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RESEARCH PROJECT

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TOPIC

**AN ASSESSMENT ON MANAGEMENT OF MIXED ABILITY CLASSES IN
TEACHING AND LEARNING OF PHYSICS AT ORDINARY LEVEL**

**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF SCIENCE
AND MATHEMATICS EDUCATION IN PARTIAL FULFILMENT OF THE
REQUIREMENTS OF THE BACHELOR OF SCIENCE EDUCATION IN PHYSICS
DEGREE**

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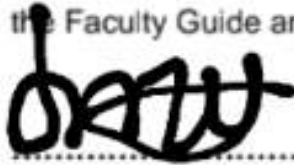
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AN INVESTIGATION INTO HOW TEACHERS MANAGE MIXED ABILITY CLASSES: A CASE STUDY OF TAFARA 2 HIGH SCHOOL IN HARARE.

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DEDICATION

This project is dedicated to the Almighty God for helping me get a higher education. I further extend my dedication to my Husband Clifford Toga and our children who supported and motivated me throughout its development. Their constant encouragement and belief in my abilities have been invaluable. May this project contribute in some small way to advancing their important work.

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ABSTRACT

The study, titled "An assessment on management of mixed ability classes in teaching and learning of physics at ordinary level examines the impact of mixed ability classes in two Murewa district secondary schools. It aims to assess how these methods affect student engagement and learning outcomes in physics. Through a qualitative multi case study, incorporating interviews, observations and focus group discussions. The research offers insight into the experiences of students and educators with mixed ability classes. The thematic analysis of data reviews that mixed ability learning promotes critical thinking.

Despite the benefits, the study identifies challenges such as insufficient teacher training and resistance to new teaching methods. To overcome this, it recommends development of interactive content, and community engagement. These strategies aims to create an inclusive and effective learning environment.

Literature reviewed showed that the management styles and teaching strategies and teaching qualification are the key to success of pupils in the teaching and learning process. Kuoni's theory of pro-active behaviour and Ganot's congruent communication were used. Leadership styles such as democratic, autocratic and laissez-faire styles were used as a theoretical framework to interpret the case study on how teachers manage mixed ability classes. The researcher discovered that the success of mixed ability classes is a task for the teachers and management styles and teaching strategies influence the performance of pupils in classes.

Contents

LIST OF TABLES	8
LIST OF FIGURES.....	9
ABBREVIATIONS	10
Chapter 1: INTRODUCTION	11
1.1 Introduction.....	11
1.2 BACKGROUND OF THE STUDY	11
1.3 STATEMENT OF THE PROBLEM	12
1.3.1 OBJECTIVES.....	12
1.4 RESEARCH QUESTIONS.....	13
1.4.1 AIMS.....	13
1.5 ASSUMPTION OF THE STUDY	13
1.6 SIGNIFICANCE OF THE STUDY	14
1.7 LIMITATIONS OF THE STUDY	14
1.8 DELIMITATION OF THE STUDY.....	14
1.9 DEFINATION OF KEY TERMS.....	15
1.10 ORGANISATION OF THE STUDY	15
SUMMARY	16
CHAPTER TWO: LITERATURE REVIEW	17
2.1: Introduction.....	17
2.2: THEORETICAL FRAMEWORK	17
2.2.1: WHAT IS IMPORTANT WHEN WORKING WITH MIXED ABILITY CLASSES?..	19
2.2.2 HOW TO ESTABLISH AN EFFECTIVE LESSON: TEACHING STRATEGIES	22
2.2.2 PROBLEMS OF TEACHING MIXED ABILITY CLASSES.....	23
2.3 ADVANTAGES OF TEACHING MIXED ABILITY CLASSES	24
2.4 SUMMARY	25
CHAPTER THREE: RESEARCH METHODOLOGY	26
3.1 INTRODUCTION.....	26
3.2 RESEARCH DESIGN	26
3.3 RESEARCH METHODOLOGY	27
3.4 Research Paradigm/Philosophy	27
3.4 DATA ANALYSIS PROCEDURE	30
3.5 POPULATION SAMPLING	30
3.6 DATA COLLECTION.....	30

3.7 QUESTIONNAIRE.....	30
3.8 INTERVIEWS.....	32
3.9 VALIDITY.....	34
3.11 SUMMARY.....	35
CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRITATION	36
4.1: INTRODUCTION.....	36
4.2 BIO DATA.....	36
4.2.1 Biodata for physics teachers.....	37
4.2.2 Biodata for physics learners.....	37
4.3: DATA PRESENTATION.....	39
4.3.1 Active participation in group activities fosters deeper learning and critical thinking.....	40
4.3.2: How teachers manage mixed ability classes?.....	41
4.3.3 Effects of pedagogical skills on classroom management.....	41
4.3.4: How teachers cope with fast and slow learners.....	44
4.3.5 Perception of observation from physics classes.....	45
4.4 CHALLENGES.....	46
4.5 DISSCUSSION.....	47
4.5.1 Research question 1.....	47
4.5.2 Research Question 2.....	48
4.6: SUMMARY.....	49
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	51
5.1 INTRODUCTION.....	51
CONCLUSION.....	52
5.3: RECOMMENDATIONS.....	55
REFERENCES.....	55
APPENDICES.....	56
APPENDIX A: QUESTIONNAIRE COVER LETTER.....	56
Appendix 2: Questionnaire to key staff.....	57
APPENDIX 3: Release Form.....	59

LIST OF TABLES

Table 1: biodata for Physics teachers	35
Table 2: Physics learners biodata for school A	36
Table 3: Physics learners biodata for school B	36
Table 4: how teachers manage mixed ability classes	38
Table 5: effects of pedagogical skills on classroom management	40
Table 6: methods used when dealing with fast and slow learners	42

LIST OF FIGURES

Figure 1: Management of mixed ability classes	39
Figure 2: pedagogical skills on classroom management	41

ABBREVIATIONS

n:	number
%:	percentage

Chapter 1: INTRODUCTION

1.1 Introduction

Among the many challenges facing teaching instructors today is the mixed-ability class. According to Chapman and King (2013), a mixed-ability classroom consists of a group of students with differing levels of learning abilities, interest, and skills. O level physics teachers have grown to identify this as one of the greatest aspects that invariably determines the level of teaching and understanding of what the students undergo in the long run. In support of this, Hedge (2020) noted that teaching a classroom of mixed-ability students is a vital and genuine issue that instructors experienced daily. He also went on to reckon that the mixed-ability problem demanded serious attention from experts in the educational field. While each learner has their own unique way of learning physics coupled with different linguistic knowledge and the individual pace of learning; there seems to be an overarching need for the instructor to apply methods that would engage all the students in the same measure. This is especially because a dilemma normally arises for the instructor on who to concentrate on. Should they concentrate on the advanced learners and neglect the weaker ones? The converse of this would also be disadvantageous to the advanced learners, since they will not be able to participate based on their true potential. Following this situation, this study attempts to explore the challenges of mixed-ability classes and strategies that are utilized by physics teachers to overcome these matters.

1.2 BACKGROUND OF THE STUDY

The aim of the research is to find out how teachers manage mixed ability classes in the teaching and learning of physics in secondary schools, because some would perform well and some performed below average in their prior examinations.

