report the following:

“In Grades 8 and 9, we love to play games with them. This year we've done an escape room, where they've done a whole bunch of puzzles and word searches and all these different challenges within an escape room. They've been so engaged and have come running to the history classrooms. It's centered on World War One which would be so boring for a girl to study but they've loved it.” (Participant 7)

“I wouldn't necessarily have evidence of it but I have found that when you do

things in a slightly different way or change the environment or change the context, it definitely has an impact and is typically well-received. I do think creates more engagement and without hard evidence, I do think makes concepts stick a little bit better. The Grade 10s were doing quadratic equations and we played a game where we would go outside and put all of the equations and all the solutions out on the grass and then they worked in pairs to match them. Just doing things differently creates more engagement and has a positive impact.” (Participant 11)

The findings above highlight the significance of activities designed to captivate learner interest, illustrating how unpredictability, novelty, and changes in context can enhance learner curiosity and engagement. Moreover, when learners are more engaged with the material, they are more likely to understand and retain the concepts, which leads to better learning outcomes.

Reflecting on the role of resources in stimulating curiosity, a teacher (excerpt below) shares an anecdote about a novel that garnered intense learner interest. The learners' deep curiosity about the story and characters led to high engagement and positive learning outcomes.

“They wrote that paper at the beginning of this week – when I asked one student how the paper had gone, she said, “Ma’am it was like I was right inside the book.”. She said that she nearly didn’t finish because she was taking her time. I haven’t marked those papers yet but I’m confident that they performed well.” (Participant 8)

Participant 9 suggests that while technology can boost learners' interest and engagement during the learning process, this heightened engagement does not always translate into better learning outcomes.

“...you can do pretty much anything with technology – they have gadgets and can use it the entire lesson. The positive side is that they are engaged and interested in the classroom. The other side is that two days later, they have forgotten what they learnt because it was just a game, it wasn’t learning, so you always have to balance the two. For instance, if you’re doing a game then there should be something or a link or a website where they can find the learning and go through it again. The game and enthusiasm don’t always translate to learning.” (Participant 9)

The findings above suggest that although technology plays a role in stimulating engagement, it is important to supplement it with alternative strategies to strengthen understanding and ensure retention. Thus, teachers need to have a balanced approach to the use of technology:

one that balances interest-driven activities with reinforcing exercises to achieve the best outcomes.

Theme 3: *Increased autonomy over learning*

Holmes (2021) notes that defining learner autonomy presents a challenge, as it is often used interchangeably with the concept of independent learning. Within the context of this study, learner autonomy is understood as learners taking increased ownership over the learning process. Autonomy enables learners to view themselves as active participants in the construction of their learning. The relationship between curiosity and autonomy emerges through several key findings, evidenced in the excerpts that follow.

“With the Grade 10s, we’ve done a wonderful assignment this term. In Grade 12 they’ve got to do a source analysis which is a big part of the IEB mark and so we thought let’s teach them to teach themselves. We gave them topics within the Second World War and we let them go on their journeys within that topic - finding sources, doing a presentation - teaching the class about this specific topic - and they’ve just written their essays on their specific topic - which was quite a challenge for us as teachers as we’ve set individual topics per child. It’s been wonderful and while they were doing that, they’ve learned the skills that they need to do for their Grade 12 portfolio piece. We gave them a list of topics to choose from and then they chose, and we said if there are any topics here that we haven’t covered that you are interested in, let us know and we’ll work around it. It was amazing so we’re going to keep that.” (Participant 7)

“I think when there is a moment of curiosity in a classroom, whether it’s collective or individual - that’s also quite important - you can get a class curious about a topic and that’s different to one or two kids that are curious within the topic that others might not be - but I think that there’s an ownership of that knowledge that comes in from fostering that. If I’ve got a topic about bees and my teacher has allowed me to question about food - if those links are made - I think I’m going to know more about bees ... I think definitely. The other outcomes they have achieved are being self-directed in their learning, being able to take ownership of their learning, and being able to understand the metacognitive workings behind learning: how do I approach this subject, this content, this particular theme or topic, what’s the best way, what is my thinking of this knowledge and how best would I learn it.” (Participant 13)

According to the excerpts above, assignments that allow learners to control their learning experience can have a positive influence on learner curiosity. This approach not only cultivates a sense of autonomy but also ensures the acquisition of essential skills is driven by the learners' interests.

Teachers play a significant role in fostering a learning environment that is responsive to the diverse interests and inquiries of learners. By welcoming a variety of questions and interests, teachers enable learners to make meaningful connections in their learning. Allowing learners autonomy over learning improves metacognition enabling them to make sense of how they learn thus leading to enhanced learning outcomes.

Learners gain autonomy by having to grapple with difficult concepts. Participant 3, in the excerpt below, reflects on the benefit of ensuring that learners are challenged by their learning.

"I say to my classes when they say, "Prep was hard" – I say thank goodness for that – that's a good thing – if I gave you prep and you could do every single question, I'm wasting your time. When you can't do a question, that's when a red light starts flashing WARNING – learning is about to happen – You want the red lights to be flashing, that's when you get stuck in and you dig deep. If it takes you a little bit longer, that's great, that's learning happening." (Participant 3)

From the findings above, it is evident that when tasks present the right level of challenge, they force learners to invest time, engage thoroughly, and show greater commitment thus, fostering deep learning. Teachers need to be skilled in discerning the optimal gap in learning, ensuring that the work given offers sufficient challenge without exceeding the capabilities of the learner. This optimal level of engagement, according to the findings, results in more meaningful and lasting learning outcomes.

Theme 4: Improved content retention

Effective learning relies on the ability to recall and apply knowledge. To analyse, problem-solve, and engage in critical thinking, learners must have a foundational knowledge base. The findings of this study underscore that when learners exhibit curiosity about a subject, they are inclined to retain information over an extended period. Below are participant responses regarding content retention:

"...an emotion, even a negative one - not as in a trauma - in my literacy class we were doing a comprehension, which turned into a history lesson, about North and South Korea. We were reading this passage about it. Thenegative associations that they had with certain events that took place - they

felt strongly that what had happened was bad. Three lessons later they were still able to recall facts: who was involved and what had happened. Not all of them, but definitely the boys who were engaged and asking questions about it.” (Participant 1)

“I’m convinced that it (interest and emotion) helps them to recall. They don’t necessarily remember abstract concepts - they link them to an event. The challenge though is whether they can apply it to a different context. It’s useful for recalling.” (Participant 4)

The excerpts above highlight that cultivating interest and prompting strong emotional reactions during learning can enhance learners' retention of information. When learners are emotionally invested in a topic, they are more inclined to ask questions and participate actively. Interestingly, while learners often associate information with memorable events, recalling lessons or experiences sparked by curiosity this approach may not always facilitate the application of knowledge in unfamiliar contexts. Once again, emphasising the need for teachers to adopt a balanced approach to pedagogy: combining interest-driven approaches, reinforcement activities and opportunities for the application of knowledge.

Theme 5: Higher emotional intelligence

Learners who display high emotional intelligence exhibit the capacity to comprehend, articulate, and appropriately respond to emotions in a way that promotes both emotional and intellectual growth (Basu & Mermilland, 2011). Feedback from participants indicates a correlation between heightened curiosity and increased emotional intelligence among learners. It is unclear whether curiosity directly fosters emotional intelligence or if these attributes tend to occur together in learners. Below are excerpts from interviews on emotional intelligence:

“I think curious students are more open to different points of view; I think they have a higher EQ. When we visit the Markets of Warwick, they are the ones that can pick up that...“There’s a big difference between the way I live and the way these people live.” And it’s not necessarily done in a negative, judgmental way, it’s more a realisation of the disparity. I think they’re more empathetic. I think they are maybe able to express their emotions better and I think because they’ve delved into things deeper, they’ve got different points of view on different aspects. To create their own opinions of things, they’ve done a little bit of research around stuff and have really thought about stuff in a lot more detail and therefore are more emotionally in touch or respond in a more mature kind of way.” (Participant 2)

“You try and get them to see the link between what we are doing and the impact that it has. So what is their responsibility? Understand how we get energy into the house – do we know how it works and what our responsibility is? An important link between curiosity and a greater understanding of environmental and social responsibility.” (Participant 3)

“If you're curious about other people, you'll take time to listen to them or observe them and try and develop empathy but if you're not interested in people, your focus will always remain on yourself.” (Participant 15)

The findings above suggest that curious learners often exhibit heightened social and environmental awareness. This may stem from their tendency to consider multiple perspectives and engage in deep thought or research on various issues. Curious learners are seen to possess better listening skills, articulate their emotions more clearly, and demonstrate empathy.

5.6 : Findings on ways in which teachers stimulate curiosity among learners

This study aimed to understand how teachers stimulate curiosity among learners. Teachers use multiple approaches to fostering curiosity in learners, often using techniques at the start of the lesson to capture interest. Additionally, teachers employ a range of strategies to maintain attention and encourage meaningful learning. Analysis of the interview data reveals 10 themes: linking learning to stories and storytelling; the wow factor and heightened emotions; novelty, ambiguity and uncertainty; relevant and authentic experiences; clear connections; questioning; providing opportunities for collaboration; visual stimulation; providing time and space for open exploration and the use of technology.

Theme 1: Linking learning to stories and storytelling

Teachers employ storytelling in several ways to engage learners. By connecting learning to a story, drawing from others' experiences, or explaining the origin of a concept, they provide context that bridges the gap between the classroom and real-world application. This approach not only engages learners but also underscores the relevance of their studies beyond the confines of academic settings. Participants report:

“I think everyone loves a story so when you can, particularly with boys who do struggle, to help recall, to make something a story and to make it more linear.” (Participant 1)

“What I've started doing lately now with TEAMS - is just giving guys links to an article showing how this concept was used by students elsewhere or how

another student used this concept to build something or discovered a new prime number. The top guys will go and read that by themselves, they don't need to be told the stories.” (Participant 5)

“It was a lesson I taught to a Grade 11 group of maths kids; we were doing trigonometry; we started learning about all the terminology. They were asking where that name came from. Where did that word...? Why is it called tangent? We know, we understand what the tangent is, but why is it called this in trigonometry? I showed them where that came from. It wasn't in the syllabus but it was a really interesting lesson. Everybody knew that it wasn't going to be for marks, it wasn't going to be in a test; it wasn't going to be something that they had to note down and so they just enjoyed the discussion around where this all originated. That for me was a productive time because afterwards they asked more questions about that and it also made the concepts of trigonometry more tangible because they understood that this has an origin - this came from somewhere, not just something we have to learn because it is the way it is.” (Participant 12)

From the interview excerpts, it is evident that the use of stories and anecdotes serves to connect ideas, contextualise learning and provide evidence of real-world application. Although some of the information taught was not essential for mastering the concept or required for examination purposes, it contributed to a deeper understanding among the learners. The findings suggest that employing narratives for enhancing learning yields a common outcome: heightened engagement and depth of comprehension.

Theme 2: The “wow factor” and heightened emotions

Utilising the “wow factor” in lessons involves showcasing something impressive, shocking, or surprising. Evoking heightened emotions in learners typically involves incorporating emotive content or addressing topics and experiences that resonate deeply with them. Both approaches are instrumental in capturing learners' initial attention and fostering continued engagement throughout the learning process. Participants reflect on the strategic use of heightened emotions in their teaching methodologies.

“Sometimes I just ask quite a controversial question. I mean the death penalty always works. Or often a gender question will work: so, if you had to replace government with only women how do you think our country would be different? Sometimes in those classes just speaking is all I want from them. The ability to converse with someone and to actually take the

information that someone else has said and ingest, digest and then formulate your response - some of them struggle with that.” (Participant 1)

“I think the real impact of a number of these video clips that we show them - what gets to them is the damage and the loss. I'd like to think they're curious about the causes but a lot of curiosity is around the damage, the destruction, the woman in tears. Maybe that is because they can try to put themselves in those people's shoes and live that experience. They can almost imagine losing their father and their mother.” (Participant 2)

“I'm trying to make things link to their lives in their day-to-day life so I will often use the tuckshop. You start with whatever a chicken mayo toasty costs and then once you've got over the outrage - but I do think the outrage allows them to forget themselves a little bit - so they're not so judgmental about themselves – I suppose outrage as a strategy for curiosity – emotion – if you feel strongly about something.” (Participant 4)

“We do the Aztecs in Grade 10 when they are just starting to learn argument versus counterargument. We don't get them to write an essay, but we give them a whole bunch of sources and we say “Were the Spanish guilty of genocide?” At the end of their time, the Aztecs were wiped out. We give them a whole bunch of sources and then we put them into guilty versus not guilty and we do physical court cases where they have to represent the two sides. By doing that, they have then mastered the skill of looking at something, having an argument but also seeing that there is a counterargument and that's a fun way of doing it.” (Participant 7)

The findings above indicate that controversy, empathy, and outrage can serve as potent catalysts for learning. Teachers describe a variety of methods they employ to pique learners' curiosity. Controversial questions can be used to actively engage all learners thus encouraging critical thinking and fostering meaningful dialogue among peers. Similarly, deliberately evoking a sense of outrage among learners by highlighting an issue that directly impacts them can have a similar effect in capturing their attention. Leveraging this emotional response, the teacher effectively introduces complex concepts, capitalising on the learners' heightened engagement. Encouraging empathy in learners can enhance curiosity and deepen their investment in the learning process.

Participant 3 aimed to foster a sense of wonder and surprise through practical demonstrations. He explains:

“There are several demonstrations you can do – if you’re prepared to sacrifice a plastic ruler and you whack it and you break it – on the one end you hit it with a piece of paper and on the other end you smash it on the desk and it breaks and you ask, “Why is this happening?” Then you start talking about air pressure. Or we’ve got these hemispheres – and you suck the air pressure out and it’s acting from the inside and you get the guy to try and pull them apart and they struggle – they can’t get them apart. You ask “Why? What is going on? What is the incredible force here? There’s a wow factor – why is it doing this thing? These are all WOW things which the boys enjoy but you need to be asking WHY is this happening.” (Participant 3)

The above excerpts emphasise the importance of not only impressing the learners but also continuously prompting them to reflect on the root cause of reactions. Thus, a methodical approach, beginning with the demonstration to captivate learners' attention, and then transitioning into teaching the associated concepts works to effectively capture attention and develop understanding. Teachers have the challenge of preserving the learners' initial sense of wonder, recognising that this plays a crucial role in effective learning. They must strike a balance, offering explanations and ensuring lessons are both captivating and scaffolded in a manner that guarantees learners leave the classroom with a clear grasp of the underlying process.

Theme 3: Novelty and Uncertainty

Novel or unconventional methods of lesson delivery, coupled with an element of unpredictability where learners cannot anticipate outcomes, can cultivate curiosity in the classroom. Teachers note that adopting a playful, fun, and unpredictable approach proves effective in sparking interest and creating memorable learning experiences. Participants report:

“Physical movement is highly underrated – with the problem-solving activity, the fact that they have to move from table to table. They react differently when they move than when they sit.” (Participant 4)

“I like to do outside activities – taking my mind out of the classroom makes me more open to other things. We did one where they did not write – the girls kept asking if they were going to cover this – will they get notes on this? We just sat in a circle and we just talked.” (Participant 6)

“We went on a sensory walk around the school. We started here and we looked up the white buildings and I said, “What do you see? What do you

hear? Touch?” and then we walked around and stopped at the plants and we all felt the leaves. Then we went to the Junior School and we played on the playground and they loved it and then we went to the pavilion and we sat on the balcony - you can see over the Astro and freeway. You could hear the traffic and then they had to sit down and write a paragraph focusing on one of the locations.” (Participant 10)

The above excerpts highlight the effectiveness of deviating from traditional desk-bound learning approaches by promoting physical movement either within the confines of the classroom or outdoors. The novelty of this change, coupled with the energising effect of physical activity, not only engages learners initially but can also aid in sustaining their interest over time.

Participant 10, below, likens teaching to being in the entertainment business. She recounts:

“I feel like I’m in the entertainment business. - I just remember what it was like being a teenager - Shakespeare can be quite soul-destroying and very foreign. Last year I had quite a weak matric set so I pulled out all the fancy dress stuff - I had a wizard’s hat which came out with Prospero. If you spoke the part you got a little stick and you got the hat. I even stuck pictures of the characters on the board so that they could see them. At the end of the lesson, I would do little speech bubbles to summarise what was happening. So, I’m in the entertainment business – I try to make it visual, make it interactive and be enthusiastic.” (Participant 10)

“A colleague put together a James Cameron Todd treasure hunt based on cryptic clues, and we left QR codes scattered around different landmarks in the school for them to follow. We’ve done events like this quite often and sometimes at certain times of the year you can get a bit pessimistic about it - I don’t know if this is going to work, they’re going to just ignore us - but that particular one caught their attention got them curious. They had very little context for this. I think it was the mystery of what this new thing was all about - why is Ma’am posting these messages that seem so cryptic and puzzling?” (Participant 14)

The findings above indicate that incorporating play and fostering a playful environment in the classroom enhances learning outcomes. Challenging topics such as Shakespearean literature can be made more enjoyable and accessible by using props and visual aids to infuse a sense of enjoyment and interest in the material. Furthermore, an activity such as a treasure hunt can

cultivate curiosity in reading and prompt learners to utilise the resources of the library. The lack of context and mystery can heighten curiosity and contribute to learning objectives.

Participant 5 introduces another strategy; wherein other teachers are invited to deliver a lesson or segment of the syllabus to the class. The introduction of an alternative perspective through a different voice not only captures the learners' interest but can also offer them a different approach to the subject matter. Participant 5 reports:

“One way is to have someone else come in and teach the same thing – at the moment we’ve got access to YouTube – I use it to show different ways of thinking about the same topic and then I will get the students to share their opinions about which of the approaches they agree with and how they would then follow up. I will then ask them if they can think of a different way from these guys – how would you approach this particular thing?” (Participant 5)

From the interview excerpts above, teachers need to maintain a balance between novelty and unpredictability while preserving the essential structure within the classroom, because learners need to experience unpredictability and novelty within a predictable environment. While novelty can positively impact learning outcomes and enhance engagement, these innovative approaches must operate within a coherent framework that resonates with the learners. Therefore, while incorporating exciting, fun, and original methods, it remains imperative to provide learners with a sense of stability and structure.

