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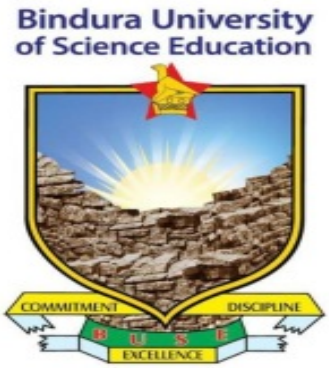

EXPLORING THE APPLICABILITY OF HERITAGE BASED MATHEMATICS CURRICULUM IN ZIMBABWE SECONDARY SCHOOLS.

BY

CHIWANZA MARICA

REG NO. B225431B

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE BACHELOR OF SCIENCE HONORS DEGREE IN MATHEMATICS EDUCATION

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   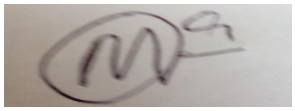

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   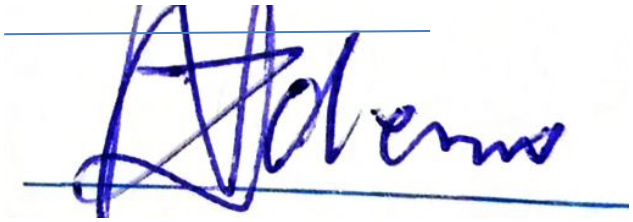

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Name of the student: CHIWANZA MARICA

Registration Number: B225431B

Dissertation Title: Exploring The Applicability Of Heritage Based Curriculum Mathematics In Zimbabwe Secondary Schools.

Degree Title: Bachelor of Science Honours Degree in Mathematics Education.

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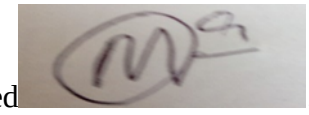
Signed  …

Date …12…/…07……./…24……

Permanent Address
708 Budiriro 1

Harare

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DEDICATION

This research is dedicated to the loving memory of my parents, who instilled in me the value of knowledge and excellence. Their unwavering support and guidance throughout my academic journey have been a constant source of inspiration, and I am forever grateful for the sacrifices they made for me. I hope that this work would have made them proud. I also dedicate this research to my daughters Takundanashe and Tanatswanashe Chiwanza, who are the lights of my life. May this work contribute to a better future for them and generations to come. I hope that they will grow up to be curious, compassionate and courageous individuals who will make positive impact to the world. This research is a testament to the power of love, family and resilience. May it inspire others to pursue their passions and make a difference in the lives of those around them.

ABREVIATIONS/ACCRONYMS

HBC- Heritage-Based Curriculum

HBSCED- Honours Bachelors Science Education Degree

ABSTRACT

The success of any curriculum change is hinged in the preparedness of the teachers as the implementers. To realize the 2030 vision, teachers ought to be thoroughly prepared to introduce the Heritage Based Curriculum (HBC) with enthusiasm. Considering the recent changes and lack of scientific evidence, guidelines and discussions on teacher preparedness, the current study seeks to investigate the extent of which the mathematics teachers are prepared to implement the HBC mathematics curriculum. The research objectives that guided the study are; to assess the degree of teacher preparedness for Zimbabwean secondary school's heritage-based mathematics curriculum; to investigate the challenges and gaps that may hinder the teachers' preparedness in the successful implementation of the heritage-based (HBC) mathematics curriculum; to propose recommendations and strategies to enhance teacher preparedness and improve the applicability of the Heritage Based mathematics Curriculum. The study was grounded on the Concerns Based Adoption Model theoretical framework developed by Hall and partners and the Teacher Self Efficacy Theory proposed by Albert Bandura. Based on the pragmatic paradigm, the researcher adopted the mixed method approach. The study targeted population was 180 mathematics teachers who are TCD students at Bindura University of Science Education at level 2.2. Random sampling was used to select 42 participants. Quantitative and qualitative data was collected using semi structured questionnaires and telephone interviews respectively. Quantitative data obtained was analyzed through descriptive statistics while qualitative data was thematically analyzed. The study found out that lack of knowledge, poor remuneration, inadequate resource materials and lack of training and support influenced the lack of preparedness of mathematics teachers to implement the HBC mathematics curriculum. Further study findings, indicated lack of teacher involvement in the curriculum development as another contributing factor in lack of teacher preparedness. The researcher recommends that, teachers should be engaged in curriculum development, the relevant authorities should ensure that there is adequate resources need for the successful implementation of the curriculum as well as improved salaries.

TABLE OF CONTENTS

Contents

RELEASE FORM....ii
APPROVAL FORM....iii
AKNOWLEDGEMENTS....iv
DEDICATION....v
ABREVIATIONS/ACCRONYMS....vi
ABSTRACT....vii
1.1 Abstract:....vii
TABLE OF CONTENTS....viii
LIST OF TABLES....x
LIST OF FIGURES....xi
LIST OF APPENDICES....xi
Chapter 1: STUDY OVERVIEW....1
1.1 Introduction:....1
1.2 Background of the Study....2
1.3 Purpose of the Study....3
1.4 Statement of the Problem....4
1.5 Research objectives....4
1.6 Research Questions....4
1.8 Significance of the Study....6

1.9 Delimitations 6
1.10 Limitations 7
1.11 Definition of Terms 7
1.12 Organization of the Study 7
1.13 Chapter Summary 8
CHAPTER 2: LITERATURE REVIEW 9
2.1 Introduction 9
2.2 Theoretical framework 9
2.2.1 Concerns Based Adoption Model 14
2.2.2 Teacher Self efficacy Theory 14
2.3 Heritage Based Curriculum as a concept 14
2.4 Teacher preparedness in HBC mathematics implemantation 15
2.5 Challenges faced by mathematics teachers in implementing HBC 20
2.6 Reccomendations and strategies from teachers to be prepared to implement the HBC 20
2.7 Research gap 20
2.8 Chapter Summary 21
CHAPTER 3 23
3.1 Introdution 25
3.2 Research design 25
3.3 Research paradigm 25
3.4 Research approach 25
3.4.1 Mixed method 26
3.4.1 Questionnaires 26
3.4.1.1 Closed ended questionnaires 26
3.4.2 The in-depth interview 27
3.4.2.1 Semi structured Interview Schedule 27
3.5 Sample and sample procedure: 27
3.7 Data genaration procedure 28
3.10 Chapter summary 29
CHAPTER 4 29
4.1 Introduction 29

4.2 Characteristics of participants..... 30
4.3 Understanding Heritage Based Curriculum..... 32
4.3.1 Lackof preparedness..... 34
4.4 Challenges and gaps..... 37
4.4.1 Lack of knowledge..... 40
4.4.2 Lack of resources..... 41
4.5 Recommendation and strategies.....42
4.5.1 Teacher participation...... 44
4.5.2 Availability of resources.....47
4.6 Chapter summary.....49
CHAPTER FIVE SUMMARY: CONCLUSIONS AND RECOMMENDATIONS..... 51
5.1 Summary..... 51
5.2 Conclusions.....51
5.3 Recommendations.....52
5.4 SUMMARY.....53
APPENDIX I: Request for permission to carry out a research..... 58
APPENDIX II: Permission letter from the Ministry of Primary and Secondary education61
APPENDIX III: INTERVIEW GUIDE.....62

LIST OF TABLES

Table 4.1: Demographic characteristics of selected teachers…….

Table 4.2: Reasons for lack of preparedness by teachers…….

Table 4.3: Teaching documents used by teachers…….

Table 4.4: Frequency on teaching methods used by teachers……..

Table 4.5: Lists of challenges…….…….

Table 4.6: Lack of knowledge as a challenge…….……..

Table 4.7: Responses from questionnaires……..

Table 4.8 Availability of resources…….

Table 4.9 Training and support……

Table 4.10 Improved remuneration……

LIST OF APPENDICES

APPENDIX I: Request for permission to carry out a research

APPENDIX II: Permission letter from the Ministry of Primary and Secondary education

APPENDIX III: Interview guide.

CHAPTER 1
PROBLEM AND ITS SETTINGS

1.0 TOPIC

Exploring the applicability of Heritage Based Curriculum (HBC) in Mathematics curriculum in Zimbabwe secondary schools.

1.1 INTRODUCTION

In this first chapter the issue under investigation will put into perspective through the following: background to the study, statement of the problem, research objectives, research questions, significance of the study, delimitation of the study, limitations of the study, definition of key terms, chapter summary.

1.2 BACKGROUND TO THE STUDY

The curriculum in Zimbabwe has undergone shifts multiple times since the country's independence in 1980 (Chimbunde et al, 2021). One of its first reforms just after independence was Education for All Policy in 1980, aimed to redress the pre-colonial education system disparities which favored the white minority over the African majority Kanyogo (2015). The EFA policy key component was declaration of free primary education in the first decade which dramatically expanded access to education to the majority of Zimbabwe children. Additionally, the EFA policy targeted marginalized and disadvantaged groups, particularly girls to ensure they could access and benefit from educational opportunities. The Education Act and related laws provided the basis, while the Ministry of Education, Sports and Culture was tasked with leading the implementation nationwide. Throughout this multifaceted approach, the Zimbabwean government sought to transform its education system into one that could truly serve the needs of all citizens and drive broader national development in the post-independence era.

However the success story of the EFA policy, had its shortcomings as highlighted by Raftopoulos & Pilossof (2017), that the coming of the Economic Structural Adjustment Programe (ESAP) in the 1990s the sustainability of the policy was brought into question. He further explained that,

concerns were raised about the financial viability of such education provision, and the relevance of the curriculum provided. Also, a joint report by the Ministry of Education, Sports and Culture, and the Ministry of Higher Education and Technology 1998 indicated that, there was no comprehensive training document for teachers, due to absence of this led document led to political announcements, policy circulars and Chief Education Officers circulars that at times were conflicting (Raftopolous & Pilossof, 2017). They added that the lack of clarity created confusion on the ground that affected learners and school leavers and parents. This paved to the establishment of the Nziramasanga Commission in 1999 to conduct a comprehensive review of the Zimbabwe educational system. Among the recommendations of the Commission was the introduction of an outcome based-curriculum that is broad based in subject offerings including mathematics as the core subject.

Nyandoro (2019) research highlights that, in the second decade of post- independence, Zimbabwe faced economic difficulties which had an effect on education. Munowenyu cited in Raftopolous & Pilossof (2017) states that, the curriculum in Zimbabwe failed to a large extended to help school leavers become better skilled, educated and confident problem solvers. Thus the curriculum was revised to emphasize practical applications and critical thinking, aligning with the country's economic and social goals Sunzuma et al (2023). Attempts were made to improve the teaching of mathematics. The curriculum aimed at positioning mathematics as a tool for acquiring 21st-century skills such as numeracy and problem solving (Chitate, 2016; Goto, 2021). To support this curricular change, teacher training programs were enhanced to improve pedagogy and incorporate Information Communication Technology (ICT).

However, the mathematics teachers tasked with implementing these changes were not fully prepared for the task at hand. The revised curriculum represented a marked departure from the traditional emphasis of rote learning and called for a more learner centered approach (Sunzuma et al, 2022). Yet, the majority of the teachers lacked the necessary content knowledge, pedagogical skills and professional support to effectively transition to the new teaching methodology (Makamure, 2016). Supported by the research conducted by Ngwenya (2020) establishes that, the in-service training provided to teachers primarily focused on interpreting the syllabus rather than equipping them with the tools to transform their classroom practices. Additionally, the teachers claimed that the training was inadequate because it was limited to an annual one-time event, rather than an ongoing process of support and development (Mutanga, 2022). Despite the government's effort to modernize and improve mathematics education, the teachers were simply not prepared to take on the challenges posed by the curriculum changes.

The Competency-Based Curriculum (CBC) framework in Zimbabwe was introduced in 2015 by then Minister of Primary and Secondary Education, Dr Lazarus Dokora, making a significant shift in the country's education system. The Ministry of Primary Secondary Education (MoPSE) developed a new education policy, the Education Amendment Act of 2015, which aimed to move away from traditional academic achievements and focus on competency-based learning emphasizing skill development and practical application. The CBC mathematics was developed and put into use as a result of a curriculum reform process started by Zimbabwe Ministry of

Primary and Secondary Education (MOPSE) in order to solve these problems. According to the CBC curriculum framework blueprint (2015) states that in order to empower Zimbabwean citizenry schools need to engage learners with renewed focus on Science Technology Engineering Mathematics and Science (STEM) education. A variety of teaching and learning techniques were incorporated into the curriculum, such as Continuous Assessment Learning Area (CALA) and the use of technology to improve pupils' understanding of mathematics. Sunzuma & Luneta (2023) highlight that learners are encouraged to be actively engaged in knowledge construction as well as applying the acquired knowledge in real life situation.