According to Ireson and Hallam (2017) a mixed ability class consists of learners having different strength and weakness and these pupils develop at different rates. All children are born with potential and we cannot be sure of the learning limits of any child. Educators can create an environment that maximizes the learning potential of all students. Differentiated instruction and tailored approaches can help students

progress at their own pace, challenging high achieving students and provide additional support to those who require it.(Robert Fishers (2014). McKeown (2020) believes that many teachers see a mixed ability class as consisting of a group of average and able children with a subset of children who have learning problems. A mixed ability class does not just consist of range of abilities but also a range of learning styles and preferences. All pupils will show strength at different times depending on the topic being studied and the learning style being used.

Zimbabwe is aiming at providing education for all; most schools enroll all pupils regardless of their weakness. This automatically calls for effective classroom management on the part of teachers. Therefore, teachers need to develop management techniques that cater for individual differences, which is the purpose of this research.

Cohen, Manion and Morrison (2019) carried out an extensive research on mixed ability classes and found out that lower ability groups are exposed to less and more simplified versions of curriculum whereas high ability groups have broader and more challenging materials covered.

1.3 STATEMENT OF THE PROBLEM

The high school dropout rate in our community has risen by 25 percent over the past two years, negatively impacting our future workforce. The objective of this multiple case study was to explore the issues identified by ten secondary science teachers in one urban public-school district as they were teaching classes which included students representing a wide range of abilities and prior academic success. Teachers working with mixed ability classroom encounter many problems like low student interaction and participation, different learning styles and different levels of proficiency on language. Teachers should recognize the strengths and weakness of each individual, control the and deliver the lesson plan effectively.

1.3.1 OBJECTIVES

1. To find problems that are being experienced by teachers as they teach mixed ability classes.

2. To establish the organizational and teaching competencies that teachers need in order to optimize mixed ability grouping.
3. To assess the impact of the pedagogical skills on classroom management.

1.4 RESEARCH QUESTIONS

1. How do teachers manage mixed ability classes in teaching and learning of physics at o level?
2. What other strategies can the teacher use to foster understanding?
3. How does the teaching method used assist pupils to understand the concepts?

1.4.1 AIMS

This study was intended to explore some of the issues that develop when schooldistricts attempt to bring rigorous science to all of their students, particularly when the students in the same classroom have various degrees of science skills and background experiences. Practicing classroom teachers should be able to find meaning in these cases to assist them with strategies in their own mixed-ability science classrooms. Administrators and professional developers within the school district under study should be able to use the results to plan professional development and other support systems for teachers, as well as consider the findings when making decisions for the science program. Additionally, seeks to investigate the strategies and approaches currently employed by teachers to address these challenges and assess their effectiveness in promoting equitable learning experiences for all students. Finally, it was intended that the results of this research should create new questions and expose new areas for future research. This was not a study to evaluate the program as right, or, wrong., but rather to use these cases to learn more about what is actually happening. Spurred by the new insights, further research should seek additional understanding of issues facing secondary science teachers in mixed-ability classrooms.

1.5 ASSUMPTION OF THE STUDY

- The assumption of the on management of mixed ability classes in O Level physics is that there is a need for effective strategies and approaches to address the diverse learning needs of students within these classes. It is assumed that the current management practices may not fully meet the needs

of all students, particularly those with lower proficiency levels, and there is a room for improvement in promoting equitable learning opportunities.

- The study assumes that teachers have the willingness and motivation to implement and adapt to new strategies in their classrooms to better manage mixed ability classes.
- O Level Physics curriculum and resources provide a foundation for teachers to implement effective management strategies in mixed ability classes.
- Student engagement and active participation play a crucial role in management in the learning process can contribute to positive learning outcomes.

1.6 SIGNIFICANCE OF THE STUDY

The significance of this study is to assess and analyses how teachers' efforts in the study of physics benefit students and how those efforts brought to fruition. The study is useful as it explores management styles employed by the teachers in mixed ability classes. It reviews the effect of these styles in classroom environment especially in a mixed ability class.

1.7 LIMITATIONS OF THE STUDY

The researcher is likely to face challenges like getting bias information from the respondents, were participants may provide socially desirable answers. The management of mixed ability classes can be influenced by various external factors beyond the control of the researchers, such as school policies, curriculum guidelines, or societal influence. The researcher may also have problems to get access to the pupils for interviews since their time tables are fully packed.

1.8 DELIMITATION OF THE STUDY

Delimitation of the study on how teachers manage mixed ability classes in teaching ordinary level physics could include the following, the study specifically focuses on the management of mixed ability classes in the context of O Level Physics education. It does not extend to other subjects or educational levels, as the dynamics and challenges of mixed ability classes may vary across different disciplines and educational context. time limitation: the study may focus on a specific time period. Sample size limitation: the study may have limited number of

participants. Geographical limitation: the study may focus on a specific school, rather than a global perspective.

1.9 DEFINITION OF KEY TERMS

MIXED ABILITY

According to Matthew Aydinli and Horne (2016) mixed ability or multilevel classes is the class where students with wide range of levels of competence in listening, reading, speaking and writing. Mixed ability refers to a group of pupils with varied abilities taught together. Waxler (2018).

CLASSROOM MANAGEMENT

Denovah and Cross (2018) define classroom management as the strategies used by teachers in organizing and managing classroom activities for the purpose of teaching and learning.

PEDAGOGY

Waxler (2018) defines pedagogy as the art of teaching, which involves the capability to convey knowledge and skills in ways that pupils can understand, remember and apply.

CASE STUDY

According to Hamilton, L. (2015) case study is often seen as a means of gathering together data and giving coherence and limit to what is being taught.

1.10 ORGANISATION OF THE STUDY

To effectively manage mixed ability class in teaching, it is essential to have a well-organized study plan. Begin by thoroughly understanding the O level physics curriculum and its learning outcomes. Break down the curriculum into specific topics, subtopics and concepts that need to be covered. This will help you have a clear roadmap of what needs to be taught. Identify the most important foundational concepts that student must grasp. Prioritize these concepts and plan to teach them early in the course. Sequencing the topics logically can help students build a solid foundation and facilitate their understanding of more complex concepts later on. Develop strategy of differentiate instruction based on student's abilities and

learning needs. Plan lessons in detail, including the learning objective, teaching method, resources and assessment strategies. Offer individual support to students who require extra assistance. Establish clear expectations and classroom rules to create positive and focused learning environment. Implement effective classroom management strategies such as reinforcement, active supervision and timely interventions to address behavioral issues. Remain flexible and willing to adapt your teaching strategies based on ongoing observation and assessment of student needs. Lastly, engage in continuous professional development to enhance knowledge and teaching skills in physical education.

SUMMARY

In simpler context, this research study proposes to assess and analyses how teachers manage teaching mixed ability classes in ordinary level physics. The study aims at identifying, analyzing and raising possible practical solutions on the teaching of physics.