Theme 4: Relevant and authentic experiences

To cultivate curiosity effectively, learning opportunities must resonate with learners on a personal level. This means they should directly relate to the learners' experiences and align with their existing framework of understanding. Furthermore, whenever feasible, teachers should aim to offer authentic experiences that enable learners to move beyond abstract conceptualisation and understand the relevance of what they are learning in the real world. According to excerpts from the interview transcripts, the teachers reported the following:

“Often on those field trips, they go with apprehension because it's seen as work - it's not just fun. But I think a lot of the time, without them even really knowing, they are learning huge amounts. If I think about our field trip to the Markets of Warwick - it's one of the few places in the world where informal traders have a formal venue where they trade - it's mind-blowing. When we go there with the boys initially they say “Why do I want to go here? It's dirty. It's grimy.” The response while we are there and when we come back is often very very positive and favourable. Some of them the matrices when they've

left have said to me that was one of the most valuable experiences. I think exposure often helps to plant that seed of curiosity.” (Participant 2)

Participant 2 underscores the value that field trips contribute to the curriculum. Experiencing first-hand the application of concepts they have studied offers learners an authentic and memorable experience, cementing their understanding while potentially instilling curiosity about different perspectives and experiences. Moreover, having a syllabus that is closely related to the learners' lives is crucial in promoting curiosity. By ensuring that the concepts, skills, and knowledge taught directly relate to the learners' immediate environment, teachers can effectively engage learners and provide genuine learning opportunities.

Participants 3, 7, and 15 assert that integrating current events into the curriculum is important for generating learner curiosity. They report:

“In an ideal situation, I'm on top of my time management; I'm on top of what I'm doing and I've got time to bring in fascinating things that happened in the world around us into the science classroom: it's a short YouTube or an article about whatever – there's a rover landing on Mars... try and bring external things into the classroom and make them aware of the science involved in these things. I'll bring up a minute of the most hectic Grand Prix crashes. You see these guys walking out... How did he do that? Let's talk about it. It's fascinating and if I can get them to see that I'm fascinated by it. So those kinds of things – what's going on in the world around you? That doesn't necessarily relate to what's in the test but it engenders a sense of wonder but that's often the challenge because it's not in the test ...the test is in two lessons time and I have to get through the stuff.” (Participant 3)

“What's so lovely about History as a subject is that we have a current media section, so we often look at current media and current affairs. We look at what's going on now and then look back at something that has either triggered this current event or has links to the current event, so we are constantly linking. I also stay on TikTok and things and I'm often looking at historical things on there to keep that connection.” (Participant 7)

“In visual literacy, we just take something current - when we had to introduce Fake News I took a picture of the Pope and the puffer jacket and looked at that. They're intrigued - what's wrong with the puffer? Why would there be an offence? You always lead to other kinds of discussions around that.” (Participant 15)

Connecting current events to lessons makes the subject matter relevant to the world outside of the classroom. One teacher emphasises the value of showing learners how historical events shape contemporary issues, thus highlighting the relevance of the study of History. Notably, teachers express concern about deviating from the prescribed syllabus, despite the positive impact it can have on learner interest as any additional material or deviation can lead to a loss of teaching time.

Participant 5 recounts his approach to teaching financial mathematics:

“The nature of the subject is so beautiful in that we do different topics and all of them require different approaches. When teaching guys about finance, initially you get them to jot down their budget – how much are their parents giving them, where are they spending the money – if they were to invest it, this is what these three different banks are offering as interest rates but if they were to take credit, this is what they are offering – where would they go? Which one would they choose and why? I would tell them that this would be their assignment in a week. Now we will learn the fundamentals of this. Already the guys are quite curious about everything that we are doing.”

(Participant 5)

By directly relating concepts to their own finances, the lessons acquire personal meaning and relevance. Through this approach, learners not only master the terminology and other factors involved but also ignite a sense of curiosity, driven by personal application.

Participant 13 recounts how using the Sustainable Development Goals (SDGs) as a framework for learning enhances the learning experience. He states:

“In the Future Fit Programme, our purpose is to equip boys for a future that is uncertain and complex, by using a transdisciplinary lens looking at education and focusing on competencies, values and attitudes. There are many levels to this and how it factors in - but the first would be we have an understanding that this is not a subject like other subjects - it's a real-world authentic premise or framework. We use the SDGs as our framework at this point so that the concepts they are dealing with are larger than just pure sciences or pure language or pure social sciences.” (Participant 13)

From the findings presented above, it is evident that the use of the SDGs makes learning relevant and meaningful giving learners a sense that what they are learning in the classroom matters. Furthermore, prioritising not just content retention, but also the development of skills, values, and attitudes, provides a holistic approach to learning. The findings underscore that

curiosity is heightened when learners recognise the relevance of what they are studying within a practical, real-world context.

Theme 5: Clear Connections

Knowledge does not exist in isolation. Demonstrating the interconnections within and across disciplines is important for deepening learners' understanding. Moreover, understanding how classroom knowledge translates into real-world applications allows learners to understand the relevance of their learning. Teachers report that when these connections are made explicit, learners' curiosity increases, enhancing their engagement and enthusiasm for the subject matter. They report:

“With the guys that find Maths challenging – one of the things you would do is explain that this is what the concept does, and you would show them exactly from the beginning that this is where it's applied. It can be used in Economics, it can be used in Accounting, it's used in the Stock Exchange and the one that they love is the trading part from forex to the stock exchange - these are the graphs that we're using – you can see the graphs and how they are used – and once you've got the excitement and they can see how they can use this later in business – that's when the guys are more engaged and bit more interested in trying learn the topic because they know they will use it later in life.” (Participant 5)

“Another thing that I love about the IEB is the intertextual links. It's important to show links because things don't exist in isolation – in life, everything is linked and they need to see that.” (Participant 10)

“With senior classes - when you're using a particular formula that's given on the data sheets, knowing how to prove the formula isn't examinable. I found that it's useful to still show them the proof. Even for a middle to weaker set to say this isn't just something that's being sucked out of thin air. There's a process and there's a context that goes behind this so that they have that understanding even if they don't need to use that level of understanding again, I think it's helpful to have that context rather than just saying: this is the formula, this is how you use it, just get on with it.” (Participant 11)

“I think that it's important that these kids understand what they're doing and that it makes sense in other subjects as well. For instance, I talk a lot about computer coding and how that is related to Mathematics. How that would work and how you would use Mathematics in say Physical Sciences or any

other subject that is relevant for that topic. If we're talking about Financial Math, then I'll launch into as much as I understand about banks and things like that. Then we'll link it to Economics or Accounting. So for me, in terms of teaching to stimulate curiosity, it is important to make those links with other subjects and with other areas of life.” (Participant 12)

The findings presented above suggest that learners must understand not just the mechanics of formulas, but the underlying principles they represent. Without this comprehension, learning remains detached from context, thus hindering the attainment of deep understanding. Similarly, establishing connections within and across disciplines has significant intrinsic value. By drawing attention to the links between knowledge and concepts, teachers show that learning has purpose and significance, thus fostering a deeper appreciation among learners.

Theme 6: Quality Questioning

Quality questioning plays a pivotal role in the classroom. The questions posed by teachers serve several functions: they gauge comprehension, identify gaps in knowledge, provoke reflection and critical analysis, engage and focus learners' attention, and facilitate the scaffolding of learning. While the importance of teachers' questions is clear, teaching learners to ask questions is equally essential. Learners' questions allow them to consolidate existing knowledge, and identify areas of uncertainty, thereby fostering a spirit of curiosity. Engaging in questioning not only cultivates critical thinking but also develops analytical skills and problem-solving skills. Participants discussed the role of questioning in the classroom, reporting the following:

“Curiosity doesn't have to be complicated. Curiosity can be fostered through a few simple words like showing a visual and saying to boys: “What are you looking at?” ... I'm looking at a rainbow ... and encouraging them to delve deeper: “Why is this rainbow here? How did this rainbow form?” So simply by using simple words - curiosity doesn't have to go into a huge amount of detail - it's just: “What are you looking at? Why does this form? How does this form? When does this form? Just using simple words - and without them even noticing or realising it - they're delving deeper into something.” (Participant 2)

“In terms of the questions, you want some open-ended questions: what do you think it might be? That allows for various discussions to take place. And other quick questions; firing questions to as many boys as possible as a form of revision.” (Participant 3)

Interestingly, the findings promote simplicity in questioning, emphasising how simple questions provide a scaffold for learners to progressively deepen their understanding. Through the practice of posing four fundamental questions— “What; When; Why; How?”— a teacher not only fosters knowledge construction but also models curiosity for learners. Posing overly complex questions, where learners do not have enough of a foundation, can lead to confusion and disengagement. Similarly, teachers must use different questioning strategies that align with the specific instructional goal.

In the following excerpt, Participant 3 explains how questions can serve to encourage the engagement of every learner in the lesson. This approach is key in capturing and sustaining learners' attention throughout the instructional process.

“I ask a lot of questions and I intend that every boy is asked at least one question every lesson. One of the things I would always say to my department is that you need to engage boys. When I sit and listen, particularly to new teachers, I encourage them to get the boys' attention using their names. Sometimes you ask a question and then name the pupil. So that you get everybody thinking. Every boy needs to be engaged in some way every lesson.” (Participant 3)

Questions can also serve to introduce topics, encourage thought and discussion and extract key ideas. Participants 10, 14 and 15 discuss their use of questioning for this purpose:

“Last year, with the Grade 8s, I used prompting questions that they could spend time engaging with first and then I drew out the main themes. I did that again recently with quite a difficult poem. If you just read the language it sounds very complicated and so I drew out the main ideas and we discussed them and so when I saw that they were getting a bit fidgety and confused, we returned to those main ideas.” (Participant 10)

“I can sometimes be a little bit reliant on having a slideshow that structures my lesson and that queues me to move through things. Lately, I've been using CHAT GPT to come up with, instead of a title at the top of this slide, a question that's worded like a leading question. Instead of reading what we're going to talk about, now I'll ask that question and they'll see that question to guide them. That's helped with getting a bit of conversation going sometimes and maybe feeling a little less didactic.” (Participant 14)

“I always enjoy the first lesson as you introduce a novel. Particularly if it's going to introduce them to something that they have never really thought

about before. Maybe addressing it in a surprise way like asking a question. That could be anything from Purple Hibiscus or The Handmaid's Tale. You introduce an idea or a question - Has anybody ever been to Nigeria? Know anyone from Nigeria? What is your perception of missionary work in North Africa? We start talking about it a little bit and the interest is peaked because they haven't thought about that before.” (Participant 15)

Based on the interview excerpts it is evident that questions are used to introduce new topics or texts, thereby engaging learners and prompting them to consider their own perspectives. By using questioning to extract the main themes before analysing a challenging text, teachers effectively simplify the subject matter for learners. Before starting a new topic, using questions in place of traditional topic headings can help identify existing knowledge gaps and establish learners' prior understanding. In addition, questioning plays a significant role in familiarising learners with unfamiliar concepts or experiences, providing them with a framework for understanding novel concepts or experiences.

Questioning can serve as an important tool for reflection as described by Participants 5 and 13:

That's another thing that I wanted to chat about is getting guys to articulate their understanding of a concept that is being taught. I used to do this quite a lot in class - because I felt like boys didn't listen; I would say: "What did I just say?" Now, I rather say "What do you understand about this?" They will now say: I understand the concept is this. I will then ask someone else: "What do you think about what he has just said?" (Participant 5)

"I give my Life Sciences classes a check-in - once every three, four weeks - I change the questions that they're reflecting on but it's about: How's it going? What does this work mean for me? Have I found this interesting? Is there scope for learning something else? That kind of reflection and feedback. Asking why five times or more in the process of questioning is really useful and I think that also generates curiosity.” (Participant 13)

From the findings presented above, it can be argued that teachers should be intentional in crafting questions to extract insights into learners' understanding while forcing them to grapple with the content learned. Similarly, questioning can be used to encourage reflection among learners, guiding them to think about what they have learned and identify knowledge gaps. This reflective process fosters curiosity by prompting learners to explore further and find answers to unanswered questions.

Encouraging learners to generate their own questions serves as an effective tool for nurturing curiosity. Prompting learners to think about what they would like to know not only primes them for actively engaging with new information but also enhances their receptivity to identifying, comprehending, and retaining that knowledge once they encounter it (Clark et al., 2019). Participant 7 reports:

“Other more successful ways that we’ve used is to give them lots of photographs and post-it notes and then the students write down as many questions that the pictures evoke. Then we put it on something called a Wonder Wall: questions like what’s happening in the picture? Who is this? Why are they there? Have they done something wrong? We place those on our classroom wall with all the post-it notes before we’ve even started the topic and they stay there for the term. At the end of that section, we go back and look at how many of these questions we can now answer. History is a wonderful space for questions – there are so many sources to look at.”
(Participant 7)

From the interview excerpts above, it is evident that using visual stimuli to encourage wonder not only cultivates curiosity within the subject matter but also creates a shared sense of knowledge construction among learners and the teacher. By prompting questions before exploring the content, learners inadvertently direct their learning, thereby fostering a heightened sense of agency and ownership over the acquisition of knowledge.

Theme 7: Providing opportunities for collaboration

Collaboration holds the potential to heighten learner curiosity. Recognising learning as a social process, wherein learners actively listen to and engage with their peers' viewpoints, serves to deepen their understanding and encourage a greater motivation for learning. Participants discussed the impact of collaboration on learner curiosity:

“Things like doing pair work, getting guys to articulate their understanding, talking about their thinking and being able to explain to the group this is what they think, and stand by their thinking. Building the confidence in guys to say, this is my answer and I think it is right.” (Participant 5)

“Sometimes, I group them into pairs or teams and then on the board, they write a sentence or a word in their pairs; they have to write an answer – if they’re comfortable, we can project it and then we correct it together. In their pairs or groups, they are more curious and I find they can learn from each other.” (Participant 9)

“The Future Fit Group is as diverse a group as possible. I think when dealing with a lot of these concepts, the more diverse the opinions, the backgrounds, and the thinking around it the better in pushing and stretching and teasing and wrestling with these kinds of ideas.” (Participant 13)

From the findings above, it can be argued that collaboration works in multiple ways to enhance learner curiosity and engagement. It prompts learners to articulate and defend their ideas within a small group setting, thereby refining their understanding and bolstering their confidence in expressing their thoughts verbally. Moreover, the importance of embedding collaborative practices into classroom routines is highlighted, as it draws together diverse ideas and nurtures an appreciation for different perspectives among learners.

Theme 8: Visual Stimulation

The use of images to accompany learning materials is a widespread and effective strategy among teachers. The findings reveal that teachers effectively employ visual stimulation to enhance their teaching practices. Visual stimulation involves using images to clarify, contextualise, and enhance learning materials. These images frequently serve to spark interest and emotion or to help learners grasp abstract concepts. Teachers report integrating images into their instructional practices to enhance engagement and stimulate curiosity. The following excerpts reflect their experiences:

“We will put up a picture that has a shock factor and we will ask them what they see or we’ll say think of 10 things that you can see in the photograph and then we will talk about it; we will share it and we’ll say find 10 more things. So really encouraging them to look and to ask themselves what they can see, what message etc - so we really do use sources a lot.” (Participant 7)

“If we’re going to do a short story, I’m not going to say, “OK, today we’re going to do a short story.” I will just give them pictures, different pictures related to what is in the story and then I will say to them, “OK, look at the pictures with a friend or your own”. They look at the pictures, I’m not going to say anything, you are going to tell me, I’m not going to say what is happening there. Let’s see what they come up with and then obviously they will come up with all the different ideas. At the end, I will say OK now are we going to do the short story. I just want them to come up with the vocabulary they will need for the story. In the end, it also helps in remembering the story. It works better than me just reading and them telling

me the words they don't understand. But if I do it like that it helps in the end because it's like they created that story." (Participant 8)

"I've always been a believer that boys, especially, are visually engaged - so I always make sure that I judge books by their covers and make sure that we've got shiny good-looking books. We print out book covers and laminate them and have them advertised in different places. It stops boys and they say "Is this a movie? Is this a DVD? – No, that's the cover of a book you could read. I think visually you've got to appeal. You've got to have a bit of colour and a bit of pop and it's got to be user-friendly and not complicated to look at -keeping things visually simple and visually appealing." (Participant 14)

From the findings presented above, by prompting learners to closely examine such images for visual cues, teachers can instil a sense of curiosity. Additionally, emotive images depicting the consequences of significant events can be used to deepen learners' curiosity about the underlying causes and sequences of events. These images elicit empathy and emotional responses in learners, thereby fostering a deeper engagement with the subject matter.

Theme 9: Providing time and space for open-ended exploration

Allocating time and creating a conducive environment for open-ended, learner-driven exploration is another strategy for nurturing curiosity in learners. By allowing learners to take part in activities where they can fully immerse themselves, engage all their senses, seek out solutions, and solve problems, teachers enrich the learning process and cultivate a sense of curiosity among learners. Participants report the following:

"In Science, where it's more practical, they can touch and see and experience things – using their senses to learn. Teacher demonstrations where you can demonstrate something and you can say "What do you think is going to happen next or why is this happening?" (Participant 3)

"I have an activity where there's a page divided into four quadrants and in the middle is a type of market failure: eg pollution, traffic congestion... They're all at separate tables around the classroom, in the top left corner you go to your first problem, probably in pairs and suggest government intervention to solve it. Then they move on. Then you get to a page where someone suggested a solution to a problem and on the top left-right quadrant you say why it would fail. Then you move on and the third group looks at the problem, the solution, why it would fail, and offers a new solution

and so they are criticizing each other which they quite enjoy because there's a competitive element and at the same time they're solving a problem. I suppose plays on existing curiosity but I'm hoping to inspire some curiosity as well - how do we solve this problem - I try and pick things that they will see in the real world.” (Participant 4)

One teacher describes a classroom activity where learners are encouraged to move around, offering multiple solutions to presented problems and providing feedback on their peers' responses. This dynamic approach incorporates several elements that stimulate curiosity, including physical movement, collaborative problem-solving, peer critique, and an element of competition, all working together to captivate and engage learners.

Participant 5 advocates for fostering a mindset of exploration and experimentation among learners, encouraging them to tackle problems using multiple approaches. By prompting learners to explore alternative methods, this approach encourages a thorough examination of the problem, demonstrating that outcomes can be achieved through various methods. Such an approach empowers learners to see themselves as active participants in their own learning journey.

“One of the things that I encourage with doing problems for the first time is to try to do it in three different ways and then see if they get the same answer or try and do this in another way, other than the one I have just shown them. Is there a different way that you can approach this particular concept?”
(Participant 5)

Participant 11 notes the importance of giving learners autonomy in certain aspects of their learning as a means to foster interest and engagement.

“A lesson that I did recently with my Grade 8s was on data handling and rather than teaching them from the notes, I got them to take out cards and dice and draw cards and throw dice and enter the results onto their laptops. I then asked them to plot their results. I said I don't mind how you plot them; I'm not going to tell you what to do. I'm not going to tell you to do a bar graph or pie chart – I said do whatever you think makes sense and think about why that's the right choice. I think it was it was an interesting lesson because they had quite a lot of freedom. I think to some extent a lot of them thought it was a little bit vague and were not all that comfortable but lots of them embraced it and I think through that process they learned more about why we do this.

Why does something make sense? Why would we choose between different types of graphs to represent a data set?” (Participant 11)

Based on the interview results above, it can be argued that by using alternative resources instead of traditional notes, the teacher empowers learners to explore different methods of presenting information. However, it's noteworthy that not all learners reacted positively to this approach; some felt uneasy with the level of freedom granted and preferred more structured guidelines. The findings indicate that engaging in activities that allow learners to experiment with different approaches and make decisions about what works best for them, leads to heightened curiosity and a greater sense of autonomy over their work.

