

**Bindura University  
of Science Education**



**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE AND MATHEMATICS EDUCATION**

**DEPARTMENT OF MATHEMATICS**

**AN INVESTIGATION INTO THE EFFECTS OF CLASSROOM  
MANAGEMENT ON STUDENTS' ACADEMIC ACHIEVEMENT IN  
MATHEMATICS: THE CASE OF ZAKA DISTRICT OF MASVINGO  
PROVINCE**

**BY**

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**DUE DATE: 30 SEPTEMBER, 2022**

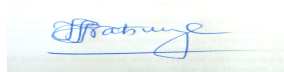
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## **DECLARATION FORM**

I, Muchingamidzwa Paul, B211530B), declare that this is my original work that has not been submitted for any degree or examination in any other university and that all the sources I have used or quoted here have been indicated and acknowledged.

Muchingamidzwa Paul (B211530B)

**Signature:**

A handwritten signature in blue ink, appearing to read 'Muchingamidzwa Paul', written over a horizontal line.

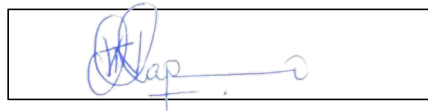
**Date: 30/09/2022**

## APPROVAL FORM

The undersigned certify that they have supervised, have read and recommend to the University for acceptance and examination a research project entitled: **An investigation into the effects of classroom management on students' academic achievement in mathematics: the case of Zaka District of Masvingo province**, submitted by Muchingamidzwa Paul (B211530B) in partial fulfilment of the requirements for the award of Honours Bachelor of Science Education Mathematics.

Dr. Mapuwei

**Supervisor Signature:**



**Date: 30/09/2022**

Dr. T.W. Mapuwei

## **DEDICATION**

This work is dedicated to my father and mother, Mr and Mrs Muchingamidzwa, for their unending support, love and encouragement during the course of this research project. They were the pillars of my strength.

## **ACKNOWLEDGEMENTS**

Firstly I would like to give glory and honour to the almighty God for his grace and mercies which guided, protected and helped me during my research project. I also extend my sincere gratitude to my supervisor, Doctor Mapuwei for being the best and understanding supervisor, and for sacrificing his time and being patient with me during the course of this research. Without his inspiring supervision, I would not have been able to complete this research. Also, my gratitude goes to my brothers: Isaac Muchingamidzwa, Philemon Muchingamidzwa, Earnest Muchingamidzwa and Prosper Muchingamidzwa, for helping me with both financial and socio-emotional support during my research. My final gratitude goes to my wife, Chikati Praise, whose unwavering support saw me finishing this project within stipulated timelines.

## **ABSTRACT**

The main aim of this study was to investigate the effects of classroom management on students' academic performance in mathematics at secondary school level. The researcher sought to address the following research questions: which classroom management strategies can be used in the teaching and learning of mathematics at secondary school, what is the impact of effective classroom management on the academic performance of mathematics learners at secondary school level and what techniques can be used to improve the classroom management of secondary school mathematics teachers? The researcher used the descriptive survey research design in which questionnaires, interviews and non-participatory observations were used to gather data for the study. The data obtained indicates that the main classroom management techniques used by teachers include: adequate planning and lesson preparation, involving all learners in classroom management plan, maintaining consistency on classroom rules, installing cooperative learning strategies, monitoring classroom activities as well as instituting proper seating arrangement. The impacts of effective classroom management noted include: high motivation among learners, a positive classroom climate, non-disruptive behaviour, maximum student engagement, punctuality and socio-emotional balance, as well as absence of delinquent behaviour. The study recommended teachers to: open an effective communication chain, celebrate success of learners, resolve conflicts efficiently, avoid humiliating learners in class, create temperament situation and give learners wide choices from which to choose their likes and dislikes. The researcher did not encounter any major challenges in carrying out the study. The study was completed in 2022.

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## **CHAPTER 1**

### **1.0 THE PROBLEM AND ITS SETTING**

#### **1.1 Introduction**

This chapter looks at the circumstances surrounding the study. These entail: the background to the problem, a brief statement of the problem, research objectives as well as research questions. As the chapter progresses, the researcher highlights the importance of the study, assumptions on which this study is based, study limitations, and how the challenges were mitigated. Finally, the researcher examines: the study boundaries, definition of key terms, and gives the chapter summary.

#### **1.2 Background of the Study**

Learning entails knowledge acquired through experience or by being taught, and this can be achieved through different ways including interactions between the teacher and students or between students and their peers. The process of interaction between teachers and students, and also between the students themselves is called teaching and learning (Brannon, 2020). This also follows that the methods and efficiency of the interaction between the students or between students and teachers, as well as the teacher's management strategies, will decide the success or failure of the teaching and learning situation.

Classroom management, according to Tal (2020) is the action a teacher takes to create an environment that supports and facilitates academic, social and emotional learning. It is the process of creating favorable conditions to facilitate instructions as well as that of regulating behavior of students. Teachers in the classroom are by nature of their profession, managers of the classroom activities (Wong, Wong, Rodgers and Brooks, 2021). Thus, teachers' roles include maintaining order, allocating resources, creating an ubiquitous classroom climate, regulating sequence of events and directing their own attention towards achieving educational goals (Weiss, 2017; Suleman and Hussain, 2019). This implies that in managing classes, teachers assume numerous duties, among them: order maintenance, resource allocation as well as designing appropriate procedures that enable them to navigate through the syllabus sequentially.

According to Evertson and Weinstein (2016), classroom management also refers to the actions teachers take to create a supportive environment for the academic, social and emotional learning of learners. This implies that the management of a class requires certain attributes from teachers to make sure prevalence of a conducive environment suitable for all

learning to take place. In the ancient eras of education, the researcher believes that the amount of recognition accorded to classroom management is not congruous to what is expected in classes today. Edwards & Watts (2020) opine that in the past, teachers did not give much significance to management of the classroom, and the countless problems in classroom management today are a principal source of stress and burnout for both new and experienced teachers. The researcher believes that with the advent of technology, the sentiments of the above authors are of great substance as cases of mischief, indiscipline and juvenile delinquency continue to be on the rise.

The researcher has noted that in a number of schools in Zaka District, the extent of mischief is increasing and teachers have to be very meticulous in approach if they have to manage the learners' mathematics activities effectively. It is vital to note that: inattention, unnecessarily calling out, disturbing others and non-compliance, are ranked as the most commonly reported classroom behavior problems (Anderson & Kincaid, 2015). If teachers are not observant and available, the majority of learners may not take heed of what transpires during learning time, and may consistently engage in disruptive activities at the expense of serious learners. Students in classrooms with frequent disruptive behavior experience less academic engagement and lower academic outcomes (Allday & Pakurar, 2017), and the absence of effective classroom management may also exacerbate the progression of aggressive behavior for learners with higher levels of disruption (Gregory & Ripski, 2018).

Effective approaches to classroom management are indispensable to establish classroom environments that support student behavior and the learning process, and to reduce teacher stress and exhaustion (Friedman, 2016). Teachers who use effective classroom management can expect to experience improvements in student behavior and improvements that establish the context for effective instructional practices to occur (Saifi, Hussain, Salamat & Bakht, 2018). Similarly, Freiberg (2018) affirms that classroom management is directly correlated with student learning and academic achievements. This means that the academic results culminating from a teaching and learning episode entirely rely on classroom management skills.

In another study by Freiberg (2018), students were found to be more receptive to those classrooms with sound management systems because they experienced more responsibility for their learning and developed a sense of connectedness. Similar studies on impact of classroom management in Asia also showed that classroom management increase students'

learning ability as well as their capability to become more participatory inside the classroom (Chionh & Fraser, 2019; Nishioka, 2016). All the studies carried prior to this research seem to contend that effective classroom management could effectively be a yardstick to use to measure the classroom atmosphere, as well as to predict student learning and motivation.

Classroom management, according to Anikweze (2019), is the most neglected area in our secondary schools today, and success or failure of any teaching and learning process depends on a large extent, with the way classrooms are managed. Failure to effectively manage the classroom can have an overall negative influence on the entire school, most especially in terms of sound academic performance. When educators talk about classroom management, one of the first things that come to mind is the maintenance of discipline, control, motivational teaching methods, leadership styles, use of instructional materials and communication (Suleman and Hussain, 2019).

Ada (2018) sees classroom discipline as a subset of classroom management, and highly contributory to the interaction between teachers and students to bring about self-control and respect for authority. This means that discipline is a core component of classroom management that brings powerful and fruitful instruction. Classroom motivation is another classroom management technique that Alderman and Greene (2016) contend stimulates students to take actions that will accomplish desired goals. A teacher can reward students in order to increase the probability of registering desired behavior.

Classroom management plays an important role in the teaching and learning of Mathematics. It is an instrumental tool in the process of passing instructions from the teachers to the students and the success of any educational system is heavily reliant on the effectiveness of classroom management (Nishioka, 2016). Classroom teachers are managers and so ought to be in control from the beginning of the lesson to the end, so as to ensure that the students benefit from the interactive business that transpires in the classroom situation. While a lot of research has been done to assess the general influence of classroom management on academic achievement in various learning areas, the researcher observes that knowledge gaps still exist on such influence in Mathematics at secondary school level, hence his interest to partake of this study.

### **1.3 Statement of the Problem**

The researcher has observed that classroom management is being greatly neglected in the majority of secondary schools. The researcher noted that in most of the public schools in

Zaka District, Masvingo Province, the managerial demands on the classroom practitioners are by no means high. These supervisory burdens range from keeping of student records and reports, provision of support and equipment, as well as the necessary routine of classroom management. The contemporary Mathematics teacher finds himself/herself regularly interacting with and managing some students from varied cultural and socio-economic ssbackground, where different adjustment capabilities and social interactions abilities are required (Freiberg, 2018). Some of the problems facing today's teachers in class management include: inequality of opportunity in the classroom, improper uplift of rights of students, inappropriate school rules, inconsistency of classroom teachers' management styles, as well as poor level of preparedness on the part of the teachers to adequately pass on instructions to the learners (Tauber, 2017). It is against this background that the researcher sought to ascertain how effective classroom management influences students' academic achievement in mathematics in Zaka District of Masvingo Province.

### **1.3 Research Objectives**

#### **1.4.1 Main Research Objective**

- To examine how classroom management influences the academic performance of mathematics learners at secondary school level.

#### **1.4.2 Specific Objectives**

- 1.4.2.1 To identify classroom management strategies that can be used by teachers in the teaching and learning of mathematics at secondary school level.
- 1.4.2.2 To assess the influence of classroom management on the teaching and learning of mathematics at secondary school level.
- 1.4.2.3 To suggest possible techniques that can be used to improve classroom management skills of mathematics teachers at secondary school level.

### **1.4 Research Questions**

#### **1.4.1 Main Research Question**

- How does classroom management influence the academic performance of mathematics learners at secondary school level?

#### **1.4.2 Specific Research Questions**

- 1.4.2.1 Which classroom management strategies can be used by teachers in the teaching and learning of mathematics at secondary school level?

1.4.2.2 What is the influence of classroom management on the teaching and learning of mathematics at secondary school level?

1.4.2.3 What techniques can be used to improve classroom management skills of mathematics teachers at secondary school level?

## **1.6 Significance of the Study**

### **1.6.1: To Teachers**

The researcher hopes that this study may enlighten the classroom practitioners on the merits of using desirable strategies of class management to reap positive results from teaching and learning of mathematics. This implies that the findings of this study shall be very instrumental in assisting teachers with viable techniques of effective classroom management. In addition, the researcher contends that educators who are going to allude to the recommendations to be proposed by this study will not only improve their class management skills, but will eventually improve their pass rates in Mathematics.

### **1.6.2: To Students**

The researcher also hopes that students may derive numerous benefits from this study as the improvement of class management skills by educators will see them reaping positive results in the teaching and learning of Mathematics. To add to that the researcher acknowledges that the study may also equip the learners with other life skills that they can use in their prospective careers, e.g. punctuality, self-restraint and maximum respect for ideas from their peers. Again, other subcomponents of classroom management like discipline and motivation could be used to induce behavior change in learners.