CHAPTER TWO:LITERATURE REVIEW

2.1: Introduction

Mixed ability classes and teaching is a kind of education strategy where students can work together with teachers despite the differences in individual skills, personal interests, personalities and learning needs. Despite the fact that most classes are often multi-level, instructors, particularly the less experienced find giving instruction to such classes a very tasking job. The work of lesson planning for every student as determined by the different learning abilities and styles is quite challenging. The teaching styles have to correspond to the students' capabilities and learning styles, but the classes often have a great variation in these abilities. Nonetheless, non-homogeneous class can be looked at in a positive manner because it serves as trigger for instructors' professional growth and development. This is because it calls for the use of a variety of strategies, teaching styles, responsibilities and interaction patterns

2.2: THEORETICAL FRAMEWORK

Marriam (2019) sets a theoretical framework providing the researcher the lens to review the world. It explains the phenomena and maps this research study. Mixed-ability classes are groupings of students who have greatly varying capabilities, motivation for learning, experiences, interests, learning needs, learning styles, Language, cultural background among other characteristics (Baker 2012, p. 25). These classes are also multileveled hence pose varying degrees of challenge to the teacher based on how multileveled they are. It's pertinent to distinguish between the mixed ability classes and teaching because whereas the class could be mixed in terms of the student abilities, the teachers may not be employing mixed ability teaching styles. Common Challenges as a result of the differences in class include:

- Getting all the students to pay attention, learn and take part in class
- Avoid boring the fast learners (Tomlinson 2015, p. 262)
- Avoiding losing focus as younger students or slow learners can feel intimidated by stronger learners
- Planning different activities for the varied needs of the learners

Grouping may demean weaker students and may refuse to go to lower groups Ireson and Hallam (2019, p. 56) proposed that instructors needed to appreciate the different or varied abilities of the students because it is natural for children to develop at different rates. As a result, the student would prefer different things ranging from learning styles and how they present their work. All the students would demonstrate a range of abilities with strengths at different times of study sometimes based on the topic under study or the style of teaching being used (Ireson & Hallam 2019, p. 56). When students are taught with their preferred style of learning, they are likely to perform just as good. Regardless of the place or the type of school, the existence of mixed ability classes is inevitable. Each individual has unique characteristics and needs which are very different from the rest of the students in several aspects (Ireson & Hallam 2019, p. 57).

Gender, attitudes, intelligence, confidence, motivation, language development, ethnicity, age and culture play a very big role in determining the learning preferences of each student. Teachers should consider all the different factors and assess particular situations of different groups. The ultimate objective is to ensure that all the students make progress in academic performance (Tomlinson 2015, p. 262). This means, teachers have to make the most of this to take place and it entails monitoring and detecting differences among the students.

Baker (2012, p. 45) gives an argument that, teaching was not all about having children in class that is the challenge but that each of the required attention because of the different ability level. She further explains that keeping the student attentive to the lesson was very difficult in such classes. They can generally have poor motivation and can get frustrated because, the poor students may not be attended to because of time constraints (Baker 2012, p. 45). Additionally, the learning style may not match the teaching approach and the students may seem uncooperative and lose attention easily hence precipitating into commotion in the class.

Lesson planning and preparation of teaching material consume a lot of time for the different students. This could sometimes make the teachers feel inadequately prepared and not able to cope with the class as Hess (2019, p. 78)

identifies. Teaching a mixed ability class can be taught efficiently when the teacher appreciates that the whole class cannot be taught by controlling the class from the front. The students are well taught if they are permitted to learn as individuals (Hess 2019, p. 78).

However, this may fail when the teacher insists on teaching the students as a group of homogenous individuals or average students. It would be unrealistic to expect that students with different capabilities to learn through the lesson and curriculum at the same pace (Susan & Judith 2018, p. 5).

2.2.1: WHAT IS IMPORTANT WHEN WORKING WITH MIXED ABILITY CLASSES?

The advice on how to work with these classes is appropriate for students of all abilities (Kelly, 2012). It is important for teachers to create a relaxed, positive atmosphere in the classroom. (Ainslie, 2016), Wright (2015) supports this theory, and he also claims that there is a strong connection between a good classroom atmosphere and having a good behavior management. This will create a good learning situation. Teacher should assess students before planning a lesson, know student's strengths and weaknesses, interests and goals. Never punish an entire class for one student's behavior, set guidelines and stick to them.

TEACHER PUPIL RELATIONSHIP

In order to create a good environment, it is vital for the teacher to form a good relationship between him/herself and the students. Examples of how to do that are to learn the student names, as quickly as possible, as well as learn about their lives, what they like/ do not like, interests and difficulties (Hess, 2017)

ANXIETY

Anxiety can be a barrier, for some students can be afraid of making mistakes when they write or talk because of the fear of being laughed at. According to Lessow Hurley (2013) it is important for the teacher not to rely too much on correctness but to focus on communicative competence and create motivating situations with calm

and well coming environment were the students know that it is normal to make mistakes as it is a part of the learning process.

BEHAVIOUR

It is important to set certain rules with students about how to behave in order not to interfere with a good learning situation. A teacher should discuss proper rules for a good learning situation with the students and why the class needs to have them (Bowman, 2020).

ATMOSPHERE

A teacher should not just explain what they are going to do each lesson but also why it is important, what they are going to learn and how they are going to work, for example pair work, individual and so on. The teacher should begin each lesson by giving clear instruction to the whole class and end by addressing the whole class to get routines, both daily but also weekly. These routines, create a sense of stability and structure which is helpful to many weaker students (Bowman, 2020).

ASSESSMENT

For a teacher, assessment is very important just after each unit but on day to day level. This is important because it helps to see how the lesson went and how it can be improved next time by better instructions, group work etc. (Tomlinson, 2019)

DEVELOPING THE STUDENTS RESPONSIBILITY FOR LEARNING

It is important to let the students be part of assessment by letting them discuss in small groups with the teacher, for example how can assignment went, what could have been improved and so on. (Tomlinson, 2019). Brown (2012) and Supple (2021) both stress the importance of helping the students to learn different learning strategies so the students can develop their own study skills that work for them, since all students have their own ways of learning.

GIVING CLEAR INSTRUCTIONS

One of the most important ways to deal with mixed ability classes is to always give clear instructions, and information and manageable ways. This contributes to making the students feel it is more meaningful and interesting. The teacher should give the

students the information in the whole class, and showing an overhead or writing on the board (Kelly,2012)

When explaining something to the students, it is very useful to show concrete examples and illustrations. Using several methods to inform the students reinforces their understanding. After they have given clear instructions, it is advisable to give them time to think and discuss with their workmate and then ask questions. (Dornyei, 2014).

MOTIVATOIN AND DIFFERENTIATION

Green (2020) mentions the use of computer tasks to increase motivation, for example programs program where students can practice grammar, vocabulary but also use computers to write letters, emails and finding information and other exercises. Ainslie (2016) and wright (2015) also agree with the view that differentiation is important in mixed ability classes. One key to good differentiated classroom is to occasionally include the student in the choice of their topics and the media to work with.

GROUP WORK

Charles and Senter (2014:58) acknowledge that successful teachers should have "Systems for gaining student attention and clarifying expectations". Thus, lesson management and displine rely on group alerting to keep students focused in the classroom. At times the pupils can facilitate discussion which is an important element in managing a mixed ability class, however for this to be effective, the teacher needs to be well organized, able to communicate to pupils' expectations and implement lesson points with high participation format, Gootman (2018). Pairing up weaker and stronger students for activities will allow them to communicate and help each other.The stronger students will feel like they have more responsibility and weaker students will receive help. The research has shown that method of grouping students of the same ability/level together is actually detrimental to students as it just keeps them at the same level with little or no growth. By mixing students of varying abilities they are able to take an active role in their education, academic growth, and social/emotional growth.