Theme 10: The use of technology

The research findings indicate that integrating technology into the classroom can effectively stimulate learner curiosity. Employing visual aids, research tools, relevant applications, collaborative online platforms, and artificial intelligence not only equips teachers with additional resources but can also increase their capacity to engage and motivate learners. According to excerpts from the interview transcripts, the teachers reported the following:

“We have quite a lot of nice, up-to-date video / DVD material and particularly for the visual learners, it is hugely stimulating for them. I mean just access to the news sites, newspapers. But there are amazing sites – there’s this hurricane tracker - you’re watching live the movement and the development and the growth of hurricanes. If I think about what we did with the Grade 9 Heartbeat Day last year - the different sites where you can look at your carbon footprint; you can track every single aeroplane that’s in the air at the moment. So there’s a lot of stuff that maybe not only stimulates curiosity in your subject but just general curiosity and what’s going on out there. So using a lot of visuals, using the Internet, I think reading encouraging reading, reading types of different materials.” (Participant 2)

“I’m trying to be less information overload and getting them to be more involved. We use OneNote so you can do a collaboration space and then you can also send out worksheets digitally and they can type in.” (Participant 10)

“I got AI to write a prompt based on the slide content - it often included something like students gathered around a touch screen. I said anytime that you are mentioning a student represent them with ... and I described our uniform - blue blazer white shirt and a red striped tie. Suddenly, it was giving

me these images that sort of resembled the boys in the classroom in front of me. I think those images helped hook a little bit of creativity because straight away they could see cartoon versions of themselves and they started asking questions about AI.” (Participant 14)

From the interview excerpts, it is evident that employing technology to facilitate collaborative learning experiences allows learners to actively participate in constructing their knowledge, fostering a sense of ownership and autonomy. The use of applications that bring the outside world into the classroom, not only stimulate curiosity in the subject but also cultivate a broader curiosity about the wider environment. Thus, it can also be argued that it is important for teachers to equip themselves with the requisite technological skills and tools, enabling them to effectively leverage technology in the classroom to amplify learner curiosity.

5.7 : Findings on barriers teachers experience in the use of curiosity in the classroom

Through the interview process, the study explored the barriers that teachers experience in creating a culture of curiosity in their classrooms. Teacher participants identified several key barriers which have been divided into three main themes: teacher-related barriers, learner-related barriers and school-related barriers. The first theme: teacher-related barriers that affect teachers and teaching approaches is divided into 3 sub-themes: *inadequate time available for lesson planning, teacher fatigue and over-extension, and teachers’ fear of the unknown*. The second theme: learner-related barriers is divided into 3 sub-themes: *learner fatigue and over-extension, learner engagement and apathy and a results-orientated mindset*. Finally, the school-related barriers are divided into 3 sub-themes, namely, *curriculum demands and time constraints, rigid assessment criteria and a diverse range of learners in classrooms*.

The themes and sub-themes on barriers teachers experience in the use of curiosity in the classroom are presented in Figure 2 below.

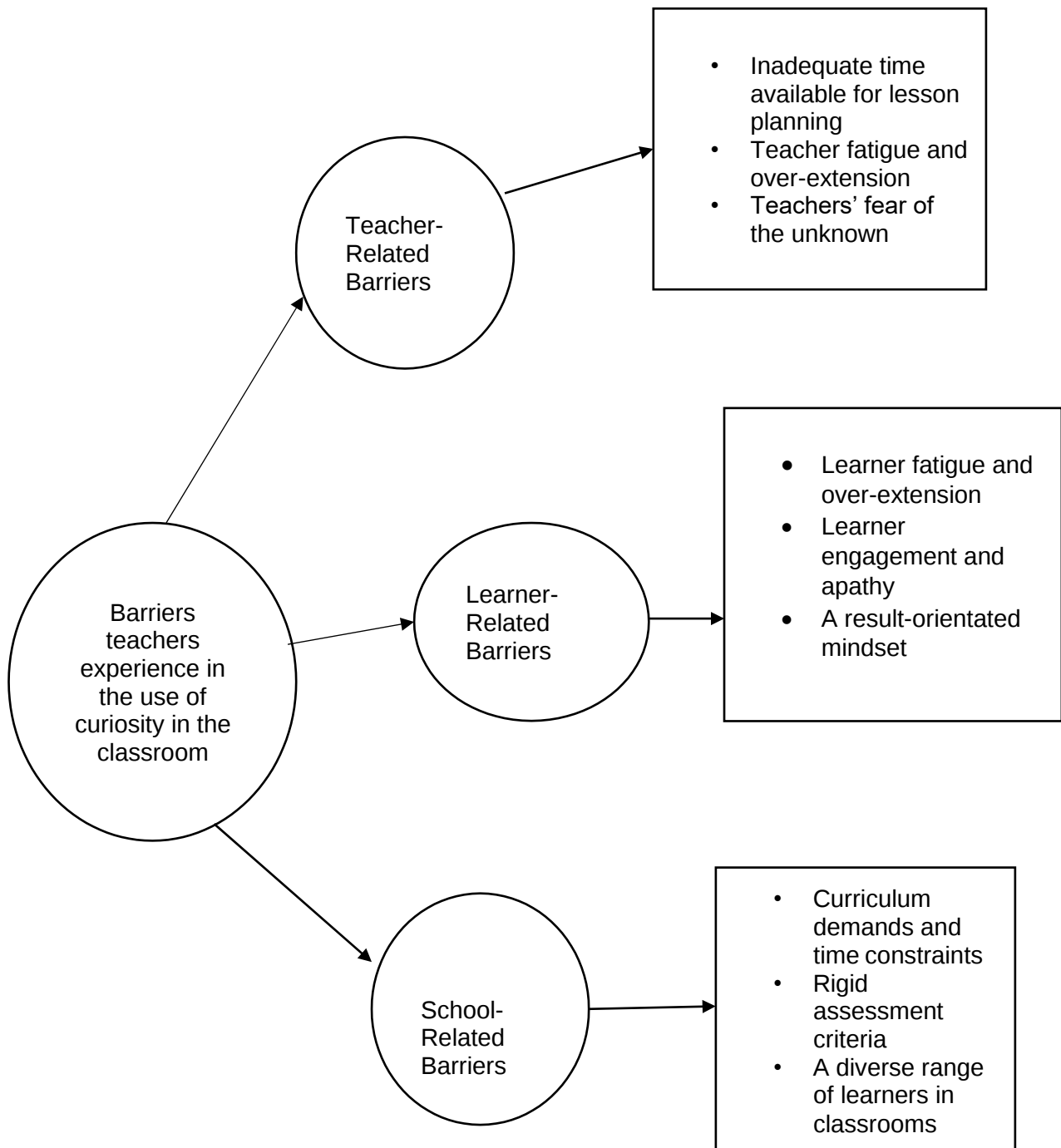


Figure 2: Themes and sub-themes on barriers teachers experience in the use of curiosity in the classroom (Source: Analysed Primary data, 2024)

The main themes and sub-themes are presented and discussed as follows:

5.7.1 : Theme 1: Teacher-Related Barriers

The findings of the study suggest that several teacher-related barriers prevent teachers from fostering a sense of curiosity in the classroom. The teacher-related factors are those factors that revolve around their beliefs and values, interpersonal skills and ability to manage external pressures in the classroom. The study's findings indicated that the sub-themes on teacher-related barriers that affect teachers and teaching approaches include inadequate times available for lesson planning, teacher fatigue and over-extension, and teachers' fear of the unknown. The sub-themes are discussed as follows:

5.7.1.1 : Sub-theme 1: *Inadequate time available for lesson planning*

The study suggests that teachers frequently experience a shortage of time for both lesson planning and the development of new and innovative resources. Participant 1 expressed that a packed schedule leaves little room for reflection regarding her teaching methods. She believes that with the chance to reflect, she could customise lessons to align more closely with learners' interests, thereby enhancing their engagement and curiosity. She states:

"I think that sometimes I'm preoccupied with getting through the content. I think I need to be better at thinking about things that are genuinely interesting to them and then creating more sound links between what we're covering and what lights their fire. I think I could be a more reflective practitioner. I don't know if our timetables allow for hours and hours of reflection. I wish it did." (Participant 1)

Participant 4 supports the notion that a scarcity of time directly reduces the chances for reflective practice, consequently influencing the approach to lesson delivery. He reports:

"Time - when do you come up with interesting lesson plans? Time to plan better and to reflect - you have to think and I don't feel like we do have time for that. Then time for them because what's so fun about economics is it's applicable everywhere so take them out into the real world to see and do things and then come back and reflect on it." (Participant 4)

Furthermore, he suggests that with additional time, teachers could offer learners authentic experiences in real-world contexts, thereby reviving the subject matter. The findings suggest that a lack of planning time adversely affects teaching methods. Despite teachers starting the year earlier than learners, this time gets absorbed by activities unrelated to classroom instruction.

“Planning time. Even though we start school earlier than the pupils at the start of the year, that time is taken up with meetings and no time is dedicated to planning. Schools should make compulsory days for planning with no scheduled meetings. People end up repeating lessons because they haven’t had time to do the planning. Sometimes experience helps but sometimes it doesn’t because you need to change what you did yesterday. The kids shouldn’t be able to predict what will happen – we don’t want to bore them. We have ideas and the resources but if we just had that time.” (Participant 8)

Due to time constraints, teachers may rely on outdated resources, resulting in waning interest among learners and consequently dampening their curiosity.

Participant 7 provides an alternative perspective, expressed as follows:

“I feel like if anything going from public to private school has improved my teaching because I’ve got the space to now be curious and foster that curiosity and creativity. That has been amazing. I’m feeling very fortunate because I felt like I’ve been sleepwalking through my teaching career for a large portion of it and now, all of a sudden, there are so many amazing ideas out there - and online - and I’ve got the opportunity and the resources and the time and space to do it all.” (Participant 7)

Based on the interview results above, it is important to acknowledge this alternative viewpoint, as well as the challenges faced by teachers in the state sector. However, it’s equally crucial to recognise the time constraints and pressures faced by educators in independent schools. Both sectors encounter barriers hindering the design of lessons and the development of resources that cultivate curiosity among learners.

5.7.1.2 : Sub-theme 2: Teacher fatigue and over-extension

Fatigue and over-extension because of involvement in extracurricular activities and broader school-life commitments are identified as significant obstacles to a teacher’s capacity to nurture curiosity in the classroom. The role of a teacher often extends well beyond the confines of classroom instruction, including involvement in sports, cultural events, academic support, and various leadership positions. Analysis of participant interviews reveals the following:

“I think my first year teaching has been quite an overwhelming year and then you are coaching sports all the time. I’ve struggled with energy levels to sustain that creativity - to think how am I going to approach this in an incredibly new and never-before-seen way - where the boys are just going

to walk out of my class and go “That was the best lesson!” I think the onus does fall on the teacher because children need to be given opportunities to experiment and solve and dive into things, and so I think if you are lacking in curiosity and interest and drive yourself that is just going to reflect in the class.” (Participant 1)

“Teachers can get worn down; the school needs to have us at the optimum of our productivity. If you are run off your feet the whole time, developing curiosity in your students falls right away; you just need to get through the hoops. The school needs to protect the staff.” (Participant 3)

“Time – juggling lots of different pressure; 1000s of emails that need a response. You might think you have a gap between lessons and then you have to answer your emails. At home, you say you are going to do work at home but once I get home, it’s all about home. Time to create interesting lessons – with technology – there is a lot one can do but time is a factor. You have to create questions that will lead them to curiosity but then you go back to doing it the traditional way. Even with using pictures to teach them, you need to find relevant pictures. That takes time. We do have holidays but we need to rest. If we had that time at school, we do have frees but they get taken up with marking, meetings, and emails – the diary is always full.” (Participant 8)

The analysis of the excerpts above underscores the challenge of being overextended and its implications for teaching methods. Teachers frequently find themselves overwhelmed, exhausted, and stretched thin, leading to a perceived decrease in their effectiveness in the classroom. It appears that there is a direct correlation between a teacher's lack of energy, curiosity, or enthusiasm for their subject and the level of energy and enthusiasm exhibited by learners. As such, schools must safeguard their staff's well-being to maintain productivity.

The data suggests that teachers' allocated non-contact hours are often consumed by administrative duties rather than the development of resources and interesting lessons. This, coupled with after-school commitments, severely restricts the time for lesson planning. Consequently, teachers may default to "traditional" (Participant 8) and potentially outdated teaching methods, thereby affecting learner curiosity negatively.

Fatigue can also be caused by a lack of teacher interest in the syllabus or the monotony of revisiting the same content repeatedly. Participant 4 reflects:

“Doing the syllabus over and over again you lose your own curiosity; they know that; they can feel that so it's making sure that your excitement for what you're teaching - because they can feel when you're faking it. So trying to stay interested yourself is almost as important as keeping them interested.”

(Participant 4)

The findings indicate that learners are attuned to their teacher's enthusiasm for the subject matter, and a noticeable lack of enthusiasm can lead to diminished interest among learners. As such, teachers must exhibit genuine excitement and maintain a keen interest in their subject.

Participant 11 presents an alternative perspective on this matter, underscoring the importance of teachers being intentional in their time management while also recognising the enriching benefits that teacher engagement in broader school activities can bring to learners' educational experiences:

“I think it's just around creating time and space and being more intentional about it. The challenge is that you end up then taking on other responsibilities and other things full that time and space so whereas I could have used my time to maybe be more creative in terms of my teaching, I ended up running the outdoor education programme and that takes a whole lot of time. On the flip side though, I was probably doing a much better job in terms of instilling curiosity in that space (outdoor education). There's always going to be those trade-offs.” (Participant 11)

On the basis of the interview excerpts above, it can be concluded that while school leadership must ensure that teachers are not over-extended and fatigued, it is equally important to acknowledge that education extends beyond classroom walls. Therefore, teachers are encouraged to leverage diverse opportunities to nurture a sense of wonder and inquiry among learners.

5.7.1.3 : Sub-theme 3: Teachers' Fear of the Unknown

High expectations are placed on teachers, especially within the context of independent schools where parents have typically made substantial financial investments in their child's education. Teachers face immense pressure to achieve impressive results, a burden not only imposed by school leaders and boards of governors but also by alumni and other stakeholders within the school community. This pressure is heightened by the understanding that the success of a group of learners can impact future enrollment at a school. The weight of this pressure can lead teachers to avoid innovative approaches to the curriculum, instead opting

for traditional methods or focusing solely on examination-oriented teaching. Consequently, this diminishes opportunities for exploration, inquiry, and creativity in the classroom. Teacher participants report the following:

“Maybe just fear that it's not going to work; fear that you put a huge amount of time and energy into something and it doesn't work. I know I'm wrong in thinking this, but if there's absolute chaos in the classroom, and nobody comes up with a proper solution - unfortunately, that's what I would view as not working. But that's not to say that it hasn't sparked something, some boy hasn't learnt something, or it sparked an interest in something. Maybe we should just let it go and let the boys run with it and actually, it's OK if it's ...It's that fear of chaos which I think in most schools especially a school like this we shy away from - things are very structured.” (Participant 2)

“I think we must stop saying time actually - I'm sure everyone says time. Future Fit has just demonstrated that we can collapse a timetable and bring curiosity into the classroom. It's fear – that's a big one - fear of missing out on curriculum, of outcomes, getting through the work, of performance appraisal.” (Participant 13)

The aforementioned participants highlight fear as a significant factor shaping their teaching methods. Concerns about potential classroom chaos, the risk of investing time and energy into unsuccessful activities, or learners not achieving learning objectives deter teachers from attempting innovative approaches. While teachers must use the most effective methods to meet the needs of their learners, Participant 13 emphasises that despite these risks, the introduction of the alternative Future Fit Programme has shown that prioritising curiosity-driven learning is possible. He explains teachers' initial reluctance to become involved in the programme:

“I think trust of the system - that it was going to work - trust of what we're doing. I think they wanted to see if it would pan out first. We've had a lot of interest after this year – people can see that it now is a safe avenue. I suppose the same is true of the boys - in terms of their numbers now - funny we didn't have a huge uptake in the beginning, and we did a lot of marketing to get boys to sign up again. I've had extraordinary feedback from the parents of boys who have done Future Fit. Parents who traditionally come from conservative mindsets and backgrounds –have just raved about it for their sons. I've done this survey with the current Grade 8s to try and dig deep into what's holding them back from still signing up. Some of the things

that are holding them back are marks, performance in exams, worry about subjects and missing out on subjects. The fear of missing out, or what happens to their marks, how do they get marked? That was interesting - it's just so ingrained in our system.” (Participant 13)

From the interview excerpts above, it can be argued that all stakeholders were concerned about the potential impact on grades and the possibility of missing out on important subject content. Interest in the programme only grew once evidence of its successful implementation emerged. While this evidence-based approach is not inherently negative—teachers should indeed rely on evidence to inform their practice—it is crucial to research and implement teaching methods that prioritise the best possible outcomes for learners. However, the danger arises when learners' achievements are solely measured by a number on a report card. This narrow focus can hinder opportunities for learners to truly explore, research, and take ownership of their learning journey due to fear of straying from established metrics.

5.7.2 : Theme 2: Learner Related Barriers

Participants' responses indicate various learner-related factors that hinder learners from fully engaging with interest. These sub-themes include learner fatigue and overextension, learner engagement and apathy, and a result-oriented mindset. The sub-themes on learner-related factors are discussed below:

5.7.2.1 : Sub-theme 1: Learner fatigue and over-extension

Interestingly, participants note that fatigue and over-extension are not exclusive to teachers but also affect learners. This phenomenon seemed to be more prevalent in boys' boarding schools, where participants observed high levels of engagement in sports.

“Fatigue. I think our boys are stretched in every single direction and sometimes I find they are just “pap” and they are just exhausted. So, I think that hinders curiosity in the classroom. Because they are playing way too much sport - and off-season sport - and waking up to do gym in the morning. And then I don't think our calendar, with the number of tests is working. I think boys are writing more than two to three tests in a day. So, I think they just actually have a little bit of burnout.” (Participant 1)

“Time. In our school the prominence of sport. Sport is a great thing but somehow in SA we've lost the plot in terms of how important sport is in our schools, it's not a unique thing to our school, but often we play catch up – I understand the nature of teenage boys, but it occupies more of their headspace than it should.” (Participant 3)

Participants acknowledge the significance of sports in school life. However, heavy involvement in sports can lead to learners feeling stretched, overwhelmed and distracted. The prominence of sports can detract from learners' curiosity about learning, as they may feel exhausted and, in some cases, experience burnout. When combined with excessive academic testing, these factors serve as barriers to learners' excitement about learning and their ability to engage fully and meaningfully.