### **1.6.3 To the Researcher**

The researcher stands to be the greatest beneficiary since he is in the midst of the study. The ability to carry out research and the experience in doing it has recently been the leading added advantage for job seekers in the contemporary digital world. The study will equip the researcher with a lot of research experience which will make him the vibrant professional in the education sector. Apart from amassing immense professional growth, the research will also mark a step forward towards the fulfilment and achievement of a top flight qualification in Mathematics. This implies that successfully completing this study will earn the researcher a professional qualification to improve his worth.

### **1.6.4 To Bindura University of Science Education**

The Bindura University will be well placed to emerge as a research-oriented institute in the country, resultantly attracting the best brains in terms of students as well as the lecturers. In the modern set-up, universities world-wide are ranked in line with the quality of their research work and the relevance thereof in the industry. Such a study like this one will put the Bindura University of Science Education (BUSE) at the helm of high-level research, not only in the country but in the Sub-Saharan region. This study will also enhance library documentation at BUSE and add to the sources used by the students to gain knowledge and information on issues related to the importance of effective classroom management in improving learners' academic efforts in Mathematics.

### **1.7 Assumptions of the Study**

According to Creswell (2014), assumptions in research studies refer to all phenomena already known, which does not require verification and will not be part of the study's findings. This means assumptions relate to information already known by the researcher, and will not be investigated. The following assumptions are valid for this study:

- Teachers, school heads and learners used in this study were mature enough to offer credible and unbiased data.
- Mathematics is a compulsory subject in all the secondary schools selected for use in this study.
- Mathematics is being taught by qualified teachers who have undergone thorough college or university teacher training programs.

### **1.8 Limitations**

#### **1.8.1 Time constraints**

The researcher feels that the amount of time at his disposal is limited when related to the level of this study. He feels that a study of this magnitude should have been accorded ample time to improve on its finesse, considering that the researcher is a full time teacher in the Ministry of Primary and Secondary Education. To address time shortages, the researcher worked hard and utilized his weekends and school holidays to come up with a comprehensive write up and to balance time for recreation, school study and family life. The researcher also ensured that he periodically discussed the progress of the study with the supervisor cumulatively, so as to reduce pressure on timelines set to finish dissertations.

#### **1.8.2 Financial imbalances**

To add to that, the researcher had a wish to carry this study on a larger group of people, but financial shortages were also a major setback to this aspiration. He could have wanted this study to cover a larger catchment area, e.g. the entire Masvingo Province, but lack of money to foot transport bills were a forceful blow. He also pumped out financial resources to meet costs of typing and printing this research. To mitigate costs, the researcher typed some of his material, and got external assistance where necessary, e.g. on typing statistical graphs. Again, since he is a full time teacher, the researcher depended on the proceeds from his salary to meet some of the costs pertaining to this study. To add to that, the researcher also got some financial reprieve from his wife, who had to forgo numerous family commitments to fund the study. Fortunately, the researcher was on scholarship and the financial obligations for tuition were met by the Zimbabwe Government.

### **1.8.3 Work and family commitments**

Another impediment that militated on the refinement of the findings of this study was the magnitude of commitment and divided attention of the researcher towards work and family matters. The researcher is a family man who assumes full responsibility to fend for his family, and is also a full time teacher who is supposed to meet teaching requirements of the Ministry of Primary and Secondary Education in terms of execution of his duties. These commitments chewed some of the researcher's precious time, as he needed to balance between the trio – family, work and study commitments. The researcher's family, particularly his wife, was very supportive throughout the study, and this enabled him to work on this project even during odd hours

### **The COVID-19 pandemic**

The researcher also carried this study amidst the dreadful COVID-19 pandemic, which made data collection an uphill battle as there were protocols to adhere to, in order to avoid the spread of the fatal scourge. The researcher used online interviews and postal questionnaires to cover up costs. The researcher also made use of non-participatory observations to collect data.

## **1.9 Delimitations**

This study was carried out in Zaka District of Masvingo Province. To avert time and financial constraints, the researcher used only participants from five schools selected from one district. Zaka District has a total of 43 secondary schools from which the researcher took his sample. The researcher worked with a total of sixty (60) participants, among them, ten (10) mathematics teachers and 50 (fifty) secondary school learners. The researcher worked with

the following secondary and high schools: St Anthony's, St Joseph, Chimbwembwe, Zaka and Chinorumba. The main aim of this study was to assess the correlations between class management strategies and the academic performance of learners in teaching of equations at secondary school level. The study was completed in 2022/

### 1.10 Definition of Key Terms

- **Classroom management** – course of action of teachers' behavior and activities that are basically anticipated and that would develop student co-operation and consideration in classroom (Brannon, 2020). The researcher views classroom management as all the activities done by the teachers in an effort to assist learners to acquire certain subject matter, in this study, mathematical skills.
- **Academic achievement** – cognitive accomplishment in a particular facet as represented by action (Saifi et al., 2018). In this study, academic achievement shall relate to the learners' abilities in manipulating mathematical tasks.
- **Learner** – a person receiving education in a school environment ()
- **Mathematics** – the science which looks at relations between quantities to understand everyday problems (Protheroe, 2017). The researcher defines mathematics as the study of numbers as well as spatial and quantitative relations.

### 1.11 Conclusion

In this Chapter, the researcher alluded to pertinent issues encircling the study. The researcher highlighted: background to the study, problem statement, study objectives, sub-questions, as well as the relevance of the study to Bindura University of Science Education, other researchers, teachers, learners as well as school heads. The researcher also looked at: assumptions on which this study is hinged, limitations that militated on the study, the study's delimitations, as well as the conceptual analysis of key terms. The next section, Chapter 2, alludes to the Literature Review.

## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

#### **2.0 Introduction**

This chapter assesses the contributions of other scholars in the area of class management. The researcher highlights both the theoretical and conceptual frameworks. Further to that, the researcher examines classroom management strategies that can be used by educators in the teaching and learning of mathematics at secondary level. As the chapter progresses, the researcher explores the influence of effective class management on the teaching and learning of mathematics at secondary level. Finally, the researcher scrutinizes the techniques that can be adopted by mathematics educators in order to improve their class management skills.

#### **2.1 Theoretical Framework**

This study shall be modelled in line with the theory of operant conditioning, whose main proponent used techniques and principles of behaviourism to understand human behaviour (Anikweze, 2019). According to the theory of operant conditioning, it is possible to produce desirable behaviour outcomes through rewarding whilst undesirable behaviour can be gotten rid of by punishment (Edwards and Watts, 2015). Comparably, Matheson and Shriver (2015) admit that at its inception, the operant conditioning theory was not meant for classroom management, but further researches and refinement influenced educationists to adopt it to ensure discipline in the classroom. Operant conditioning mainly relies on the concepts of reinforcement and punishment. According to this theory, an individual cannot learn by doing something alone but by using the consequences that follow after the performance – hence the use of the term reinforcement (Anderson & Kincaid, 2015).

Correspondingly, Tauber (2017) stresses that when learners adhere to classroom rules and regulations; they are producing favourable behaviour that should be reinforced by reward. Conversely, the same author above posits that disobeying classroom rules and regulations entails producing undesirable behaviour which is reinforced by punishment. Thus, reinforcement works in both instances, hence its classification as positive and negative in the two situations above, respectively. According to Tal (2020), positive reinforcement occurs when desirable behaviour is rewarded so that it recurs, e.g. giving well performing learners good comments, while negative reinforcement is applied when undesirable is projected by learners, and is consequently punished to induce appropriate behaviour.

## **2.2 Conceptual Framework**

The study shall be conceptualized to outline a number of issues encircling classroom management when teaching mathematics to secondary school learners. According to Asiyai (2021), classroom management entails a wide range of tactics adopted by teachers to ensure that decorum behaviour prevails in the classroom and thus, create a health and conducive atmosphere for learning. Tauber (2017) cited in Asiyai (2021) also avers that classroom management is a pre-requisite for achieving instructional objectives and safeguarding the wellbeing of students, for whom the myriad of teaching and learning activities are centred. Tal (2020) also insists that classroom management implies the ability by the classroom practitioner to lead the class towards achieving the socio-emotional welfare and effective learning of students. This means that classroom management requires teachers to have effective management attributes that will enable them to balance the learners' social and emotional life (Matheson & Shriver, 2015).

Everston and Weinstein (2016) also stipulate that classroom management involves the numerous actions adopted by the teachers to create a supportive teaching and learning environment. This is achieved by planning, supervising, controlling and coordinating students' activities in the teaching and learning process. Asiyai (2021) specifies that a good classroom environment facilitates desirable behaviour and attitudes among students, thus, enhancing positive academic achievement. In another study by Little & Akin-Little (2018), classroom management encompasses a set of procedures that can help the teacher to maintain order and involves both antecedent and consequent procedures that can be combined to provide a comprehensive approach to classroom management. Antecedent procedures refer to those actions done before the onset of a problem while consequent procedures are taken as remedies to what has already occurred (Tauber, 2017).

The concept of classroom management is also construed by Hart (2015) as the core component of powerful and fruitful instructional process. This means without classroom management, instructional objectives may not be attained, or if attained it will be with great difficulty. Further to that, Jones and Jones (2017) aver that it is effective classroom management which stimulates and motivates classes to reap positive results. Thus, this study shall try to ascertain if efficient classroom management is a necessity in mathematics classes, and the most profitable strategies that teachers could adopt to effectively improve its implementation.

## **2.3 Which classroom management strategies can be used by teachers in the teaching and learning of mathematics at secondary school level?**

### **2.3.1 Adequate planning and lesson preparation**

According to Suleman & Hussain (2019) planning is the lynchpin of all teaching and learning in mathematics, and a teacher without good planning attributes may fail to effectively manage a class. Planning is defined by Asiyai (2021) as the ability by a teacher to rope in all the vital factors to be considered to enhance successful teaching and learning. This entails that without adequate planning, the teacher will be unable to sequentially organize instruction, manage a class and prepare teaching and learning material that is valid and relevant for learners (Devender & Sokolosky, 2017). For mathematics teachers, planning may call for the need to take cognizance of learning area integration, multidisciplinary approach, learner-centered approaches as well as the use of assumed knowledge to build new knowledge (Sugai and Horner, 2016). Some social commentators hint that failing to plan on the part of the teacher means planning to fail, literally implying that neglecting the planning phase leads to failure.

### **2.3.2 Involving all learners in the classroom management plan**

The need to realize the significance of all learners in the class when designing a classroom management plan is also construed as another class control strategy that educators can resort to when teaching mathematics (Anikweze, 2019). Learner involvement entails that mathematics teacher will make use of contributions from the entire class when setting out plans that they would use to manage their classes. For example, mathematics teachers can rope in the services of learners to prepare media to use in mathematics lessons as well as the safekeeping of such media. Similarly, Little and Akin-Little (2018) aver that mathematics teachers may also formulate groups with some of the learners being given key positions in ensuring the smooth flow of the group activities. The active involvement of learners also manifests in mathematics teachers giving learners real life problems that sound familiar and can be solved pragmatically. This will eventually enable learners to have a sense of belonging when class activities are being carried out.

### **2.3.3 Formulating and maintaining consistency on classroom rules**

Apart from merely involving learners in the classroom management scheme of things, Everson & Weinstein (2016) acknowledges that mathematics teachers need to have a list of rules for their lessons which should be observed consistently. The rules should not entirely emanate from the teacher, but they should also come from the learners so that their observance does not face stiff resistance. To add to that, Marzano, Marzano & Pickering

(2018) claim that the rules can also be availed in written form so that all the learners can constantly check on them. The teacher should make sure that the rules are applied fairly and consistently, without sparing other learners. This will greatly help to improve aspects of discipline and thwart delinquent forms of behavior. For example, a rule might be given that disallows chorus answers, with perpetrators knowing related consequences. Other notable educationists, Coddington and Smyth (2018) call for the use of a behavior contract, in which set rules also go along with punishments and sanctions that can be instituted on violators to deter would-be offenders.

#### **2.3.4 Equipping the class with adequate physical facilities**

Mathematics classes should also be embellished with all the physical facilities that help to improve instructional approaches and eventually class management (Lippmann, 2015). Some of the facilities include: charts and other media necessary for mathematics lessons. The researcher feels that though not common in many secondary schools, mathematics teachers should be encouraged to create a mathematics corner for displaying all the paraphernalia used in mathematics lessons, e.g. geometric shapes, charts of multiplication tables and formulae, as well as geometrical instruments (Weis, 2017; Suleman & Hussain, 2019). Where possible, Tal (2020) advises educators to enable learners to have access to the mathematics facilities referred to above, so that they benefit the latter. Some of the facilities that can decorate a mathematics classroom include: overhead projectors, printed walls, models, whiteboards and adequate ventilation (Jennings and Diprette, 2016; Lippmann, 2015). When used correctly, the above facilities stand a chance to control behavior of learners, especially when learning Mathematics.