2.2.2 HOW TO ESTABLISH AN EFFECTIVE LESSON: TEACHING STRATEGIES

Waxler (2016) proposed that the key to classroom management is keeping the students actively during the entire lesson. He suggested some management tips that would keep students actively involved in all classroom activities as outlined below.

COMPLIMENT POSSITIVE BEHAVIOR AND HARD WORK

When you see a student paying attention, work hard and doing what they are supposed to be doing to meet your goal, compliment them. Make sure that all students see you doing this, so they will understand why you are pleasing and in turn try to meet your objectives for the lesson in a positive way as well.

ALL WRITE

Waxler (2016) proposed that instead of having students raise their hands to respond to a question aloud, they may write down an answer to the teacher's question. He believes that this increase learner participation as well as quality students' response. This is an important aspect when teaching mixed ability classes.

DO NOW

Waxler (2016) also noted that effective classroom management starts students enter the class. Accordingly, "do now" is a short assignment that the students are to complete as soon as they enter the classroom. This gives student work to do right away. This is important in understanding how teachers manage under resourced mixed ability classes.

CLASSROOM MANAGEMENT STYLE

There are styles that a teacher can employ in the classroom. This includes the automatic, and laissez fair management.

THE AUTOCRATIC MANAGEMENT STYLES

In this style the teacher forces his/her will on students in order to control the class. Usually authoritarian teachers use sharp and unfriendly tone of voice, criticizing words including severe punishment, Hanson (2013). Thus, this style never recognize student's input. They rely on their own experience, knowledge and understanding. The disadvantage is that it promotes demotivation and laziness due to lack of student participation, Schneider (2016).

THE LAISSERZ-FAIR STYLE

It also called child centered style Teachers display little behavior and control pupils and demand little from them. Teacher promotes freedom to learners. According to Kruger and Van Schalkwyk (2017), this style promotes misbehavior in the classroom. This style however, lacks management and control of learners in the classroom by the teacher. This style has negative effects in a mixed ability class because learners are left alone without any guardian and motivation. This style can also lead to low performance, confusion, frustration and disorder in the classroom, Robbins (2019). It is also only an advantage to serious and fast learners. For example, when doing science experiment, the first thing that teacher do is to show the students how to properly use the materials

2.2.2 PROBLEMS OF TEACHING MIXED ABILITY CLASSES

Student differs in their competency, motivation for learning needs, interest, styles of learning and experiences. Students have different needs and learning styles. There are learners who are bright and can comprehend easily, learners who can hardly understand basic information and learners who fall somewhere in between these two extremes. (Reyes and Rodriguez, 2015). In a classroom the teacher can find students who are motivated an essential factor in language acquisition as well as others who do not have interest for learning a new language (Simanova, 2020)

Students differ in language proficiency and they even differ in their attitudes towards learning a language and they differ in self –discipline (Valentine, 2015) Moreover, Gordon (2015) defines mixed ability classes as a descriptor used to describe students who are in the same grade and have similar background, but they differ in their abilities in the subject area.

It is quite difficult for teachers to know about each student, to follow what each one does during lessons. So, the teacher has to monitor each and every student and to reach their needs in a variety of ways to achieve effective teaching, Lewis (2018). Since foreign language is used in many of the subjects, some students find it difficult to in the target language for many reasons ranging from interest to confidence, from age to knowledge.

Mixed ability teaching makes greater demands than traditional forms of teaching because teachers need to ensure that they cater for the full ability range through individualized teaching. Teachers have to complete a great deal of preparation, obtain a range of materials and develop assignments which match pupils and are also motivating. Teachers spent most of their time managing pupils' activities and responding to pupils demands rather than teaching. It also has a negative impact on high ability pupils' level of motivation and achievement because teachers spent most of their time working with individual; the majority of the class is often poorly supervised.

Baker (2022) argues that it is not just the fact that there are many students in a class, but that all of them are at so many different ability levels that provide the biggest challenge. She further claims that in mixed ability classes it can be difficult to keep the attention of all students. Their motivation can be poor and the teacher can feel frustrated because he/she does not have enough time to help the weaker students.

2.3 ADVANTAGES OF TEACHING MIXED ABILITY CLASSES

Mixed ability classes allow the opportunity to accept, discuss and listen to others' diverse perspectives, (Marriam, 2019). Mixed ability classes are useful for topic introduction, general direction, read-aloud, closure and team building Lewis (2018)

Hooper (2013) found advantages on increase in self –esteem and an improvement in the student's attitude towards school work, Towns, Kreke and fields (2012) found that mixed ability groups enhanced achievement by requiring students to participate and become more active in their learning.

Poole (2018) showed that low ability students can develop and improve skills from simply observing and interacting with high ability students. Poole (2018) also found that low ability students will frequently feel more comfortable asking their peers for help with challenging materials, than they would asking their instructor. The clarification of implicated topics provided by high –ability students has the potential to build confidence in low ability students, Heath, (2019) (Saler and De Jong, 2015).

The increased confidence in low ability students stemming from understanding material through a peer's perspectives for analytic thought.

2.4 SUMMARY

This chapter has provided a discussion and theoretical framework and literature relating to classroom management in a mixed ability class. Theories supporting the management style have been also included together with the advantages and problems of mixed ability classes.

In addition to the above-mentioned challenges students have their own way of learning, and the weaker ones probably have more difficulties working in a noisy atmosphere since they have usually distracted more easily (Kelly, 2022). A mixed ability class can be uncooperative, the students can get bored easily and this can cause commotion in the classroom. Planning the lesson and making work-material can take too much time for the teacher and the planned material is often too easy or too difficult for the students. This may make the teacher feel inadequate and unable to cope with the class (Hess, 2017). A huge problem that we must not forget, according to Bowman (2020), is the teacher's unawareness of the need for a new approach to deal with the mixed-ability class.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter justifies the methodology of the study. It includes the method used to collect data, participants and the data analysis procedure. It describes the research design, paradigm, methods of data collection and analysis employed to address the research questions. The chapter outlines research methods, population and sampling, reliability and validity considerations, ethical issues, and a summary of the chapter. Let us explore the various components of our research design

3.2 RESEARCH DESIGN

Research design is defined by smith (2015) as the plan and structure of the investigation used to obtain evidence to answer research questions. This is merely an operational framework within which facts are placed so that their meaning can be seen Kumar et al (2020) defines a research design as a blue print used to guide a research study towards achieving its set objectives. The qualitative approach is appropriate in social research since it can be done in a natural setting and the information is directly obtained from the participants through surveys, interviews and questionnaires (Creswell, 2016). The survey enabled relevant information to be collected from the respondents through the use of structured questionnaires and interviews. The qualitative approach can unearth deep issues thereby making voices to be heard (Creswell, 2016). Through the use of a survey, the researcher was able to explore the factors that affect the management of mixed ability classes in the teaching and learning of physics at the ordinary level (McMillan and Schumacher, 2015).