Participant 14 notes that the rigid structure of the school day, moving from one subject to another, can hinder curiosity. Learners are required to frequently switch their focus, which can impede their ability to explore topics of interest.

“The rigid structure - moving between classes and the emphasis on marks as a numerical determinant. I think both of those things play against the chance of having curiosity happen.” (Participant 14)

From the interview result above, the belief that success is solely determined by marks awarded in examinations can discourage learners from taking risks in their learning. Instead, they may stick to safe learning strategies geared towards exam preparation.

5.7.2.2 : Sub-theme 2: Learner engagement and apathy

While the teacher plays a pivotal role in impacting learner engagement and fostering curiosity, several other factors can determine whether a learner engages in the classroom some of which are beyond the teacher's control. Analysis of participant interviews reveals the following:

“For me and I'm just thinking specifically of my subject, I don't know that students who choose the subject necessarily have a massive interest in it which I think can stifle curiosity. I would like to think that students who choose Geography do so because they are curious and are interested in the environment and their place in the environment and relationships. I think a lot of students do it because it's not an easy subject but it's a subject that the majority of students can pass with a bit of hard work. I think that is a challenge that you are not just getting the kids who are interested in the subject.” (Participant 2)

“The girls want to be spoon-fed – they want to know what is going to be in the test.” (Participant 6)

“I would say boys who struggle with impulse control and dominate and shout out. They sabotage others' interests and curiosity – it means many boys just

sit - because there's always that person who's distracting, and disruptive. That's a big challenge in my lower grades.” (Participant 15)

The excerpts above suggest that some learners choose subjects not out of genuine interest, but because they perceive them as less challenging than others. This can adversely affect learner engagement. Moreover, some students may resist taking responsibility for their own learning, developing an over-reliance on the teacher. Conversely, others may deliberately disrupt the classroom environment, impacting not only their own engagement but also that of their peers. All these factors have a detrimental effect on learner curiosity.

Participant 3 contrasts the responses of two distinct groups of learners: those from a community partnership school and those from the independent school where he teaches. He observes:

“Many of our boys have not had to work really hard in life. So when I do Vula work, I will open my mouth and start talking and some of the Vula pupils are already writing down what I have said. For them, they want to get out of the cycle that they are in – they see their parents and grandparents in this cycle and they want to get out of it. Whereas our pupils have a massive safety net and the safety net is too big. There’s this thing – I don’t need to work for it. It will just happen. Life is too easy for many of our pupils.” (Participant 3)

From this finding above, it is evident that learners’ curiosity and engagement can be reduced because they have grown accustomed to achieving success with minimal effort. This certainty of success can result in a lack of investment in learning opportunities.

Participant 14 expresses frustration at the lack of curiosity shown by his learners as shown in the following excerpt:

“I’m struggling to get them curious about AI. We got the go-ahead from the IT department to have no blocks on this stuff - this is an AI classroom - we can do this stuff and talk about it. But I get no interest or curiosity, so that’s why I am struggling at the moment to think why aren’t they as excited about this as I am? What do I know that they don’t know? So trying to talk to them about it, and basically, the best response I’ve got so far is something like – “Oh, that’s just what computers are supposed to do.” I don’t know if they’re impossible to amaze when using technology anymore because if it’s possible, they’re already expecting that it’s possible. They’re jaded by what’s out there.” (Participant 14)

From the interview excerpt above, it is evident that learners have developed an expectation that technology can accomplish anything, which leads them to accept outcomes without questioning the processes or reasons behind them, thereby dampening their natural curiosity.

5.7.2.3 : Sub-theme 3: Results-orientated mindset

Unsurprisingly, the study highlights a preoccupation with results among learners, as their achievements are measured primarily through examinations and assignments. Participant 12 remarks, “curiosity is a risk,” indicating that straying from conventional methods of learning can be seen as potentially jeopardising success. The following excerpts demonstrate how a result-oriented mindset can diminish learner curiosity.

“The outcomes-focused guys, the mark-getters with typically lots of family pressure, and those who like measurable achievement, will find a lot of the way I teach frustrating. What do I get marks for? Is this going to be in the test?” (Participant 4)

“Every time you give them something, the first thing they ask is this for marks. If you say it’s not for marks, they will not be interested. Sometimes you just have to say “I’m recording this for marks” even if you’re not.” (Participant 8)

“Assessment – they always ask if it is for marks. Marks seem to motivate the girls.” (Participant 9)

They go from class to class, they write notes and even the top kids become secure in that kind of environment because they know the recipe to get the marks. Sometimes they (bright kids) are the most intimidated by doing something a little bit different because they’re not too sure of the pathway to the A. I think for some of those top achievers, curiosity is a risk - especially if they’re kids who have to work hard to get their top marks and that’s their identity around their marks.” (Participant 12)

The findings indicate that learners value tasks that yield numerical results; this can be exacerbated by family pressure. As such, some learners have mastered a formulaic approach that reliably secures results. Therefore, it can be argued that deviations from conventional teaching methods can therefore be perceived as risky by these learners. However, to foster greater curiosity and promote deep learning, teachers must be prepared to challenge learners and extend them beyond their comfort zones.

5.7.3 : School-related barriers

School-related barriers are those aspects within the school system that hinder teachers' experience in the use of curiosity in the classroom. The study findings indicated that the school-related barriers are divided into 3 sub-themes, namely, curriculum demands and time constraints, rigid assessment criteria and a diverse range of learners in classrooms.

5.7.3.1 : Sub-theme 1: Curriculum demands and time constraints

The study findings show that teachers perceive time constraints as a significant barrier that impedes them from fostering curiosity among learners. It is important to understand that the challenge of time is multifaceted. Firstly, this sub-theme considers the amount of time needed to cover the curriculum with most teachers feeling that the number of lessons allocated to cover the syllabus was not sufficient in the senior grades. This places significant pressure on both teachers and learners to cover the work leaving little time for exploration and inquiry. This discrepancy places considerable pressure on both teachers and learners to cover the necessary material, consequently leaving scant time for exploration and inquiry. The interview excerpts from participants are reported as follows:

“Time, time definitely in terms of getting through certain amounts of work within a certain time frame. I could see how in Grade 11 and Matric curiosity is substituted for just reaching the final goal, maybe both in teaching and in learning. Boys realising in matric that ‘I’m not here for fun – just tell me what I need to know.’” (Participant 1)

“I think to myself it’s taking up time; it’s not part of the syllabus; can afford to do that; how will it benefit their mark; the final outcome; the result at the end of matric?” (Participant 2)

“We’ve been told to use up to 8 minutes at the beginning of the lesson for recall – sometimes I don’t have 8 minutes. Time. I wish I could ask the question properly, but I can’t.” (Participant 3)

“Time - with the girls and time to prepare. I feel if we had more time, I would have more fun with my teaching and they would have more fun with their learning- I had planned to do an amazing race but we just didn’t finish on time.” (Participant 6)

“I think sometimes in the senior classes the amount of content is quite dense and so sometimes you just must put curiosity on the back burner to get through the content so that’s a contributing factor.” (Participant 7)

“Moving from government to IEB there's so much more freedom and playfulness that we can do but as I've mentioned earlier, it is restricted to the junior grades - we just don't have time in the senior grades to explore and have that free time. I would say that the big obstacle is time.” (Participant 10)

The findings suggest that teachers perceive the cultivation of greater curiosity as a time-intensive task. Particularly in Grades 11 and 12, teachers overwhelmingly believe that the density of the syllabus leaves little room for fostering curiosity. Teachers are pressured to prioritise results over curiosity. As such, fun, freedom, and playfulness in learning are often relegated to the junior grades, while learners preparing for external examinations are primarily focused on covering content and preparing for examinations.

Participant 12, excerpt below, suggests a potential solution to this constraint: the omission of certain sections of the curriculum. The inclusion of topics deemed unnecessary or more suitable for other subjects exacerbates the pressure felt by teachers.

“Then the syllabus itself is a constraint. Some of the things that we do, don't need to be done in Maths and could be done in Accounting - like financial Math could be done in Economics or Accounting. My opinion is that that's a topic that doesn't need to be included which would then alleviate some of the time. Most of the kids also ask why are we doing this in Maths. It is a mathematical concept but it's not that important for what we're doing.”
(Participant 12)

Participants 11 and 12 reflect on another time-related constraint: the duration of lessons. They argue that a standard 40-minute lesson does not afford sufficient time for exploration and reflection, consequently impeding the cultivation of curiosity. Participants report:

“Within the 40-minute lesson, there's also only so much that you can do – time is quite a significant factor because if you want to do something where you're instilling and encouraging curiosity, you need to have that space and time to explore and go down one route and realise what isn't working and change tack. You can't do that within 40 minutes - you've got to have a meaningful chunk of time. Two hours at least to be able to do something meaningful. I think the time constraints become problematic. That's where what they're doing with the Future Fit Programme and by giving them their time and space to work on projects and not be constrained to 40-minute lessons. I think is really valuable.” (Participant 11)

"I've mentioned the time constraints. That's always going to be one. Here, the length of lesson time is very short - it's a 40-minute lesson. So there's not a lot of time to go through what we did yesterday - have you understood - introduce a new topic - practice a little bit. There's not a lot of time, you have to set aside a whole lesson if you want to do something different, which is great with the younger grades." (Participant 12)

From the interview results above, it is interesting to note that teachers seem to view the cultivation of curiosity in learning as an additional task rather than an integral part of their current teaching approach. Therefore, considering the density of the curriculum and limited lesson durations, it becomes crucial for teachers to be equipped with tools that enable them to integrate curiosity-enhancing techniques into their existing practices, rather than treating them as supplementary or enrichment activities.

5.7.3.2 : Sub-theme 2: Rigid assessment criteria

The assessment of learner outcomes solely through examinations poses a further barrier to teachers. Participants note that the constraints imposed by a system reliant on test scores diminish learners' creativity and, consequently, their curiosity. Participants report:

I worry that at the end of the day, I am preparing these girls to write a matric exam and, if I am not standing up there telling them every little thing they need to know I might disadvantage them. How do I know if they will discover things on their own? (Participant 6)

"Probably just the time constraints - if you must cover certain content for an exam or block test or something - I do think we over-assess. I don't know if we do enough creative work - it's hard to assess that - so why do we have to assess? Now we don't ever do poetry writing because we are not going to assess that. But now we know we don't ever write poetry – we don't write enough creative pieces either. If we do want them to write creatively, we've got the challenge of CHAT GPT which has completely destroyed original thought. That's a big challenge, too. Creativity and curiosity go hand in hand." (Participant 15)

Based on the excerpts above, it is apparent that teachers are reluctant to incorporate opportunities for independent study for fear of disadvantaging learners or not preparing them adequately for examinations. Furthermore, the nature of assessment, including what is assessed and how it is assessed, influences the content covered in the curriculum. As a result, there has been a decline in the emphasis placed on creative writing, as it is not assessed to

the same degree as other curriculum components. Moreover, the emergence of AI tools such as ChatGPT has influenced teachers' views on creative work, prompting concerns about AI's capacity to limit original thought and creativity.

Participants 6 and 12 identify another time-related constraint: the time limits imposed during examinations, which hinder learners from articulating the breadth and depth of their understanding. The excerpts below discuss these concerns:

"It is also the time limit on the exam. They have three hours to show what they know – it's not just what they know, it's how quickly they know it. We don't need to know things quickly. We should not test under time constraints. With time they would have time to reflect and their responses would be better." (Participant 6)

"I think a lot of the anxiety comes around the fact that there is a stringent time limit and so it's like a race - it's like a sprint - every time they do an assessment or an exam it's like they've got to beat the clock." (Participant 12)

From the results above, it can be argued that some teachers advocate against testing under timed conditions, contending that aside from intensifying learner anxiety, it fails to offer an authentic experience as rapid recall is seldom as crucial as comprehensive understanding. Therefore, providing learners with the chance to demonstrate the depth of their knowledge in an authentic setting away without rigid time constraints would be a more effective way of evaluating learning.

5.7.3.3 : Sub-theme 3: A diverse range of learner needs in classrooms

Within a single classroom, there exists a spectrum of learners, each with unique needs and backgrounds. These students vary in academic abilities, and some may experience learning difficulties or exhibit diverse social, emotional, and behavioural needs. Teachers must have the expertise to differentiate content and delivery methods to ensure that learning is accessible to all learners. Furthermore, they must cater to a range of interests to effectively engage and enthuse every learner. This undertaking presents a significant challenge, as reflected by the following participants:

"In the classroom space, where we have 20 to 25 boys sometimes, I find with curiosity that I am appealing to just a small percentage of boys and not all the boys are curious about the same thing." (Participant 5)

“Children are different and have different interests as well which I think is a limitation - especially with English, you have the girls who love poetry and writing and love reading, and other girls who will just eye-roll the whole time. I think that is also a problem we have no control over whether they're receptive and whether they want to know.” (Participant 10).

The diverse interests of learners can influence their responses to various subjects or specific topics. The findings indicate that teachers acknowledge the difficulty in engaging the entire class, noting that there are instances where teachers may lack control over whether individuals will be receptive and respond enthusiastically.

Another challenge encountered by teachers in independent schools is the broad diversity of feeder primary schools from which learners transition. Consequently, when commencing Grade 8, learners exhibit varying levels of foundational knowledge. Participant 12 reports:

“It's hard when kids come in Grade 8 and they've all come from different schools, and they've all come from different types of teachers, and sometimes they haven't had the same teacher for a full year because of where they come from and the teachers change. It's setting up that foundation in Grade 8 which is already a time when we're launching full speed ahead. Maybe in the first three months, we can review some of the stuff but we are having to reteach things like fractions, adding and subtracting and yet those are the foundational topics that keep tripping them up - even up in matric. I find that I need to be more familiar with the Junior School syllabus so that I can remind these kids and try and trigger memories in them about when they learnt certain things. I find that quite a challenge where we have to try and get these kids, not to the same level, but at least those that don't understand, to a Grade 8 level.” (Participant 12)

From the interview excerpts above, it is evident that becoming more familiar with the primary school syllabus could aid in supporting learners as they transition to a high school setting. Therefore, it could be argued that implementing these support measures would enable teachers to structure lessons in a manner accessible to all learners, thereby increasing the likelihood of engaging their interests.

5.8: Conclusion of the Chapter

This chapter presented the findings and interpretation from the thematically analysed data. Each section considered the data related to the study's objective: understanding teachers'

experiences in fostering curiosity in the classroom to improve learning outcomes. The next chapter presents a summary of findings, discussion, conclusion, recommendations, and suggestions for further research from this study.

CHAPTER SIX

6.0 : SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

6.1 : Introduction

This chapter contains a summary of findings, discussion, conclusion and recommendations. The findings are discussed according to the research questions of the study. Furthermore, the chapter presents the limitations of the study and suggestions for further research.

6.2 : Summary of Findings

The study's findings are summarised below.

6.2.1 : Teachers' understanding of curiosity in teaching and learning

This study examined teachers' understanding of curiosity in the context of teaching and learning. The findings revealed that teachers recognise curiosity as a powerful motivator for learning. Curious learners extend their efforts beyond the curriculum and classroom, seeking greater insight and depth of understanding. Although curious learners tend to perform well academically, they are driven by a desire for knowledge and understanding rather than by results alone. They strive to establish connections among different subjects, leading to a holistic understanding of the material.

Additionally, the findings indicate that questioning is a clear indicator of learner curiosity. When learners ask questions, it shows they have identified gaps in their understanding and seek to fill them. Therefore, teachers must equip learners with the skills to formulate effective questions and create a classroom environment that encourages inquisitiveness. In addition, the findings indicate that curious learners are self-motivated, independently seeking learning opportunities and taking an active role in their education. Curriculums that are relevant and meaningful foster a greater sense of curiosity, allowing learners to find significance in their learning and promoting an understanding of the interconnections among subjects. Consequently, the study suggests that learning environments should nurture curiosity by providing opportunities for learners to explore and develop interests beyond the immediate curriculum.

6.2.2 : Factors influencing teachers' adoption of curiosity in the classroom

The findings identified four main factors influencing the classroom environment: teacher-related, learner-related, school-related, and community-related. The findings indicated that teacher-related factors are shaped by pedagogical approach, self-perception, interests, and experiences. The beliefs and behaviours of teachers significantly impact the value placed on

curiosity, the methods used to encourage it, and learner responses in the classroom. Key elements such as classroom management, willingness to show vulnerability, collaboration, humour, authenticity, and intentionality play crucial roles in integrating curiosity. Factors including the expectations placed on teachers, their curiosity mindset, the degree of agency and autonomy they experience, and their willingness to experiment, adapt, and grow all influence how curiosity is cultivated. Additionally, teachers' interests and experiences shape the content they emphasise, their examples and analogies, and how learners respond to them.

Learner-related factors include engagement in lessons, a sense of belonging, and peer responses to curiosity. The findings reveal significant variation in learner engagement and enthusiasm, with some learners' passivity negatively affecting both their own and the class's curiosity. Frustration with challenging content can also diminish curiosity. Learners are more likely to exhibit curiosity when they feel comfortable and safe, leading to increased engagement and risk-taking in their learning. Positive peer interactions can greatly enhance curiosity, underscoring the importance of teachers fostering an environment where learning and academic achievement are valued, and peers support one another.

School-related factors encompass structures and systems, prescribed curricula, attainment scores, professional development opportunities, and extracurricular opportunities. The number of lessons per day, their timing, and duration all impact learner curiosity, with overly busy schedules hindering it. While independent schools offer curriculum flexibility, the high volume of content required in senior grades can stifle curiosity. Intentional use of the physical environment and resources is crucial for fostering curiosity. Professional development and self-reflection opportunities play significant roles in enhancing teacher efficacy and the adoption of curiosity in teaching. Additionally, providing learners with extracurricular opportunities to explore and engage in a variety of authentic, hands-on experiences is essential for nurturing genuine curiosity and improving classroom engagement.

Lastly, community-related factors such as parenting styles and expectations significantly influence learner curiosity. Family backgrounds, values, and expectations shape the curiosity learners display towards certain subjects or aspects of the curriculum. These influences can be both positive and negative, affecting the extent to which learners engage with and explore new topics.

6.2.3 : Teachers' understanding of the importance of curiosity in the classroom

The study's findings suggested a positive correlation between curiosity and academic performance. Teachers observe that curious learners often integrate lived experiences with theoretical concepts, leading to a deeper understanding of the material. Additionally, these learners tend to have more tools at their disposal to engage with content and questions,

resulting in better performance. However, while teachers believe that curious learners perform better, there is little quantitative data to support this perception. Moreover, being curious does not guarantee academic success. Various factors can impact a learner's achievement despite their curiosity. For instance, learners who struggle with mathematical concepts or comprehension may perform poorly in assessments despite their interest. Nonetheless, the study indicates that increased curiosity enhances academic engagement. To capture this interest, teachers need to design activities that are unpredictable, novel, or provide a change of context, which leads to higher engagement. This increased engagement, in turn, leads to greater retention, better knowledge transfer, and improved learning outcomes. Interestingly, the study notes that while technology is used to engage learners, it does not necessarily result in deep learning, retention, or knowledge transfer.