Additionally, teachers received professional development and training to acquaint themselves with the new curriculum and pedagogical approaches during the implementation stage. However, the training was a one-day workshop which was mainly done by teachers with examination classes at that moment. The training was not sufficient enough for the teachers to successfully implement the CBC. According to recent research, the training of teachers is supposedly to help them to interpret the curriculum and translate it into the applied curriculum in the classroom, as they engage with their curriculum resources in design process (Cai & Hwang, 2021) This suggest the need of teachers to be participants in the curriculum reforms.

However, the CBC mathematics was reflected more on paper than on practice as some of the stakeholders such as teachers, pupils and parents called for the removal of the CALA component during the nationwide consultations done in September 2023 (Gory et al, 2021). The discord between the stakeholders of CBC was that teachers claimed that the curriculum was imposed to them and this influenced yet another curriculum change, with its emphasis on heritage. Further research by Nyikadzino (2023) posits that, the CBC had its fair of challenges which included resistance by teachers, lack of specialists teachers trained to teach the new learning areas, and lack of motivation of teachers in terms of their salaries. In addition, he recommend that policy makers should consider reviewing their one directional communication networks to accommodate feedback channels. Additionally, Gory et al. (2021) further provide different view that the success of curriculum change require a systematic collaboration and stable conditions, and at this stage it remains to be seen which direction the change takes. Furthermore, the relationship between the teacher and the curriculum reform have been filled with significant tensions and challenges (Remillard, 2000) hence the successful implementation of the curriculum was in jeopardy. This forced the policy makers to make amendments to the curriculum, and changed from CBC to Heritage-based curriculum.

Heritage Based Curriculum (HBC) 2024-2030 curriculum framework which was unveiled to the public in March 2024 claims to help decolonize an inherited, culturally dominant curriculum that was shaped by colonialism and will be rooted in the philosophy of unhu/ubuntu. Mgqwashu (2023) highlights that Zimbabwe like many African states, co-opted imperial educational values that became valued as crucial vehicles of development in post-colonial states. Moreover, the Minister of information and publicity Dr Muswere cited in the chronicle (2024) says that the HBC curriculum framework is expected to transform the education system to produce citizens with relevant skills, applied knowledge, values and dispositions that are key to national development.

However, secretary-general of Educators Union of Zimbabwe, Mr Tapedza Zhou said the Government has to explain how the proposed HBC differs from the previous CBC and how education will be funded to ensure a smooth implementation of the framework (Newsday, 2024).

It is against this background that the study seeks to gain insight into the influence of the preparedness of teachers and pupils, and how much training do teachers have in the applicability of heritage-based mathematics curriculum in Zimbabwe secondary schools.

1.3 STATEMENT OF THE PROBLEM

In Zimbabwe, the heritage-based mathematics curriculum has been recently rolled to secondary schools with the aim of incorporating culturally relevant information into the curriculum. CIET (1999) and MoPSE (2015) emphasized the need to underpin the Zimbabwe education system with unhu/Ubuntu philosophy as an antithesis to coloniality, and demonstrated the authority of this philosophy in strengthening and deepening contemporary Zimbabwean education. However the challenge at hand is the potential misalignment between the preparation among teachers and the HBC. In-order to properly implement the curriculum and effectively foster pupils' comprehension teachers are needed. The HBC may not be implemented successfully if teachers are not adequately prepared. This could lead to poor learning outcome, low pupil engagement and lost chance to enhance connection between the pupils and their cultures through mathematics.

1.4 Purpose of the study

The purpose of the study is to find out the influence of the teacher preparedness on the implementation of the Heritage Based mathematics Curriculum (HBC) in Zimbabwe secondary schools.

1.5 Research objectives

- To assess the degree of teacher preparedness for Zimbabwean secondary school's heritage based mathematics curriculum.
- To investigate the challenges and gaps that may hinder the teachers' preparedness in the successful implementation of the heritage-based (HBC) mathematics curriculum.
- To propose recommendations and strategies to enhance teacher preparedness and improve the applicability of the Heritage Based mathematics Curriculum.

1.6 Research questions

This research aims to answer the following questions;

- To what extend are the secondary school teachers prepared for the HBC mathematics curriculum?
- What are the challenges and gaps that hinder the teachers' preparedness of the HBC mathematics curriculum?
- What recommendations and strategies can be put in place to enhance teacher preparedness and improve the applicability of Heritage based mathematics curriculum

1.7 Significance of the study

The findings of the study will benefit the following;

Policymakers

The Government of Zimbabwe need to ensure that teachers receive the support and professional development required to implement the HBC. Also to conduct a thorough research on the teachers' knowledge, abilities and preparedness using focus groups, surveys and interviews. There is a need to work with the teachers in curriculum development so that they have an insight on the suitable teaching resources, culturally sensitive teaching techniques so that they can set aside enough funds and time to create educational materials required.

Mathematics teachers

Teachers engaged in the research process can offer valuable perspectives and hands on experiences that will help shape our understanding of the best way to implement a HBC mathematics curriculum. Their confidence and sense of empowerment will increase their professional expertise and independence are acknowledged.

Learner

Teachers who participate in the study can modify their teaching tactics to fit the specific cultural needs and background of their pupils through receiving professional developments from the findings. This may lead to a welcoming and encouraging were the pupils can relate mathematical concept with their culture.

Researcher

It is hoped that the findings of this study will help the researcher to make contribution to the growth of knowledge heritage based mathematics curriculum field. The researcher will have insights on the challenges that affects the successful implementation of the curriculum.

1.8 Delimitation of the study

This study focuses specifically on Zimbabwe secondary school teachers. The research is delimited to mathematics 2.2 teachers from different provinces who are enrolled in HBScEd Mathematics program at Bindura Science University Education. The findings may not be generalized to all the provinces in Zimbabwe. The selection of the participants will be based on a purposive sampling technique aiming to capture different views from various teachers. However, the study does not include teachers who are not part of the HBScEd Mathematics program. Additionally, the study does not address the overall curriculum design or implementation beyond the mathematics subject. The findings may not reflect long term changes in the implementation of the HBC mathematics curriculum. The study primarily focuses on the views of mathematics teachers. The study employs a mixed methods approach, using semi structured interviews, questionnaire to gather qualitative data. While these methods provide valuable insights into the teachers' experiences other methods such as document analysis are not included. Due to the specific context and participant selection the findings of this study may have limited generalizability beyond mathematics teachers from different provinces on the HBScEd Mathematics program at Bindura Science University Education. Caution should be exercised when applying the results to other educational context of population.

1.9 Limitation to the study

Limitations refers to the specific study which may influence the result but which the researcher has absolutely no control over (Mugenda & Mugenda, 2007). The findings of the study may have limited generalizability beyond the specific context of mathematics teachers from different provinces on the block program at Bindura Science University Education. The study relies on the self- reported data from mathematics teachers which may be subject to bias. The responses may also be aligned to their perceived expectations, potentially affecting the accuracy and reliability of the data. The study is done within a period of six months therefore the data collection and analysis are limited to this period. Long term effect changes in the implementation may not be fully captured.

1.10 Definition of key terms

Curriculum is defined as the collection of learning experiences in a prescribed instructional unit of study, leading to a defined outcome (Ngwenya, 2020).

Curriculum Framework is a systematic and structured policy guide which schools use to plan and develop their educational programe. It comprises a set of interlocking components, including learning experiences, skills, values and principles underpinning the curriculum, learning outcomes, learning areas and nature of the learning context and assessment procedure in different learning areas across the curriculum (MoPSE Curriculum Framework, 2015)

Heritage Based Curriculum is an educational approach that centers on the heritage, history, culture and experiences of a country. Its goals is to provide pupils with a curriculum that is reflective of and relevant to their own backgrounds, identities and the country's resources thereby creating an education experience that is more inclusive, representative and meaningful for pupils

from that heritage background. It can lead to increased engagement, better academic outcome and stronger connections between schools and communities (DRAFT HBC for primary and secondary education 2024-2030, 2024)

Competence-Based Curriculum are learning activities through which a country can empower its citizens with skills, knowledge, and values that will help them fit in the global village which is characterised by advanced technology (Lwonga and Sengenda, 2018).

Teacher is going to be defined as a person who helps pupils to acquire knowledge, competence through the practice of teaching.

Ordinary level Mathematics is the field of study that deals with the properties, relationship and operations of numbers, quantities, shapes and patterns. It is learned in two levels: level 1and 2 then level 3 and 4inclusively (Zimbabwe School Examination Council, 2015).

1.11 Summary of the study

In this study, the gap to be filled by the study was identified through the interrogation of the following: statement of the problem, the significance of the study, delimitation of the study, and limitation of the study. In addition, key terms were contextually defined. The next chapter focuses on the discussion of relevant literature.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of related literature on the applicability of Heritage-Based Curriculum (HBC) mathematics in Zimbabwe secondary schools. The review of the literature is divided into three sections grounded on the research objectives which include, to assess the effect of teachers' preparedness on the implementation of the HBC mathematics curriculum, to identify the teachers' challenges in the implementation of the HBC mathematics curriculum and to highlight recommendations and strategies in the implementation of the HBC mathematics curriculum.

2.2 THEORETICAL FRAMEWORK

This section centers on theories that contribute to the lens through which the issue under discussion will be investigated. Concerns-based adoption model and teacher self-efficacy theories will be discussed. These theories contribute in the establishment of a lens through which the issues under discussion will be observed.

2.21 CONCERNS –BASED ADOPTION MODEL (CBAM)

The curriculum change of mathematics in Zimbabwe secondary schools has been deemed as a critical step towards decolonizing and contextualizing mathematics education (Mazire, 2020). To understand the complexities of this process, the CBAM as a theoretical framework developed by Hall and partners in 1987 provides a roadmap for understanding and supporting teachers during the implementation of curriculum innovations. The CBAM is grounded on the seven component stages which includes, Awareness, Informational, Personal, Management, Consequences, Collaboration and Refocusing. Integrating the components of the CBAM to the HBC mathematics curriculum, can help to identify and address teachers' concerns, ultimately enhancing their preparedness in successful implementation. Studies has indicated that, the concerns of the teachers and levels of use of the curriculum are crucial factors in its successful implementation (Chimbunde, 2019). The CBAM can provides a comprehensive lens through which to explore the dynamics and the implementation of a HBC mathematics curriculum. It acknowledges the multifaceted nature of the implementation process and recognizes that teachers' concerns and engagement evolve over time (Chimbunde, 2019).

Thus, by identifying teachers' specific concerns at each stage, policy makers can provide targeted support and resources to help teachers progress through the stages and feel more prepared to implement the HBC mathematics curriculum (Hall & Hord, 1987). In addition, the CBAM

describes the eight level of implementation ranging from Non-Use to Renewal which can be used as a tool to assists the policy makers to provide teachers with tailor-made professional development opportunities and support systems to enhance the quality of HBC mathematics curriculum delivery (Author, 2019). Furthermore, the CBAM component which emphasis on Innovation Configuration provides a tool for defining and describing the essential components of the curriculum and their variations (Wiggins & McTighe, 2015). If this component is integrated in the HBC mathematics it can assists the teachers to understand the expected implementation process and feel more prepared to deliver the curriculum consistently across different classrooms and school. The findings of this study will provide valuable insights into the support and professional development needs of teachers' preparedness and successful implementation of the heritage based mathematics curriculum. In the end, the purpose of this research is to contribute to the continuing efforts to improve mathematics education in Zimbabwe, and promote cultural responsiveness and relevance in the curriculum.

2.22 THE TEACHER SELF-EFFICACY THEORY (TSET)

The Teacher Self –Efficacy Theory, proposed by Albert Bandura posits that individual's belief in their own capabilities to organize and execute action plan required to attain specific goals. To prepare teachers for the implementation of HBC mathematics curriculum, this study drew on the principles of TSET which includes, self-concept, experience, readiness to learn, orientation to learning and motivation to learn (Bandura, 1997). Considering this theory, the policy makers can be guided to acknowledge the importance of professional development and training in shaping teachers' beliefs in their ability to effectively execute actions required to attain specific goals. The professional developments program should be grounded on cultural competence, differentiated instructions, and classroom management techniques tailored to diverse student population.