A descriptive survey research design was used to obtain an accurate portrayal of the current practices, perceived benefits and challenges as well as effective integration

strategies regarding ICT use in physics teaching and learning (Maree, 2016). A descriptive survey design allows qualitative data collection to address the research questions effectively. The descriptive survey design allowed for a comprehensive understanding of the phenomena under investigation

3.3 RESEARCH METHODOLOGY

Hair et al (2022) defines descriptive research as research that uses a set of scientific methods and procedures to collect data structures that are used to identify, determine and describe the existing characteristics of a target population. The researcher used it to collect opinions, views and perceptions from the treasury dealers with an urban school in Zimbabwe. A descriptive survey allows qualitative data collection to address the research questions effectively. The descriptive survey allowed for a comprehensive understanding of the phenomena under investigation

3.4 Research Paradigm/Philosophy

Philosophy view on ontology, epistemology and axiology help to study in depth the meaning of assessment in physics learning. Ontology addresses the existence, being and relationship of entities in the physics world. Epistemology addresses source of knowledge and how students understand physics concepts, while axiology addresses values and ethics in physics teaching, learning and assessment. These concepts summarize the philosophical foundations that shape the practice of physics education, opening the door to a deeper understanding of the nature of knowledge, the learning process and the development of student character. Through an understanding of ontology, epistemology and axiology in physics education, an inclusive, meaningful learning environment can be achieved and students can be shaped as lifelong learners.

An interpretive research paradigm guided this study with the view that knowledge is socially constructed through peoples subjective meaning and experience (Collis & Hussey, 2015). Interpretivism emphasizes understanding the social reality and subjective meanings constructed by individuals

Ontology: An ontological approach to education opens up space to explore the various philosophical issues that underlie educational policy and practice. Ontology provides a philosophical basis for understanding whether education is considered as a means to achieve certain goals or as a process of empowering individuals to reach their potential (Hardanti, 2020). In this context, ontology also reflects perspectives on the fundamental values that should be included in the educational experience. Therefore, educational ontology provides a solid basis for discussing the philosophical differences and values that shape worldviews in education. The ontology of assessment in physics education involves understanding the nature of assessment activities in the field of physics learning (Panjaitan, 2023). This includes philosophical concepts that determine the purpose of physics assessments, the extent to which assessments reflect students' deep understanding of physics concepts, scientific thinking skills, and practical applications in the context of everyday life.

In practice, the ontology of assessment in physics education can include both formative and summative approaches. Formative approaches focus on continuous feedback to improve students' understanding during the learning process, while summative approaches evaluate students' final achievement. This ontology may also include consideration of how assessment can stimulate thinking.

Epistemology: the epistemology in physics forms the basis of understanding of how students understand and utilise physics concepts (Panjaitan, 2023). A fundamental question involves the source of physics knowledge whether that knowledge comes from direct experience in the laboratory, interaction with teaching materials, or theoretical concepts provided through instruction. The epistemology of physics education also includes the relationship between teaching methods and students' understanding of physics concepts. This view questions how various teaching methods, such as experiments, discussions, or simulations, affect the way students conceptualize and integrate physics knowledge (Murdani, 2020). The epistemology of physics education explores the role of experience in the formation of students' knowledge. This includes whether hands-on experiences, such as lab experiments or field trips, are more effective in conveying physics concepts than theoretical experiences.

The epistemology of physics education addresses the difficulty attribute of a physics concept and how the learning context affect student understanding. The difficulty attribute provides an understanding of the complexity of a material and the challenges students face in understanding it. The epistemology of physics education can also shape curriculum development. By understanding how students acquire physics knowledge, curricula can be designed to facilitate the development of a deeper and more contextualized understanding.

Epistemology in physics education brings philosophical thinking about the source and nature of knowledge into the context of physics learning. It helps detail how students can effectively understand the world of physics and how physics education can be designed to facilitate this understanding. Zamron, M. (2020)

AXIOLOGY: The axiology in physics education refers to the consideration of ethical values and principles that guide the assessment process in the context of physics learning (Panjaitan, 2023). The application of these ethical values has major impact on the way assessment is conducted, providing guidelines of educators to make ethical decision and provide constructive feedback to students.

Educators should consider the diversity of students, both in terms of their learning styles and backgrounds. Assessment should avoid bias and provide equal opportunities for all students to demonstrate their understanding of physics concepts. This approach helps create an inclusive educational environment and support every student to reach their potential. The values in the axiology of assessment highlight the importance of constructive feedback and motivation in physics education. Assessment is not just about giving grades or scores, but also providing meaningful feedback to students. Feedback should help students understand their strengths and weaknesses in understanding physics concepts and provide direction for further improvement. This approach ensures that assessment is not only an evaluative tool, but also a source of inspiration for students' development as continuous learners.

3.4 DATA ANALYSIS PROCEDURE

This involves the cyclical process of data reduction, data display and further data reduction using factor analysis. The process involves several levels of data coding. Qualitative data will be descriptions arising from themes derived from research objectives. The tables analysing collected data were prepared.

3.5 POPULATION SAMPLING

This is a process of selecting a relatively small number of elements from a larger defined group of elements so that the smaller group allows one to make judgments about the larger group of elements (Hair et al 2022). However, in this study Ten form four teachers were used as the sample. The ten teachers were selected using the purposive sampling enables the researcher to research data intensively, (Platton 2012) the population was a sizeable number such that the researcher examined the whole population. Population is defined as the entire group of individuals having common observable characteristics (Creswell, 2019).

3.6 DATA COLLECTION RESEARCH INSTRUMENTS

The research instruments used in this study were interviews, questionnaires. The questionnaires were distributed to the students and the interviews were conducted with the teachers. The researcher used questionnaires and interviews as instruments for data collection. The questionnaires were distributed to the ordinary-level students and the interviews were conducted with teachers of these chosen students. Similar responses were grouped into categories. The identification of themes provided depth to the insights about understanding the individual views of the students and their teachers. Similar codes were aggregated together to form a major idea from the data (Creswell, 2020).

3.7 QUESTIONNAIRE

Hair et al (2022) defines questionnaires as a set of questions and scales designed to generate enough raw data for accomplishing the information requirements that underlie the research objectives. The researcher also chose this method because of its versatility-that is almost every problem of field-research can be approached from

the questionnaire stand point. This method was chosen mainly because of its quick turnaround time, high response rates and minimal interviewer influence on the answers. However, the major setback of questionnaires is that the respondent may fail to understand the question and as such may answer the question inappropriately. There is also a possibility that the respondent may deliberately put wrong answers just to do away with the questioner. The questionnaires will be designed to gather both closed-ended and open-ended responses, allowing for qualitative insights. These involve the preparation of a final list of questions with spaces provided for responses. Questionnaires were prepared and given to respondents to complete. time (Kothari, 2014). The researcher used the questionnaire method of data collection because of its advantages:

ADVANTAGES OF QUESTIONNAIRES

There are several advantages that researchers may consider while selecting a questionnaire as their preferred data collection tool. A questionnaire is easy to conduct and surely, large amounts of information can be obtained from a large number of respondents. Questionnaires are also cost-effective when the researchers aim to target a large population. Broad Carrying out research with questionnaires is less time consuming and respondents can fill in questionnaires at a convenient time as well. Better information could be obtained. The respondents had enough time to consider their answers and could consult each other in certain instances. The questionnaire method places less pressure on the subject or respondent for immediate responses. The different responses given or filled in will still need to be used for future references.