Learners are more curious and engaged when they have some autonomy over their learning, becoming active participants in constructing their learning experiences. This autonomy boosts curiosity, as learners have control over what and how they learn. The findings also suggest that learner autonomy develops when tasks are appropriately challenging. Such tasks lead to thorough engagement, resulting in deeper learning and improved outcomes. Additionally, when learners are curious about a topic, they tend to retain the associated information longer, particularly when they have a heightened emotional response to their learning. In such cases, they ask more questions and participate more actively, leading to greater content retention.

Finally, the study highlights a strong correlation between curiosity and emotional intelligence. Curious learners exhibit greater social and emotional awareness. Although it is unclear whether one trait causes the other, the findings suggest that curious learners ask more questions, consider multiple viewpoints, and think more deeply, contributing to higher emotional intelligence.

6.2.4 : How teachers stimulate curiosity among learners

The findings reveal that teachers employ a variety of techniques to stimulate learner interest. Firstly, they use stories or anecdotes to capture attention, simplify complex concepts, and make abstract ideas more relatable. Secondly, they aim to surprise, shock, or impress learners when introducing new concepts—the 'wow factor' evokes strong emotions that initially garner attention and foster continued engagement throughout the lesson. Teachers report that heightened emotions help learners retain information more easily. Controversy, empathy and relevance actively engage learners, encourage critical thinking, and stimulate dialogue.

The study highlights the crucial role teachers play in orchestrating lessons: eliciting interest, connecting new content to learners' existing interests, and teaching skills and knowledge while maintaining initial engagement. Another strategy teachers use to stimulate interest is

employing novel or unconventional methods of lesson delivery. Moving away from traditional desk-bound learning towards playful, unpredictable, and physical approaches energises and engages learners, making them more interested in the material. The findings suggest that teachers view themselves as entertainers in many respects. Novelty can also be employed by inviting another teacher in to deliver a section of material to the class. This alternative perspective can garner attention and offer a different approach to the subject matter.

A key finding is the importance of relevant material and authentic experiences in fostering curiosity. Activities like field trips, guest speakers, and hands-on experiences stimulate interest, enhance understanding, and deepen learning. Integrating current events into lessons makes learning more relevant and meaningful. Teachers are encouraged to demonstrate the interconnections between different disciplines and real-world contexts. When connections are explicit, classroom learning is seen as more purposeful and relevant, which increases learner interest.

Questioning plays a critical role in establishing and maintaining curiosity. Both teacher-posed and learner-generated questions encourage interest, identify information gaps, and develop understanding. The study promotes simplicity in questioning to scaffold learning. Using questions to develop understanding not only captures learner interest but also models curiosity. An effective strategy is to use questions instead of traditional topic headings, helping to identify knowledge gaps and involve learners in knowledge construction. The study also emphasises the link between curiosity and reflection, using questioning as a tool to guide learners in reflecting on their learning and identifying areas for improvement. Encouraging learners to generate their own questions fosters curiosity by prompting them to consider their existing knowledge and gaps, making them active participants in their learning process.

Moreover, the study supports the notion of learning as a socially mediated process, highlighting the importance of collaboration in promoting curiosity. Learners learn to appreciate diverse perspectives by listening to others and articulating their ideas. Visual stimulation captures interest and heightens emotion, fostering deeper engagement with the subject matter. Technology also stimulates curiosity, with applications that expose students to a broader range of resources and experiences, making learning more relevant. Finally, teachers recognise the need to allocate adequate time and space for open-ended, learner-centered exploration. Activities designed to incorporate collaboration, problem-solving, exploration, and experimentation promote autonomy by empowering learners to be active participants in their learning, thereby heightening curiosity.

6.2.5 : Barriers that teachers experience in the use of curiosity in the classroom

The study findings identified three key areas presenting barriers to teachers in fostering curiosity in the classroom: teacher-related, learner-related, and school-related barriers.

The study findings indicate that teacher-related barriers include a lack of time which hampers their ability to develop resources and plan innovative lessons. This time constraint also limits opportunities for reflection, causing them to rely on outdated resources and methodologies. Moreover, teachers reported feeling overextended due to commitments outside the academic classroom, leading to fatigue that affects their ability to deliver lessons tailored to their learners' needs, thus diminishing learning curiosity. Additionally, the study indicated that teacher fatigue increases when they have less interest in the subject matter, negatively impacting their enthusiasm for teaching. Teachers in independent school settings face significant pressure from parents and other stakeholders to achieve impressive learner results, which can discourage them from experimenting with new or innovative practices. This pressure leads to a preference for results-driven approaches, as teachers fear chaos in the classroom, wasted time, and uncertain outcomes, ultimately affecting how they stimulate curiosity among their learners.

The study also noted that fatigue and overextension are not exclusive to teachers; learners can also experience exhaustion, which impacts their ability to respond with curiosity in the classroom. An intensive focus on sports, over-assessment, and rigid school structures were identified as leading causes of learner fatigue, resulting in reduced interest in their studies. Learner engagement and apathy are highlighted as significant barriers to fostering curiosity. Teachers report frustration with learners who show a lack of genuine interest in subjects, take minimal responsibility for their learning, or are disruptive in class. This frustration hinders teachers from engaging the class in a meaningful way that stimulates interest and curiosity, leading them to rely on more traditional, teacher-centric methods. Lastly, the study finds that both teachers and learners are wary of deviating from traditional, results-oriented methods. Learners, like teachers, often fear attempting new approaches and prefer formulaic methods that offer greater security in achieving results.

The study highlights several school-related factors contributing to time constraints: heavy curriculum demands and limited allocated academic time place significant pressure on teachers, leaving little room for exploration and inquiry. Teachers view the cultivation of curiosity as time-intensive, occurring in addition to rather than embedded into the general teaching of the material. When under time pressure, they prioritise results over fostering curiosity. In addition to dense curriculum loads and limited contact time, teachers feel that lessons are too short to explore ideas deeply. The excessive amount of content to cover and

rigid assessment criteria, particularly in the senior phase, further restrict creativity in teaching and learning. Teachers feel pressured to teach towards examinations, limiting creative approaches in both instruction and assessment. Moreover, the study suggests that the time constraints imposed on assessments themselves act as barriers to learner achievement, advocating for more authentic assessments that allow learners to demonstrate a depth of knowledge. The diverse range of learner needs in any classroom also poses challenges for teachers in pitching learning at an optimal level for all. This leads to some learners feeling under-extended and others overwhelmed by the curriculum's difficulty. This challenge is exacerbated by the large number of primary feeder schools that independent schools draw from, resulting in learners starting Grade 8 with a diverse level of ability and making it difficult for teachers to pitch learning at an appropriate level.

6.3 : Discussion of Findings

The study's findings are discussed below.

6.3.1 : Teachers' understanding of curiosity in teaching and learning

This study explored teachers' conceptualisation of curiosity within the context of teaching and learning. The findings provided insight into how teachers define curiosity, the characteristics they associate with curious learners, the relationship between questioning and curiosity, and the connection between curriculum and curiosity.

The findings suggested that teachers share a common understanding of curiosity. They recognise it as a powerful motivator for learning and as an innate desire to know more and extend understanding beyond the confines of the classroom. This understanding aligns with definitions from both premodern philosophers and 20th-century psychologists. Aristotle described curiosity as an intrinsically motivated desire for information; Cicero referred to it as an innate love for learning; and Freud characterised curious individuals as having a thirst for knowledge (Loewenstein, 1994). Similarly, Litman (2005) defines curiosity as "a desire to know, to see, or to experience" (p. 793), explaining that this desire drives information-seeking behaviours. Kidd and Hayden (2015) further note that the core function of curiosity is to facilitate learning.

The findings show that teachers perceive curious learners as those who challenge the boundaries of the curriculum. These learners seek knowledge and explanations beyond what is required for task completion. Additionally, teachers observe that curious learners are self-motivated, independently seeking out learning opportunities rather than passively waiting for them to be provided. While teachers recognise the role of curiosity in academic achievement, they also note that curious learners are driven by a desire for understanding rather than by results. This finding aligns with Litman's (2005) concept of interest-type curiosity, where

curiosity is a pleasurable experience and the understanding gained is the reward. Litman further identified a different type of curiosity, deprivation-type, which arises from a desire to avoid feelings of uncertainty. This form of curiosity, however, is not reflected in the findings, which suggest that teachers perceive curious learners as those who are intrinsically curious and exhibit high trait curiosity. Grossnickle (2004) describes trait curiosity as a stable characteristic of individuals who respond with interest, wonder, and awe.

The current study's findings indicate that teachers recognise this type of curiosity, seeing these learners as more receptive and motivated to acquire new knowledge which correlates to how Kidd and Hayden (2015) describe those with high trait curiosity. Teachers seem to differentiate between learners who exhibit curiosity and those who do not, which is problematic. Curiosity should be viewed as a malleable trait influenced by environmental factors, suggesting that all learners have the potential to develop curiosity if given the right conditions. Based on the current study, teachers associate several key characteristics with curious learners: inquisitiveness, intrinsic motivation, questioning, and a desire to understand causal relationships and connections. These findings closely align with Herwin and Nurhayati (2020) which identified four primary traits: attentiveness, note-taking, inquisitiveness, and information comparison. These characteristics enable learners to gain deeper insights, moving from a basic understanding to a more comprehensive grasp of a topic.

The findings suggest that teachers view questioning as a crucial element in demonstrating and fostering learner curiosity. Through questioning, learners actively seek information, leading to better knowledge retention. This finding agrees with Loewenstein (1994) who highlighted the information gap, noting that curiosity arises from perceiving such a gap. Similarly, this finding agrees with Berlyne (1954), who suggested that according to Gestalt psychologists, humans are driven to make sense of their environments and close informational gaps.

Teachers' recognition of the importance of questioning in demonstrating curiosity and identifying information gaps is a significant finding of this study. Learners who exhibit the most curiosity are often those who have identified an information gap in their understanding. These learners typically have a moderate understanding of the concept being taught, providing them with the necessary foundation and vocabulary to engage with new material and recognise gaps in their knowledge. This idea is supported not only by Loewenstein but also by Day's (1982) model of the zone of curiosity and Wade and Kidd's (2019) which showed that learners are most curious about subjects they are on the verge of understanding.

The current study confirms teachers' vital role in pitching and scaffolding learning at the appropriate level and equipping learners with the tools necessary to investigate and

understand new concepts. In agreement, Dunn (2013) emphasised that most policy directives and curriculum guidelines remain vague, offering little guidance on how to foster curiosity in learners or leverage it to enhance learning. Moreover, curiosity is seldom included in assessments or evaluations of learners. Based on the findings above, the implication is that there is a need to educate teachers on a diverse understanding of curiosity in classrooms. Additionally, there should be clear and practical guidelines within policy and curriculum design to promote subject-specific methods for fostering curiosity.

6.3.2 : Factors influencing teachers' adoption of curiosity in the classroom

The findings indicated four main areas that influence teachers' adoption of curiosity in the classroom: teacher-related factors, learner-related factors, school-related factors and community-related factors.

6.3.2.1 : Teacher-related factors

The study identifies pedagogical approaches, teachers' self-perception, and teachers' interests and experiences as influencing the way teachers generate curiosity in learners and whether learners respond with curiosity.

The study findings indicated that teachers who adopt a curiosity mindset are more likely to value and foster curiosity in the classroom. In agreement, both Oliveira and Lathrop (2022) and Jirout and Zumbrunn (2018) support this finding, asserting that teachers must have and model a curiosity mindset if they wish their learners to do the same. Teachers who are comfortable grappling with new knowledge and modelling uncertainty create an environment where it is safe for learners to do the same. The findings suggest that teachers with a curious mindset tend to be curious about their subjects, pedagogical approaches, and the learners themselves, thus creating an environment characterised by social congruence, subject-matter expertise, and cognitive congruence. These findings align with Rotgans and Schmidt's (2010) study which reported that teachers who scored high in these three characteristics had a greater impact on learner curiosity. Teachers high in social congruence can recognise and respond to the social needs of a class, creating an environment where all learners feel seen and valued. Teachers with high cognitive congruence understood the best ways to scaffold and communicate knowledge to learners, thus acting as the more knowledgeable other (MKO) and leading the learner to a deeper understanding.

The study's findings also showed that teachers open to ongoing learning, reflection, and experimentation see their pedagogical approach as evolving rather than static. Reed, Davis, and Nyabanyaba (2022) support this finding by asserting that reflective practice leads to better teaching. Reflection in planning and delivery enables teachers to engage learners more

effectively and identify the optimal level for introducing new material, thereby harnessing the optimal information gap (Loewenstein, 1994) or the zone of curiosity (Day, 1982). Loewenstein and Day suggest that people are most curious about topics they have some information about but have not yet mastered. This study indicates that curious teachers, through reflection, are better equipped to identify this information gap as they view their learners, their subjects, and their teaching approach as dynamic and adaptable.

The findings indicate that classroom management styles significantly affect a teacher's approach to fostering curiosity and learners' responses. Teachers suggest that an authoritarian style tends to shut down inquiry, whereas a calm, structured, and safe environment encourages questioning and curiosity. In agreement, Inayat and Ali (2020) posited that teachers who show support and interest in their learners foster an environment where heightened interest and curiosity in learning are evident. Their study revealed a positive correlation between perceived teacher supportiveness and learner curiosity, attendance, and academic achievement. In agreement, classrooms perceived as safe spaces are most likely to result in learners feeling confident and empowered to express curiosity. Similarly, Engel (2013) supports this notion, suggesting that poor classroom management—whether through a lack of control or excessive control—stifles curiosity by failing to allow for exploration and expression. Thus, effective classroom management and a supportive teaching approach are crucial in fostering an environment where curiosity thrives. The presence of supportive, interested and approachable teachers creates a positive feedback loop, enhancing learner engagement, curiosity, and overall academic achievement.

6.3.2.2 : Learner-related factors

The study findings indicate that a sense of belonging and peer response to curiosity significantly impact how learners respond to teachers' attempts to foster curiosity.

The findings indicated that learners who experience a sense of belonging in the classroom are more likely to engage with curiosity. Thus, personal connections with learners and an environment characterised by inclusivity and nurture are crucial factors in fostering curiosity among learners. In agreement, Oliveira and Lathrop (2022), argued that a learner's sense of belonging significantly promotes a curiosity-rich environment. Similarly, Inayat and Ali (2020) assert that when learners feel supported and valued by their teachers, they are more likely to respond with interest and curiosity. These findings highlight the importance of perceived safety and authentic connections between learners and teachers. A stable relationship between the teacher and the learner enables learners to respond with interest, ask questions, share responses, and take risks.

The findings also indicated that another significant factor impacting learner curiosity is how peers respond to displays of curiosity. In agreement, Vygotsky's theoretical assertion (McLeod, 2022; Powell & Kalina, 2009) describes learning as a socially mediated process and emphasises the role of social interaction and collaboration in cognitive development. According to Vygotsky, a child's curiosity and inclination to explore are stimulated through social interaction, making the role of the group in learning highly important. However, the findings revealed that negative peer responses can often hinder curiosity, particularly in a boys' school environment, where there can be a stigma around diligence and hard work. In addition, Nakamura et al. (2022) noted that positive peer engagement significantly boosts learner curiosity, as learners respond to their peers' perspectives, thereby influencing engagement and learning outcomes. Given the crucial role of the group in learning, teachers need to establish an environment where demonstrations of interest, enthusiasm, and learning are encouraged and valued. The implication of this finding is that there is a need for teacher training programmes, the Department of Education and school professional development programmes to train teachers on how to plan for effective collaborative learning techniques in classrooms.

6.3.2.3 : School-related factors

The study's findings reveal that several school-related factors influence teachers' ability to foster curiosity in the classroom. These include organisational structures and systems, curriculum requirements, the physical environment and availability of resources, opportunities for professional development, and opportunities to be curious outside of the classroom.

This finding agrees with Jansen and Blank (2014) which highlighted that established routines within a school contribute to improved learning outcomes. While this is true, the study suggests that the structure of the school day also impacts learner curiosity. Short lessons do not allow for in-depth understanding, and frequent transitions throughout the day cause learners to shift focus, affecting their engagement and concentration. Additionally, the findings indicated that the busy nature of school environments, especially in high-pressure independent and boarding schools, influences learner curiosity. The study indicated that such environments provide little downtime, reducing opportunities for relaxation and boredom. In agreement, Jirout et al. (2018) argued that excessive emphasis on performance-based behaviours restricts curiosity and leads to passive learning. This study supports their view, finding that an intense focus on academic, sporting, or cultural performance can suppress curiosity due to rigid structures leaving little time for reflection and exploration.

The study also found that curriculum requirements in the senior phase hinder teachers' ability to foster curiosity. In agreement, Kibga, Gakuba, and Sentongo (2021) found that teachers

were reluctant to adopt learner-centered approaches, viewing them as time-consuming and ineffective for examination preparation. This study echoed those sentiments, with the dense curriculum and assessment priorities preventing teachers from being creative in their curriculum delivery. Teachers recognised the freedom they have with younger learners (Grades 8 and 9) to enrich and adapt the curriculum, emphasising the importance of leveraging these opportunities. This finding agrees with the Bioecological Systems Theoretical perspective as indicated in Grossnickle Peterson (2020) that repeated exposure to curiosity-enhancing experiences will enhance the trait of curiosity leading to more creative, critical and engaged learners. Consequently, teachers must incorporate such experiences into the curriculum whenever possible intentionally. The findings suggest that a transdisciplinary and inquiry-based approach to curriculum delivery in the junior phase significantly impacts learner curiosity. This approach allows learners to see connections across different subject areas, encouraging questioning and problem-solving, which in turn fosters curiosity (Pluck & Johnson, 2011).

The findings also reported that another factor influencing teachers' ability to foster curiosity in the classroom is the physical environment of the school and the availability of resources. Although the study found that the participant schools were well-resourced, it was evident that teachers did not always use these resources effectively. Additionally, classroom spaces that were not purpose-built hindered teachers' ability to adopt teaching approaches that promote learner curiosity. In agreement, Meier and West (2020) highlighted that infrastructure impacts a teacher's ability to create a positive learning environment. Therefore, classroom spaces must not confine teachers to a specific teaching style, such as being forced to adopt a lecture-centric approach due to the layout of a lecture theatre. In agreement, Grossnickle Peterson (2020) noted that access to relevant resources influences teachers' decisions on how to engage learners. However, the study does not consider other factors that prevent teachers from utilising these resources effectively.