#### **2.3.5 Implementing cooperative learning strategies**

Another forthcoming strategy key when managing a mathematics classroom involves use of collaborative teaching strategies, e.g. the group work or pair work approach. According to the sentiments opined by Asiyai (2021), cooperative teaching and learning methods are influential in class management as they promote: teacher-pupil relations, pupil-pupil relations, sharing of skills as well as critical analysis of ideas. Moreover, Hart (2015) acknowledges that teachers who use cooperative teaching methodologies in mathematics help to inculcate life skills in learners, among these: leadership skills, punctuality, togetherness as well as group solidarity. Similarly, Coddington & Smyth (2018) affirm that the cooperative teaching and learning approaches should rope in problem-solving activities that allow for discussions,

refining and critiquing each other's ideas. This will inevitably lead to divergent reasoning which makes classroom management enjoyable (Onyira, 2016).

### **2.3.6 Monitoring classroom activities frequently**

In addition to the use of collaborative efforts in classroom management, Asiyai (2021) urges mathematics teachers to move around the class to monitor activities being done by the learners. Be it individual work, pair work or group work, Gregory and Ripski (2018) advise teachers to periodically move around the class marking learners' activities, helping those who are struggling as well as offering enrichment or acceleration activities to the gifted learners. Again, Oliver, Wehby & Reschly (2016) assert that moving around the class helps to ensure that all the learners are engaged in given activities, as some learners may take time for group work to sit and do activities unrelated to the lesson. In other instances, the researcher contends that some groups or pairs may be composed of too friendly companions who may take group work time to attend to their personal issues – calling for the teachers to make adjustments in terms of sitting arrangements. In the same vein, Waseer (2018) advises teachers not to regard issuing of group work activities as time for them to relax, as they should attend to individual groups and check progress.

### **2.3.7 Marking students' work as they write in class**

In addition to monitoring the learners' progress and assisting individual learners depending on their pace, Allday and Pakur (2017) also stipulate that mathematics teachers who move around help to reduce incidences of cheating. Mathematics teachers who are not articulate may interpret their learners as industrious in the subject if they are not meticulous about the way they administer and mark their activities. In most cases, learners have a tendency to share each other's work, compelling the teacher to have false assertions that the class is doing well. The above authors recommend the issuing of in-class exercises that are marked there and there as a way to avert efforts by learners to cheat. The above authors are supported by Asiyai (2021) who claims that cheating is a form of academic dishonesty committed by over 90% of mathematics students, and the disease is rampant among secondary school learners. Thus, teachers should not just move around the classroom to monitor behavioral challenges, but to also decipher cases of academic fraud and underhand ways of getting marks. The classroom environment should also have severe penalties for those students found cheating, for example: sharing among them the few marks they get, as well as sending cheating students on punishment.

### **2.3.8 Balancing teaching and facilitation**

The teacher should also appreciate the fact that classroom management requires a balanced effort between teaching and facilitating (Anikweze, 2019). In the former scenario, most of the material comes from the teacher with little contributions from the learners, while in the latter; the teacher accords learners maximum liberty to contribute to the teaching and learning situation. Protheroe (2017) acknowledges that mathematics teachers who facilitate the teaching and learning situation accept learners' divergent ideas, pose challenging but interesting questions that are gradual in nature, develop procedural literacy and suggest positive projections of learners' abilities. Correspondingly, Asiyai (2021) submits that some teachers create difficult classroom situations by claiming that all knowledge should come from them, at the expense of creative and inquisitive learners. In the same line of opinion, Peters (2017) condescends that mathematics teachers should allow learners to work problems on the chalkboard and explaining the steps that lead to the final answer.

### **2.3.9 Proper seating arrangement**

Another vital component of classroom management is the way learners are seated in class during a mathematics lesson. The learners should not only seat facing the chalkboard, but they should also be seated in such a way that they are all in few view of the educator. This implies that the teacher should position his/her desk at the center of the chalkboard. According to Higgins et al. (2015), this will enable the teacher to view all angles of the class with ease and spot any possible wayward activities. The researcher believes that learners have a tendency to misbehave if the teacher is positioned far away from them. Supporting the same sentiments is Hart (2015) who declares that the teacher may arrange learners in such a way that disruptive learners are seated in front, and there are wide gaps to enable free movement to all learners. This will enable the teacher to quickly notice cases of noise making, unnecessary movement as well as any form of disruption to effective lesson flow.

## **2.4 What is the impact of classroom management on the teaching and learning of mathematics at secondary school level?**

### **2.4.1 Positive effect on students' academic achievement**

The management of mathematics classrooms in an effective way results in a rise in the performance of the students. Jones & Jones (2015) stress that the proper management of classes is very beneficial for learners as their academic grades improve. This calls for teachers to be conversant with all the possible techniques that can be implemented to lessen disorders in a lesson. Onyira (2016) claims that a myriad of factors lead to the positive

growth in performance, among these: the interdependence that develops between teachers and learners, as well as the orderliness of the learner. Learners in well managed classrooms can work mathematical problems on their own or with their peers, and they have maximum liberty to seek help from the teacher in case of challenges (Matheson & Shriver, 2015). Such learners can also set targets for themselves and compete against themselves.

#### **2.4.2 High motivation for learners**

Additionally, it is worthwhile to mention that well managed classes have higher motivation levels than those managed poorly. According to Lamy & Steve (2016), learners who are highly motivated display some excellent attributes in mathematics, and they construe the subject as interesting. Highly motivated learners are self-driven and have a tendency to score strong scores whether they are intelligent or less gifted. Edwards & Watts (2015) also consolidates the above sentiments and further articulate that firm classroom management enables learners to exhibit indicators of motivation such as: interest, discipline and social uprightness, that all help to scaffold academic endeavors. According to Alzahrani & Stojanoviski (2019), interest and motivation can be used interchangeably as they connote a tendency by learners to have curiosity for success. Likewise, the researcher feels that an educator who teaches motivated learners faces fewer challenges compared to one working with chaotic learners (Friedman, 2016; Brannon, 2020).

#### **2.4.3 Positive classroom climate**

Another benefit of an organized classroom is a favorable climate that is created by the prevailing conditions (Classroom Management Resource Guide, 2019). In the opinions of Rockstroh (2018) a positive classroom climate for mathematical learners is one that is conducive for learning of mathematical concepts. By the same token, Saifi, Hussain, Salamat & Bakht (2018) aver that efficiency in classroom management culminates in a teacher-learner as well as learner-learner working environment that supports effective learning. The researcher would like to acknowledge also that where learners are exposed to a conducive teaching and learning environment, they put concerted efforts in mathematics, resultantly demystifying it. In another interesting version, Chitiyo & Chitiyo (2017) submit that in a class with a positive climate, learners are given the respect they desire, and they are attended to individually. Such learners can gain confidence to tackle mathematical tasks as well as to work mathematical problems in front of others. This entails that an orderly classroom inculcates traits of confidence in students, as they are accorded adequate time to display their flairs.

#### **2.4.4 Non-disruptive behavior**

In another study carried out by Higgins et al. (2015), effective classroom management should be evidenced by the absence of disruptive behavior. The researcher defines disruptive behavior as any form of action that disturbs the smooth flow of activities. Every mathematics class is characteristic of disruptive students who may indulge in interference without knowing. Echoing the same sentiments is Oliver et al. (2016) who insist that disruptive learners can issue out chorus answers or try to know all questions being asked by the teacher. If classes are devoid of a working plan hinting learners on the vital aspects to be followed, there will be utter chaos. Relatedly, Buddin & Zamarro (2015) maintain that interruptive behavior is unavoidable in many mathematics classes and teachers have to design ways to weaken its prevalence. In most cases, disruptive learners, or hecklers, react out of proportion and may cause lessons to have intermittent stoppages (Thomson, Bortoli & Buckley, 2018). The researcher being a mathematics teacher has witnessed disruptive learners who wanted to answer any question posed by the teacher, to the extent of frustrating other learners.

#### **2.4.5 Maximum student engagement**

Effectively managed mathematics classrooms are also punctuated by high levels of student commitment to given activities. There are episodes when learners may be disinterested to carry out mathematical tasks given by the teacher owing to lack of a motivation and teacher control (Matheson & Shriver, 2015). According to Leflot, Lier, Onghena & Colpin (2015) learner engagement refers to the extent to which learners are occupied by academic tasks - in this context, mathematical tasks. Student engagement is regarded as one of the chief tools and indicators depicting an industrious attitude on the part of the learners. Thomson et al. (2018) also uphold that learner engagement on mathematical tasks does not only signify high levels of effective classroom control, but it is also a sign that learners are highly self-motivated and have greater chances of scoring higher grades during examinations. Lamy & Steve (2016) suggest that student engagement can also be cemented by giving and monitoring learners' homework activities so that they can have something to work on during their free times.

#### **2.4.6 Effective transition between classroom activities**

The ability to successfully shift gears between learning sections is also another vital signal that the teacher has good classroom management skills. According to Coddling & Smyth (2018), a teacher who is conversant with contemporary approaches of classroom management can easily navigate from the onset of the lesson to the finish without interruptions that may confuse learners. This means that effective transition between learning episodes also ropes in

the teacher's attributes in enabling a smooth flow of events that keep learners on task. There are no moments when learners are seated doing nothing. The effective transition also requires a teacher who is able to pace mathematics lessons with the individual learners, thus accommodating both fast and slow learners (Rockstroh, 2018; Buddin & Zamarro, 2015). This implies that the teacher should employ other class management skills like: moving around the class to check individual learner progress, allowing learners to pay attention as others work on the chalkboard and give time to all learners for discussing and critiquing of the class' divergent views.

#### **2.4.7 Punctuality and socio-emotional balance**

In studies carried out by Durlak, Weisberg, Dymnicki, Taylor & Schellinger (2016), it also emerged that effective classroom management may translate to high levels of punctuality and more orderliness. Punctuality in classroom management is defined by Freiberg (2018) as timeliness in carrying out classroom activities. The researcher defines punctuality as the ability of educators to do the right activities in their expected manner and at the rightful moment. While punctuality is a subset of classroom organization, Brannon (2020) champions that classrooms which lack punctuality traits are also disorderly in terms of organization. Classroom organization is another multifaceted term referring to the various techniques used by mathematics teachers to make their classrooms appealing to the learners (Protheroe, 2017), and apart from punctuality, learners exposed to appropriately managed classrooms exhibit high levels of socio-emotional skills that even allow them to effectively cope with other later issues of life (Jemmings & Diprette, 2016)

#### **2.4.8 Inexistence of delinquent behavior**

To consolidate all the aforementioned facts and ideas, Devender & Sokolosky (2017) aver that properly managed mathematics classes are free from unruly and disruptive behavior. Unruly behavior should not be confused with disruptive behavior, although in some cases the former may culminate into the latter. According to Peters (2017), unruly behavior imitates deviant or delinquent personalities, and is evidenced in form of truancy, drug abuse as well as weapon possession. Unruly behavior can also manifest in the form of class violence, noise making amidst lessons, aggression as well as lack of socio-emotional skills (Jones and Jones, 2017; Shook, 2017). Some learners may shirk mathematics lessons if teachers have poor classroom management strategies that do not call for bringing subject registers in class and checking the physical presence of each and every individual. Again, some learners have a tendency to attend mathematics under the influence as a myth, but end up engaging in

unwanted behavior. In a class with appropriate etiquette, Oliver et al. (2016) avow that delinquent behavior may prevail and cause ineffective learning.

## **2.5 What factors should be considered to improve classroom management skills of mathematics teachers at secondary school level?**

### **2.5.1 Ability to resolve conflicts**

Any mathematics educator should be aware that mathematics lessons are consistent with contentious circumstances which would require the teacher to solve them in amicable way that does not demoralize learners. According to Marzano et al. (2018) misunderstandings may arise during discussions, in group work activities or during marking of individual assignments. Teachers should be able to keep flames when learners appear to be disagreeing on a concept. The teacher may rope in other learners to douse the fire or may use professional skills acquired at college to amicably bring sanity in the class. In another point of advice, Chionh and Fraser (2019) hints that teachers should: equally treat all learners, integrate interests of all learners and avoid damaging remarks. The researcher believes that teachers should be calculative enough not to belittle learners, to the extent of using wrong answers to come out with correct ones, so that they don't douse spirits of the struggling learners.