Marian, S (2019)

DISADVANTAGES OF QUESTIONNAIRES

Questionnaires are relatively easy to design, but good questionnaires represent a significant investment in time and expertise to prepare. Questionnaires can take considerable time to distribute, process, analyze, and report. Questionnaires are not as flexible as interviews or focus groups. The latter permit the exploration of unanticipated issues whereas questionnaires usually only provide information directly related to the specific questions included in them. Many people are reluctant to respond to questionnaires and response rates of forty percent or lower are not

unusual. clarification for ambiguous questions. Many experts argue that questionnaires are inadequate to understand human behavior, attitude, feelings. Likewise, a questionnaire may sometimes be too cluttered too long. Questionnaires are more rigid than interviewers. Unless the researcher leaves a space for the interviewee to write the answer, the respondent can only select from the range of answers the researcher has provided (the open university 2023). Likewise, inadequate motivation to respond is a problem. Unattractive style and format of questionnaires may put some respondents off. According to NBRI (2022) poorly designed questionnaires usually do not take into consideration the needs of people with physical and mental limitations or people who are from diverse backgrounds and cultures.

3.8 INTERVIEWS

Interviews involve face-to-face situations or telephone contacts in which the researcher orally solicits responses. Personal interviews involve face-to-face communication with the informant. The researcher again used this method of primary data collection because of the following advantages:

ADVANTAGES OF INTERVIEWS

Interviews have several advantages as a qualitative research method. First, they allow to gain rich and detailed data from the participant own words and expressions, which can reveal their feelings, motivations, and meanings. Allows the researcher to obtain original and unique data directly from a source based on the study requirements. Structured interviews can reach a large section of the target population. Baker, P (2022). Allows samples to be controlled. Easy to carry out and obtain reliable results quickly. Provide better response than mailed questionnaires. Offers flexibility to use different techniques to get the desired information. Provides non-verbal clues or body language of the interviewee. In personal face-to-face interviews, questions can be modified to obtain the required information. It was more flexible in that respondents were within the organization and could be reached and interviewed without incurring any other expenses. Reframing and rephrasing of questions that appear to be vague was also possible where it was necessary to do so. They allow more detailed questions to be asked. They usually achieve a high

response rate respondents' own words are recorded ambiguities can be clarified and incomplete answers followed up precise wording can be tailored to respondent and precise meaning of questions clarified (for example for students with English as a Second Language) interviewees are not influenced by others in the group some interviewees may be less self-conscious in a one-to-one situation.

MAIN PROBLEMS OF INTERVIEWS

1. Quick to judge

Interviews are frequently used to learn more about candidates and their skills, but it takes a lot of time. Decisions are frequently taken in the first few minutes of the interview itself, and the remaining time is usually utilized to confirm or justify the original decision. This approach is not ineffective, but it may also be more difficult to evaluate candidates during interviews. Susan, S (2017)

2. Developing stereotypes

An interviewer will make assumptions about a candidate's skills, aptitude, and personality based on how they respond to questions.

3. Challenging to verify the truth

It is a fantastic technique to learn in-depth details about a company. It's essential to keep in mind that not all of what is mentioned during an interview will be actually correct or true. Several times, the statements are completely wrong.

4. Unpredicted result

Although interviews are not as accurate as exams, they can still be useful in some situations. For example, while interviewing a new employee, you learn more about how the person and how he or she will interact with others at work. If an interviewer has to lack predictive ability, then they cannot be able to predict how a candidate's abilities will convert into professional success.

5. Disappointed

Applicants may be disappointed when the interviewer asks questions that are not related to the field. Because of this, a talented applicant might be rejected.

6. Expensive.

They can be very time-consuming: setting up, interviewing, transcribing, analyzing, feedback, reporting, they can be costly, different interviewers may understand and transcribe interviews in different ways.

3.9 VALIDITY

Questions were based on information gathered during the literature review to ensure that they were representative of what students should know about physics. Content validity was further ensured by consistency in administering the questionnaires. All questionnaires were distributed to subjects by the researcher personally. The questions were formulated in simple language for clarity and ease of understanding. Clear instructions were given and the researcher completed the questionnaires for those who could not read. All the questions were completed in the presence of the researcher. This was done to prevent students giving questionnaires to other people to complete on their behalf. As a result, more questions were added to ensure higher representativeness. (Burns & Grove 1993:373).

3.10 OBSERVATIONS

Observation is the process of checking a situation of interest and recording the results observed.

ADVANTAGES OF OBSERVATIONS

- Information observed is original and the researcher could analyse it in the way he desired.
- This method does not rely on the willingness and ability of respondents to report accurately as in the case of interviews.
- The researcher could ask questions for clarification were necessary.

DISADVANTAGES OF PARTICIPANT OBSERVATION

- **Time Consuming**

Participant Observation is often time-consuming for an analyst. It may require resources, such as technical experts, who are not available.

- **Observer Cannot Always be Present**

There are times when the analyst cannot be present because he or she does not know where and when an incident will occur. Sometimes the analyst may be able to determine when an incident will occur but his or her presence may interfere with the incident. Chapman, C (2020)

- **Observation can affect behaviour**

Being observed can alter a participant's work behaviour. A participant who feels his or her performance is being evaluated may change usual work habits to conform to what he or she believes is more acceptable behaviour

The researcher used both participatory and non-participatory observation. Under participatory observation the researcher could also do the work therefore getting more insight into the activities being carried out. Browers, A (2020)

3.11 SUMMARY

The above is an explanation of the research methodology used in the study that is research design, research population and research instruments, data collection methods and instruments. They have necessitated the analysis and presentation of the research findings, which will be the main focus of the next chapter.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRITATION

4.1: INTRODUCTION

In this chapter, research findings obtained through interviews were presented and analysed. It drew on data from interviews with teachers, classroom observation and focus group discussion with physics learners. The study analysed this data to identify key themes. Findings on benefits of integration of blended learning methods, its challenges as well as possible solutions

4.2 BIO DATA

Conducting diagnostic tests at the start of the academic year can provide valuable data on students' prior knowledge and skill level in physics, this helps teachers identify students' strength, weakness and misconceptions which is crucial for tailoring instructional strategies. Data driven analysis of students can inform the development of scaffolded resources and support systems. Teachers can create levelled worksheets, tutorials, or online materials that cater for students with varying levels of understanding in physics concepts and problem-solving skills. Grouping data can be used to facilitate peer assisted learning, where students with stronger abilities can support and mentor their peers this can benefit both the high performing and the struggling students in the mixed ability class. Frequent formative

assessment and data analysis can help teachers monitor student progress and provide timely feedback. Lastly, teachers can share best practices, discussing data driven insight, and receive support to enhance their skills in managing mixed ability classes in physics. Biodata for O level physics teachers and students were presented.

4.2.1 Biodata for physics teachers

Ten physics teachers participated in the study. Two schools were used one from urban and the other from rural school. Six teachers were male and four were female. All the teachers were holders of bachelor of science degree. Table below summarise biodata for the teachers. 5 teachers are from school A and another 5 from school B.