In this study, the TSET provides insightful information into the teachers' preparedness for the implementation of HBC mathematics curriculum in Zimbabwe secondary schools. By examining teachers' self-efficacy, beliefs, this research can get a more profound understanding of the factors influencing teachers' readiness and effectiveness in implementing the curriculum. The understanding can inform targeted interventions and personal developments programs aimed at enhancing teacher self-efficacy and consequently, improving the overall implementation of the mathematics curriculum (Sifelani, 2022).

2.3 HERITAGE-BASED CURRICULUM AS A CONCEPT

The heritage-based curriculum aims to integrate the country's cultural heritage and identity into the teaching and learning process, including in the subject of mathematics. This approach seeks to make the curriculum more significant and meaningful for Zimbabwean learners by establishing a foundation in their own cultural context and experiences. The curriculum framework emphasizes exposing all learners to discipline like science, technology, mathematics and heritage studies

(Sunzuma & Luneta, 2023). Through integrating heritage into inquiry-based learning, students can investigate mathematical concepts within the context of their own cultural heritage, making the learning more genuine and relevant.

However, the implementation of the HBC mathematics curriculum has implications for teachers' preparedness. The reforms in the mathematics curriculum have been ushered in a range of changes in relation to teacher knowledge, skills, and practices (Sunzuma & Luneta, 2023). In line with this notion, teachers need to be equipped with the necessary skills and content knowledge to effectively deliver the heritage-based curriculum (Mtetwa, Shizha, 2024). The research results suggest that, sustainable professional development for in-service and pre-service teachers are crucial to ensure they are prepared to implement the heritage-based curriculum (Mtetwa, Shizha, 2024). Moreover, integrating cultural heritage and identity into mathematics instructions, as well as developing learner-centered teaching approaches (Sunzuma & Luneta, 2023; Shizha, 2024). All in all, the HBC mathematics curriculum in Zimbabwe is a significant shift that requires comprehensive teachers' preparation and support to ensure its successful implementation (Sunzuma & Luneta, 2023; Mtetwa, 2024; Shizha, 2024)

2.4 TEACHERS PREPAREDNESS IN HBC MATHEMATICS CURRICULUM IMPLEMENTATION

Curriculum implementation is the course of action of putting into practice the learning activities and program of subjects such as mathematics and the ability to produce the program result rationally (UNESCO 2019). Correspondingly, in accordance with a Zimbabwean scholar, Jeriphanos (2014) curriculum implementation is multi-phased process that involves planning, execution, and evaluation at various levels, including the national, school, and classroom levels requiring the active engagement and participation of teachers, learners and other stakeholders. He further posits that; effective curriculum implementation is critical to achieve the goals and objectives of education and is influenced by teacher professional development.

Kashora (2015) defines curriculum design as the process of creating a curriculum that aligns with the goals, objectives, and learning outcomes of a course. Mathematics curriculum in Zimbabwe, in the educational system is going through a change to orient with the Heritage-Based Curriculum Framework 2024-2030. Thus, teacher participation in the curriculum design of the HBC mathematics curriculum in Zimbabwe secondary schools is crucial for ensuring the effective integration of cultural heritage into the learning process. The HBC Framework, as highlighted in by the spokesperson of Ministry of Primary and Secondary Education Mr Taungana Ndoro in the The Sunday Mail (2024), emphasizes the importance of infusing cultural identity into education. While the level of involvement is not explicitly mentioned in The Herald (2024), research by Bolema (2022) underscores the significance of active teacher engagement in curriculum development to enhance interpretation and implementation.

Furthermore, findings by Chimbunde & Masondo (2020) founded that, employing the top down approach in dissemination of the Zimbabwean curriculum, devoid of the teachers' consultations and participation, catalyzes the manifestation of acerbic and innumerable challenges that included inadequate resources, lack of consultation, lack of training, and poor public relations, which led to poor implementation of the curriculum. Additionally, Moyo (2018) indicates that, a problem in curriculum renovation in Zimbabwe as attempts to change classroom practice have been unsuccessful, it seems there is a wide gap between what the curriculum documents wants and what the teachers do. Drawing from these insights, it is crucial to acknowledge empowering teachers to actively participate in curriculum design. Zimbabwean secondary schools can create a Mathematics curriculum that not only imparts knowledge but also celebrates the rich cultural heritage of the nation, fostering a more inclusive and engaging learning environment.

The preparedness of Zimbabwean teachers in implementing the mathematics curriculum is closely tied to their training and personal development opportunities. Reza (2021) highlights the important role teachers play in curriculum change because they are responsible for the implementation of the curriculum. He adds on that, in-order for them to interpret and make sense of the curriculum, they should be professionally prepared for such activities both in mathematics content and pedagogy continuous in-service training. Furthermore, findings by Mangwende & Maharaj (2018) reveal that the mathematics teachers' teaching and assessment strategies were not based on their knowledge of their students' learning styles. Information and communication technology (ICT) and audio teaching aids were not used by most teachers. The foregoing literature review suggested that the mathematics teachers be in-service on the implications of students' learning style for mathematics teaching. The teachers also needed some in-service training on how to use different forms of ICT in mathematics teachings.

This suggests that ongoing professional development that encourages reflective practice can be instrumental in equipping teachers with the necessary skills and mindset to effectively deliver the curriculum. The HBC approach requires the teachers to have a strong grasp of cultural identity into the learning process. Therefore, equipping Zimbabwean mathematics teachers with the knowledge and pedagogical strategies to seamlessly blend HBC elements into their instruction can enhance the relevance and effectiveness of the curriculum. Overall, most literature from Zimbabwean scholars emphasizes the critical role of teachers training and personal development of educators to implement the mathematics curriculum a manner that aligns with country's educational goals.

The availability of resources is a critical factor in the implementation of HBC mathematics curriculum. Research have indicated that teachers' lack of access to relevant resources, including textbooks, teaching materials, and technology, can hinder their ability of effectively implementing

the curriculum (Mupinga, 2018). Similarly, a study by Chigwada & Gavi (2020) found that teachers in Zimbabwe secondary schools lacked access to sufficient resources, including textbooks and teaching materials, to effectively implement a CBC mathematics curriculum. The study revealed that 30% of teachers had access to the required resources, while 70% relied on inadequate and outdated materials. Likewise, research by Mazarire (2019) found that the lack of technology, including computers and internet connectivity, was a major barrier to the effective implementation of the mathematics curriculum in Zimbabwe. The study revealed that 20% of schools had access to computers and internet connectivity while 80% relied on traditional teaching methods.

Furthermore, lack of resources had been identified as a major challenge facing teachers in Zimbabwe secondary schools. A study by Nyota & Mapfumo (2019) discovered that teachers spent a significant amount of their own money to purchase resources, including textbooks and teaching materials, due to the lack of government funding. The availability of resources in determining teachers' preparedness to implement the HBC mathematics curriculum. Similarly, Chelesile & Lwazi (2018) reports insufficient resources such as low locally published schoolbooks, computer facilities, as well connectivity as major challenges encountered by schools in implementing in the curriculum as Zimbabwe. internet Research has shown that teachers who have access to sufficient resources, including textbooks, teaching materials and technology are more likely to feel more confident and prepared to implement the curriculum (Machingambi & Wadesango, 2017). In conclusion, the literature highlights the importance of availability of resources in determining teachers' preparedness to implement the HBC mathematics curriculum, including textbooks, teaching materials, and technology, has been identified as a major hindrance to effective implementation.

Various researchers have also identified teacher remuneration as a critical factor in determining teachers' preparedness to implement curriculum in Zimbabwe secondary schools. Research by Mupinga (2018) has shown that, teachers' salaries and benefits have a significant impact on their motivation, job satisfaction, and ultimately, their ability to effectively implement the curriculum. A study by Bakasa (2016) uncovered that, teachers in Zimbabwe secondary schools were dissatisfied with their salaries and benefits, which led to low morale and motivation. The study revealed that, 70 % of teachers felt that their salaries were inadequate, and 60% reported that they had to supplement their income with extra jobs to make ends meet. A similar research by Mazarire (2019) found that teachers' remuneration was a major challenge facing the implementation of mathematics curriculum. The study revealed that, teachers' salaries were below prevailing inflation rate, leading to a decline in their purchasing power and standard of living. From the preceding literature, the study has revealed that teachers who are adequately remunerated are more likely to feel valued, motivated and prepared to implement the mathematics curriculum effectively (Chandanakira, 2016). Therefore, it is necessary to take action on the issue of teacher remuneration to ascertain successful implementation of the curriculum.

2.5 CHALLENGES FACED BY TEACHERS IN IMPLEMENTING HBC MATHEMATICS CURRICULUM.

To comprehend the teacher challenges affecting the teacher preparedness for curriculum implementation, we first define the term teacher challenges. According to Cambridge Dictionary (2020), teacher challenges refer to the situation when a teacher is confronted with something that requires excessive mental and physical determination to be successful and consequently tests his/her capability. Merriam (2020) defines teacher challenges as the limitations that hinder teachers' successful execution of tasks.

The previous CBC, with its similar expectations to the HBC, has faced numerous challenges during its implementation, providing valuable lessons for future curriculum rollout. Studies has revealed that the teachers have struggled with the allocation of time for teaching the curriculum (Madondo, 2020). Comparatively, Chimbunde (2019) alludes that the timetable has been criticized for being too congested, leaving little time for teachers to adequately cover the curriculum. Additionally, the lack of flexibility in the timetable has made it difficult for the teachers to adjust their teachings to meet the needs of the curriculum. Thus teachers have reported feeling rushed and pressured to complete the national syllabus within the allotted time, leading to a lack of depth in teaching and learning (Chimbi, 2018; Reniko, 2019). Furthermore the timetable has been criticized for not taking into account the different learning styles and abilities of students (Sithole & Mafa, 2013).

Furthermore, teachers have stated that it is difficult to serve the different needs of their students within the constraints of the timetable. In conclusion, the timetable has been an imperative challenge for teachers implementing the mathematics curriculum in Zimbabwe. The congested and inflexible timetable has led to a lack of depth in teaching and learning, and has made it difficult for teachers to cater for the diverse needs of their students. However, the researches mentioned earlier which yielded those findings, were actually based on the outgoing Competency Based Curriculum (CBC). Therefore, addressing these timetable-related challenges is crucial for the implementation of the HBC mathematics curriculum.

Teacher-pupil ratio-related issues is another challenge that has been discovered by numerous researchers. Findings by Chimbi (2018) indicates that, teachers have struggled with large class sizes, which have made it difficult to effectively implement the mathematics curriculum. The high teacher-pupil ratio has led to a lack of individualized attention and support for students, making it challenging to cater to the diverse needs of their students (Ngwenya, 2020). In addition the above findings, teacher-pupil ratio has also made it difficult for teachers to assess student learning and progress, which is a critical component of the mathematics curriculum (Gasva, et al, 2019). Teachers have reported struggling to keep up with the demands of marking and feedback, which has led to a lack of timely and effective feedback to students. These studies have demonstrated that, the large class sizes have led to lack of individualized attention, a lack of resources and a lack

of timely and effective feedback will hinder the successful implementation of the HBC mathematics curriculum. Whilst the previous studies on challenges of large class size were relevant, they lacked the HBC mathematics curriculum context, which this current study is investigating as they are no known literature on the current curriculum in Zimbabwe.

2.6 RECCOMENDATION AND STRATEGIES FOR TEACHERS' TO BE PREPARED TO IMPLEMENT THE HBC MATHEMATICS CURRICULUM.

Studies from earlier curriculum reforms have highlighted key strategies and recommendations, informing policymakers on how to equip teachers for successful curriculum implementation. Findings from Gasva et al (2019) has shown that teachers recommend that the government and schools should provide adequate resources, including textbooks, teaching materials and technology to support the implementation of the curriculum. Additionally teachers have recommended that the curriculum be adapted to suit the available resources and context of the schools (Phiri, 2020). Teachers have also recommended that the government and schools provide additional support, such as teaching assistant and mentors, to help them implement the curriculum effectively (Makamure & Jita, 2019). However the forgoing researches are based on the findings of the CBC curriculum framework which have the same demands with the HBC mathematics. As a result, this study seeks to assess what have been done to ensure teachers' are prepared for the HBC mathematics curriculum implementation.