### **2.5.2 Children should be known by names**

Another factor not to be underestimated in classroom management is the teachers' ability to know all the learners by names, so that they can be able to direct some questions to individual learners. Rockstroh (2018) alleges that in most classes in developing countries, the teacher-pupil ratio is unbearable and teachers may fail to know all their learners by names. As a result teachers have a tendency to remember the names of only the few gifted learners or those struggling learners, at the expense of average performing learners who also require the teacher's acceleration or scaffolding as may be deemed necessary. In addition to knowing learners by names, Chitiyo and Chitiyo (2017) urge teachers to have knowledge of learners' home background so that they can be able to relate performance and home upbringing. This may resultantly help teachers to comprehend the rationale behind certain learners' behavior, especially those of a delinquent nature. Moreover, there is a trend by learners to misbehave if they realize that they are not known by teachers, thus, for new classes, teachers may recommend learners to place name tags at their desks to support memory of their names. Though this practice of placing name tags at desks is not practical in the Zimbabwean education system, the researcher contends that it is instrumental in curbing the prevalence of deviant or delinquent behaviour.

### **2.5.3 Children should not be humiliated in class**

To avoid clashes with learners, Wong et al. (2017) proclaim that teachers should desist from humiliating the former in class, especially in front of their peers. Humiliation is a process of dressing down a learner either because of indecorous behavior or any deserving offence. Anderson & Kincaid (2015) also profess that learners may react violently if denigrated in full view of their compatriots, thus, teachers should treat learners with extreme caution, especially those of a violent indisposition. The researcher admits that some teachers demean other learners who are poor in mathematics and praise those that tend to do pretty well, at the expense of social consequences. As a result, the affected learner may cause a scene or vent anger on either the teacher or the other innocent learner who facilitated the humiliation (Alderman & Green, 2016). Teachers may also resort to calling warring parties aside to settle their differences without the interference of third parties.

### **2.5.4 Teachers should vary voice control**

The use of the voice is also an indispensable attribute expected of the mathematics teacher. According to Suleman & Hussain (2019), the teacher's voice should be varied in line with the degree of emphasis being called for. Some teachers' voices are not only monotonous to hear but they are also threatening. Friedman (2016) concedes that yelling the whole day is not necessary, as learners do not grasp concepts owing to the pitch of the educator's voice. Voice control should also consider the size of the class and the nature of the learners being addressed. Freiberg (2018) divulges that voice projection variance is requisite when teachers hope to reap positive results in the teaching and learning of mathematics. There are certain instances when the voice should be lowered or raised to capture the attention of the learners. For example, when emphasizing a step in going through the general quadratic formula, the teacher may lower his/her voice so that even those learners who do not pay attention may be drawn into the lesson.

### **2.5.5 Humorous temperament from the teacher is indispensable**

Another educational thinker, Waseer (2018) discloses that the majority of teachers may fail to reap intended goals because their mathematics lessons lack humorous escapades. The researcher accepts that while cracking of jokes may end up diverting attention of learners, humorous moments are called for amidst mathematics lessons to ease pressure from the learners. The humor should not be offensive to individual learners or to a group of learners, lest its purpose may not materialize. Peters (2017) also declares that mathematics lessons conducted with teachers wearing serious faces are not conducive for learning, but those

lessons managed by teachers who tell learners some funny stories that are not distractive to the teaching and learning process yield better results. Learners should be told stories about their past, and examples used by teachers should not only be real life, but should also directly involve learners so that concepts learnt that way are retained for longer periods of time (Rockstroh, 2018). This helps to build teacher-learner relationships that help with classroom control (Marzano et al., 2018; Everston & Weinstein, 2016).

#### **2.5.6 Good behavior should be acknowledged**

Another vital consideration in effective classroom management is the ability of the teacher to acknowledge the good behavior exhibited by learners. According to the sentiments of Sugai & Horner (2016), some teachers construe as unimportant the need to appreciate the quality of good performance displayed by learners, at the expense of the industrious learners. For example, a learner might go on the chalkboard to successfully work on a challenging problem. This would require acknowledgement from the teacher and the entire class so as to build confidence and motivation for future similar situations. In a study by Everston & Weinstein (2016), appreciating the good deeds that learners have done in class also helps to promote harmonious teacher-pupil and pupil-pupil relations, resultantly creating a very conducive learning atmosphere. The researcher has witnessed many classroom situations when a learner who has done a great deal of work receives no recognition from both the teacher and other learners (Thomson et al., 2018; Jones et al., 2016).

#### **2.5.7 Learners should be given choices**

A teaching and learning environment in which learners are given maximum liberty to choose activities that are within their competence levels induces some sense of belonging in a mathematics class. According to the sentiments opined by Toropova, Johansson & Myrberg (2019), mathematics is a challenging subject but learners can share given activities using their level of difficulty. Thus, it is not worthwhile to let gifted learners work on simple tasks at the expense of the less gifted, who may again watch helplessly as the gifted learners tackle challenging activities. Likewise, Saifi et al. (2018) suggest that giving learners the nod for them to choose activities within their capacity level helps to gauge their competences and may later graduate them for higher order operations. This means that in effectively managed classes, where a gradual approach to question choices is highly recommended, learners' transition from doing simple activities to complex ones is achieved with ease. This follows that mathematics teachers should be conversant with questioning techniques, lest the learners may feel demotivated by nature of activities.

### **2.5.8 Successful moments should be celebrated**

In another line of opinion by Wong et al. (2017), learners should be allowed to get into a celebratory mood for their success, especially the problem learners. Though allowing learners to rejoice for their accomplishments in solving mathematical tasks is highly recommended, Asiyai (2016) warns teachers to monitor the situation closely, as the praising of one's success or that of others may divert the attention of the class from meaningful learning. Similarly, Rockstroh (2018) holds that celebratory moments are very ideal in shaping the behavior of delinquent learners as celebrations help the learners to realize that they are also able to do activities that are worth of praise. Thus, according to Lippmann (2015) praising triumph in tackling mathematical challenges helps to deter learners from engaging in forms of unwanted behavior such as disruption, aggression and violence (Matheson and Shriver, 2015; Peters, 2017). This means that achievement in solving mathematical problems can be an effective tool to use for behavior modification when dealing with deviant personalities (Toropova et al., 2019).

### **2.5.9 Enforce an effective communication chain**

Allowing free and clear communication in mathematics classes is also another way of promoting effective classroom management. According to the sentiments avowed by Asiyai (2021), proficient communication is the lynchpin of well-organized classroom management. It is the use of both written and oral communication that enables teachers to convey what they want learners to do, as well as to get feedback. The teacher should advise learners to clearly write their tasks – with clear procedural literacy – and they should also mark learners' work and communicate their feedback with clear and constructive comments (Toropova et al., 2019; Crean & Johnson, 2018). Communication of learners' performance is one of the ways through which teachers can use to motivate their learners to have interest in mathematics. Nonetheless, due to high enrolment figures prevalent in schools, mathematics classes are so full that teachers are unable to know individual learners, and consequently fail to give feedback in each and every learner's book (Wong et al., 2017; Alzahrani et al., 2017).

## **2.6 Summary**

This chapter examined the ideas of earlier scholars who made their researches on class management and the teaching and learning of mathematics. Some of the aspects explored by the researcher encompass: the nature of classroom management strategies being used by mathematics teachers, the impact of these strategies, as well as mechanisms that can be used to improve mathematics teachers' classroom management skills.

## CHAPTER THREE

### 3.0 RESEARCH METHODOLOGIES

#### 3.1 Introduction

This chapter outlines the methods and techniques used by the researcher to collect data. This entails the research design which the researcher adopted. The advantages and disadvantages of the research design are to be discussed as well. The chapter also examines the target population, the sample and the sampling technique, as well as the merits and setbacks of the research instruments used to collect data for this study. The data collection procedure, the data analysis and interpretation plans as well as ethical issues seal the contents of this chapter.

#### 3.2 Research Paradigm

The researcher selected the research paradigm, commonly called the research philosophy, from Saunders' most acclaimed 'Research Onion' (Saunders, Lewis and Thornhill 2019).

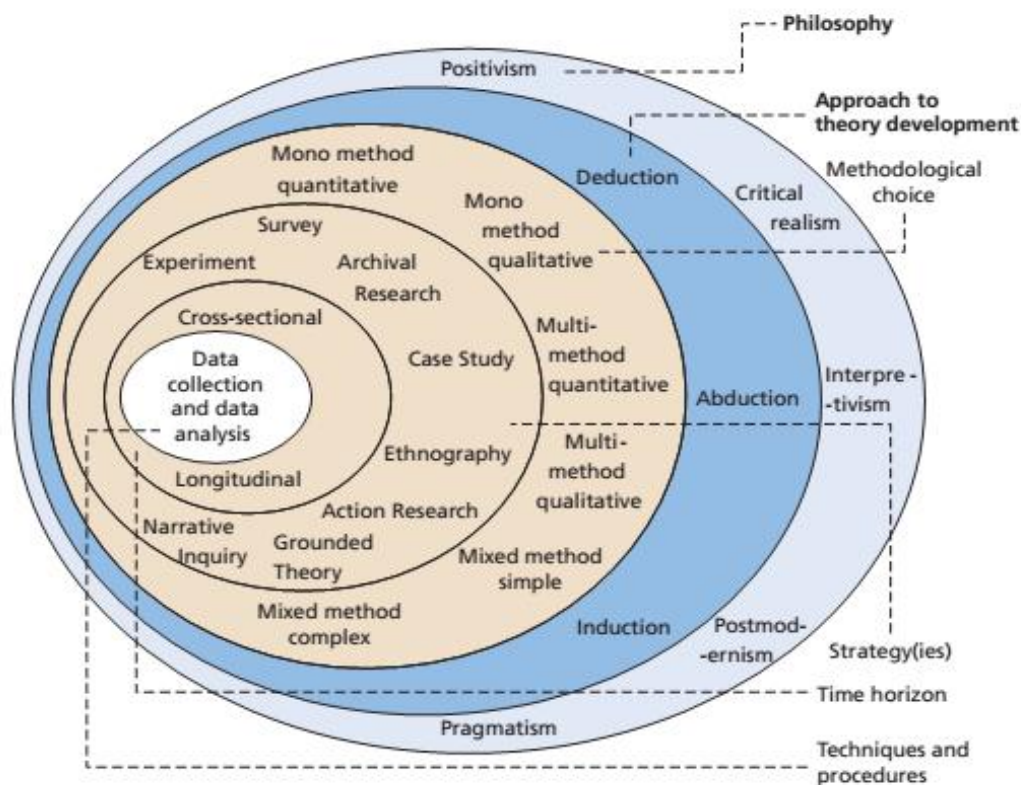


Figure 3.1 Research Onion (SOURCE: Saunders et al., 2019).

According to Creswell (2014), a research paradigm is a set of commonly held beliefs and assumptions within a research community about ontological, epistemological and methodological concerns. This entails that such a paradigm constitutes a mental model that influences and structures how the members of a research community perceive their field of study. Similarly, Mittwede (2017) defines a research paradigm as a template of deeply held conjectures or conceptual frameworks that undergird and influence research. Saunders et al. (2019) define a research paradigm as a system of beliefs and assumptions about knowledge development done when embarking on research. From the 'Research Onion' in Figure 3.1, the research philosophy could be: positivism, realism, interpretivism, postmodernism or pragmatism - with each philosophy having its tenets that govern it.