Table 1: biodata for physics teachers

SCHOOL	Participant	Code	Age	Gender	Teaching experience (Years)
A	Teacher 1	T1	25	Female	4
		T2	27	female	7
		T3	25	Male	3
		T4	30	Male	6
		T5	37	Male	10
B		T6	42	female	15
		T7	51	Male	25
		T8	48	Male	17
		T9	39	female	9
		T10	29	Male	8

4.2.2 Biodata for physics learners.

The learners who participated in this study were doing physics at ordinary level. 12 form 4 and 8 form 3 giving a total of 20. Learners were selected from the two schools. School A is a day school in peri- urban and school B is also a day school in

rural area. Participants were both female and male. Participants were between the ages 16 and 18. The tables 4.3 and 4.4 below summarises the biodata for learners from both schools. Codes are used instead of real names for ethical considerations. Learners were coded as A1 A2 etc for school A and B1 B2 etc for school B

Table 2: physics learners Biodata for school A

School	Participant	Code	Age	Gender	Class
A	1	A1	15	Female	F3
	2	A2	15	Female	F3
	3	A3	17	Male	F4
	4	A4	16	Male	F3
	5	A5	18	Female	F4
	6	A6	18	Male	F4
	7	A7	17	Male	F4
	8	A8	18	Female	F4
	9	A9	18	Female	F4
	10	A10	17	Male	F3

Table 3: Physics learners Biodata for school B

School	Participant	Code	Age	Gender	Class
B	1	B1	18	Female	F4
	2	B2	16	Female	F3
	3	B3	15	Male	F3
	4	B4	17	Male	F4
	5	B5	15	Male	F3

	6	B6	15	Female	F3
	7	B7	16	Male	F3
	8	B8	18	Female	F4
	9	B9	17	Female	F4
	10	B10	15	Male	F3

The responses indicated that there is increase in student engagement as attributed to the interactive and diverse content provided by these methods, which seems to cater to different learning styles and preferences. They have observed that group discussion, with its interactive and diverse content, has led to more engaged students.

The responses from four teachers showed that 40% of them manage their classes using group work. Group work makes learning enjoyable, students analyse information, evaluate ideas and develop well supported arguments, fostering critical thinking. Students learn to articulate thoughts, listen to peers, and respond effectively, developing essential communication skills. Group discussion simulates scientific research teams, teaching students to work together towards a common goal. It brings together students with different backgrounds, experiences and ideas, enriching learning environment. It brings confidence and self-esteem, and prepare students to engage in respectful and evident based discussion. However, some students may dominate the discussion, leaving others with limited opportunities to participate. Group discussion can lead to conflict, potentially create a negative learning environment. It can also be challenging assessing individual students' understanding and learning. According to Sibert (2005) group work is a great teaching strategy to use in class as it enables pupils to participate actively and to gain confidence. Group work is essential as it enables pupils in mixed ability to share ideas.

4.3: DATA PRESENTATION

Data was collected through interviews which were done to ten teachers at a secondary school in rural area and urban.

4.3.1 Active participation in group activities fosters deeper learning and critical thinking.

Group activities during lesson especially using group work by the teachers in both schools was observed to be fostering deeper learning and critical thinking. It is observed that group discussion offers a rich environment for active learning where students can engage with the material and each other in various ways. This continuous engagement, according to teachers' observations was said to have led to more profound learning outcomes and a better grasp of physics concepts. Positive teacher learner and peer interaction during the use of discussion platforms can facilitate more frequent and diverse interactions, contributing to a supportive learning

The responses from teachers showed that 40% of them manage their classes using group work. Group work makes learning enjoyable, students analyse information, evaluate ideas and develop well supported arguments, fostering critical thinking. Students learn to articulate thoughts, listen to peers, and respond effectively, developing essential communication skills. Group discussion simulates scientific research teams, teaching students to work together towards a common goal. It brings together students with different backgrounds, experiences and ideas, enriching learning environment. It brings confidence and self-esteem, and prepare students to engage in respectful and evidence based discussion. However, some students may dominate the discussion, leaving others with limited opportunities to participate. Group discussion can lead to conflict, potentially create a negative learning environment. It can also be challenging assessing individual students' understanding and learning. According to Sibert (2005) group work is a great teaching strategy to use in class as it enables pupils to participate actively and to gain confidence. Group work is essential as it enables pupils in mixed ability to share ideas.

10% of the teachers noted that they use the do now method and the all write method. Waxler (2006) proposed that instead of pupil raising up their hands they may write down the answers to the teacher's question. He believes that this increase learner participation as well as quality pupil response. Do now work also known as warm up or starter activity grabs students' attention, engaging them from the start of the lesson. It establishes a productive and focused classroom environment. Do now

work often reviews previous material, reinforcing students' understanding, encourages students to think critically and develop problem solving strategies. It helps teacher to take attendance, distribute materials, and organize the classroom while students work.

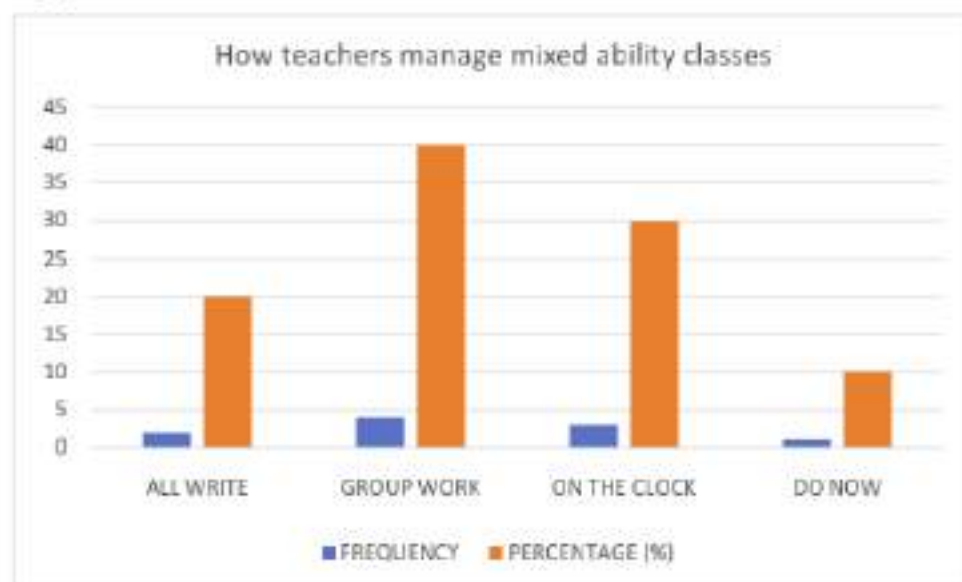
4.3.2: How teachers manage mixed ability classes?

The table below shows the different ways in which different teachers try to manage mixed ability classes they teach.

TABLE 4: How teachers manage mixed ability classes?

RESPONSE CATEGORY	FREQUENCY	PERCENTAGE (%)
ALL WRITE	2	20
GROUP WORK	4	40
ON THE CLOCK	3	30
DO NOW	1	10
TOTAL	10	100

Figure 1



4.3.3 Effects of pedagogical skills on classroom management

The table below provides information on the effects of pedagogical skills on classroom management.