The study's findings highlighted that access to both formal and informal professional development opportunities is crucial for encouraging teachers to adopt a curiosity-rich approach to their teaching. In support of the above finding, Hargreaves and Fullan (2012) emphasised that harnessing a teacher's professional capital is essential for achieving effective teaching and improving learning outcomes. When schools invest in developing teacher capital, it fosters greater collaboration among teachers and enhances their sense of agency and authority. Finally, the study findings underscored the importance of providing learners with curiosity-enriching experiences outside the classroom. This finding is particularly significant in light of Grossnickle's (2014) assertion about the malleable nature of curiosity. It suggests that learners who develop deep interest, inquiry, and understanding in one area can transfer a

curiosity-rich approach to learning in other areas. The implication of this finding is that school principals should consider providing support to teachers in schools to enhance the utilisation of curiosity both inside and outside the classrooms for optimum learning experiences.

6.3.2.4 : Community-related factors

Parents play a significant role in shaping learners' values, interests, and approaches to learning. The reviewed literature highlights the crucial impact of parental involvement on enhancing learning outcomes. Simweleba and Serpell (2020) emphasised the importance of parents' involvement in homework, while le Roux (2021) noted the value of fostering home-school relationships that empower parents to confidently support their children's learning beyond the classroom. This study's findings highlighted the influence of parenting styles and expectations in fostering curiosity. Families who engage in conversation, debate, and open discussion nurture their children's interest in the world around them. The way families discuss and approach knowledge significantly impacts how learners engage with new concepts, often increasing curiosity in subjects frequently discussed at home. In agreement, Iwasaki, Moriguchi, and Sekiyama's (2023) study supported the notion that parental interaction shapes children's epistemic curiosity, particularly in early and middle childhood, while school-related factors become more influential in fostering curiosity in older children. Nonetheless, the study notes that parental responsiveness in later childhood positively affects academic achievement. Furthermore, the value parents place on certain subjects influences learner curiosity, with children sometimes feeling pressured to prioritise specific subjects or activities, which can diminish curiosity in areas perceived as less important by their parents. In their case study, Sujarwo et al. (2021) recognised the positive impact of parental involvement in senior high schools on academic success. They highlighted the benefits of effective partnership models between parents and schools, which extended not only to the learners but also to the parents and the school as a whole. The implication of this finding is that school principals should develop collaborative practices to continuously involve parents in the learning processes.

6.3.3 : Teachers' understanding of the importance of curiosity in the classroom

This study examined the importance that teachers attribute to curiosity in impacting learning outcomes. Notably, the study found that teachers believe there is a positive correlation between curiosity and improved learning outcomes. In agreement, Kidd and Hayden (2015) stated that curiosity activates learning systems in the brain, while Jirout, Vitiello, and Zumbunn (2018) note that curious learners are more engaged as they ask more questions, are more persistent and remain motivated for longer periods. These behaviours, stimulated by curiosity, lead to better learning outcomes. Supporting the study's findings, Lamnina and

Chase (2019) claims that curiosity, when coupled with high effort, is a greater predictor of academic success than intelligence alone. Learners motivated to seek information actively engage in learning and make greater progress than their passive counterparts. Similarly, Pluck and Johnson (2011), stated that curious learners process information more deeply, participants in this study believe that curious learners perform better because they engage more deeply with the material, have a wider range of life experiences to make sense of abstract concepts, ask more questions, and persist with difficult concepts.

The study findings underscored the importance of teachers' intentionality in designing activities that stimulate curiosity. When teachers incorporate unpredictability and novelty into learning experiences, they motivate learners to respond with curiosity. In agreement, Grossnickle (2014) claims that environments and teachers can influence learner curiosity; not only do teachers affect state curiosity, but repeated exposure to curiosity-enhancing experiences can also affect trait curiosity, thereby altering how learners respond to experiences outside the classroom. This finding aligns with Kigba, Gakuba, and Sentongo (2021), which reported an increase in learner curiosity over time after introducing more hands-on activities in the classroom. The findings of the study along with the reviewed literature reinforce the importance of teachers actively creating curiosity-rich environments.

Despite teachers' confidence that increased learner curiosity leads to improved learning outcomes, they recognise that other factors could impact learner outcomes regardless of interest in a topic. Thus, the study findings indicated that learning difficulties, weak comprehension skills, or poor numeracy skills could negatively affect performance. Abakpa, Abah, and Agbo-Egwu (2018) make a similar point, showing that science curiosity and learner curiosity do not have a positive correlation. They note that learners' experiences, personal competencies, and support systems play key roles in determining academic success.

Furthermore, the study suggested that when learners have autonomy over their learning, they display more curiosity. Having some input into what and how they learn results in learners feeling invested in and motivated to learn. Similarly, Jirout, Vitiello, and Zumbunn (2018) reported that curiosity about a task result in a greater sense of autonomy and a desire to seek information and master skills and concepts independently. The study underscores the importance of teachers identifying the right level of challenge for learners. When teachers pinpoint the optimal learning gap and set activities at an appropriate level, learners are more likely to respond positively. Pluck and Johnson (2011) concurred that deeper processing of information occurs when learners think more deeply about the material they engage with. This finding agrees with both Loewenstein's information gap theory (1994) and Day's zone of curiosity (1982) that learning needs to be targeted at an optimal level: learners must have

some existing knowledge to make sense of new information, but the new information must provide enough novelty and incongruity to stimulate excitement and exploration (von Renesse & Ecke, 2016).

The study's findings showed that teachers recognise the need to employ novel strategies to engage learners. In agreement, Sikhakhane, Govender, and Maphalala (2020), integrated digital technologies into educational practices. Interestingly, the findings suggest that while technology can effectively capture learners' attention initially, it does not result in deep learning, retention, or knowledge transfer. In addition, Cain (2019) holds similar beliefs, stating that while technology provides learners with a means to seek information, it conditions them to be content with merely finding answers. Moreover, the finding agrees with Grossnickle (2014) which states that cultivating curiosity should be a goal in itself, regardless of its impact on learning outcomes. Interestingly, this study found a positive correlation between curiosity and emotional intelligence. Curious learners showed greater interest in and empathy towards others and were able to understand a diverse range of perspectives. This finding aligns with Singh and Manjaly's (2022) study, which reported that curious learners analyse more deeply, consider multiple angles and relationships, and make connections more easily. The implication of this finding is that teacher training programs, the Department of Education, and school leaders must equip teachers and trainee teachers with the essential training to understand the importance of fostering curiosity in the classroom and to develop the skills necessary to do so effectively.

6.3.4 : How teachers stimulate curiosity among learners

The study findings revealed that teachers possess a variety of tools and techniques to stimulate curiosity among learners. This finding contrasts with Loewenstein (1994), who noted that while teachers understood the importance of curiosity in learning, they lacked strategies to initiate it. The study suggests that although teachers understand the importance of fostering curiosity in learners as well as how to do this, other factors can hinder their ability to do so.

The findings indicated that teachers recognised the value of relevant and authentic resources and learning experiences in fostering learner curiosity. In agreement, Singh and Manjay (2022) emphasised the need for teachers to make explicit the relevance of the content to the real world. Moreover, Okolie et al. (2021) noted that grounding learning in real-life contexts deepens learners' understanding and stimulates dialogue, exposing them to a wider range of perspectives. Nakamura et al. (2022) concurred that learning becomes more valuable when learners perceive content as relevant and useful, such as through the use of current affairs or frameworks like the Sustainable Development Goals, which heighten interest by showing real-world applicability. Furthermore, Lamnina and Chase (2019) and Jirout et al. (2018) assert

that curiosity can be piqued by introducing uncertainty, unpredictability, or incongruence into learning. The findings also reported that novelty and uncertainty, along with increasing physicality in learning, energise and engage learners, and that introducing alternative voices, like another teacher covering a section of the curriculum, also sustains engagement. In agreement, Lamnina and Chase (2019) noted that learners prepared for uncertainty respond positively to it. This study supports that notion and suggests that novelty and uncertainty should exist within a predictable environment, providing a coherent framework for learners. Similarly, Jirout et al. (2018) highlighted the importance of connecting what learners know with what they do not know and encouraging them to generate multiple ideas to foster curiosity.

The study findings also underscored the importance of questioning in fostering learner curiosity. Well-structured questions capture initial interest, identify prior understanding, and reveal knowledge gaps. In agreement, Grossnickle Peterson (2020) noted that teachers use questioning to gauge understanding and identify gaps. Similarly, Wade and Kidd (2019) highlighted that effective questioning draws attention to knowledge gaps. The study suggests that teachers should use questions to scaffold learning, initially gauging understanding and then developing and deepening comprehension. In agreement, Engel (2013) and Jirout et al. (2018) advocated for teachers to be comfortable with uncertainty, asking questions and verbalising their thought processes to encourage greater curiosity. Similarly, Clark et al. (2018) showed that explicitly teaching questioning skills increases curiosity and improves learning outcomes, noting that encouraging learners to generate questions strengthens trait curiosity. This finding agrees with Vygotsky's socio-cultural theoretical assertion which highlights the significance of social interaction and language in learning construction (Powell & Kalina, 2009). The study findings showed that collaboration among learners, through discussions and debates, increases curiosity and improves learning outcomes. In agreement, Nakamura et al. (2022) noted that positive peer engagement enhances curiosity, as hearing peers' perspectives encourages deeper exploration of the material. Working with peers prompts learners to articulate their ideas, listen to others, and integrate new ideas with prior understanding, exposing them to diverse viewpoints. This aligns with Vygotsky's understanding of language use in learning (Hyslop-Margison, 2008). Therefore, learners who engage in interpersonal dialogue with peers and teachers better comprehend new content and internalise it, enabling them to apply new knowledge, reason, and problem-solve. The implication of this finding is that school stakeholders—including the Department of Education, school leaders, and governing bodies—must ensure that teachers have the necessary skills and resources to effectively stimulate curiosity in learners through diverse methods.

6.3.5 : Barriers that teachers experience in the use of curiosity in the classroom

The findings indicated three areas where teachers experience barriers in the adoption of curiosity in the classroom: teacher-related barriers, learner-related barriers and school-related barriers.

6.3.5.1 : Teacher-related barriers

The study findings revealed that teachers frequently experience a scarcity of time, largely due to the pressure of completing curriculum content and managing additional non-classroom commitments such as extracurricular activities, leadership roles, and administrative duties. This perceived lack of time hinders their ability to reflect on their teaching, plan, and deliver engaging and innovative lessons. The study indicates that teacher fatigue negatively affects their ability to craft effective lessons, thereby impacting learner outcomes. Teacher fatigue and overextension also lead to decreased enthusiasm for their subject, which in turn diminishes learners' interest and enthusiasm. In agreement, Klusmann et al. (2022) found that increased teacher exhaustion correlates with decreased learner interest and enthusiasm, ultimately leading to poorer learner outcomes. Additionally, the study findings showed that exhausted teachers often resort to less innovative pedagogical approaches, repeatedly using outdated materials and lecture-style, teacher-centric methods. In agreement, Singh and Manjaly (2022) reported that external pressures leading to an over-reliance on teacher-centric methods significantly hinder a teacher's ability to foster curiosity.

The study findings also highlighted the positive effect of reflection on teaching practice. When teachers have time and space to reflect, they can design more effective lessons that engage learners. In agreement, Bontwini (2017) posited that a lack of teacher reflection leads to unengaging lessons with little connection to learners' authentic experiences. Furthermore, Kibga, Gakuba, and Sentongo (2021) assert that teachers fear deviating from teacher-centric approaches because they worry about disrupting syllabus completion and inadequately preparing learners for assessments. In addition, the study reports that teachers fear losing control of the classroom environment if they deviate from teacher-centric methods. Engel (2013) further agrees and acknowledges the negative effects of excessive or insufficient classroom control on learner creativity and curiosity.

However, the study also reported that not all teachers feel burdened by a lack of time or restricted in their ability to deviate from traditional curricula and some recognise the positive impact that teacher and learner engagement outside the classroom can have on cultivating curiosity. This is significant given the malleable nature of curiosity (Grossnickle Peterson, 2020). More exposure to curiosity-rich experiences, whether in the classroom or other structured learning environments, leads to more engaged, critical, and creative learners. The

implication of this finding is that school leaders and governing bodies must ensure that teachers use their time in meaningful and effective ways that best support learner progress.

6.3.5.2 : Learner-related barriers

The study findings indicated that teachers perceive that learners in high-pressure school environments also experience overextension and fatigue. This is due to demanding sports, cultural, and academic schedules, as well as the rigid school routines often found in boarding schools. These pressures leave learners merely trying to get through the school day, with little room for genuine curiosity about their learning. Supporting this finding, Pascoe, Hetrick, and Parker (2019) reported that ongoing school-related stress negatively impacts learners' academic performance and enjoyment of learning, along with other adverse physical and mental outcomes. Additionally, a result-oriented mindset, where learners measure success solely through assessments, hinders the fostering of a curiosity-rich environment. Jirout et al. (2018) support this finding, stating that school cultures emphasising performance-based behaviours restrict curiosity. Moreover, excessive pressure to excel academically can further dampen curiosity in the classroom.

Finally, the study findings suggested that teachers perceive learner apathy or lack of engagement as negatively impacting their efforts to stimulate curiosity. Learners who are uninterested in the subject, fail to take responsibility for their learning, or display disruptive behaviours can influence the pedagogical approach teachers use. In such cases, teachers are more likely to adopt a lecture-based or authoritative approach. According to Okolie et al. (2021), this shift to a lecture-centric approach, although for different reasons, leads to the same outcome: a lack of development in critical and creative thinking among learners. The implication of this finding is that school leaders need to carefully manage learners' schedules to prevent them from overextending themselves and experiencing burnout. Additionally, professional development programmes should equip teachers with the tools to support learners who feel overwhelmed or apathetic about their learning.

6.3.5.3 : School-related barriers

The study's findings indicated that teachers feel overburdened by the dense curriculum, particularly in the senior grades. This aligns with the findings of Kibga, Gakuba, and Sentongo (2021), who reported that teachers view engaging learners in the learning process as time-intensive and doubt its effectiveness in adequately preparing them for assessments. Additionally, the study finding suggests that the length of lessons can impact learner curiosity. Short lessons do not allow for sufficient exploration and reflection, resulting in less curiosity from learners. In agreement, Kibga, Gakuba, and Sentongo (2021) noted that when under time pressure, a teacher's primary aim becomes completing the syllabus and preparing

learners for examinations. Similarly, Jirout et al. (2018) also observed that when there is insufficient time for exploration and investigative activities, learners become passive, leading to minimal curiosity and negatively impacting learning outcomes.

The study findings revealed that rigid assessment criteria are a barrier to cultivating curiosity. The nature of what is assessed, how it is assessed, the frequency of assessments, and the time constraints all influence how teachers engage with the curriculum and the outcomes expected from learners. In agreement, Jirout et al. (2018) noted that classroom environments with an excessive focus on performance-related behaviours suppress curiosity. Consequently, teachers tend to maintain strict control over the learning process, adopting a teacher-centric model and directing the pace of learning (Singh, 2021).

Lastly, the study findings showed that teachers find the diverse range of learner needs in the classroom challenging when trying to cultivate a curiosity-rich environment. A significant variation in learner abilities, needs, and interests affects how teachers engage students. This makes it difficult to target learning effectively and address the appropriate information gap (Loewenstein, 1994) or zone of curiosity (Day, 1982). As a result, some learners may lose interest because the material is too easy or irrelevant, while others may find it too challenging and beyond their reach. Singh (2021) emphasises that learners are likely to become disengaged when content is either too easy or too difficult, underscoring the importance of targeting learning at an appropriate level. The implication of this finding is that through effective teacher training programmes, the Department of Education and professional development opportunities, teachers should be equipped with the tools to design meaningful assessments that accurately gauge learner understanding. Additionally, professional development opportunities must provide teachers with the resources and strategies necessary to differentiate and scaffold learning effectively.

6.4: Conclusion

The study concludes that teachers recognise and value the role of curiosity in motivating learning, in that they appreciate having curious learners in their classrooms, noting that these learners possess an innate drive to seek, do, and understand more. The findings indicated that teachers identify trait curiosity in learners but view it as separate from their pedagogical approach, categorising learners as either curious or not. However, teachers need to shift this mindset and see curiosity as a quality that can be nurtured and developed through consistent curiosity-enhancing strategies. The study concludes that there is little evidence of practices that teach learners how to formulate and ask effective questions. Since questions can reveal information gaps, teachers must instruct learners in the art of questioning and provide opportunities for them to practise this skill.

The study also concludes that several key factors influence a teacher's approach to fostering curiosity in learners. The study concludes that a crucial element is the teacher's own relationship with curiosity: teachers who are open and inquisitive about their subject matter, teaching methods and learners, are more likely to cultivate a similar sense of curiosity in their classrooms. Additionally, there is a strong link between curiosity and reflective practice. When teachers reflect on their teaching, they demonstrate curiosity about their pedagogy, which helps them identify gaps in knowledge and areas for improvement. Similarly, when learners are taught reflective practices, they not only become interested in what they learn but also in how they learn. This leads to identifying information gaps and nurturing a desire to fill these gaps.

The study recognises the importance of a sense of belonging in promoting learner curiosity. Thus, the study concludes that learners who feel safe and have established relationships with their teachers and peers can be authentic and show vulnerability, creating a space where they are comfortable with uncertainty and unpredictability—key factors that stimulate curiosity. The peer group plays a vital role in creating an optimal classroom environment, and negative peer responses to curiosity can lead to a reluctance to engage with interest. Given the malleable nature of curiosity, teachers need to create an environment that encourages, rather than criticises and restricts, curiosity. The study also concludes that learners who constantly move from one performance-driven activity to another cannot engage deeply with any one interest to generate real curiosity. In addition, parents who exert excessive pressure and have unrealistic expectations of their child's performance can negatively impact not only the curiosity of the child but also how teachers approach learning.

The study highlights the positive impact of both formal and informal professional development opportunities on teachers' approach to curiosity. The study concludes that professional development provides teachers with the space and time for reflection and discussions about pedagogy. Thus, sharing best practices builds teacher confidence and agency by creating a community for exploring new approaches and demonstrating the value placed on teachers and teaching methodologies by school leaders. Lastly, the relationship between home and school plays a crucial role in influencing how teachers generate curiosity in the classroom and how learners respond. Learners who engage in rich conversations at home are more likely to do the same at school.

The study concludes that teachers firmly believe increased curiosity leads to improved learning outcomes, though this belief is primarily based on informal observation and inference rather than numerical evidence. Nonetheless, there is a clear perception that more curious learners engage more deeply, spend more time mastering concepts, and generally perform

better in assessments. The findings emphasise the importance of teachers recognising that curiosity can be nurtured. Exposure to activities that enhance curiosity leads to an increase in trait curiosity. Teachers must cultivate curiosity in the classroom, enabling learners to deepen their understanding and respond with curiosity in various contexts, both within and outside of school. Different pedagogical approaches are designed to elicit different responses and behaviours in learners. The study shows that while novelty and unpredictability are crucial for sparking curiosity, teachers must employ various strategies to engage learners, explain concepts, support retention, encourage deep learning, and facilitate application and knowledge transfer. No single method accomplishes all these goals, so teachers must rely on their pedagogical expertise to design effective learning experiences. A key finding of the study is the link between curiosity and emotional intelligence. Empathetic and emotionally intelligent learners tend to be better problem-solvers and leaders. Therefore, teachers should leverage learner curiosity to develop their emotional intelligence.