For the sake of this study, the researcher adopted the post-modernism research paradigm, which highly recommends mixed-methods research. The post-modernism philosophy advocates that theories and concepts are too simplistic hence focus should be on narratives, stories, perceptions and interpretations (Saunders et al., 2019). The post-modernism approach also insists that new understanding by researchers and worldviews are contributory to new knowledge. The researcher employed the post-modernism paradigm in this study since it involved the use of both quantitative and qualitative methods of data gathering, presentation and interpretation. This is because qualitative and quantitative research methods are not mutually exclusive (De Villiers, De Villiers, & Kent, 2015). A variety of research benefits were derived from adopting mixed methods; since the researcher was part of the study, researcher interpretation to the problem under study was highly valued by the majority of stakeholders and the researcher was reflexive (Punch, 2015; Burrell and Morgan, 2016). In this study, the post-modernism mixed methods approach fitted well because the researcher used fairly large samples, carried out an in-depth investigation and collected a wide range of data that called for both quantitative and qualitative analysis (Creswell, 2014; Punch, 2015s).

### **3.3 Research Design**

Best and Khan (2018), define a research design as a program to guide the researcher in collecting, analyzing and interpreting observed facts. In this study, the researcher adopted a descriptive survey research design which is mixed approach in nature. The descriptive survey approach allowed the researcher to observe and talk face-to-face with participants. It was best used as a means of generating ideas; brainstorming solutions and developing hypothesis that the researcher eventually decided to test quantitatively. Mixed research seeks to understand a

given research problem or topic from the perspective of the local population (Punch, 2015; Phillips & Pugh, 2016). It is also effective in obtaining cultural behaviors in the social context of particular populations (Creswell, 2014). The researcher chose the mixed approach because it helped to gain new perspectives on things about which a lot is already known and gain new more in-depth information that was difficult to solely convey either quantitatively or qualitatively.

### **3.4 Target Population**

Best and Kahn (2018), define a population as any group of individuals that have one or more characteristics in common, and that are of interest to the researcher. The above authors further explain that the population may be individuals of a particular type, or a more restricted part of that group. Thus, a population in research is the target group from which one intends to solicit information, notably values and attitudes. Fraenkel and Wallen (2016) aver that a population is defined as a group of individuals from which a sample is drawn. In this study, the population was all 43 secondary schools in Zaka District. Due to the size of the population, the researcher's sample was trimmed to include only five secondary schools sampled for use in this study. The schools are: St Anthony's, St Joseph, Chimbwembwe, Zaka and Chinorumba.

### **3.5 Sample**

The sample consists of individuals selected from a larger group of persons called the population. Fraenkel and Wallen (2016) define a sample as a group in a research study on which information is obtained. For the purpose of this research, the sample consisted of 60 participants, among them: 50 learners and 10 teachers, and these were selected from the five schools sampled by convenience sampling. The 50 learners consisted of boys and girls in order to depict the true reflection of ideas from all sex groups. Again, the teacher population comprised males and females for gender equity.

### **3.6 Sampling Procedures**

A small sample carefully drawn from a large target population saves the time and expense than studying the entire population (Creswell, 2014). Sampling is a systematic process of selecting a number of individuals for study in a way that the selected individuals would equally represent the larger group, making it easier to arrive at generalizations for the whole group (Wandelt, 2015). To get the required number of schools that the researcher used convenience sampling, which selected schools by virtue of their proximity to each other (Borg and Gall, 2014).

The researcher also employed both purposive and simple random sampling to choose respondents for this study. According to Phillips & Pugh (2016), purposive sampling refers to selection of participants for use in research basing on a certain characteristic, in this case the fact of being mathematics teachers and learners. The 60 participants were also chosen randomly as a way to avoid bias. Borg and Gall (2014) view random sampling as precisely a process of selecting individuals from a population that provides every sample of a given size an equal probability of being selected. Best and Kahn (2018), also postulate that in a simple random sample, the individuals are chosen in such a way that each has an equal chance of being selected and each choice is independent of any other choice. Random Sampling was preferred because it permitted the researcher to apply inferential statistics to the data.

To get the required sample of 50 learners and 10 teachers, the researcher placed 50 and 10 even numbers, respectively, written on small manila cards in small boxes mixed with odd numbers. He then asked the possible participants to pick a number randomly, without replacement. Those who picked even numbers were considered eligible to use in the study, while those who picked odd numbers were disqualified. The researcher felt that simple random sampling was the best since no possible respondents felt disadvantaged during the selection process. Again, randomization was preferred as it reduced bias and enabled that each participant's chance of selection for use in the study was equal.

### **3.7 Research Instruments**

These are tools the researcher used in gathering data for the research. According to Borg and Gall (2014), research instruments are tools used in the collection of data in the conduct of a research. The researcher used the triangulation approach in data collection where three instruments namely: questionnaires, direct observations and oral face-to-face interviews were used. The questionnaires were administered to teachers, oral interviews were conducted with students and non-participatory observations were used on both teachers and learners.

#### **3.7.1 Observations**

The researcher physically observed the respondents, that is, both teachers and learners during mathematics lessons, and took down necessary information for appropriate analysis. Best and Khan (2018), define an observation as a systematic data collection approach, in which researchers use all of their senses to examine people in natural settings. Having been so

defined, it implies that observations have their own merits and demerits as instruments of research.

Wandelt (2015) believes that observations are advantageous since they provide direct access to the subjects under study. The researcher physically sees the subject and records what he/she wants unlike relying on reports or responses from asking people. Where people may need to falsify data, direct observation will guard against this drawback. Further to that, Leedy (2019) also contends that with observations, there is a greater provision for a permanent record. He argues that much of the physical behavior which is of high interest to the researcher is immensely transient. The fact that all observation entails some form of recording means that it provides a permanent record of such events or behavior, thus, permitting prospective analysis or future comparisons to be done easily.

Nonetheless, Leedy (2019) agrees that direct observation is time consuming and is highly susceptible to bias from the observer. This means that the observer may be tempted to record events that did not take place, and this may consequently undermine the validity and reliability of such observed data. Observer effect is also another potential weakness of observations, where the presence of the observer may influence the behavior of those subjects under observation. Thus, strict care was taken, to ensure that the subjects observed did not hide their actual behaviors, due to the fact that they were being observed.

### **3.7.2 Interviews**

Creswell (2014) defines an interview as a process which involves collecting data through direct verbal interaction between individuals. Like any other research tools, interviews have got advantages and disadvantages. Creswell (2014) contends that interviews are suitable when one intends to solicit for information, even from illiterate respondents, as the wording of interview items can be modified to suit the level of interviewees. Moreover, with interviews, subjects cannot falsify data such as age, sex and race (Phillips and Pugh, 2016; Creswell, 2014). Again, interviews help to build relations between the researcher and respondents, as there is a greater need to confide in each other, especially when dealing with sensitive information (Popper, 2014). This implies that apart from allowing researchers an immense opportunity for screening, inter-personal relations between the interviewer and interviewees improve tremendously.

The researcher preferred information about personal feelings, opinions and perceptions. Thus, another advantage of oral interviews is that, they allow for soliciting of sensitive information from respondents (Phillips & Pugh, 2016). The respondents' own words are recorded, ambiguities can be clarified and the respondents are able to give reasons for their responses. Interviews are not influenced by others in the groups (Best and Khan, 2018). In this case, the researcher was able to record first-hand information directly from the participants, such as their emotions and behaviors.

However, oral interviews are disadvantageous in that they may be subjective and biased, and they are time consuming, especially when dealing with very large populations (Phillips and Pugh, 2016). Probes should be neutral and the interviewer must allow sufficient time for the respondents to answer and should stop anticipating and cuing potential answers. Again, with interviews, at times respondents may feel uneasy and adopt avoidance tactics if the questioning is too long, sensitive or deep (Creswell, 2014). To mitigate this disadvantage, the interviewer built trust and rapport with respondents, and made it possible to obtain information that would not have been revealed by any other data collection method. Again, Borg & Gall (20014) suggest that interviews cannot provide for anonymity of the respondents. This means that for face to face oral interviews, it is an uphill battle for interviewees to hide their identity as in other instruments like questionnaires. To carry out face-to-face oral interviews on the sample, the researcher arranged to have them in groups of five and spread them in stages over a given period of time.

### **3.7.3 Questionnaires**

Best and Kahn (2018) define a questionnaire as a document containing questions designed to solicit for information appropriate for data analysis. Questionnaires are easy to analyze and are familiar to most people, for nearly everyone has had some experience in completing them (Creswell, 2014). Again, Popper (2014) contends that questionnaires do not generally alarm respondents. This helped the researcher, because most of the participants were interested in completing questionnaires. Moreover, since names of respondents were not written on the questionnaires, this gave the participants maximum autonomy to freely express their feelings and attitudes (Best and Kahn, 2018). In addition, the researcher chose questionnaires because their questioning did not change for all respondents, and had no middleman bias (Popper, 2014). This implies that notwithstanding the number of respondents, all of them answered similar questions, which made data analysis easy and quantifiable, and amenable for analysis.

The researcher's own opinions do not influence the respondents to answer questions in a certain manner which leads to the recording of inappropriate information (Creswell, 2014).

Questionnaires were also chosen because they were made to conform to the level of respondents. The researcher chose both closed and open-ended questions, as they are generally easy to answer, by allowing respondents to express their feelings in detail. Best and Kahn (2018), also acknowledge that through the use of questionnaires, researchers can accumulate substantial volumes of information from a large population within a short space of time. Furthermore, Leedy (2019) acknowledges that with questionnaires, information can be collected from distant respondents. This means that questionnaires can be sent by email to respondents, and sent back by the same means. Popper (2014) argues that unlike interviews, questionnaires are easy to plan, construct and administer. Leedy (2019) also posits that questionnaires tend to direct respondents on those aspects the researcher requires, thus avoiding all other irrelevant data. This means that there is no probability of gathering unwanted data, since there are guidelines to be strictly followed.

Nonetheless, questionnaires do not ask further those respondents who give interesting, ambiguous or unfinished answers, and they are not an ideal method of gathering data when working with respondents who cannot read or write (Popper, 2014). This means that issuing questionnaires to illiterate respondents will not yield desired results, as some of them may not be filled in. Moreover, there are chances that illiterate respondents may withhold information by either retaining the questionnaires or by destroying them to hide their illiteracy. The problems cited above were not encountered because the questionnaires were administered to literate respondents, and the researcher pre-tested the questionnaires to remove ambiguity and resultantly reduced bias tendencies.

### **3.8 Data Collection Procedures**

The researcher used observations, questionnaires and oral interviews as means of data collection. The questionnaires and interview schedules were constructed basing on the main problem and sub-research questions. Interview schedules were prepared for learners, questionnaires were prepared for teachers and an observation guide was prepared for both teachers and learners. The researcher arranged to meet interviewees during their spare time. The researcher used a mobile phone to record the interviews. The responses were collected and recorded for future use in data analysis. The researcher explained to respondents that the

results were strictly for research purposes only and therefore they should have maximum liberty to proffer their responses. The researcher also used an observation guide to record all the invaluable information on classroom management in mathematics lessons.

### **3.9 Data Presentation, Analysis and Interpretation Plans**

The data gathered from teachers' responses to questionnaires, learners' responses to interviews and the researcher's observations were presented on statistical tables - such as frequency distribution tables, pie charts and bar charts - as well as in narrative form, and the analysis and interpretation of the findings were done based on the researcher's study objectives. This means that the researcher correlated findings from this study with data from earlier researches, to ascertain differences or similarities.

### **3.10 Validity and Reliability**

Phillips and Pugh (2016), state that the research instruments used to collect data must be both valid and reliable. For the purpose of this study, a combination of direct observations, questionnaires and face-to-face oral interviews were used. May (2016) further contends that in order for meaningful considerations to be drawn, the research should produce true knowledge on one hand, and repeatable on the other hand. These depict validity and reliability respectively. The concepts of validity and reliability are separately discussed below and the context in which they were found to be applicable in this study.

#### **3.10.1 Validity**

Popper (2014) defines validity as the extent to which the results of an evaluation procedure serve the particular purpose for which they were intended. Leedy (2019) defines validity as the extent to which an instrument measures what it is designed to measure. The instruments that were used by the researcher had strengths and weaknesses, and the researcher tirelessly minimized the detrimental effects of the latter. The researcher tried to guard against weaknesses of ambiguity, as well as vague wording. The researcher also resorted to the use of simple language as a way to avoid double-barreled questions. The researcher also pre-tested the research tools with a locally assembled sample to ascertain if they would be employed to gather authentic data.