Moreover, teachers have also emphasized the importance of community involvement and support in the implementation of the mathematics curriculum (Madondo, 2020; 2021). According to these studies, teachers have made several recommendations regarding the availability of resources in the implementation of the mathematics curriculum. These recommendations include, providing adequate resources, additional support and community involvement and support, addressing these recommendations is crucial for the successful implementation of the curriculum.

Another recommendation from past curriculum change research findings indicates that, teachers should be involved in the curriculum design process to ensure that the curriculum is relevant, effective and aligned with the teaching practices students' needs (Mutanga, 2022; Sunzuma & Luneta, 2023). Furthermore, teachers have also recommended that the curriculum design be collaborative and inclusive, involving experts and other stakeholders (Madondo, Phiri, 2020). This, they argue, would ensure that the curriculum is comprehensive, coherent and aligned with the needs of the teachers and students. In addition, Mazire (2020) reveals that, teachers have also recommended that they be provided with autonomy and flexibility to adapt the curriculum to suit their teaching styles and student needs. This assertion has shown that, teachers have made recommendation regarding their participation in curriculum design and implementation of the HBC mathematics curriculum. These involvement include involvement in curriculum design,

collaborative and inclusive curriculum design. Taking into account these recommendation is crucial for the successful implementation of the HBC mathematics curriculum.

Previous research under the outgoing CBC has shown that, teachers have offered valuable insights on key factors that can contribute to successful curriculum implementation. Ngwenya (2020) findings portray that, teachers recommend that they receive comprehensive training and professional development opportunities to enhance their knowledge and skills in teaching the mathematics curriculum. This include, training on the curriculum's content, pedagogy, and assessment as well as on-going support and coaching (Chitate, 2016). In related research, Maphosa (2021) and Phiri (2020) recommend that the government provide teachers with training on adapting the curriculum to suit diverse student needs, using technology to enhance teaching and learning, and integrating local resources and materials into the curriculum. Similarly, research by Mapetere (2015) advocates that, schools and districts provide opportunities for teacher collaboration, mentoring and peer coaching to ensure that teachers feel confident in implementing the curriculum. Therefore, these findings mean that, they are several recommendations regarding the training and professional development in the implementation of the HBC mathematics curriculum. These recommendations include, comprehensive training, ongoing coaching and support, tailored professional development, collaboration and peer coaching among teachers. Taking into consideration the highlighted recommendations is crucial for the effective implementation of the HBC mathematics curriculum.

Besides the above recommendations, based on the findings on previous curriculum, Reniko et al (2019) recommend that, teachers should receive sufficient compensation for their work in developing and implementing the curriculum. This include payment for extra hours worked, travel expenses and resources for curriculum development and implementation (Khosa & Makuvire, 2021). This is related to the study by Gory et al (2021) suggests that, Zimbabwe teachers' salaries should be comparable to other countries who are implementing similar curriculum. Additionally teachers have recommended that they receive benefits such as professional development opportunities, study leave and sabbaticals to enhance their knowledge and skills in teaching of the mathematics curriculum. The studies reviewed confirm that, there are several recommendations regarding remuneration, these include, adequate compensation salary adjustments, benefits and incentives. Addressing these recommendation can motivate teachers to successfully and effectively implement the HBC mathematics curriculum.

2.7 RESEARCH GAP

From the preceding literature, teachers' preparedness for the implementation of the HBC mathematics curriculum in Zimbabwe secondary schools has been reviewed and highlighted. In all the researches discussed above, issues of teachers' preparedness for the implementation of the HBC mathematics curriculum are not adequately covered, illustrating a gap in the literature as explained below. The studies have highlighted the teacher challenges and recommendation and strategies, for the implementation competency-based curriculum framework not the HBC mathematics curriculum.

Furthermore, most studies reviewed were conducted in primary schools and least in secondary schools. The studies came up with teacher challenges and recommendation within different schools but did not provide the exact cause for a context of secondary school teacher preparedness and curriculum implementation in HBC mathematics curriculum. Therefore, presenting a contextual knowledge and empirical evidence gap. The current study, therefore, sought to fill this methodological gap.

2.8 CHAPTER SUMMARY

Chapter two underlined the theoretical base on which the study took reference. The chapter also looked at the preparedness of teachers on the implementation of HBC mathematics curriculum, as well as the challenges and recommendations. The following chapter looks at the methodology used to provide answers to the formulated research questions.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides an overview of the different methods that were employed in the study. It describes the research paradigm, research design, study population, sample size and selection, the sampling techniques and procedures, data collection methods, data collection techniques. The chapter also presents the methods or procedures of data collection, validity and reliability of the instruments. Data analysis, measurement of variables, and interpretation are also explained by the chapter. The chapter likewise presents the ethical considerations of the research study and methodology summary.

3.2 RESEARCH DESIGN

Creswell (2014) defines research design as planning of conditions for gathering and examination of data in a way that aims to integrate the application to the study purpose with the study process. Research design is also defined as a detailed blueprint for conducting a study with maximum control over factors that may interfere with the trustworthiness of the findings (Teherdoost, 2016). Furthermore, the research design is planned to aid in answering the research questions as authentically, objectively, and precisely as possible (Creswell & Creswell 2018).

This research utilized a multi-method approach, combining both qualitative and quantitative data collection (concurrent triangulation). This is a mixed-methods research design that is also denoted as convergent parallel design by Creswell (2014); Cohen et al (2018). Similarly, Creswell & Clark (2017), define concurrent triangulation design as a design that enables the implementation of both qualitative and quantitative methods for the gathering of data in the same time frame and with equal weight applied to them. According to Creswell et al. (2018), the concurrent triangulation research design is referred to the instantaneous collection of both quantitative and qualitative data and the use of the results to comprehend a research problem. This is a single-phase design that allows the researcher to implement the qualitative and quantitative research approaches for collecting data at the same timeframe and with the identical weight attached to them (Hancock 2009 and Creswell et al. 2018).

In this study, data was collected by administering online questionnaires first, followed by conducting in-depth telephone interviews so that qualitative data would be used to explain the quantitative data. It is more useful when the quantitative approach provides complex data, which needs to be clarified by qualitative means. In addition Cohen et al (2018), contend that the concurrent triangulation design is simple to use because findings from both data sets makes it easy

to identify areas of converges and divergences. Therefore, quantitative data offers generalizability, while qualitative data offers evidence about the context or setting (Creswell 2014). The design enabled the collection of evidence that drew on the complementary strengths of both quantitative and qualitative data collection that results in a well-validated and authenticated finding as articulated by (Leavy, 2017). Considering the above highlights, the concurrent triangulation design was deemed suitable for this research. In this study, both the qualitative and quantitative were prioritized equally. However, the design uniquely integrated both the qualitative and quantitative approach during the interpretation stage, allowing for a comprehensive understanding of the research findings.

3.3 RESEARCH PARADIGM

A research paradigm is a wide-range worldview, context, assumptions and shared concepts and values that guide research and practice in a field (Creswell, 2014). Thomas Kuhn 1970 articulates the research paradigm as rooted in a philosophical model which aims to determine the direction of research until research reaches its reality through the use of the appropriate methodology. Given this context, this study embraced the pragmatic world view. The paradigm is rooted in the works of philosophers like John Dewey, whose emphasis is on the practical application of knowledge, and the interdependence of means and ends. This paradigm permits the combining of qualitative and quantitative approaches to gain a comprehensive understanding of the research problem (Thomas, 1970).

Guided by the tenets of pragmatism, this study adopted a practical and flexible approach to address the real-world problem. Therefore, the pragmatism paradigm is important in this study in various study stages. The paradigm allows the researcher to use any methods that works best to answer the research questions. This practical orientation fits well with the goal of mixed method to provide a more comprehensive understanding of a complex phenomenon (Morgan, 2014). Additionally, pragmatism guides the researcher to formulate research questions that are meaningful and relevant to a real-world issues, emphasizing problem solving and practical implications. Shannon-baker (2016) & Njage (2018) incorporated the complementarity idea in their study by conducting telephone surveys that combined parallel design, featuring both open-ended qualitative questions and quantitative surveys. Thus, by adopting a pragmatic mindset, this enable the researchers to combine the qualitative and quantitative methods without being constrained by the incompatibilities between the positivists and interpretivists' paradigms. This is supported by (Creswell & Creswell, 2018) who clarifies that, the pragmatism paradigm permits the complementarity between qualitative and quantitative data gathering methods in one study.

Moreover, pragmatism embraces a pluralistic approach to research, recognizing that there are multiple ways to interpret the world and conduct the research. It also enables researchers to make flexible, context-dependent choices about methods based on what best for their specific study,

allowing for innovative and dynamic mixed methods design. For this reason, the pragmatic philosophical perspective was adopted due to its emphasis on practicality and flexibility, allowing researchers to focus on addressing real world problems effectively (Morgan; Creswell, 2014). However some studies argue that, they is risk of pragmatism leading mixed methods to be overly positivistic by uncritically adopting standardized quantitative methods without considering their epistemological assumptions and limitations. Pragmatism might also gloss over important philosophical differences between qualitative and quantitative approach.

3.4 RESEARCH APPROACH

In this study, research approach is referred to as a strategy of inquiry to provide specific direction of procedures in the research design (Neuman, 2014). Based on the findings of (Creswell, 2014) it is a conceptual structure within, which an investigation is conducted as outlined. Also, Creswell (2016) defines research approaches as the plans and the procedures for a research study that span the phases originating from comprehensive expectations to detailed approaches of information gathering, analysis, and, interpretation. This study used a mixed methods approach, in its data generation, analysis and discussion. The study approach allows the researcher to generate, scrutinize both qualitative and quantitative data in one study (Creswell 2018).

3.4.1 MIXED METHODS

Creswell et al (2018) define mixed approach methods a design for collecting, analyzing and mixing the quantitative and qualitative data in a single study in order to understand research problem. In addition, Patton (2019) asserts that mixed methods involves investigating a problem using various data sources in a way that presents different perspectives about the question. The definitions given above reflect that, no single method meet all the required aspects in the study (Makamure, 2015). Hence, the researcher found it necessary to use the mixed method approach in particular the triangulation method. Triangulation method involves combining different research methods, such as surveys, interviews and observations (Patton, 2015). The researcher opted for this method as it offers increased validity, comprehensive understanding and improved generalization.

Given the pragmatic approach of this study, the data collection methods used involved dialogue with the participants as source of information. According to (Creswell, 2014), the paradigm choice guides and shapes a study. The mixed method research methods combines' qualitative and quantitative methodologies to enhance research outcomes by leveraging the strengths of each approach (Creswell & Clark, 2024). Hence, mixed method aligned with the pragmatic paradigm's focus on utilizing the best methods to investigate how prepared are the teachers in implementing the HBC mathematics curriculum (Morgan, 2018). This study approach allowed the researcher to address the preparedness, challenges of teachers in implementing the curriculum effectively by employing multiple research methods (Brierley, 2017). The method enables researchers to gather numerical data, text information and various artefacts (Israel, 2019). Since the mixed method incorporates the quantitative and qualitative approaches, it is necessary to explain what these

approaches entail (Makamure, 2015). A quantitative research approach is a systematics inquiry of an event that is observable through statistical techniques (Patton, 2015). It is employed to collect numerical data using structured tools such questionnaires to assess attitude. To ensure clarity, reliability and validity, the questionnaires was pilot tested, then administered to the sample population. The collected data was analyzed on a 5-point Likert scale, applying statistical methods to identify patterns, and correlations, and then the findings are interpreted in light of the research objectives (Field, 2018).

The researcher settled to employ the mixed method approach, as the quantitative aspect deals with the statistical analysis whilst the qualitative aspect dealt with the emotional facts of the participants (Creswell, 2014). Thus the qualitative approach was used to examine the emotional side, enhancing the pragmatic paradigm, which seeks to provide a deep understanding of complex, real world problems (Patton, 2015). This approach is characterized by a pragmatic design, where research questions evolves as the study progress through in-depth interviews, focus group to gather rich contextual data (Morgan, 2014). This is similar with the focus of this study, in-depth interviews were used as a power tool to dig deep into the participants' experiences and perspectives. Participants' responses to the interviews are recorded and are used to establish how prepared are the mathematics teachers in implementing the HBC curriculum. Based on the above views, this research was built on the belief that collecting data using both the qualitative and quantitative approach (mixed method) provide a more complete understanding of the problem.