Notably, the study concludes that teachers are adept at employing strategies that foster learner interest. While some teachers describe themselves as entertainers, a more fitting analogy is that of conductors in an orchestra, knowing precisely which instrument to bring in at any given moment to achieve the optimal result. Teachers must understand their learners well enough to spark interest, outrage, wonder, and empathy. They must capture attention with heightened emotion to introduce new topics, identify what learners know and what they do not, and formulate questions to scaffold learning to advance understanding to the next level. Teachers must present new content while maintaining interest and ensuring that learners retain and transfer knowledge to other contexts.

The study also concludes that novelty, unpredictability, and uncertainty are useful in garnering learner interest. However, it is crucial to note that learners respond well to novel and uncertain stimuli within the confines of an established classroom environment. They understand the teacher's expectations and ways of operating, enabling them to react to novelty appropriately, thus leading to improved learning outcomes. The study recognises the value of questioning in fostering curiosity. Teachers are skilled at asking questions that elicit, develop, and maintain learner curiosity. However, not enough emphasis is placed on developing learners' ability to formulate effective questions. Learners need to be taught the skill of questioning and given the space in the curriculum to generate questions about what they are learning. By doing so, learners increase their curiosity and play an active role in constructing knowledge, leading to improved learning outcomes.

The study also concluded that teachers identified time as a significant barrier to fostering curiosity in learners. The scarcity of time is multifaceted: teachers report lacking sufficient time

to develop engaging resources and activities and having inadequate contact time with learners due to a dense curriculum. Timed assessments further hinder learners' ability to demonstrate authentic understanding. Another factor is the lack of free time in learners' busy schedules. Rigid school structures and demanding sports, academic, and cultural commitments leave little room for deep thinking and reflection. Some teachers noted that the barrier is not solely time but also a fear of uncertainty and risk aversion among teachers, learners, and parents, which prevents the adoption of novel teaching approaches. In performance-driven cultures, particularly in independent schools, results are often prioritised over deep learning, impeding the cultivation of curiosity. For teachers to embed curiosity in their classrooms, they need to shift the mindset from viewing it as an additional task to seeing it as a vehicle for enabling deep learning within the curriculum.

6.5: Recommendations

Based on the findings of teachers' experiences in fostering curiosity in the classroom to improve learning outcomes, the researcher has made the following recommendations to all stakeholders in the education sector as well as future researchers:

- The study recommends that school leaders should prioritise professional development opportunities for teachers. This would lead to more teacher empowerment in an understanding of learner curiosity in classrooms. This is because the study findings indicated that both formal and informal professional development significantly enhance teacher practices, support the establishment of professional communities, boost teacher agency, and subsequently improve learner outcomes.
- The study recommends that teachers should develop tools to help learners develop their questioning skills. This would assist in equipping learners with the ability to ask effective questions, which enhances their curiosity and, in turn, their learning outcomes. This is because the study findings indicated that a specific emphasis within these programmes should be placed on improving teachers' understanding of fostering curiosity in the classroom and providing strategies to achieve this.
- The study also advises schools to consider the structure of the school day, including the number and length of lessons, and to provide opportunities for reflection and rest for both learners and teachers. This would ensure that the number and duration of lessons supported deeper learning. In addition, it would promote time and space within the school day for reflection which in turn supports the development of curiosity. This

is because the study findings showed that excessively busy schedules hinder authentic learning and the demonstration of curiosity.

- Moreover, the study recommends that school leaders guard against teacher fatigue and overextension. Ensuring that teachers have dedicated time and motivation to develop relevant and authentic resources will enhance learner curiosity and learning outcomes. This is because the study findings indicated that teachers need sufficient time to create learning opportunities, develop resources, and reflect on and improve their practice.
- The study recommends that the Department of Education train and empower teachers in data capturing and tracking the impact of curiosity-rich activities on learning outcomes. This would enable teachers and school leaders to monitor the effectiveness of interventions and continue implementing those proven to improve learning outcomes. This is because the study underscores the importance of adopting a culture of evidence-based practice in schools. While teachers believe that learners progress better when they exhibit greater curiosity, there is currently a lack of supporting data.
- The study recommends that teacher tertiary institutions should embed the importance of curiosity in their teacher training programmes curriculum. This is because new teachers need the necessary skills and understanding to foster curiosity in their classrooms. The study highlights the positive impact that increased curiosity can have on learning engagement and achievement. It is therefore important that new teachers understand the importance of establishing a curiosity-rich environment in their classrooms.
- Finally, the study recommends that schools educate parents on the importance of meaningful discussions and debates at home and maintain effective home-school communication to encourage conversations about what is being learned in school. This is because the study recognises the crucial role of parental involvement in fostering curiosity and improving learning outcomes. This is because the study findings indicated that how parents engage with their children's curiosity at home significantly impacts their engagement with learning in the classroom.

6.6 : Limitations of the Study

The only study limitation is that the findings of this research reflect the experiences of teachers in three independent schools in the Midlands area of KwaZulu-Natal and may not apply to other independent or government schools in different contexts. While some generalisations can be made about teachers' experiences in similar contexts, the findings do not represent the experiences of all teachers. However, the study was focused on a particular context and hence its aim was achieved.

6.7 : Suggestions for Further Research

Based on the study, the findings, and recommendations, further research is recommended in the following areas:

- Experience of teachers in fostering curiosity in under-resourced schools.
- Relationship between curiosity and emotional intelligence in adolescence.
- Impact of streamed classes versus mixed ability classes on learner curiosity.
- Impact of demanding academic and extra-curricula learner schedules on epistemic curiosity and learning outcomes.

REFERENCES

- Abakpa, B., Abah, J., & Agbo-Egwu, A. (2018). Science curiosity as a correlate of academic performance in mathematics education: Insights from Nigerian higher education. *African Journal of Teacher Education*, 7(1), 36-52.
- Adeniran, A., Ishaku, J., & Akanni, L. O. (2020). Is Nigeria experiencing a learning crisis: Evidence from curriculum-matched learning assessment. *International Journal of Educational Development*, 77, 102199. <https://doi.org/10.1016/j.ijedudev.2020.1021>
- Allen, J. P., Pianta, R. C., Gregory, A., & Mikami, A. Y. (2011, August 19). An interaction-based approach to enhancing secondary school instruction and student achievement. *Science*, 1034-1037. doi: 10.1126/science.1207998
- Alrashidi, O., Phan, H., & Ngu, B. (2016). Academic engagement: An overview of its definitions, dimensions, and major conceptualisations. *International Education Studies*, 9(12), 41-52.
- Almusharraf, N., & Martínez Agudo, J. de D. (2020). Teachers' perspectives on promoting learner autonomy for vocabulary development: A case study. *Cogent Education*, 7(1). <https://doi.org/10.1080/2331186X.2020.1823154>
- Amorim Neto, R. do C., Golz, N., Polega, M., & Stewart, D. (2022). The Impact of curiosity on teacher-student relationships. *Journal of Education*, 202(1), 15-25. <https://doi.org/10.1177/0022057420943184>
- Bantwini, Bongani. (2017). Analysis of teaching and learning of natural sciences and technology in selected Eastern Cape province primary schools, South Africa. *Journal of Education*, 1, 39-64.
- Basu, A., & Mermillod, M. (2011). Emotional Intelligence and social-emotional learning: An overview. *Psychology Research*, 1(3), 182-185.
- Berlyne, D. (1954). A theory of human curiosity. *British Journal of Psychology*, 45(3), 180-191.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi:<https://doi.org/10.1191/1478088706qp063oa>
- Bold, T., Filmer., Martin, G., Molina, E., Stacy, B., Rockmore, C., Svensson, J., and Wane, W. 2017. Enrollment without Learning: Teacher Effort, Knowledge, and Skill in Primary Schools in Africa. *Journal of Economic Perspectives*, 31 (4): 185–204.DOI: 10.1257/jep.31.4.185
- Borowske, K. (2005). Curiosity and motivation-to-learn., (pp. 346-350). Minneapolis, Minnesota.
- Cain, J. (2019). We should pay more attention to student curiosity. *Currents in Pharmacy Teaching and Learning*, 11(7), 651-654.
- Caspersen, J., Smeby, J.-C., & Olaf Aamodt, P. (2017). Measuring learning outcomes. *European Journal of Education*, 52(1), 20-30.
- Chilisa, B., & Kawulich, B. (2012). Selecting a research approach: Paradigm, methodology and methods. In C. Wagner, B. Kawulich, & M. Garner, *Doing social research: A global*

- context (pp. 51-61). McGraw-Hill.
- Chiphiko, E., & Shawa, L. (2014). Implementing learner-centred approaches to instruction in primary schools in Malawi. *Mediterranean Journal of Social Sciences*, 5(23), 967-975. doi:10.5901/mjss.2014.v5n23p967
- CII-KPMG. (2017). *Outdated curriculum, low teacher quality behind poor learning outcomes*. Chennai: Business Line.
- Clark, S., Harbaugh, A. G., & Scott Seider. (2019). Fostering adolescent curiosity through a question brainstorming intervention. *Journal of Adolescence*, 75, 98-112. doi: <https://doi.org/10.1016/j.adolescence.2019.07.007>
- Dann, Ruth. (2013). Be curious: understanding 'curiosity' in contemporary curriculum policy and practice. *Education 3-13*. 41. 10.1080/03004279.2013.850256.
- Dias, D. (2018). Learning outcomes in European higher education. In: *Encyclopedia of International Higher Education Systems and Institutions*. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9553-1_317-1
- Department for Education. (2021). *Teachers' standards: Guidance for school leaders, school staff and governing bodies*. https://assets.publishing.service.gov.uk/media/61b73d6c8fa8f50384489c9a/Teachers__Standards_Dec_2021.pdf
- Department of Basic Education. (2011). *Curriculum and Assessment Policy Statement*. Pretoria: Government Printing Works.
- Department of Basic Education. (2022). *Annual Report 2021/22*. Pretoria: Government Printer.
- Department of Basic Education. (2023). *PIRLS 2021: South African Preliminary Highlights Report*. Pretoria: Department of Basic Education.
- Department of Education. (1996). *National Education Policy Act 27*. Government Gazette. Pretoria: Government Printer.
- Department of Education 1997b. (2005). *Curriculum: lifelong Learning for the 21st Century*. Pretoria: Government Printer.
- Development, Kenya Institute of Curriculum. (2017). *Basic Education Curriculum Framework*. Nairobi.
- Dorfner, T., Förtsch, C., & Neuhaus, B. (2018). Effects of three basic dimensions of instructional quality on students' situational interest in sixth-grade biology instruction. *Learning and Instruction*, 42-53.
- du Toit-Brits, C. (2022). Exploring the importance of a sense of belonging for a sense of ownership in learning. *South African Journal of Higher Education*, 36, 58-76.
- Engel, S. (2013). The case for curiosity. *Educational Leadership*, 70, 36-40.
- Evans, D. K., & Acosta, A. M. (2020, January). Education in Africa: What are we learning? *Journal of African Economies*, 30(1), 13-54. Retrieved from <https://doi.org/10.1093/jae/ejaa009>.
- Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your "house". *Administrative Issues Journal: Connecting Education, Practice, and Research*, 4(2), 12-26.

- Greene, D., & David, J. (1984). A research design for generalizing from multiple case studies. *Evaluation and Program Planning*, 7, 73-85.
- Grossnickle, P. E. (2020). Supporting curiosity in schools and classrooms. *Current Opinion in Behavioral Sciences*, 35, 7-13. doi:<https://doi.org/10.1016/j.cobeha.2020.05.006>
- Grossnickle, E. (2016). Disentangling curiosity: Dimensionality, definitions, and distinctions from interest in educational contexts. *Educational Psychology Review*, 28(1), 23-60. doi: <https://doi.org/10.1007/s10648-014-9294-y>
- Gruber, M., & Fandakova, Y. (2021). Curiosity in childhood and adolescence — what can we learn from the brain? *Current Opinion in Behavioral Sciences*, 39, 178-184. doi: <https://doi.org/10.1016/j.cobeha.2021.03.031>.
- Guba, E. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communications and Technology*, 29(2), 75-91.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough?: an experiment with data saturation and variability. *Field Methods*, 18(1), 59–82. doi: 10.1177/1525822X05279903
- Guest, G., MacQueen, K., & Namey, E. (2014). Validity and reliability (credibility and dependability) in qualitative research and data analysis. SAGE Publications. doi: <https://doi.org/10.4135/9781483384436>
- Gustafsson, J. (2017). Single case studies vs. multiple case studies: A comparative study. Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-33017>
- Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. New York and Toronto: Teachers College Press.
- Hargreaves, Andy & Fullan, Michael. (2020). Professional capital after the pandemic: Revisiting and revising classic understandings of teachers' work. *Journal of Professional Capital and Community*, 2, 13-23. 10.1108/JPCC-06-2020-0039.
- Hassinger-Das, B. H.-P. (2018). Appetite for knowledge: curiosity and children's academic achievement. *Pediatric Research*, 84(3), 323-324. doi: <https://doi.org/10.1038/s41390-018-0099-4>
- Herwin, & Nurhayati, R. (2021). Measuring students' curiosity character using confirmatory factor analysis. *European Journal of Educational Research*, 10(2), 773-783. <https://doi.org/10.12973/eu-jer.10.2.773>
- Holmes, A. (8-15). Can we actually assess learner autonomy? The problematic nature of assessing student autonomy. *Shanlax*, 9(3), 8-15.
- Hyslop-Margison, E., & Strobel, J. (2008). Constructivism and education: Misunderstandings and pedagogical implications. *The Teacher Educator*, 43, 72-86.
- Ifeakor, C., & Odo, A. (2020). Adopting the factors that motivate and sustain teachers' interest in the teaching profession for national development in education. *Jurnal Office*, 6(1), 45-58. DOI: 10.26858/jo. v6i1.15006
- Inayat, A., & Ali, A. Z. (2020). Influence of teaching style on students' engagement, curiosity and exploration in the classroom. *Journal of Education and Educational Development*, 7(1), 87-102.

- Iwasaki, S., Moriguchi, Y., & Sekiyama, K. (2023). Parental responsiveness and children's traits. *Frontiers in Psychology*, 13, 1-9.
doi: <https://doi.org/10.3389/fpsyg.2022.1075489>
- Jansen, J., & Blank, M. (2014). *How to Fix South Africa's Schools*. (W. Thompson, Ed.) Johannesburg: Bookstorm Limited.
- Jaramillo, J. A. (1996). Vygotsky's sociocultural theory and contributions to the development of constructivist curricula. *Education*, 117(1), 133-140.
- Jirout, J. J., Vitiello, V. E., & Zumbunn, S. K. (2018). Curiosity in schools. *The new science of curiosity*, 243–265.
- Jirout, J. J., Zumbunn, S., Evans, N. S., & Vitiello, V. E. (2022). Development and testing of the curiosity in classrooms framework and coding protocol. *Frontiers in Psychology*, 13, Article 875161. <https://doi.org/10.3389/fpsyg.2022.875161>
- Johnson, D. (2017). The role of teachers in motivating students to learn. *BU Journal of Graduate Studies in Education*, 9(1), 46-49.
- Kang, M. J., Hsu, M., Krajbich, I. M., Loewenstein, G., McClure, S. M., Wang, J. T. Y., & Camerer, C. F. (2009). The wick in the candle of learning: Epistemic curiosity activates reward circuitry and enhances memory. *Psychological science*, 20(8), 963-973.
- Kawulich, B. (2012). *Doing social research: A Global context*. McGraw-Hill
- Kedrick, K., Schrater, P., & Koutstaal, W. (2023). The multifaceted role of self-generated question asking in curiosity-driven learning. *Cognitive Science*, 47, 1-43.
- Kenya Institute of Curriculum Development. (2017). Basic education curriculum framework. <https://kicd.ac.ke/wp-content/uploads/2017/10/CURRICULUMFRAMEWORK.pdf>
- Keyes, T. S. (2019). A qualitative inquiry: Factors that promote classroom belonging and engagement among high school students. *School Community Journal*, 29(1), 171-200
- Kibga, E., Gakuba, E., & Sentongo, J. (2021). Developing students' curiosity through chemistry hands-on activities: A case of selected community secondary schools in Dar es Salaam, Tanzania. *EURASIA Journal of Mathematics, Science and Technology Education*, 17(5), 2-17.
- Kidd, C., & Hayden, B. Y. (2015). The psychology and neuroscience of curiosity. *Neuron*, 88(3), 449-460. doi: <https://doi.org/10.1016/j.neuron.2015.09.010>
- Kivunja, C., & Kuyini, A. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, 6(5), 26-41.
- Klusmann, U., Aldrup, K., Roloff, J., Lüdtke, O., & Hamre, B. K. (2022). Does instructional quality mediate the link between teachers' emotional exhaustion and student outcomes? A large-scale study using teacher and student reports. *Journal of Educational Psychology*, 114(6), 1442-1460. doi: <https://doi.org/10.1037/edu0000703>
- Ko, J., & Sammons, P. (2013). *Effective teaching: A review of research and evidence*. CfBT Education Trust.
- Komba, A. (2017). Educational accountability relationships and students' learning outcomes in Tanzania's public schools. *SAGE Open*, 1-12.