#### **3.10.2 Reliability**

Best and Kahn (2018) define reliability as the level of integral consistency, and stability of measure. Creswell (2014) also defines reliability as the extent to which the same data would be collected each time repeated observations of the same phenomenon are made. Thus, reliability is concerned with accuracy and consistency of the measuring instruments when repeated measurements are made. To ensure reliability of the data collected in this study, the researcher self-conducted interviews and ensured that interview items were related to the study objectives. The researcher also self-administered the questionnaire to teachers, and ensured that the questionnaires were filled in within a considerable period, and then returned for data analysis.

### **3.11 Ethical Considerations**

This study was done within the realms of ethics of research. Leedy (2019) defines ethics as what is morally good and bad behavior. May (2016) alludes to research ethics as principles of good behavior by researchers. Proper permission was sought from all interested stakeholders before the researcher kicked off this study. Bindura University of Science Education (BUSE), the Ministry of Primary and Secondary Education (MoPSE), as well the heads of schools where the study was done, granted permission to the researcher to carry out his study. This means that the District School Inspector (DSI) and the Provincial Education Director (PED) gave permission to the researcher to conduct this study in the sampled schools in Zaka District. This study prioritized the following ethical issues; informed consent, voluntary participation, as well as anonymity and confidentiality.

#### **3.11.1 Anonymity and Confidentiality**

Both confidentiality and anonymity were not underestimated in this study. Bell (2015) submits that the researcher needs not to tell or insinuate which responses come from participants. Thus, the researcher also maintained high confidentiality, by assuring respondents that their responses were solely applied in the educational domain. This gave the respondents vast freedom to expound their feelings.

#### **3.9.2 Voluntary Participation**

Before partaking of this study, the researcher notified respondents that participation was entirely voluntary, and there were no reprisals to those subjects who were reluctant to continue participating in the study halfway. This gave the respondents a greater opportunity

to express their inner feelings, as they participated with free will (Punch, 2015).

### **3.9.3 Informed Consent**

Informed consent refers to the revelation of the purpose, aims, as well as the study objectives to the participants by the researcher (Phillips & Pugh, 2016). The researcher explained to the research participants the rationale behind partaking of this study before they took part. To add to that, the teachers and learners signed a consent form, explaining all the details pertaining to the relevance of the study to various stakeholders. This inevitably enabled the participants to feel valued, and to proffer authentic and credible information.

### **3.10. Summary**

This chapter laid the theoretical foundations for the practical conduct of the study. It considered the research design, the population and sample, as well as the sampling techniques and procedures. In addition, the chapter also looked at the strengths and weaknesses of the research design and data collection instruments, as well as the ways to avert the latter. The data collection procedures, the data analysis and interpretation plans, ethical issues, as well as the validity and reliability of research tools were also examined at the closing sections of the chapter. The next section, chapter 4, presented, analyzed, and interpreted data collected from the research field.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### 4.0 Introduction

This chapter presents the researcher's findings on pie charts, bar graphs and frequency distribution tables. The above statistical tables do not only make the researcher's data amenable for analysis, but also compact the data, at the same time retaining original findings. The presented was analysed and interpreted with the aim of answering the study's research questions. The analysis and interpretation sought to reveal any correlations between the researcher's findings and the findings of other earlier authorities.

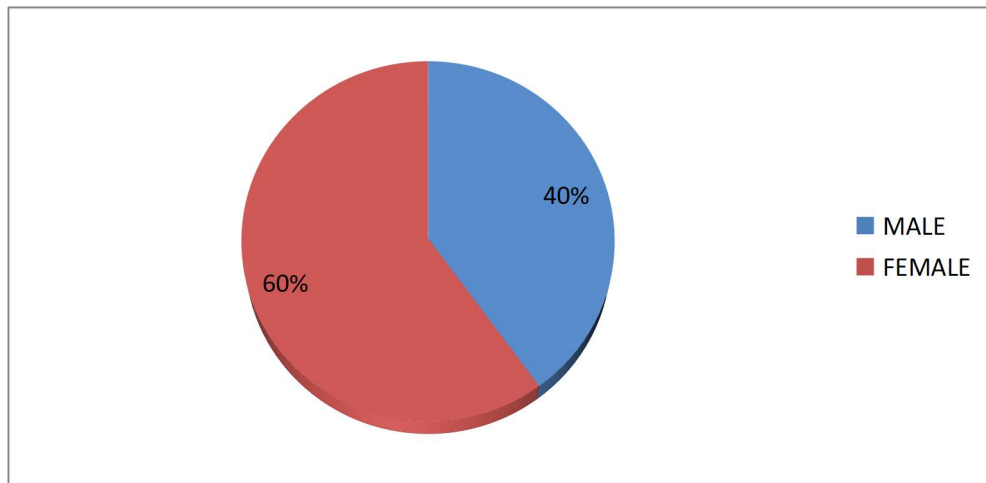
#### 4.1 Teachers' Demographic Data

**Table 4.1: Frequency Table Showing Ages of Teacher Respondents**

| Age (Years)             | Frequency | Percentage |
|-------------------------|-----------|------------|
| Between 20 and 40 years | 6         | 60%        |
| Between 40 and 50 years | 3         | 30%        |
| Above 50 years          | 1         | 10%        |
| <b>Total</b>            | 10        | 100%       |

Of the ten teachers used by the researcher, six of them, i.e. 60% were between twenty and forty years of age, while three of them (30%), were between forty and fifty years, and only one teacher (10%), was above 50 years. The above ages reflect that teachers used in this study are mostly middle-aged and could be conversant with techniques of effectively managing classes in the teaching and learning of Mathematics at secondary school level. The teachers are also not too young to be novices in use of varied strategies of classroom management; hence the researcher assumed that he gathered reliable and valid data from the teacher respondents.

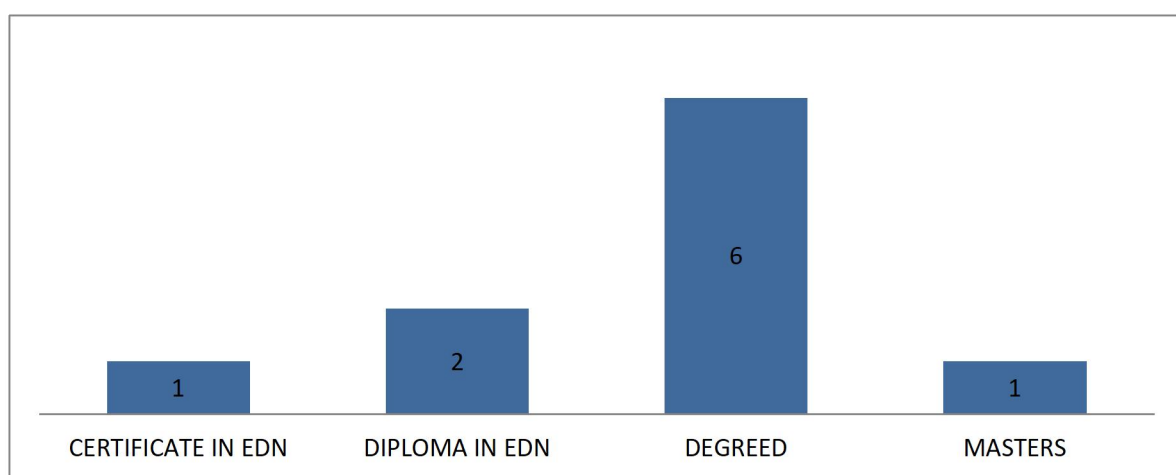
### Sexes of Teacher Respondents



**Figure 4.1: Pie Chart Showing Sexes of Teacher Respondents**

The pie chart above shows that there are four male teachers (40%), and six female ones (60%), who worked with the researcher in this study. The inclusion of both sex groups in the study indicates that the researcher obtained authentic data from both male and female respondents. This ensured credibility to the information gathered, and the researcher was assured that the findings were generalizable. Creswell (2014) advises researchers to select their research populations with discretion, lest they fail to gather evidence that is not only valid or reliable, but also fail to gather data that can be generalized on similar populations.

### Teachers' Educational Qualifications



**Figure 4.2 Bar Chart Showing Teachers' Educational Qualifications**

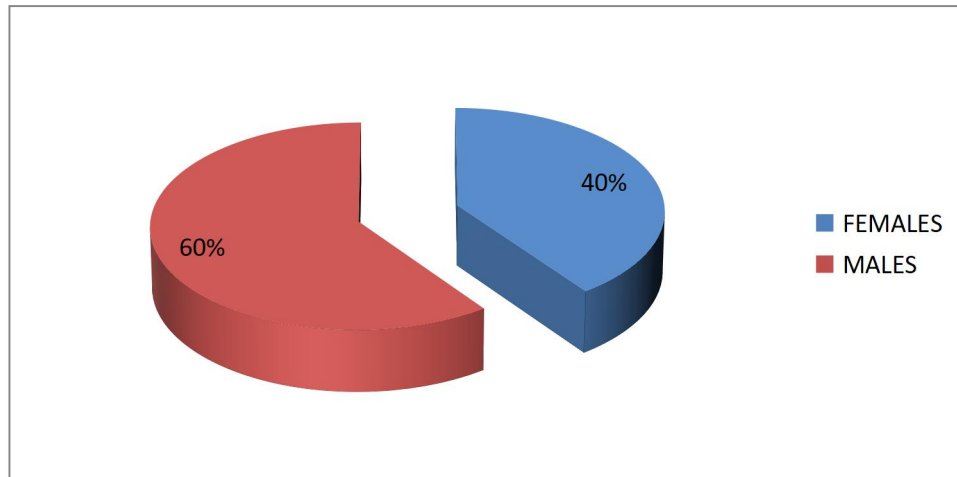
In the schools on which this study was carried out, 6 teachers selected were Degree holders (60%), two of them (20%), had Diplomas in Education, one (10%) had a Masters' degree and the other one teacher (10%), was a Certificate of Education holder. The data above indicates that the teachers used in this study are qualified to teach Mathematics in the secondary school, and thus, are conversant with the need to effectively implement classroom management strategies. The evidence above also indicates that in many secondary schools in Chipinge District, there are no classes taught by relief teachers, as there is ample manpower, and mostly degree holders. The researcher also wants to believe that the properly qualified teachers used in this study opened up their hearts as regards the nature of classroom management strategies they use when teaching Mathematics to secondary school learners.

**Table 4.2: Frequency Table Showing Years of Teaching Experience**

| <b>Working Experience</b>            | <b>Frequency</b> | <b>Percentage</b> |
|--------------------------------------|------------------|-------------------|
| <b>Less than or equal to 5 years</b> | 0                | 0%                |
| <b>Between 5 and 10 years</b>        | 4                | 40%               |
| <b>Between 10 and 15 years</b>       | 4                | 40%               |
| <b>Above or equal to 15 years</b>    | 2                | 20%               |
| <b>Total</b>                         | <b>10</b>        | <b>100%</b>       |

As shown on the frequency table above, four teachers (40%), had teaching experience of between five and ten years, four others (40%), had teaching experience of between ten and fifteen years, and two of them (20%), had more than fifteen years as classroom practitioners. No teacher had less than or five years of teaching experience. The levels of teaching experience are ideal for this study, since the researcher intends to unravel the effectiveness of classroom management strategies used by educators in the teaching and learning of Mathematics at secondary school level. Though these highly experienced teachers could be maintaining the status quo, the researcher feels that they must have amassed varied effective classroom management skills during their countless years of teaching experience.