Thus, pragmatism acknowledges that there are a multiple valid ways to interpret the world and conduct research, enabling researchers to combine different methodologies to address research questions (Morgan, 2014). The data collected by both approaches is usually used during the interpretation stage. Thus in this study, the mixed method evaluation analyzed the link between the degree of teachers preparedness and the applicability of the HBC mathematics curriculum.

3.4 METHODS

Denzel & Lincolin (2017) state that, research methods are the tools the researcher uses data generation. Hence for this study, the researcher was the chief data generation tool aided by semi-structured questionnaires and in- depth interviews:

3.4.1 The Questionnaires

This is a data collection method that consists of printed questions in a specific order on an arrangement where the respondent responds (Groves et al, 2011). The researcher used the questionnaires as a data collection methods, taking advantage that the participants were literate. Consequently, they would read, understand and complete questions on their own hence, saving time and cheap to manage as suggested by (Creswell 2014). The researcher used the questionnaires as a data generation tool on mathematics teachers; to collect information on the teacher

preparedness, teacher challenges, teacher recommendation and strategies in the implementation of the HBC mathematics curriculum. The researcher used closed-ended items in the questionnaires to obtain primary data from mathematics teachers.

3.4.1.1 Closed-ended Questionnaires

These are an assortment of pre-determined questions for all respondents that serve as a primary data collection instrument in research (Sekeran & Bougie, 2016). The researcher utilized a closed-ended questionnaire as a data collection instrument which was self-administered by mathematics teachers. This approach allows the researcher to gather quantitative data from the teachers, who responded to a set of pre-defined questions with fixed response options. The close-ended questionnaire was used to gather data on teacher preparedness, teacher challenges, and teachers' recommendation and strategies of the implementation of the HBC mathematics curriculum.

As explained by Creswell et al (2018), closed-ended questionnaire has questions accompanied by a list of all probable substitutes from which study participants select answers which pronounce their status quo. Additionally, the self-administered questionnaire was used because it facilitates easy data analysis, allowing the researcher to conveniently and accurately examine the responses from the participants and draw meaningful conclusion. Closed-ended questionnaires are easier to manage since each questionnaire item is followed by substitute responses and they are cost-effective to use in terms of money and time as advised by (Creswell, 2014).

The questionnaire was administered to thirty-six (42) out of 180 mathematics teachers selected to participate in the study. In line with the required sample size of 10- 30% of the total population as recommended by Cohen et al (2018) who explain that, the required sample size depends on various factors such as the research design, population size, desired level of precision, and power analysis. The researcher therefore, used the WhatsApp platform to randomly distribute the closed-ended questionnaires. The researcher sends the questionnaires to the participants after obtaining their contact from WhatsApp group the BUSE TCD students created. The above highlighted was due to the early check-out of TCD HBScEd mathematics students at BUSE from the compass, this made limited physical administration to some participants. However, this has reduced physical contact amongst the study participants and the researcher.

3.4.2 The In-depth Interviews

An interview is a conversation between two people to accumulate appropriate information for a research problem (Patton, 2015). Interviews can be face to face, use of telephone and focused

group, from the findings by (Bryman, 2016). Interview data collection enhances in-depth and detailed interaction flanked by the study participants and the investigator (Creswell, 2014). These are used to gather qualitative data. The preceding helped the investigator to achieve the study objectives. Interviews provide participants with a more relaxed atmosphere for sharing their opinions and reflections and permit the production of richer and more detailed data (Kvale & Brinkmann, 2015).

The in-depth interview method was used because it granted the researcher the opportunity to probe further on the study objectives (Patton, 2015). The central reason for using this method in the study was to draw upon respondents' attitudes, feelings, views, perceptions and their experience on the implementation of the HBC mathematics curriculum. This data gathering method was used to obtain information on teachers' preparedness, teacher challenges, teacher recommendation and strategies meant for the implementation of the HBC mathematics curriculum framework. The researcher used an in-depth interview schedule to obtain primary data from the study respondents.

3.4.2.1 The Semi Structure Interview Schedules

This interview schedule is orally administered to the respondents either face-to-face or by telephone (Saengboon 2016; Merriam, & Tisdell 2015). These schedules are particularly useful when collecting in-depth qualitative data. In this case, the schedule served as a data collection tool for gathering insights from key informants, providing information that could not be obtained through questionnaires alone. This data collection instrument was used to collect information on teachers' preparedness, teacher challenges, teacher recommendation and strategies in the implementation of the HBC mathematics curriculum.

This approach allowed participants to share their experience and thoughts on the HBC mathematics curriculum implementation in an open manner. The researcher used a guiding prompt to keep the conversation focused and relevant, ensuring that the discussion remained aligned with the research objectives. This instrument was used on thirty-six (42) selected mathematics teachers, out of the total population of one hundred and eighty (180) mathematics teachers on BUSE HBScEd program. Due to the unexpected check-out of most students in the middle of the program, there was limited face to face interviews with most of the participants. The researcher, therefore, managed to conduct telephone interviews with eighteen (20) out of the initial thirty-six (42) selected TCD HBScEd mathematics teachers at BUSE. Telephone interviews put on the same structural characteristics as standard interview techniques, except that it is conducted by telephone (Sturges & Hanrahan, 2017). However, this reduced physical contact between those participants and the researcher.

3.5 SAMAPLE AND SAMPLING PROCEDURE

Ritchie (2018) define the term population as the total number of people living in a country, city or district. The target population is defined as the entire set of individuals, cases, or data points that a researcher wishes to describe or make inferences about (Babbie, 2017, p.104). The target population is made up of mathematics teachers who are current students at Bindura University of Science Education (BUSE) on Teacher Capacity Development program (TCD). The current information available from one of the WhatsApp group indicated that they are 180 mathematics teachers who are on level 2.2 of the HBScEd mathematics programe at BUSE. The present research targeted all the 180 mathematics teachers who TCD students on level 2.2 HBScEd mathematics program at BUSE. The aforementioned and highlighted group constituted the target population. From this targeted population, the sample group was drawn for this study.

A sample is a smaller group of members of a population selected to represent the population (Mack, 2018). Similarly, according to Cooper & Schindler (2018), a sample is a subset of the population, selected as representatives of the bigger population. The mathematics teachers were selected using the non-probability sampling techniques.

The sample size and sampling procedures are shown on the table 3.1

Participants	Target population	Sample size	Percentage	Sampling technique
Mathematics teachers	180	42	20	Purposive sampling

Table 3.1 shows the sample size and sampling technique of the study. The study used 20% of the participants are student on level 2.2 doing HBScEd mathematics program BUSE. According to Israel (2013), a sample size of 10-30% of the targeted population is adequate for a study. The study sampled 20% of the target population who participated in the study. Therefore, the study had a sample size of 42 mathematics teachers obtained from a pool of almost one hundred and eighty (180) TCD students who are on level 2.2 HBScEd mathematics at BUSE.

Purposive sampling was used for this study based on the assumption that the targeted participants had the knowledge of the issue under investigation (Patton, 2015). Likewise, purposive sampling involves the selection of individuals who are particularly informed about a phenomenon under investigation (Mills, & Gay 2016). In addition, Cohen et al (2017) ascertain that, members of the population in purposively sampling do not have an equal opportunity of being picked for research. This study opted for the sampling technique as it enabled the researcher to use her own judgment to determine the attribute being sought (Cohen et al, 2017). Thus the researcher, made conscious decision on which mathematics teacher to deal with to provide desired information. The choice of the sampling technique by the researcher is supported by Kumar (2014), who say that a researcher normally seeks those participants who, in his/her own opinion, have relevant information and are

willing to share it. Using purposive sampling the researcher faced minimum hurdles to conducttelephone interviews as well getting responses from the participants through use of internet. This accumulated detail provide empirical evidence to the study under investigation.

3.6 DATA GENERATION PROCEDURE

Data generation is the exercise of the collection and measurement of evidence on study variables of intent in a conventional systematic mode that allows answering the specified research questions, testing of the study hypothesis, and, appraise the outcomes (Kumar, 2019). On the data generation procedure, the researcher obtained an introductory letter from the Bindura University of Science Education, Faculty of Education. The letter allowed the researcher to seek permission from the Ministry of Primary and Secondary Education (MoPSE), Mashonaland West province to carry out the study on the selected teachers. Thereafter, the researcher used questionnaires and telephone interviews in-order to acquire facts from the selected participants. The participants were selected purposively and the researcher personally conducted interviews with selected teachers. Moreover, before any interviews were conducted, issues to do with ethics were considered to be of importance.

3.7 DATA ANALYSIS PROCEDURE

Data analysis is the process of collecting, modeling and analyzing raw data to extract meaningful insights that support decision making (Field, 2018). The data collected from key informants during interviews were recorded and sorted according to themes as recommended by (Bryman, 2016). Similarly, the data collected from questionnaires were verified to ensure completeness and coded before analysis (Creswell, 2014).

3.7.1 Quantitative data analysis procedures

Quantitative data obtained was analyzed using descriptive and inferential statistics. For inferential statistics, the researcher used regression analysis. This form of statistics was considered appropriate for this study's data analysis since it permit the measurement of the effect of one variable on another (Creswell et al, 2018). This corresponds to the variable that was analyzed which helped the researcher to compute the effect of teachers' preparedness in the implementation of HBC mathematics curriculum.

Field (2018) argue that, descriptive statistics deals with measure of distribution, central tendencies, measure of relationships. After data collection the researcher checked for completeness of questionnaires. All of the questionnaires were found to be complete. Following the data check, the responses from the questionnaires were summarized and analyzed using descriptive statistics specifically percentages and frequencies. The researcher summarized patterns in the responses from the participants by tables, graphs and charts after which were later interpreted.

3.7.2 Qualitative data analysis procedures

The qualitative data analysis process began with data preparation, were audio recordings were transcribed. The data was then cleaned and coded for analysis. The data was analyzed to ascertain the accuracy, credibility, consistency, usefulness of the information as recommended by Cohen et al (2017). Key findings with themes that had more weight compared to others in terms of their perceived impact were used for interpretation and explanations of the research study grounded on the lessons learned by the investigator as suggested by (Braun & Clarke 2019). Subsequently, during analysis, the results were merged or combined by giving equal weight to both qualitative and quantitative data. This was to assist the researcher to draw inferences and conclusions based on the merged quantitative and qualitative data.

3.8 RESEARCH INTEGRITY

In this study, research integrity was grounded on the ethical consideration that are in discussed in detail below:

3.8.1 Ethical consideration of the study

Ethical considerations are the principles of conduct that guides a researcher during and after the study (Kumar, 2019). This issue of ethics is imperative in research for the reason that; "despite the high value of knowledge gained via research, knowledge should not be pursued at the expense of human dignity" (Creswell, 2014). The researcher always had the responsibility to conduct the investigations and report findings without harming the research participants (Kimel, 2020). Applying some aspects of the seven fundamental guidelines that govern research and human subjects as recommended by (Kumar, 2019). These include seeking permission, informed consent, voluntary participation, anonymity, confidentiality, privacy and no harm to participants. In this regard, the current study observed the following ethical measures;

Seeking permission; upon obtaining an introductory letter from Bindura University, the researcher sought approval from Mashonaland West provincial offices of education to carry out the study. Furthermore, the researcher notified the school head of Kenzamba secondary school, where she is employed as a teacher. Finally the researcher obtained informed consent from the participants in the research study.

Informed consent; the researcher clearly outlined the academic, objectives, potential risk and benefits of the study to the participants. This is supported by Kimel (2020), contends that ethical consideration should ensure that informed consent in which permission is sought to research the selected population is done. Likewise, in accordance with ethical guidelines, informed consent was obtained from each participant before they agreed to take part in the study. This aligns with

the assertion that participants have the right to make informed decisions about their involvement in the research (Kimel, 2020).

Confidentiality and anonymity; the researcher used codes instead of names to identify the selected study participants. Additionally, the researcher took steps to avoid personal bias and maintain objectivity through the research process, including literature review, data collection, analyzing and reporting. This was done to ensure the integrity and credibility of the study. This approach follows the guideline that of confidentiality, protection of research participants identity (Kumar, 2019).