- Koutstaal, Wilma & Kedrick, Kara & Gonzalez-Brito, Joshua. (2022). Capturing, clarifying, and consolidating the curiosity-creativity connection. *Scientific Reports*, 1-12. 10.1038/s41598-022-19694-4.
- Lamnina, M., & Chase, C. (2019). Developing a thirst for knowledge: How uncertainty in the classroom influences curiosity, affect, learning, and transfer. *Contemporary Educational Psychology*, 59. doi: <https://doi.org/10.1016/j.cedpsych.2019.101785>
- le Roux, S. G. (2021). Changing literacy outcomes in South Africa: Are home-school partnerships the missing link? *South African Journal of Education*, 41(4), 9-20.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Sage Publications.
- Litman, J. (2005). Curiosity and the pleasures of learning: Wanting and liking new information. *Cognition & Emotion*, 19(6), 793-814. doi:10.1080/02699930541000101
- Lochmiller, C. (2021). Conducting thematic analysis with qualitative data. *The Qualitative Report*, 26(6), 2029-2044.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin*, 116, 75-98. doi:10.1037/0033-2909.116.1.75.
- Makovec, D. (2018). The teacher's role and professional development. *International Journal of Professional Development*, 2, 33-45.
- Maguire, M., & Delahunt, B., (2017). Doing a thematic analysis: A practical, step-by-step guide. *AISHE-J*, 9, 3351. <http://ojs.aishe.org/index.php/aishe-j/article/view/3354>
- Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum qualitative Sozialforschung/Forum: qualitative social research*, 11(3), 1-10.
- Matsepe, D., Maluleke, M., & Cross, M. (2019). Re-imagining teacher's experience with overcrowded classrooms in the public secondary schools in South Africa. *Journal of Gender, Information and Development in Africa*, 91-103. doi: <https://hdl.handle.net/10520/EJC-1997f9e889>
- Mcgregor, S. (2011). *Transdisciplinary axiology: to be or not to be*. Research Gate. <https://integrallleadershipreview.com/3388-transdisciplinary-axiology-to-be-or-not-to-be/>
- McLeod, S.(2022). *Vygotsky's sociocultural theory of cognitive development*. https://www.simplypsychology.org/vygotsky.html?ezoic_amp=1&fb_comment_id=500779888714_15217241
- McLeod,S.A.(2007). *LevVygotsky*.<https://sites.google.com/site/pltlearningcontent/overview-theorists/lev-semyonovich-Vygotsky>
- McPhetres, J. (2019). Oh, the things you don't know: awe promotes awareness of knowledge gaps and science interest. *Cognition and Emotion*, 33(8), 1599-1615. doi:33.10.1080/02699931.2019.1585331
- Mertler, C. (2017). Introduction to action research. In *Action Research: Improving schools and empowering educators* (Fifth Edition ed., Vol. 0, pp. 2-33). SAGE Publications, Inc, <https://doi.org/10.4135/9781483396484>
- Mouton, N., Louw, G., & Strydom, G. (2012). Critical challenges of the South African school system. *International Business & Economics Research Journal (IBER)*, 12(1), 31-44. doi:10.19030/iber.v12i1.7510

- Mphale, L. M., & Mhlauli, M. B. (2014). Investigation on students academic performance for junior secondary schools in Botswana. *European Journal of Educational Research*, 3(3), 111-127.
- Mullis, I., von Davier, M., Foy, P. F., Reynolds, K., & Wry, E. (2023). *PIRLS 2021 International Results in Reading*. Boston College. TIMSS & PIRLS International Study Center. doi:10.6017/lse.tpisc.tr2103.kb5342
- Nakamura, S., Reinders, H., & Darasawang, P. (2022). A classroom-based study on the antecedents of epistemic curiosity in L2 learning. *Journal of Psycholinguistic Research*, 2, 293-308. doi: <https://doi.org/10.1007/s10936-022-09839-x>
- National Council of Educational Research and Training. (2023). *National Curriculum Framework for School Education*. India.
- OECD (2018), Education at a Glance 2018: OECD Indicators, OECD Publishing, Paris, <https://doi.org/10.1787/eag-2018-en>.
- OECD (2019), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, <https://doi.org/10.1787/f8d7880d-en>.
- Okolie, U. C., Igwe, P. A., Mong, I. K., Nwosu, H. E., Kanu, C., & Ojemuyide, C. (2021). Enhancing students' critical thinking skills through engagement with Innovative Pedagogical Practices in the Global South. *Higher Education Research & Development*, 41(4), 1184-1198.
- Oliveira, A., & Lathrop, R. (2022). Towards a curiosity mindset: Reframing the problem of student disengagement from classroom instruction. *The European Educational Researcher*, 5(3), 313-317.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (n.d.). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. doi:<https://doi.org/10.1080/02673843.2019.1596823>
- Peel, K. (2020). A beginner's guide to applied educational research using thematic analysis. *Practical Assessment, Research, and Evaluation*, 25(2), 1-16.
- Pekrun, R. (2019). The murky distinction between curiosity and interest: State of the art and future prospects. *Educational Psychology Review*, 31, 905–914. doi:<https://doi.org/10.1007/s10648-019-09512-1>
- Pernegger, L., & Godehart, S. (2007). *Townships in the South African Geographic Landscape*. Training for Township Renewal Initiative, Pretoria.
- Pervin, N., & Mokhtar, M. (2022). The interpretivist research paradigm: A subjective notion of a social context. *International Journal of Academic Research in Progressive Education and Development*, 11(2), 419-428.
- Pluck, G., & Johnson, H. (2011). Stimulating curiosity to enhance learning. *GESJ: Education Sciences and Psychology*, 2(19), 24-31.
- Powell, K., & Kalina, C. (2009). Cognitive and Social Constructivism: Developing Tools for an Effective Classroom. *Education*, 130(2), 241-250.
- Praetorius, A.-K., Klieme, E., Herbert, B., & Pinger, P. (2018). Generic dimensions of teaching quality: The German framework of three basic dimensions. *The International Journal on Mathematics Education*, 50(3), 407-426.
- Raath, S., & Hay, A. (2016). Self-efficacy: A South African case study on teachers'

- commitment to integrate climate change resilience into their teaching practices. (M. B. Editor), Ed.) *Cogent Education*, 3(1). doi:10.1080/2331186X.2016.1264698
- Reed, Y., Davis, H., & Nyabanyaba, T. (2002). Investigating teachers 'take-up' of reflective practice from an In-service professional development teacher education programme in South Africa. *Educational Action Research*, 10(2), 253-274. doi: <https://doi.org/10.1080/09650790200200185>
- Rehman, A. A., & Alharthi, K. (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8), 51-59.
- Robinson, K., & Robinson, K. (2022, March 2). *What is education for?* Retrieved from Edutopia: <https://www.edutopia.org/article/what-education/>
- Romney, A., W. Batchelder, and S. Weller. 1986. Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist* 88:313-338.
- Rotgans, J., & Schmidt, H. (2011). The role of teachers in facilitating situational interest in an active-learning classroom. *Teaching and Teacher Education*, 27, 37-42.
- Ruslin, Mashuri, S., Rasak, M., Alhabsyi, Syam, & H. (2022). Semi-structured interview: A methodological reflection on the development of a qualitative research instrument in educational studies. *Journal of Research & Method in Education*, 12(1), 22-29.
- Sanfo, J.-B., & Malgoubri, I. (2023). Teaching quality and student learning achievements in Ethiopian primary education: How effective is instructional quality in closing socioeconomic learning achievement inequalities? *International Journal of Educational Development*, 99. doi: <https://doi.org/10.1016/j.ijedudev.2023.102759>.
- Schunk, D. H., & DiBenedetto, M. K. (2021). Self-efficacy and human motivation. In A. J. Elliot (Ed.), *Advances in motivation science* (pp. 153–179). Elsevier Academic Press. <https://doi.org/10.1016/bs.adms.2020.10.001>
- Scott, S., & Palincsar, A. (2013). The historical roots of sociocultural theory. *The Gale Group*.
- Sikhakhane, M., Govender, S., & Maphalala, M. C. (2020). Investigating pedagogical paradigm shifts in the 21st century teaching and learning in South African Secondary Schools. *International Journal of Education and Practice*, 8(4), 705-719.
- Simweleba, N., & Serpell, R. (2020). Parental involvement and learners' performance in rural basic schools of Zambia. *South African Journal of Childhood Education*, 10(1), 13-23. doi: <https://doi.org/10.4102/sajce.v10i1.608>
- Singh, A., & Manjaly, J. A. (2022). Using curiosity to improve learning outcomes in schools. *Sage Open*, 12(1), 1-15. doi: <https://doi.org/10.1177/21582440211069392>
- Singh, C. (2021). Fostering epistemic curiosity in school children by instructional teaching design: Classroom realities of Indian Schools. *Issues and Ideas in Education*, 9(2), 103-112. doi: <https://doi.org/10.15415/ie.2021.92010>
- Sølvik, R., & Glenna, A. (2022). Teachers' potential to promote students' deeper learning in whole-class teaching: An observation study in Norwegian classrooms. *Journal of Educational Change*, 23, 343–369.
- Spaull, N. (2022). *Background Report for the 2030 Reading Panel*. Cape Town.
- Stahl, N., & King, J. (2020). Understanding and Using Trustworthiness in Qualitative Research. *Journal of Developmental Education*, 26-28.

- Sujarwo, S., Kusumawardani, E., Prasetyo, I., & Herwin, H. (2021). Parent Involvement in adolescents' education. *Cypriot Journal of Educational Science*, 16(4), 1563-1581. doi: <https://doi.org/10.18844/cjes.v16i4.6013>
- Taylor, S. (2019). How can learning inequalities be reduced? Lessons learnt from experimental research in South Africa. (N. Spaull, & J. Jansen, Eds.) *South African Schooling: The Enigma of Inequality. Policy Implications of Research in Education*, 10. doi: https://doi.org/10.1007/978-3-030-18811-5_17
- The Education Partnership Centre. (2013). *PSIPSE Regional Themes and Challenges: Learning Outcomes in Nigeria*. <https://learningportal.iiep.unesco.org/es/biblioteca/learning-outcomes-in-nigeria>
- Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: design and decision making for new researchers. *International Journal of Qualitative Methods*, <https://doi.org/10.1177/1609406920967174>.
- van der Berg, S., Taylor, S., Gustafsson, M., Spaull, N., & Armstrong, P. (2011). *Improving Education Quality in South Africa*. University of Stellenbosch, Economics.
- Venter, E., & Rambau, E. (2011). The effect of a latchkey situation on a child's educational success. *South African Journal of Education*, 31(3), 345-356.
- von Renesse, C., & Ecke, V. (2016). Teaching inquiry with a lens toward curiosity. *PRIMUS*, 27(1), 148–164. <https://doi.org/10.1080/10511970.2016.1176973Roux>
- von Stumm, S. H.-P. (2011). The hungry mind: Intellectual curiosity is the third pillar of academic performance. *Perspectives on Psychological Science*, 6(6), 574–588. doi:<https://doi.org/10.1177/1745691611421204>
- Vygotsky, L. S. (1978). *Mind in society: The Development of higher psychological*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.) Cambridge, MA: Harvard University Press.
- Wade, S., & Kidd, C. (2019). The role of prior knowledge and curiosity in learning. *Psychonomic Bulletin & Review*, 1377-1387. doi: <https://doi.org/10.3758/s13423-019-01598-6>
- Wagner, C., Kawulich, B., & Garner, M. (2012). EBOOK: Doing social research: A global context. McGraw Hill.
- Watson, L. (2015). What is inquisitiveness? *American Philosophical Quarterly*, 52(3), 273-287. <http://www.jstor.org/stable/24475463>
- Weeks, F. (2012). The quest for a culture of learning: a South African schools perspective. *South African Journal of Education*, 32, 1-14.
- West, J., & Meier, C. (2020). Overcrowded classrooms - The Achilles heel of South African Education? *South African Journal of Childhood Education*, 10(1), 1-10.
- Zenda, R. (2017). Essential teaching methods to enhance learner academic achievement in physical sciences in rural secondary schools: A South African case study. *Information and Learning Sciences*, 118(3/4), 170-184.

APPENDICES

APPENDIX A: LETTER REQUESTING PERMISSION TO CONDUCT RESEARCH



Title of Study: Teachers' experiences in fostering curiosity in the classroom to improve learning outcomes: A study of three independent secondary schools in KwaZulu Natal, South Africa

Institution: University of Witwatersrand, School of Education.

27 St Andrews Rd, Parktown, Johannesburg, 2193.

September 2023

Dear Sir/Madam,

Re: Permission to conduct research

My name is Ashleigh Askew and I am studying for a Master's Degree in Education at the University of the Witwatersrand. I am seeking permission to conduct research at (NAME OF SCHOOL).

I am conducting a study that focuses on teachers' experiences in fostering curiosity in the classroom to improve learning outcomes in independent schools in South Africa. The study aims to explore teachers' beliefs about curiosity, how and why those beliefs are formed, and how a teacher's conceptualisation of curiosity influences pedagogical approaches and, consequently, learning outcomes.

The research will entail collecting data from eighteen teachers (six teachers from three independent schools) in the KwaZulu Natal Midlands area. If you are amenable to your school taking part, I will look to invite six teachers from Michaelhouse to participate in an in-depth interview. Interviews will be audio recorded. All qualified teaching staff are invited to participate in the study. Interviews will take place in person, at the school and at a time suitable for the participant.

Please note the following:

- Participants' responses will be treated confidentially, and identities (their names and the name of the organisation) will be anonymous.

- Individual privacy will be maintained in all published and written data resulting from the study.
- The results will be communicated in terms of a research project.
- The research participants will not be advantaged or disadvantaged in any way.
- They will be reassured that they can withdraw their permission at any time during this project without any penalty.
- There are no foreseeable risks in participating in this study.
- The participants will not be paid for this study.
- All research data will be stored on a password-protected computer.

I therefore request written permission to conduct my research within your organisation. The authorisation letter should be presented on your organisation's official letterhead, complete with a signature and date. The letter should also specifically identify me by name and acknowledge the title of my study.

Please let me know if you require any further information. I look forward to your response at your earliest convenience.

Yours sincerely,

Ashleigh Askew (Student Number: 2771301)

0658470196

2771301@students.wits.ac.za

Supervisor:

Dr Peter Aloka

peter.aloka@wits.ac.za

APPENDIX B: PARTICIPANTS' INFORMATION SHEET



Dear Sir/Madam

My name is Ashleigh Askew, a master's student in Education from the University of Witwatersrand Education campus. My supervisor is Dr Peter Aloka. I am conducting a study that focuses on teachers' experiences in fostering curiosity in the classroom to improve learning outcomes in independent schools in KwaZulu Natal, South Africa. The study aims to explore teachers' beliefs about curiosity, how and why those beliefs are formed, and how a teacher's conceptualisation of curiosity influences pedagogical approaches and, consequently, learning outcomes. The study title is *Teachers' experiences in fostering curiosity in the classroom to improve learning outcomes: A study of three independent secondary schools in KwaZulu Natal, South Africa*.

I would like to invite you to participate in this study. Your participation involves participating in an interview (1 hour). With your permission, this interview will be recorded to ensure accuracy. Interviews will be scheduled at a date, time, and venue convenient to you. Your participation in this study is entirely voluntary and your identity will be kept anonymous.

If you decide to take part in the research study, it should be because you want to volunteer. You do not have to take part. You can stop being in the study at any time. You do not have to answer any questions if you do not want to. You have the right to withdraw from the study at any point.

There are no risks involved in participating in this study, the identity of the participants and the school will be kept anonymous. All information obtained during the study, including the interviews, will be strictly confidential and kept anonymous. There will be no names mentioned in the study. Direct quotations may be used without any identifying information. The information you provide, to the extent of the applicable laws and regulations, will not be made publicly available. Only the researcher and the supervisors will have access to the confidential information being collected. The data will be deleted after three years.

There are no direct benefits to you participating in this study. However, your participation may contribute to the literature on this phenomenon.

This research study will be written up as a research report. The report will be available on the university library website. If you would like to receive a summary of this report, I will be happy to send it to you.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), by telephone +27(0) 11 717 1408, email hreconon-medical@wits.ac.za.

Yours sincerely,

Ashleigh Askew

Researcher: Ashleigh Askew, 2771301@students.wits.ac.za, 0658470196

Supervisor: Dr Peter Aloka, peter.aloka@wits.ac.za, 011 717 3098

APPENDIX C: CONSENT FOR TEACHER PARTICIPANTS

Consent Form for Teacher Interviews

Title of project: *Teachers' Experiences in Fostering Curiosity in the Classroom to Improve Learning Outcomes: A Study of Three Independent Secondary Schools in KwaZulu Natal, South Africa.*

Name of researcher: Ashleigh Askew

I,, agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below)

The research study was explained to me. I understand what this study is about.	YES	NO
--	-----	----

I understand that I can volunteer to take part in the study.	YES	NO
--	-----	----

I agree that the interview will be audio-recorded.	YES	NO
--	-----	----

I agree that direct quotations from my interview may be used by the researcher in their research report.	YES	NO
--	-----	----

I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report)	YES	NO
---	-----	----

I agree that other researchers may use the information I provide in my interview (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on	YES	NO
--	-----	----

..... (signature)
..... (name of participant)
..... (date)

..... (signature)
Ashleigh Askew(name of researcher)
..... (date)

APPENDIX D: SEMI-STRUCTURED INTERVIEW SCHEDULE

Teachers' experiences in fostering curiosity in the classroom to improve learning outcomes: A study of three independent secondary schools in KwaZulu Natal, South Africa

Interview Questions:

1. What are teachers' understanding of curiosity in teaching and learning?

- A. How do you define the term curiosity?
- B. Based on the definition that you have provided, what is your understanding of curiosity in the context of the classroom? Explain your answer with examples.
- C. What behaviour would you expect a curious learner to exhibit in your classroom? Explain your answer.

2. What factors influence teachers' adoption of curiosity in the classrooms?

(Adoption of curiosity. Teacher –(if) and how the teacher facilitates and generates curiosity in learners – whether the teacher considers curiosity as a necessary part of the learning process)

- A. What school-based factors influence your adoption of curiosity in the classroom? Explain your answer. *(Curriculum, Structure of the school day, physical environment, assessment, culture and ethos, subject/topic)*
- B. What personal/psychological factors influence your adoption of curiosity in the classroom? Explain your answer. *(Pedagogical style, personality, own curiosity, beliefs about teaching and the role of the teacher)*
- C. What other factors influence your adoption of curiosity in the classroom? Explain your answer.

3. How do teachers understand the importance of curiosity in improving learning outcomes?

- A. In what way, if any, do you believe curiosity impacts improving cognitive learning outcomes among learners? Explain your answer. *(Think short term and long term)*
- B. In what ways does curiosity impact improving social and/or emotional learning outcomes among learners? Explain your answer
- C. Any other ways in which curiosity impacts improving learning outcomes? Explain your answer.

4. In which ways do teachers stimulate curiosity among learners?

- A. In what ways do you stimulate curiosity among learners during lessons?
- B. Can you describe a specific lesson or activity where curiosity was successfully integrated, leading to enhanced learning?

5. Which challenges do teachers experience in the use of curiosity in the classrooms?

- A. What personal challenges do you face in adopting curiosity-based teaching methods? Explain your answer.
- B. What school-based challenges do you face in adopting curiosity-based teaching methods? Explain your answer.
- C. What kind of support or resources do you believe would help you better cultivate curiosity in their classrooms?

APPENDIX E: ETHICAL CLEARANCE



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

R14/49 Askew

CLEARANCE CERTIFICATE PROTOCOL NUMBER: H23/10/01

PROJECT TITLE Teachers' experiences in fostering curiosity in the classroom to improve learning outcomes: A study of three independent secondary schools in KwaZulu Natal, South Africa

INVESTIGATOR(S) Mrs A Askew

SCHOOL/DEPARTMENT Wits School of Education/

DATE CONSIDERED 15 September 2023

DECISION OF THE COMMITTEE Approved
Risk Level: Minimal

EXPIRY DATE 23 November 2026

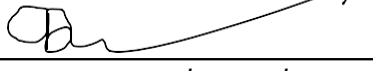
DATE 24 November 2023 **CHAIRPERSON** _____
(Professor J Watermeyer)



cc: Supervisor: Dr P Atoka

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **A SIGNED COPY** returned to the Secretary electronically. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I/we agree to completion of a regular progress report. For Minimal and Low Risk studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**



SignatureDate

06 12 2023