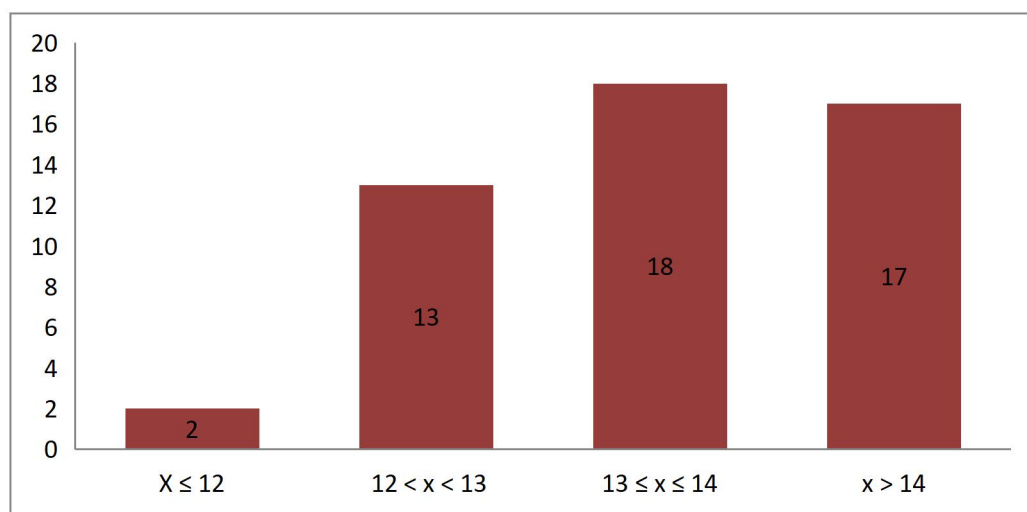
## 4.2 Learners' Demographic Data



**Figure 4.3 Pie Chart Showing Pupils' Sex (n=50)**

Data revealed on the pie chart above indicates that the researcher worked with 30 male students (60%), as well as 20 females (40%), in this study. The same data also shows that the researcher worked with a population of fifty (50) students, with the figure of males surpassing that of females. This data indicates that, in the schools where this study was done, the population of female students is below that of their male counterparts, and the researcher got views of both boys and girls, regarding the effectiveness of classroom management strategies in improving learners' academic achievements.

### Ages of Pupils



**Figure 4.4 Bar Chart Showing Pupils' Ages in Years (n=50)**

On the bar graph above, it is shown that 2 students (4%), are 12 years or less, while 13 students (26%), are between 12 and 13 years old, 18 students (36%), are between 13 and 14 years inclusive and 17 students (34%) are above 14 years. In Zimbabwean secondary schools, this is the most appropriate age group for pupils in secondary school, after starting Grade 1 with seven years or less. To the researcher's line of thought, these students are now grown-ups, who can understand the concept of classroom management in relation to their academic achievement. Thus, the researcher feels that he collected reliable and valid data from his student respondents

#### **4.3 Perceptions of teachers and learners on classroom management strategies used in the teaching and learning of mathematics at secondary school level**

**Table 4.3 Showing perceptions of teachers to classroom management strategies that can be used in teaching and learning of mathematics at secondary level**

| <b>Classroom management strategy</b>                  | <b>SA</b> | <b>A</b> | <b>D</b> | <b>SD</b> |
|-------------------------------------------------------|-----------|----------|----------|-----------|
| Adequate planning and lesson preparation              | 20        | 80       | 0        | 0         |
| Involve all learners in class management plan         | 10        | 90       | 0        | 0         |
| Formulate and maintain consistency on classroom rules | 30        | 70       | 0        | 0         |
| Equip classrooms with adequate physical facilities    | 20        | 0        | 80       | 0         |
| Set up cooperative learning strategies                | 100       | 0        | 0        | 0         |
| Monitor classroom activities                          | 100       | 0        | 0        | 0         |
| Balance teaching and facilitation                     | 10        | 80       | 10       | 0         |
| Proper sitting and furniture arrangement              | 100       | 0        | 0        | 0         |

**Key: SA – Strongly Agree; A – Agree; U – Undecided; D – Disagree; SD – Strongly Disagree**

From table 4.3 above, it is evident that teachers strongly agree that setting up cooperative teaching and learning strategies (100%), monitoring classroom activities (100%) and making sure there is proper sitting and furniture arrangement (100%). The same results also show that: 80% of the teachers agreed that adequate planning and lesson presentation, 90% agreed that learner involvement in the class management plan, 70% agreed that formulating and maintaining consistency on classroom rules and 80% agreed that balancing teaching and facilitation are some of the best strategies in effective classroom management.

The results depicted above are consistent with the ideas of Anikweze (2014), Marzano et al. (2003) and Grieser (2017), who respectively claim that learner involvement, formulation and maintenance of classroom rules and installing cooperative teaching and learning strategies are worthwhile strategies to manage mathematics classrooms. From the data above, 80% of teachers disagree that there is need to equip secondary classrooms with physical facilities, arguing that secondary school classrooms have limited space and they are used by many teachers. These sentiments by teachers are contradictory to the ideas of Lippmann (2015) and Hughes (2019), who recommend that classrooms where mathematics lessons are taking place should be embellished with charts, learning centres and good furniture to motivate learners to have interest in the subject.

From the interviews contacted with learners, it also emerged that the learners expected to be directly involved in the formulation and maintenance of classroom rules, a finding akin to the ideas of Kern and Clemens (2017), who hinted that leaving out learners in management of mathematics lessons would be disastrous in maintaining order in the class. The majority of the learners also acknowledged that they intended to be exposed to cooperative learning approaches like the group work teaching and learning method. The ideas to rope in learner-centred and cooperative methodologies are a brainchild of Asiyai (2016), Coddington and Smyth (2018) and Onyira (2018), who all advocated for interactional methodologies in the teaching and learning of mathematics.

In 60% of the classes observed by the researcher, it emerged that though the state of floors and furniture rested with the school authorities, there were no charts of mathematical activities displayed in class. Only at one of the schools (20%) did the researcher come across a Mathematics corner with geometrical instruments. The researcher indeed noted that it was an uphill battle for mathematics teachers to decorate classrooms with charts and other resources to facilitate the teaching and learning of the subject as the same classes were used by over a dozen teachers. The learners indicated that there were supposed to be base rooms for the effective teaching and learning of mathematics. Moreover, the researcher noted that there were no challenges in sitting arrangements as the furniture was well arranged in most mathematics lessons. Most teachers observed made sure that their furniture arrangement made them accessible to all the learners, an observation that resembled the sentiments opined by Higgins et al. (2015), who advised educators to properly arrange furniture to allow all learners to sit at a place convenient to all learners.

#### 4.4 Teacher and learner perceptions on the impact of classroom management in the teaching and learning of mathematics at secondary school level

**Table 4.4: Showing Teacher perceptions on the impact of classroom management in the teaching and learning of mathematics at secondary school level**

| Possible impact of effective classroom management | SA  | A  | D  | SD |
|---------------------------------------------------|-----|----|----|----|
| Positive effect on students' academic achievement | 10  | 80 | 0  | 10 |
| High motivation for learners                      | 100 | 0  | 0  | 0  |
| Positive classroom climate                        | 30  | 70 | 0  | 0  |
| Non-disruptive behavior (chorus answers learners) | 100 | 0  | 0  | 0  |
| Maximum student engagement                        | 100 | 0  | 0  | 0  |
| Effective transition between classroom activities | 10  | 80 | 10 | 0  |
| Punctuality and classroom organization            | 10  | 90 | 0  | 0  |
| Inexistence of delinquent behavior                | 20  | 10 | 70 | 0  |

**Key: SA – Strongly Agree; A – Agree; U – Undecided; D – Disagree; SD – Strongly Disagree**

As regards the impact of effective classroom management on learners' academic achievement, table 4.4 above shows that 100% of the teachers strongly agreed that effective classroom management: highly motivates learners, leads to non-disruptive behaviour, and induces maximum student engagement. Again, the results on the table above indicate that teachers agreed that effective classroom management: yields a positive effect on learners' academic achievement (80%), induces a positive classroom climate (70%), enables punctuality in attending to classroom activities (90%) and enables a smooth transition from one classroom activity to the next (80%). The sentiments opined on Table 4.4 resemble the findings of Edwards and Watts (2015), Buddin and Zamaro (2015) and Matheson and Shriver (2015) who respectively insist that effective classroom management is manifested through high levels of motivation, presence of non-disruptive behaviour as well as inducing maximum student engagement to mathematical tasks. This implies that the findings of this study are consistent with previous research findings carried out by early researchers.

In addition, though not strongly agreeing, the perceptions of the teachers that effective classroom management leads to a positive learning environment and induces maximum student timeliness in finishing classroom activities are in tandem with the ideas of Jones et al. (2017) and Protheroe (2017), who acknowledged that effective classroom management is instrumental in creating a very harmonious learning environment and inculcates punctuality traits in learners, respectively. Nonetheless, it also emerged from the data on Table 4.4 that teachers disagreed that there are no cases of delinquent behaviour in well managed classrooms. These teachers condescended that there was no relationship between classroom management and prevalence of delinquent behaviour, a finding that contradicts the sentiments of Peters (2017) and Devender and Sokolosky (2017) who all postulated that effective managed classrooms are devoid of delinquent personalities.

Results from the interview indicate that the learners also valued effective classroom management in: nurturing punctuality traits, modelling desirable forms of behaviour and in enhancing maximum concentration on classroom tasks. The learners indicated that even in the absence of their mathematics teachers, the culture implanted in them forced them to do homework tasks and discuss as a class. Though the assertions of the learners were not consistent with the teachers' contentions on use of classroom strategies to curtail unwanted forms of behaviour, the learners echoed the sentiments of Oliver et al. (2016), Meyers et al. (2016) and Thomson et al. (2018) who all maintained that effective classroom management is one of the best means to thwart incidences of unwanted forms of behaviour. No learner indicated any negative perception to the impacts of classroom management given.

Results from observations indicated that teachers were able to control their time in terms of allowing all learners to work and finish given activities. Again, the researcher noted that most of the learners were attentive during the lessons. Teachers mostly relied on pair work as well as group work activities in their lessons. The results obtained indicate that effective classroom management was really instrumental in facilitating effective acquisition of mathematics concepts by learners. The above observations hold water when compared to the findings of Matheson and Shriver (2015), who viewed effective classroom management as key in creating a positive environment, that was also characteristic with maximum learner concentration and effective time management (Freiberg, 2018). The researcher also noted that learners tended to be very cooperative when they are being observed, to please the visitors.

#### 4.4 Perceptions of teachers and learners on factors of improving classroom management skills in teaching and learning of mathematics at secondary school level

**Table 4.5 Perceptions of teachers on factors of improving classroom management skills in teaching and learning of mathematics at secondary school level**

**Key: SA–Strongly Agree; A–Agree; U–Undecided; D–Disagree; SD – Strongly Disagree**

| <b>Technique to improve classroom management</b>       | <b>SA</b> | <b>A</b> | <b>D</b> | <b>SD</b> |
|--------------------------------------------------------|-----------|----------|----------|-----------|
| Ability to resolve conflicts (during discussions,      | 20        | 60       | 10       | 10        |
| Children should be known by names                      | 100       | 0        | 0        | 0         |
| Children should not be humiliated in class             | 100       | 0        | 0        | 0         |
| Teachers should vary voice control                     | 10        | 10       | 80       | 0         |
| Humorous temperament from the teacher is indispensable | 20        | 0        | 70       | 10        |
| Good behavior should be acknowledged                   | 100       | 0        | 0        | 0         |
| Learners should be given choices                       | 10        | 20       | 70       | 0         |
| Successful moments should be celebrated                | 20        | 70       | 10       | 0         |
| Enforce a free communication channel                   | 10        | 70       | 20       | 0         |

Data shown in Table 4.5 depicts that all the teachers (100%) submitted that factors to consider in ensuring effective classroom management include: knowing all the learners in class by name, desisting from humiliating learners in front of their peers and acknowledging good behaviour by the learners. Moreover, the table above shows that, though not strongly agreeing, the teachers agreed that: ability to resolve group conflicts (60%), celebrating successful moments together with learners (70%) and enforcing a clear and free communication chain (70%), are some of the factors to rope in when intending to manage mathematics classes without much difficulty. The teachers' contention that knowing learners by names, avoiding humiliating situations and acknowledging good behaviour by learners respectively conform to the ideas posited by Chitiyo et al. (2017), Wong et al. (2017) and Rockstroh (2018). This implies that teachers insisted that learners preferred to be called by name, learners do not stomach being humiliated in class, and learners expected teachers to celebrate moments of success with impartiality.

Despite commenting other factors that positively contribute to effective classroom management, the teachers disagreed, though not strongly that: varying voice control (80%) and giving choices to learners (70%) would contribute to learner control during mathematics lessons. These sentiments are however against assertions of Friedman (2016) and Toropova et al. (2019), who urged teachers to both vary their voices' pitch when emphasizing vital points and give learners choices when attempting mathematical problems. This implies that though the teachers did not feel that varying voice pitch was crucial to instructional approaches, earlier researches had indicated that it is vital.