3.9 CHAPTER SUMMARY

This chapter outlined the research framework, including the research paradigm, research design. It also described the methods used to select participants (sampling techniques), data collection procedures and data analysis. Additionally, the chapter discussed the measures taken to ensure ethical research practices of the study. In conclusion provided a concise overview of the methodology presented in the study. In the next chapter, the generated data will be analyzed and discussed according to the identified themes.

CHAPTER 4

DATA ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

This chapter provides descriptive statistics of a sample of 42 mathematics teachers using questionnaires and the responses that were derived from the 20 interviews conducted. Quantitative data gathered using questionnaires was supported by qualitative data obtained from the interview responses. The findings from the mixed method approach are presented, analyzed and discussed according to the emerging themes.

4.2 CHARACTERISTICS OF THE PARTICIPANTS

The demographic characteristics of the selected study participants consisted of mathematics teachers as respondents; gender, respondent's age, qualifications, class taught, teaching experience and school settings. This data was not collected as part of the research questions. Although this data was not part of the original study it has been included to provide a deep understanding of the research problem.

The demographic characteristics of teachers on the table below are analyzed and discussed.

Table 4. 1 Demographic characteristics of selected teachers (n=42)

Characteristics	category	frequency	%
Gender	Male	18	42.8
	Female	25	57.2
Age	20-29	7	16.7
	30-39	27	64.3
	40-49	8	19
	50+	-	-
Qualifications	Diploma	42	100
	Degree	-	-
	Masters	-	-
	Any other	-	-
Class taught	Form 1-2	12	28.6
	Form 3-4	14	33.3
	Form 5-6	2	4.8

	Form 1-4	14	33.3
Teaching experience	0-9 years	9	21.4
	10-19 years	33	78.6
	20 years and above	-	-
School settings	Rural	20	47.6
	Peri-urban	14	33.3
	Urban	8	19.1

Table 4.1 shows that, the purposively selected teachers had more females 25 (57, 2%) than males 18 (42.8%). For the respondents' age, 7 (16.7%) were aged 20-29; 27(64.3%) were aged 30-39 and 8(19%) were aged 40-49. For the qualifications, all of the 42(100%) respondents' had diploma as their highest level of academic achievement. The researcher noted that they were 14(33.3%) teachers who taught classes from two categories, that is form 1-4, for form 1-2 they were 12(28.6%), form 3-4 they were 14(33.3%), and those who taught form 5-6 were 2(4.8%). In addition, the selected mathematics teachers have varying teaching experience. A closer look has shown that 9(21.4%) had 0-9 years teaching experience and 33(78.6%) had 10-19 years teaching experience. The above demographic characteristics presented above has revealed that all the respondents are trained teachers who have vast teaching experience and most of them are implementers of the outgoing CBC curriculum. This made the researcher assume that the respondents are credible and dependable source of data for the issue under investigation.

4.3 Research topic 1; to what extend are teachers prepared to implement the HBC mathematics curriculum.

In this section, the data generated from the participants is sort into themes with the aim to answer research question one, which sought to determine on how prepared are mathematics teachers in implementing the HBC mathematics curriculum. This section presents themes derived from the questions asked.

4.3.1 Understanding HBC

Under this theme, the study seeks to shed light on how the targeted mathematics teachers perceive about the Heritage Based Curriculum. Related responses are categorized into sub-themes.

4.3.1.1 HBC encourages appreciation of own culture

In accordance with the sub-theme, the participants exclaimed the following;

I think the HBC curriculum is a curriculum that is rooted in trying connecting the teaching and learning of mathematics to the culture of that community (interviewee 7).

My understanding of the HBC is that it is a form of curriculum that is guided by the culture and what people believe in that particular area (interviewee 15).

I do not have much information about the HBC, I am still learning but my understanding of the HBC is that it is a curriculum that seeks to encourage learners to know more about their heritage (interviewee 9).

Similarly, the qualitative data from the questionnaires aligns with the interview responses as evident from the quotes below;

It's an educational approach that centers on the heritage, history, culture and experiences of a country…..it provides learners with the curriculum that is relevant and reflective to their backgrounds(questionnaire 17).

HBC is an educational approach that centers on the heritage, history, cultures and experiences of a country. Its goal is to provide pupils with a curriculum that is reflective of and relevant to their own backgrounds, identities and the country's resources thereby creating and educational experiences that is more inclusive, representative, and meaningful for pupils from that heritage background. It can lead to increased engagement, better academic outcomes and stronger connection between school and community (questionnaire 33)

It is knowledge passed on the country's resources and traditional practices passed on from generation to generation (questionnaire 5)

4.3.1.2 HBC instills patriotism

The participants shared the following insights in the interviews;

I don't have a clear understanding of HBC, but what I know is that the government wants to instill patriotism in learners through teaching and learning (interviewee 2).

What I understand about HBC is that there is little or no difference with the CBC but I have noted that HBC wants to cultivate the issue of patriotism in learners (interviewee 1)

Likewise, the questionnaire responses below echo the same sentiments expressed in the interviews above;

HBC is an education system which aims at equipping learners with skills that will help them in life and being patriotic to their country (questionnaire 3)

It is a curriculum whose values are emphasized on upholding the country's unique heritage values thereby instilling the attributes of hunhu/Ubuntu and patriotism (questionnaire 39)

I think heritage-based curriculum are learning experiences that promote sense of national pride in learners and also encourage patriotism (questionnaire 21)

4.3.1.3 HBC promotes unhu/Ubuntu

The following quotes are taken from the interviews conducted,

My understanding of the HBC, I think because of drug abuse among youth, I think HBC wants to in-cooperate the Ubuntu philosophy in teaching and learning (interviewee 13)

In support of this, other participants exclaimed the following:

Uuummm, I think *it is a curriculum whose values are emphasized on upholding the country's unique heritage values thereby instilling the attribute of hunhu/Ubuntu (interviewee 5)*

4.3.1.4 HBC promotes practical skills for national development.

The following quotes are extracted from the qualitative responses to the questionnaire,

HBC is the education system where emphasis will be impacting learners with skills and attitude through the use of learner centered approaches such as problem solving and discovery approach that will enable them to make a contribution to the economy of a country (questionnaire 14).

A curriculum that equips learners with survival skills for example sports and digital skills (questionnaire 36).

HBC is a curriculum that focuses on providing 21st skills to learners (questionnaire 23)

The definitions above, made the researcher assume that most of the teachers have their own unique way of identifying the HBC framework. The findings revealed that the majority of the teachers believe that HBC is meant to infuse culture in the teaching and learning. This concurred with the interview done by the spokesperson of Ministry of Primary and Secondary Education Mr Taungana Ndoro in the The Sunday Mail (March, 2024), he emphasizes the importance of infusing cultural identity. In addition, teachers defined and described the essential components of the curriculum and their variations (Wiggins & McTighe, 2015).

4.3.2 Lack of preparedness

Under lack of preparedness, the research sought to determine the factors contributing to lack of preparedness in terms of lack of communication, training and professional development in the implementation of HBC mathematics. The study intend to establish whether the following reasons have effect on their lack of preparedness. The responses are presented below,

Table 4.2: The descriptive statistics on why mathematics teachers are not prepared to implement the HBC mathematics curriculum.

Statement	Response	Frequency	%
How do you rate teacher participation in the HBC mathematics curriculum development?	Very poor	17	40.4
	Poor	15	35.7
	Neutral	5	23.9

How knowledgeable are you with the overall demands of the HBC framework?	Very poor	19	45.2
	Poor	14	33.3
	Neutral	4	21.5
How do you rate the availability of resources and materials tailor made for the HBC mathematics in your school?	Very poor	22	52.3
	Poor	20	47.7

Table 4.2 above shows a summary of item responses on lack of preparedness by mathematics teachers in the implementation of the HBC. A significant number of teachers 37(88%) out of 42 indicated very poor and poor on the stated reasons given. The current data analysis indicated the mathematics teachers have concurred that there is, very poor to poor involvement of teachers in curriculum development, availability of resources and teacher knowledge of the HBC.

In support of the above sentiments, the participants from the telephone interviews said that they were not prepared to implement the HBC mathematics curriculum sighting the following reasons which are written under sub-themes lack of communication, training and personal development.

4.3.2.1 Lack of communication

In this section, the study seeks to investigate how lack of communication contributes to lack of preparedness of teachers in the implementation of the HBC mathematics. In this regard, the participants mentioned the following reasons,

I am not ready. Up to date the only communication I have about the HBC mathematics curriculum is through the radio and television. There is no formal communication that has been through the district about the HBC (interviewer 42).

I cannot say I am prepared. I am using the CBC national syllabus for my scheming. I don't know what the HBC expect me to teach (interviewer 13).

No. there is no documentation that says I should use the heritage based curriculum. i don't even know what this heritage based curriculum is all about. No I am not ready, the government have not communicated with the teachers (interviewer 19).

4.3.2.2 Training and professional development.

Furthermore, the participants shared the following reasons in line with the question on why they are not prepared to implement the HBC mathematics curriculum,

Umm I am not ready. At our school or district there has been no training on HBC. I am still applying the teaching methods of the competency based.

I am not ready because I haven't received any training on how to use heritage based curriculum to teach mathematics. I can say I don't even know what its requirements.

I am not. We did not receive any training at all. I have limited knowledge on the computers, there is no training. I don't think I can be prepared under the current conditions at our school you can be ready. No computers, no electricity.

However, 3(15%) out of 20 interviewees stated that they were ready to implement the HBC, the reasons are below;

I am ready because I think the HBC has the same demands with the CBC so I can implement it

Yes I am ready. I already using learners centered teaching approach in my class so I don't see any problems implementing the HBC.

In support of the above statements,

5(11.9%) out of 42 indicated that they were ready to implement the HBC they explained the following reasons

The PED had a cluster workshop with teachers and clarified some of the aspects of the HBC so I have an idea of what the curriculum wants (questionnaire 8).

They was a workshop at our school were parents, pupils were asked what they want the new curriculum to be (questionnaire 11).

It seem there is no difference between the curriculums which we had been using which is learner centered (questionnaire 24)

The narrations from the participants implies that the policy makers have done little or nothing to prepare the teachers to implement the HBC mathematics curriculum. These findings are similar to the results of a study conducted by Chimbunde & Masondo (2020) founded that, employing the top down approach in dissemination of the Zimbabwean curriculum, omitting of the teachers' consultations and participation, catalyzes the manifestation of acerbic and innumerable challenges that included inadequate resources, lack of consultation, lack of training, and poor public relations, which led to poor implementation of the curriculum.

4.3.3 Teaching practice

Under teaching practices, the study sought to ascertain the effect of teaching documents and teaching methods in lack of preparedness by teachers in the implementation of the HBC mathematics curriculum.

4.3.3.1 Teaching documents

This section aimed to determine whether the teaching documents being used by mathematics teachers have adequate information on HBC mathematics curriculum. The responses from the questionnaire are presented in quantitative form as follows.

Table 4.3: Teaching documents used by the teachers in their lesson deliveries.

Teaching documents	**responses**	**frequency**	**%**
Schemes of work	Not all adequate	13	31
	Somewhat adequate	16	38
	neutral	8	19
	Mostly adequate	5	12
Lesson plan	Not all adequate	15	35.7
	Somewhat adequate	21	50
	neutral	4	9.5
	Mostly adequate	2	4.8
Subject syllabus	Not at all adequate	24	57
	Somewhat adequate	13	31
	neutral	5	12
National syllabus	Not at all adequate	31	73.8
	Somewhat adequate	11	26,2
Textbooks	Not at all adequate	37	88
	Somewhat adequate	5	12

Table 4.3, the majority of teachers indicated that they use at least three teaching documents to guide them in their lesson deliveries. However the responses have shown that these teaching documents they are using do not have adequate information for them to implement the HBC mathematics curriculum.

Similarly, the interviews conducted on the question echoed the same words as evident by the quotes below,

I have the schemes of work and I do lesson planning. I cannot say they have adequate information just because I am using the 2015-2022 national syllabus. There is nothing on the HBC.

Ooh yes I have these documents. I use the schemes of work, record book and of course the national syllabus. I doth think they have adequate information because we have not received the new syllabus on heritage based curriculum.

4.3.4 Teaching methods

This part seek to establish on which of the teaching methods are frequently used by the sampled teachers. The study intend to investigate if the teaching methods are in line with the required teaching methods of HBC.

Table 4.4: How frequently are the teaching methods used by the respondents?

Teaching methods	**frequency**	**%**
Teacher expository	42	100
Discussion method	42	100

Question and answer	42	100
Group work	36	85.7
Discovery	31	73.8
Problem solving	29	69
Critical thinking	12	28.5
Field trips	0	0
Experiments	0	0

According to table 4.4 most teachers indicated that they are currently using teacher centered methods in their lesson deliveries. Teacher expository, discussion and question and answer and answer were anonymously chosen as the teaching methods being used by all the teachers.

In agreement with the quantitative responses from the questionnaire, the interviews responses are as follows,

I use group work, class discussion, teacher explanation. I think I can make some changes to include the teaching methods of the HBC if they can fit in the gazetted time of 35 minutes.

Ok, currently I am using lecture method, group work and more of question and answer method. Yes I can change them if they tell us what to use.

The data received from various responses suggested that most of the mathematics teachers are not prepared to implement the HBC mathematics curriculum. The findings have indicated that they are currently using the traditional teaching methods due to the time that has been allocated. This concurs with the findings bo the study by (Chimbunde, 2019), which revealed that, lack of flexibility in the timetable has made it difficult for the teachers to adjust their teachings to meet the needs of the curriculum.

Furthermore, the current findings on the teaching documents have shown that teachers are embracing the requirements of MoPSE to use guiding tools when teaching. However, the narrations indicated that the teachers are not prepared to implement the HBC mathematics curriculum. This could be attributed to the reasons they have highlighted that the documents do not have adequate information about HBC mathematics curriculum.

4.4 Research topic 2; What are the challenges and gaps that will hinder teacher preparedness in the implementation of the HBC mathematics curriculum?

Under research question two, this section sought to find the challenges that hinder teachers' preparedness. Various factors are categorized in themes according to the responses given. The

4.4.1 Lack of resources

This segment intend to investigate the effect of the challenges listed in the implementation of the HBC mathematics curriculum. Below are the responses from the participants,

Table 4.5: Descriptive statistics of lists of challenges.

Statement	Responses	frequency	%
Inadequate human resources	Strongly agree	37	88

	Agree	5	12
Lack of locally published textbooks	Strongly agree	9	21.4
	Agree	31	73.8
	Undecided	2	4.8
Heavy workloads	Strongly agree	14	33.3
	Agree	25	59.5
	Disagree	3	7.2

Responses on Table 4.5 indicate that the teachers agreed that preparedness of the implementation of HBC was hindered by lack of resources. This is compromising the successful implementation of the HBC.

Concurring with the quantitative data presented on the table above are responses from telephone interview below,

I am teaching at a rural satellite school, and we are only four teachers. I teach mathematics, science and geography. Imagine the workload. No I only trained to teach mathematics but we are under staffed that's why I was asked to take these other subjects. So having too many classes to teach is a challenge when implementing HBC mathematics curriculum.

I am the only teacher for mathematics with teacher-pupil ratio of 1:65. There is no way I can have time to attend to learners as individuals. The issue of few teachers is a challenge among other challenges that we have.

4.4.2 Lack of knowledge

This section seeks to find out the effect of lack of knowledge of the teachers in the implementation of the HBC mathematics curriculum. The responses are presented below,

Table 4.6: Lack of knowledge as a challenge in the implementation of HBC.

Statement	Responses	frequency	%
Lack of knowhow about the HBC	Strongly agree	12	28.5
	Agree	28	66.7
	Disagree	4	4.8
Limited knowledge of ICT	Strongly agree	10	23.8
	Agree	23	54.7
	Undecided	6	14.2
	Disagree	3	7.3

According to responses on Table 4.6., most teachers have agreed that they have limited knowledge about the HBC mathematics curriculum. This could be a contributing factor in the preparedness to implement the HBC.

Quotations from interviews conducted are in agreement on the responses from the questions are presented below,

The challenge that I foresee is that most teachers don't even know what HBC mathematics is all about.

If the HBC require the use of computers, then it will be a challenge as most teachers don't know how to use the computer, projector etc.

I have limited knowledge on ICT, I only use my phone for research because we do not have computers. So I have no access to know more about computer gadgets that are needed in the heritage based curriculum.

4.4.3 Poor remuneration

Further investigations with the mathematics teachers have revealed that poor salaries is another factor that is contributing to the lack of preparedness in the implementation of the HBC.

Below are responses from the questionnaires,

Poor remuneration and lack of involvement of teachers in the drafting of the curriculum. Demotivation of teachers from poor remuneration

Teachers are incapacitated so they might be willing to implement the curriculum.

In support of the responses from questionnaires, participants from telephone interviews exclaim that,

The challenge is resistance from the teachers because of the issue of salary. It's obvious that HBC will increase teacher workload and this will not tally with the salary we are getting.

Of course, the salary that we are currently receiving is too little for teachers to have extra work from another curriculum.

These findings indicate that teachers' lack of preparedness is caused by various challenges highlighted above. These findings corresponds with the study done by Chelesile & Lwazi (2018) reports that, insufficient resources such as low locally published schoolbooks, computer facilities, as well connectivity as major challenges encountered by schools in implementing in the curriculum as Zimbabwe. Furthermore, the current study has established that poor remuneration was highlighted by most teachers as a challenge. This concurs with the research conducted by Mupinga (2018) which has shown that, teachers' salaries and benefits have a significant impact on their motivation, job satisfaction, and ultimately, their ability to effectively implement the curriculum. In addition, a study by Bakasa (2016) uncovered that, teachers in Zimbabwe secondary schools were dissatisfied with their salaries and benefits, which led to low morale and motivation.

4.5 Research topic 3; what recommendations and strategies can be put in place for the successful implementation of the HBC mathematics curriculum?

The study in this section centers analysis and discussion on the recommendations given by the mathematics teachers on strategies that can be employed fir the successful implementation of the HBC. In an attempt to provide answers to research question three in chapter 1.

4.5.1 Teacher participation in curriculum development

This section intend to determine the suggestion by the participants on how teacher participation can influence the successful implementation of the HBC mathematics curriculum**.** The responses are presented below.

Table 4.7: Responses from questionnaires are highlighted in the table below,

Statement	Responses	Frequency	%
Involving teachers in curriculum development	Strongly agree	27	64.2
	Agree	15	35.8

From the Table 4.7., the majority of teachers 27(64, 2%) of the 42 respondents strongly agreed with the notion that involving teachers in curriculum development and the remaining 15(35.8%) also agreed that teachers should be involved

Likewise responses from the telephone interviews has shown that they are in agreement with what is highlighted above. Below are the quotations from the interviews,

I think the policy makers should involve major stakeholders such as teachers in curriculum planning from the onset. I think the most important part of proper curriculum development is starting from the grassroots by involving the teacher.

I think the government should address the issue teacher involvement in the curriculum development. I think the teachers have the knowledge on the amount of resources that are needed. The last part is that the government should think of a curriculum change after a long run because you cannot tell the success of a curriculum in a period of five years.

4.5.2 Availability of resources

This section seeks to uncover the recommendations that have been put in place by the participants that can positively influence teachers to effective implement the HBC mathematics curriculum.

Table 4.8: Descriptive statistics obtained from questionnaires is highlighted on the table below,

Statement	Response	frequency	%
Availability of resources	Strongly agree	29	69
	Agree	13	31
Internet connectivity	Strongly agree	17	40.4
	Agree	23	54.7
	Undecided	5	4.9
Technical rooms for school based project	Strongly agree	16	38
	Agree	27	64.2
	Undecided	1	2.2
HBC mathematics backed textbooks	Strongly agree	24	57.1
	Agree	18	42.9

Similarly the responses from interview concur with above as shown by the quotations below,

Looking at my school I think they are many resources which should be made available. At our school we need textbooks, electricity, computers, infrastructure even the teachers. A lot needs to be done if they really want to successfully implement the HBC.

I believe if they can provide sufficient textbooks which are updated about HBC. More teachers are needed *because the number of students we are teaching is too much.*

I think the most pertinent change is teacher-pupil ratio. The classes are too big for one teacher. So more teachers are needed and also the classroom should have resources such as textbooks that are aligned to the curriculum and also internet.

4.5.3 Training and support

This section aim to explore the recommendation on the type of training and support the teachers require for the successful implementation of the HBC. Responses are presented below,

Table 4.9: Training and support for the successful implementation of the HBC.

Statement	Responses	Frequency	%
Training of teachers	Strongly agree	38	90.4
	Agree	4	9.6

Table 4.9 indicate that the majority of the teachers anonymously agree that the Ministry should provide training to the teachers so that they can effectively implement the HBC.

Supporting the above notion, participants from telephone interviews exclaim that,

I think we need training on how to implement the heritage based learning. I think it should be continuous process giving feedback if the target is being reached.

Teacher training should be treated as a matter of urgency because the teachers are the implementers so they are supposed to be trained.

4.5.4 Improved remuneration

Table 4.10: Responses from questionnaire are tabled below,

Statement	Responses	Frequency	%
Improved remuneration	Strongly agree	37	88
	Agree	5	12

From the above recommendations the first 3 choices from the teachers are improved remuneration, training of teachers and availability of resources

Participants from telephone interviews are in agreement with the sentiments from questionnaire,

If they can increase our salary. Teachers will be willing to implement the HBC. We are incapacitated.

I think us as teachers we need motivation, through improving our salaries. Because sometimes we are not willing to work because of the issue of money.

I think we go back to salaries again. The government should treat this a matter of urgency.

These narrations from the participants imply that there are willing to implement the HBC if the they receive training; the required resources are availed and the government attends to salary reviews. The current findings agree with Maphosa (2021) and Phiri (2021) in their research recommended that government should provide teachers with training on adapting the curriculum to suit diverse learners needs. Furthermore, Gory et al (2021) in their study concur with the current findings that Zimbabwe teachers' salaries should be comparable to other countries who are implementing similar curriculum.

4.6 CHAPTER SUMMARY

This chapter presented, analyzed data and discussed the findings of the study on exploring the applicability of the HBC mathematics in Zimbabwe secondary schools. In addition, the researcher attempted to provide answers to research questions raised in chapter1. The next chapter will provide a summary of the study, general conclusions and recommendations.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECCOMENDATIONS

5.1 Introduction

In the previous chapter, data was analyzed and discussed. This chapter represents the summary of the project, conclusion, recommendations, area for further study, and chapter summary.

5.2 Summary of the project

In chapter 1, the researcher examined the problem and its context where the focus was on the background of the study, statement of the problem, the research objectives, and research questions, assumption of the study, limitations of the study, and delimitations of the study as well as definitions of key terms. Chapter 2, outlines the theoretical framework through which the gaps in the consulted literature were interrogated. Chapter 3 highlighted the methodologies employed for data collection, presentation, analysis and interpretation. Furthermore, Chapter 4 presented the research findings, which involved the presentation, analysis, and discussion of the data. The data was examined in relation to the research questions leading to the identifications of key findings. The chapter revealed the following major findings:

- The majority of mathematics teachers are not prepared to implement the Heritage Based Curriculum. The reasons for lack of preparedness is due to lack of knowledge, lack of training and support and poor remuneration.

- There is little or no active teacher involvement in curriculum development. The majority of teachers felt that the HBC was being imposed on them.

- Most teachers are using teacher centered teaching methods rather than the learner centered methods. The teachers have indicated that the time allocated is not sufficient enough for them to actively engage the learners.

- The participants suggested the following solution, improved remuneration, continuous in-service training, teacher involvement in curriculum development and availability of resources.

5.3 Conclusion

From the generated, analyzed and interpreted data, the researcher reached the following conclusion. Based on research question one, the researcher concluded that the teachers are not prepared to implement the HBC mathematics curriculum. The determinants of the lack of preparedness include, poor remuneration, lack of knowledge, lack of training and support. In light of research question two, the study concludes noted that rigidity in the timetable, inadequate information on the teaching documents used and lack of training are some of the challenges hindering the successful implementation of the HBC. Based on the last research question, the researcher concluded that the teachers are willing to implement the HBC if the Ministry of Primary Secondary Education take into consideration of their recommendation they have highlighted.

5.4 Recommendations

Based on the above summary and conclusion, the study made the following recommendation:

1. The government need to intensely train teachers before the implementation of any curriculum.

2. They should be a round table between the policy makers and the teachers from different areas of Zimbabwe especially the rural teachers during curriculum development.