From the interviews conducted with learners, it emerged that learners drew joy from: being called by names, being respected in front of their peers as well as being given the chances to be heard. This implies that the learners were of the opinion that teachers should call them by names, often directing a question to an individual. Again, the responses from the learners indicated that they hated humiliation in front of their peer group in spite of the intensity of the offence. The sentiments of the learners are aligned to the declarations of Hughes (2019) and Anderson and Kincaid (2015) who respectively encourage teachers to know their learners by name as well as to control their tempers to avoid confrontation with learners in front of others. To a greater extent, the other portion of learners expected the teachers to allow criticisms of their lesson delivery by opening all channels of communication, a finding akin to the sentiments of Crean and Johnson (2018) and Alzahran et al. (2017) who advocate for an opening channel in the class to ensure effective classroom management.

The observations made by the researcher indicated that there were countless cases of mutual understanding between teachers and learners as evidenced by: teachers calling their learners by names, teachers using professional ways of correcting mistakes, celebration of excellent performance as well as free communication. While most lessons observed appeared to be well rehearsed, the researcher noted that the majority of educators were doing their level best to create a conducive teaching and learning environment.

#### **4.5 Summary**

This chapter presented the findings of the researcher on statistical graphs such as pie charts, bar charts and frequency tables. The data was then analysed and interpreted in relation to research objectives. The findings, conclusions and recommendations are given in the next section, Chapter 5.

## **CHAPTER FIVE**

### **5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

Chapter five wraps up the study by outlining summary of the whole study, findings and conclusions as well as recommendations proposed basing on the study findings. The findings are given in line with the research objectives. The researcher made an effort to sync findings on each objective, using data from all the three instruments used.

#### **5.2 Summary of the study**

This study was carried out on five secondary and high schools in Jerera Cluster found in Zaka District. The main purpose of carrying out this study was to investigate the effects of classroom management on students' academic performance in mathematics at secondary school level. The study involved 60 participants, among them 10 teachers and 50 learners. The study was organized in five sections. Chapter one highlighted the general overview of the whole study. The general outline entailed a brief history of classroom management, the merits of the study to different groups of people, research questions and related objectives, assumptions, and research boundaries. Also highlighted in the first chapter was the conceptual analysis of key terms related to the study.

Chapter two examined the literature gathered from other renowned authors and websites with information related to the effects of classroom management on students' academic performance in mathematics at secondary school level. In this study, the researcher examined classroom management strategies that can be used in the teaching and learning of mathematics at secondary school, the impact of effective classroom management on the academic performance of mathematics learners at secondary school level and techniques that can be used to improve the classroom management by secondary school mathematics teachers. The literature consulted indicated that while classroom management was being done well in other institutions, mostly those in the developed world, there was need to correlate this literature with what obtained on the ground in the five sampled schools. This means that the researcher made an effort to establish differences and similarities between literature from earlier findings and the data gathered from this study.

The third chapter involved the methods and techniques which the researcher adopted to enable him to effectively gather evidence for the study. These include the research methodology and design, population and sample size, sampling techniques, and the nature of research tools that were used to gather data. The researcher adopted the post-modernism research paradigm, which highly recommended mixed-methods research. The researcher also used the descriptive survey research design in which questionnaires, interviews and non-participatory observations were used to gather data for the study. The merits and shortcomings of each of the research instruments used in this study were also highlighted in this chapter, together with the detailed procedure of collecting, presenting, analysing and interpreting the findings.

Chapter four mainly focused on how the gathered data was presented on various statistical tables to deduce meaning out of them. Mostly used statistical graphs include frequency distribution tables, pie charts, bar charts, as well as tally tables. Thereafter, the data was analysed and interpreted with reference to the study's research questions and objectives.

### **5.3 Findings from the study**

#### **5.3.1 Research Objective 1: Classroom management strategies that can be used in the teaching and learning of mathematics at secondary school level**

The perceptions of the respondents as regards the classroom management skills employed by teachers indicate that most of them called for: all learner inclusion in formulating classroom rules, maintaining consistency on classroom rules, using cooperative teaching and learning strategies, proper furniture arrangement, as well as closely monitoring classroom activities. The respondents also submitted that it was an uphill battle to equip secondary school classrooms with physical activities since there were shortages of space, insecurity as well as use of classes by close to a dozen teachers different daily. It means that secondary schools are unlike primary schools as the latter can be used by one teacher for the whole year.

#### **5.3.2 Research Objective 2: Impact of classroom management in the teaching and learning of mathematics at secondary school level**

The respondents acknowledged that effective classroom management yields numerous positive effects on learners' academic achievement. Some of the positive effects of effective classroom management include: high motivation for learners, conducive classroom climate, non-disruptive behaviour, maximum student engagement as well as punctuality. The

respondents did not however link effective classroom management to effective transition between classroom activities and inexistence of delinquent behaviour. The results obtained indicate that there was a very high correlation between effective classroom management skills and academic success. Academic success was seen to be a result of properly managed classrooms, especially with challenging subjects like mathematics.

### **5.1.3 Research Objective 3: Factors of improving classroom management skills in teaching and learning of mathematics at secondary school level**

As regards the factors to be considered in order to improve class management skills during teaching and learning of mathematics, it was established that teachers should: know learners by name, enforce an effective communication chain, show impartiality in resolving group conflicts, and not humiliate learners in front of their peers. Though not so significantly, the respondents also indicated the need for mathematics educators to: provoke humorous temperaments during lessons, give learners choices, vary voice control for emphasis and to celebrate with learners the successful moments they enjoy in class. Thus, the respondents indicated that the ability of the mathematics teacher to observe the above-mentioned factors would create a positive classroom environment that promotes effective acquisition of mathematics skills.

## **5.2 Conclusions**

Conclusively, it was noted that most notable classroom management strategies to use include: roping in the learners in formation and enforcement of classroom regulations, using cooperative teaching and learning approaches, and monitoring all the activities ensuing in the classroom. Again, it emerged that effective classroom management has the potential to ignite mathematics lessons through motivating learners, inducing maximum student engagement, enabling a positive classroom climate and thwarting existence of disruptive behaviour amidst mathematics lessons. Above all, it was established that factors to be greatly considered in managing mathematics classes incorporate: knowing learners by name, enforcing effective communication channels and desisting from humiliating learners in front of their peer group. The researcher did not encounter major problems in partaking of this study, save for limited time to partake of this study and the effects of the Covid-19 pandemic, which made it difficult to have face-to-face interaction with the research participants during data collection and the tutor for guidelines and way forward.

### **5.3 Recommendations**

- Mathematics teachers should continue doing researches on the best strategies to implement during mathematics lessons to improve learners' academic endeavors.
- Further research should be carried out to carry out a study of this nature with primary school learners as well as those at tertiary learning institutions.
- The responsible authorities at Curriculum Development and Technical Services department (CDTS) should help educators with literature on contemporary classroom management strategies as a way to boost motivation in mathematics lessons.

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## 7.0 APPENDICES

### APPENDIX A: Interview Guide for Learners

The researcher conducted face to face oral interviews with secondary school learners to ascertain their views on how their teachers managed mathematics classes.

#### Section A: Demographic Data

1. **Sex:**                Male [    ]                Female: [    ]
2. **Age:**                [    ]
3. **Form :**                [    ]

#### Section B: Research Items

4. Which of the following classroom strategies does your teacher use during your mathematics lessons? Does your teacher:

| Classroom management strategy                          | YES | NO |
|--------------------------------------------------------|-----|----|
| Involve all learners in class management plan?         |     |    |
| Formulate and maintain consistency on classroom rules? |     |    |
| Equip classrooms with adequate physical facilities?    |     |    |
| Set up cooperative learning strategies?                |     |    |
| Monitor classroom activities?                          |     |    |
| Proper sitting arrangement?                            |     |    |

#### Comments

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5. Which of the following are effects of effective classroom management experienced during your mathematics learning? Does classroom management lead to:

| Possible influence of effective classroom management | YES | NO |
|------------------------------------------------------|-----|----|
| Positive effect on your academic achievement?        |     |    |
| High motivation for you?                             |     |    |
| Positive classroom climate?                          |     |    |
| Non-disruptive behavior (chorus answers learners)?   |     |    |
| Maximum student engagement?                          |     |    |
| Effective transition between classroom activities?   |     |    |
| Punctuality and classroom organization?              |     |    |
| Inexistence of delinquent behavior?                  |     |    |

### Comments

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6. What do you think can be done to improve classroom management during the teaching and learning of mathematics in your class?

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## APPENDIX B: Observation Guide

The researcher used an observation guide to examine the ways teachers managed their mathematics classes.

1. Classroom presentation (floor, charts, media and arrangement of furniture/learners).

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2. Teacher – pupil relations.

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3. Learner – learner relations.

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4. Teaching and learning approaches used by mathematics teachers.

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5. Incidences of delinquent behavior among mathematics learners.

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6. Class control strategies used by mathematics teachers.

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7. Furniture arrangement during mathematics lessons.

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8. Teacher – pupil ratio during mathematics lessons

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## APPENDIX C: QUESTIONNAIRE FOR TEACHERS

### Section A: Introduction

My name is Muchingamidzwa Paul, and I am studying for a Bachelor of Science Education Degree at Bindura University of Science Education majoring in Mathematics. I am carrying out a study to ascertain the influence of classroom management strategies in the teaching and learning of Mathematics at secondary level. May you kindly fill in the questionnaire below to the best of your knowledge. Please feel free to do so, and be assured that your opinions shall be treated with the strictest confidentiality, and shall solely be used for educational purposes. Do not write your name on the questionnaire.

### Section B: Demographic Data

1. **Sex:** Male [    ] Female [    ]

2. **Age:** Below 20 Years [    ]  
Between 20 and 40 Years [    ]  
Between 40 and 50 Years [    ]  
Above 50 Years [    ]

### 3. Educational Qualifications

Certificate in Education [    ]  
Diploma in Education [    ]  
Degreed (With Education) [    ]  
Degreed (Without Education) [    ]

### 4. Working Experience

Less Than Five Years [    ]  
Between 5 and 10 Years [    ]  
Between 10 and 15 Years [    ]  
Above 15 Years [    ]

## Section B: Research Questions

5. Which of the following classroom strategies do you use during your mathematics lessons?

| Classroom management strategy                         | SA | A | U | D | SD |
|-------------------------------------------------------|----|---|---|---|----|
| Adequate planning and lesson preparation              |    |   |   |   |    |
| Involve all learners in class management plan         |    |   |   |   |    |
| Formulate and maintain consistency on classroom rules |    |   |   |   |    |
| Equip classrooms with adequate physical facilities    |    |   |   |   |    |
| Set up cooperative learning strategies                |    |   |   |   |    |
| Monitor classroom activities                          |    |   |   |   |    |
| Balance teaching and facilitation                     |    |   |   |   |    |
| Proper sitting arrangement                            |    |   |   |   |    |

**Key:** SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree

Other (specify)

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6. Which of the following are effects of effective classroom management you experience during your mathematics teaching?

| Possible influence of effective classroom management | SA | A | U | D | SD |
|------------------------------------------------------|----|---|---|---|----|
| Positive effect on students' academic achievement    |    |   |   |   |    |
| High motivation for learners                         |    |   |   |   |    |
| Positive classroom climate                           |    |   |   |   |    |
| Non-disruptive behavior (chorus answers learners)    |    |   |   |   |    |
| Maximum student engagement                           |    |   |   |   |    |
| Effective transition between classroom activities    |    |   |   |   |    |
| Punctuality and classroom organization               |    |   |   |   |    |
| Inexistence of delinquent behavior                   |    |   |   |   |    |

**Key: SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree**

Other (specify)

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7. What strategies can be used to improve classroom management skills during mathematics lessons?

| Technique to improve classroom management              | SA | A | U | D | SD |
|--------------------------------------------------------|----|---|---|---|----|
| Ability to resolve conflicts (during discussions,      |    |   |   |   |    |
| Children should be known by names                      |    |   |   |   |    |
| Children should not be humiliated in class             |    |   |   |   |    |
| Teachers should vary voice control                     |    |   |   |   |    |
| Humorous temperament from the teacher is indispensable |    |   |   |   |    |
| Good behavior should be acknowledged                   |    |   |   |   |    |
| Learners should be given choices                       |    |   |   |   |    |
| Successful moments should be celebrated                |    |   |   |   |    |
| Enforce a free communication channel                   |    |   |   |   |    |

**Key: SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree**

**Other (specify)**

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