3. MoPSE should ensure that there is availability of resources to facilitate the smooth implementation of the HBC mathematics curriculum.

4. Most teachers need training in the use of ICT gadgets used in the implementation of the HBC mathematics curriculum.

5.5 Area of further research

The research revealed that teachers are faced with number of challenges that affect their preparedness in implementing the HBC mathematics curriculum. In future, similar study should be done on the strategies to overcome the teacher challenges hindering the successful implementation of the HBC.

Furthermore, the study was done on mathematics teachers. Therefore, similar research should be done to other learning areas.

5.6 Chapter Summary

In this chapter, the study was summarized, the conclusion was derived and recommendations were made and the area of study was identified.

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All communications should be addressed to
"The Provincial Education Director"
Telephone: 067-23043/25655
Tele Fax: 067-23320
Email edumashwest@gmail.com

ZIMBABWE

Ministry of Primary & Secondary Education
Mashonaland West Province
P.O Box 328
Chinhoyi
24/05/24

The District Schools Inspector
MAKONDE District

AUTHORITY TO CARRY OUT EDUCATIONAL RESEARCH: SCHOOLS IN
MAKONDE **DISTRICT: ~~MR/MRS/MS~~:** CHIWANZA MARICIA
EC.NO/~~ID NO~~ 19822111B **STATION** KENZAMBIA SECONDARY
DISTRICT MAKONDE **INSTITUITION** BUST
REG.NO B225431B **PROGRAMME** BSc Ed maths

The above named student has been granted authority by the Provincial Education Director to carry out a research in Makonde District. The student has been advised to visit your office before entering the schools.

Research Topic: Exploring the applicability of Heritage Based curriculum in mathematics in Zimbabwean Secondary Schools
Period of research: 27/05/24 — 30/06/24
Targeted school/s: Kenzambia Secondary, Kasunde Sec, Obra Sec, Gadzi Sec Kenyaya secondary
Method of research: Interviews, questionnaires

Please ensure that the learning and teaching programmes at the targeted schools are not interrupted in any way; the student strictly adheres to the activities and topics specified in his/her letter of request and that the research should be conducted according to the given time frame.

The District Schools Inspector is requested to liaise with the researcher on the specific schools where the research will be conducted and advise the Provincial Office of the chosen schools. Furthermore, the District Schools Inspector should ensure that a copy of the research findings is submitted to the Provincial Education Director once the research is completed.

Chakaipa S
FOR ACTING PROVINCIAL EDUCATION DIRECTOR
MASHONALAND WEST PROVINCE

MIN. OF PRY. & SEC. EDUCATION
MASHONALAND WEST PROVINCE
HUMAN RESOURCES (DISCIPLINE)
24 MAY 2024
P.O. BOX 328, CHINHOYI
ZIMBABWE

SAMED

P Bag 1020
BINDURA
ZIMBABWE

Tel: 0271 - 7531 ext 1038
Fax: 263 - 71 - 7616

BINDURA UNIVERSITY OF SCIENCE EDUCATION

Date: 09-04-24

TO WHOM IT MAY CONCERN

NAME: MARICA REGISTRATION NUMBER: B225431B

PROGRAMME: HBScEd Maths PART: 2.2

This memo serves to confirm that the above is a bona fide student at Bindura University of Science Education in the Faculty of Science Education.

The student has to undertake research and thereafter present a Research Project in partial fulfillment of the programme. The research topic is:

In this regard, the department kindly requests your permission to allow the student to carry out his/her research in your institutions.

Your co-operation and assistance is greatly appreciated.

Thank you

BINDURA UNIVERSITY OF SCIENCE EDUCATION
DEPARTMENT OF EDUCATIONAL FOUNDATIONS
9 APR 2024
P. BAG 1020
BINDURA

Z Ndemo (Dr.)
CHAIRPERSON - SAMED

INTERVIEW GUIDE QUESTIONS FOR TEACHERS

Thank you for agreeing to be interview. The study focuses on exploring the preparedness of teachers in implementing the Heritage Based Curriculum (HBC). I believe you can make a significant contribution to gaining insight into the issues under investigation. I am going to ask you some few questions which you are free to elaborate in any language you choose fit. If you do not feel like not answering the question you are more than free to say so. I would like to let you know from the start that your personal details will not be included in the final report.

Background characteristics

1. Briefly tell me something about yourself (with reference to professional qualifications, and teaching experiences).

Research question 1. To what extent are the secondary school teachers prepared for the HBC mathematics curriculum?

2. What do you understand about the HBC curriculum?
3. In your own opinion, do you feel you are ready to implement the HBC mathematics? If YES, what have been done to prepare you to implement the HBC mathematics? If NOT what makes you feel not ready to implement it?
4. Have you received any training on the HBC? If YES, what are you expected to have a mathematics teacher? that are tailor made for the HBC mathematics curriculum that has been availed by the policy makers to prepare the teachers for the implementation?
5. Can you tell me the teaching methods you use when teaching mathematics. Do you think you can change them to incorporate the HBC mathematics curriculum?
6. What teaching documents do you use to guide you in your daily lessons? Can you explain whether these documents have adequate information to facilitate the implementation of the HBC mathematics curriculum?
7. To what extent are you knowledgeable regarding the use of ICT?

What are the challenges that hinder the teacher preparation of the HBC mathematics curriculum**?**

8. In your own view what challenges will be there when teachers start to implement the HBC mathematics curriculum?
9. How many mathematics teachers are there at your school? How can this be a challenge for the successful implementation of the HBC mathematics curriculum?
10. Do you feel that you have received sufficient training and professional growth to effectively teach the HBC mathematics curriculum, and if not what specific areas of support do you feel are lacking?
11. Do you have mathematics textbooks which are tailor made for the HBC? If YES, are they adequate enough to allow teachers to implement the HBC mathematics? If NO, so how are you delivering your lessons?

12. Can you explain on any challenges and gaps you have about changing to an HBC mathematics curriculum?

What recommendations and strategies can be put in place to enhance teacher preparedness to improve the applicability of HBC mathematics curriculum?

13. In your view, how do you want the policy makers to involve you in the curriculum development?
14. What resources do you believe are important to successfully implement the HBC mathematics curriculum?
15. What changes or adjustments do you think are needed in the classroom set up, which will permit the teachers to successfully implement the HBC mathematics curriculum?
16. In your own opinion, what kind of training do you feel you need to get prepared to implement the HBC mathematics curriculum?
17. Can you name one specific area which you recommend the government to address as a matter of urgency, which might help the teachers to prepare for the HBC mathematics? Can you justify your option?

APPENDIX: QUESTIONNAIRES FOR HERITAGE BASED MATHEMATICS CURRICULUM

This questionnaire is to collect information to achieve the purposes of the study titled "Applicability of heritage-based mathematics curriculum in Zimbabwean secondary schools". Kindly respond to all the questions as honestly as possible. You have been picked randomly to participate in this study. Therefore, your full participation will be highly appreciated. The findings of this study that will be generated will be handled with the highest level of confidentiality and used for this academic study only. All information provided would strictly be used for this study only. Kindly be assured of concealment as well as the confidentiality of the information you will provide.

BACKGROUND CHARACTERISTICS

ID	Question	Response
	What is your gender?	
	What is your age bracket? 1. 20-29 2. 30-39 3. 40-49 4. 50+	
	What is your current highest qualification? 1. Diploma 2. Degree 3. Masters Any other specify…….	
	Which Class are you currently teaching? 1. Form 1-2 2. Form 3-4 3. Form 5-6	
	How many years have you been teaching? 1. 0-9years 2. 10-19years 3. 20years and above	
	What is the school setting? 1. Rural 2. Peri-urban 3. urban	

SECTION A. PREPAREDNESS OF TEACHERS TO HBC MATHEMATICS CURRICULUM

A1. Can you explain what you understand about the term Heritage Based Curriculum (HBC)

……
……

A2. Are you ready to implement the Heritage Based Curriculum framework? YES/NO

1. YES ( ) 2. ( )

A3. If YES, what specific training or professional development have you received on HBC that makes you ready to implement it?

……

If your answer to (A1) above is NO, please pick a box from A4 to A6 which matches with the possible reason for your answer. Please read each item carefully and give your response one by one with the help of the following keys:

Very Poor=1, Poor=2, Fair=3, Good=4 and, Excellent=5.

ID	Statement	Very Poor	Poor	Fair	Good	Excellent
A4	How do you rate teacher participation in the HBC mathematics curriculum development?					
A5	How knowledgeable are you with the overall demands of the HBC framework?					
A6	How do you rate the availability of resources and materials tailor made for the implementation of the HBC mathematics in your school?					

A7 can you think of any other reasons that have contributed to lack of preparedness by mathematics teachers in implementing the HBC mathematics curriculum? If so can you describe them?

……
……
……
……

A9 Are you expected to have some teaching documents? YES /NO

1. YES ( ) 2. NO( )

If your answer in question (A9) above is YES; Basing on your experience while using these documents, kindly give your response on whether the documents have adequate information to facilitate the implementation of the new HBC mathematics curriculum: Using the following keys;

Use 1 for Not at All Adequate, 2 for Somewhat Inadequate, 3 for Neutral, 4 for Mostly Adequate, and, 5 for Completely Adequate.

ID	**Statement**	**Not at All Adequate**	**Somewhat Inadequate**	**Neutral**	**Mostly Adequate**	**Completely Adequate**
A10	Schemes of work					
A11	Lesson Plan					
A12	Subject-based Syllabus					
A13	National Syllabus					
A14	Relevant Textbooks					

A15 The following are some of the learner-centered teaching/learning techniques expected to be used when implementing the HBC mathematics curriculum:

1. Problem solving 2. Question and Answer 3. Discussion 4. Teacher expository 5. Discovery 6. Field trips 7. Critical Thinking 8. Experiments 19. Group work/ Collaboration

10. using the space below, write the number(s) of the techniques you use. In order of how often you use them

……

SECTION B: Challenges and gaps

Please pick the option that most closely matches the extent to which you agree or disagree with the following statements on teacher challenges that hinder the implementation of the HBC mathematics curriculum. Use Strongly Agree=1, Agree = 2, Undecided = 3, Disagree = 4, and, Strongly Disagree = 5.

1D	Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
B1	Inadequate human resource hinder the teachers preparedness in the implementation of the HBC mathematics curriculum					
B2	The rigidity of teachers to shift from teacher-centered to learner-centered teaching method poses as a challenge in teachers preparedness in the implementation of the HBC					

	mathematics curriculum					
B3	Lack of locally published textbooks hinder teachers' preparedness in the implementation of the HBC mathematics					
B4	Inadequate time allocation affects teacher preparedness in the implementation of the HBC mathematics curriculum					
B5	Heavy workloads hinders teacher preparedness in the implementation of the HBC mathematics curriculum					
B6	Lack of knowhow hinders teachers' preparedness in the implementation of the HBC mathematics curriculum.					
B7	Limited knowledge of					

	ICT hinders teachers' preparedness in the implementation of the HBC mathematics curriculum.					

SECTION C: Recommendations and Strategies

According to research, the HBC mathematics curriculum is demanding the availability and the use of resources and materials for its successful implementation. Please tick a box that closely matches with what you expect Ministry of Primary and Secondary Education (MoPSE) to provide for the teachers to be ready to implement the HBC mathematics.

USE KEY:

Strongly Agree=1, Agree = 2, Undecided = 3, Disagree = 4, and, Strongly Disagree = 5.

1D	Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
C1	Availability of electricity					
C2	Internet Connectivity					
C3	Technical rooms for school-based projects					
C4	Computer aided instruments					
C5	HBC mathematics-backed textbooks					
C6	Training of teachers					

C7	Involving teachers in the curriculum development					
C8	Reducing teacher-pupil ratio					
C9	Improved remuneration					
C10	Reduced workload					

C11 From the above table, which of the recommendations and strategies should be given first priority by (MoPSE)?

PLEASE TICK THREE ONLY

C1 ( ) C2 ( ) C3 ( ) C4 ( ) C5 ( )

C6 ( ) C7 ( ) C8 ( ) C9 ( ) C10 ( )

a) Give reason(s) for your choices above

……
……

C12 In your own opinion, what other improvements should the Ministry of Primary and Secondary Education do to ensure that teachers are prepared for the effective implementation of the HBC mathematics?

……
……
……
……
……..

THANK YOU FOR YOUR CONTRIBUTIONS AND TIME.