The table above reviews that 20% of the participants use the Autocratic management style, autocratic management refers to a leadership style where the teacher has complete control and authority over the classroom. The teacher makes all the decisions, and enforces them without seeking input or feedback from students. Autocratic teaching provides clear instructions and direction, which can be beneficial for students who require structure and guidance in understanding complex physics concepts. It maintains classroom discipline, creates a focused learning environment with minimum disruptions. However, an autocratic approach has limitations such as limited student engagement and participation, reduced creativity and critical thinking.

40% use the democratic management style where students are involved in decision-making processes, such as setting learning goals and choosing topics. Students are encouraged to ask questions, share ideas, and engage in discussions. Students work in groups, share resources and learn from each other. The teacher acts as the facilitator or coach, rather than an authority figure. Students are encouraged to think critically, analyse problems, and develop solutions. By adopting a democratic management approach, teachers can create a dynamic and engaging learning environment that fosters a deeper understanding of O level physics concepts and promotes students' overall academic and personal growth.

40% use laissez-faire style, where teachers take a hands-off or minimalist approach, giving students a high degree of autonomy and freedom to learn at their own pace and direction. The teacher rarely intervenes or provides guidance, allowing students to work independently. Students take full responsibility for their learning, setting their own goals and pace. However, it can also lead to confusion, and lack of direction, resulting in unequal learning opportunities. Laissez-faire is most effective with highly motivated and self-disciplined students who can take full advantage of the autonomy and freedom offered. However, it may not be suitable for all students, particularly those who require more guidance and support.

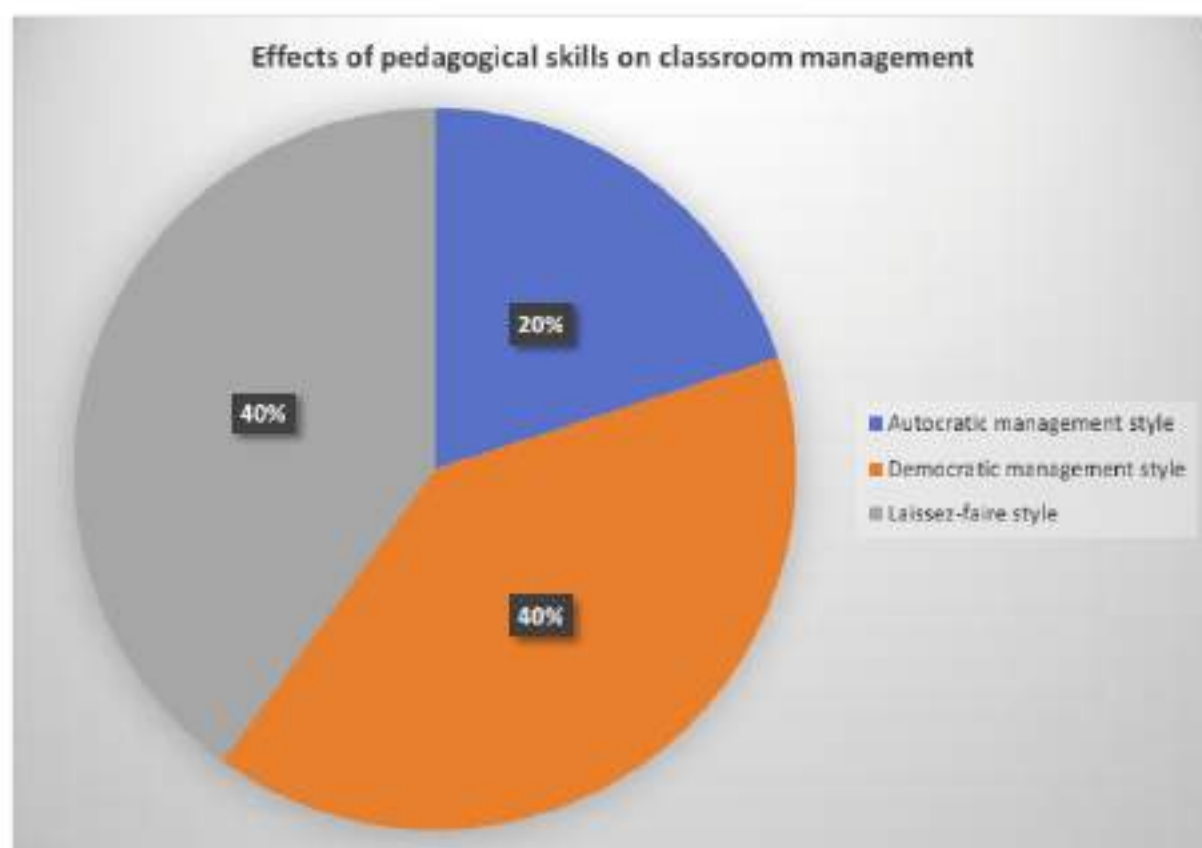
Participants showed pedagogical skills in different ways and views. Trained and qualified teachers with management skills showed ability to manage their classes using the democratic management style. Pedagogical skills are necessary for effective classroom management. Nakamura (2000) states that teachers without

pedagogical skills seem to brush through without definite teaching style and almost lecturing to the pupils. Thus, pedagogy is a key element for effective classroom management in a mixed ability class.

TABLE 5: Effects of pedagogical skills on classroom management n=10

Response category	Frequency	Percentage (%)
Autocratic management style	2	20
Democratic management style	4	40
Laissez-faire style	4	40
Total	10	100

Figure 2



4.3.4: How teachers cope with fast and slow learners

The response from the teachers showed that 70% gave extension work to the pupils and only 30% gave remedial work. This automatically means teachers concentrate less on the slow learners. Charles and Senter (2004) suggest that pupils have different ways of learning and they learn and progress at different ways and different speed, so teachers should be aware of pupils' differences so as to organize and arrange activities accordingly.

Remedial work is an important component in teaching and learning of physics, as it helps address the specific needs of students who are struggling with the subject. 3 teachers suggested that remedial is important because if students have missed or misunderstood fundamental concepts, it can lead to struggles throughout the course. Remedial work allows teachers to identify and fill these learning gaps, ensuring that students have a solid foundation before moving on to more advanced topics. It also provides opportunity for individualised attention and support. Students who require extra help can receive targeted instruction.

Seven teachers used extension work method and suggested that extension work challenges students to apply concepts in new context, deepening their understanding and promoting critical thinking. It encourages students to tackle complex problems, developing their ability to analyse, synthesise and evaluate information. Extension work simulates real world scenarios, preparing students to apply physics principles in practical situations, promote self-directed learning, developing essential skills for lifelong learning. Extension work prepares students for physics competition, and advanced assessment, provides a sense of accomplishment, boosting students' confidence and motivation to learn. By incorporating extension work into physics teaching and learning, educators can create a challenging and engaging environment that fosters academic excellence and prepares students for future success.

**TABLE 6: Methods used by teachers on dealing with fast and slow learners
n=10**

Response category	Frequency	Percentage (%)
Remedial work	3	30
Extension work	7	70
Total	10	100

This table above shows the responds from the teachers on different methods they use to cope with the slow and fast learners

ADVANTAGES OF TEACHING MIXED ABILITY CLASSES

Mixed ability classes promote an inclusive learning environment where students of varying abilities learn together, fostering a sense of community and belonging. Teachers can tailor instructions to meet the diverse needs of students, challenging advanced learners and supporting struggling students. Students learn from one another, with more able students supporting and mentoring peers. Mixed ability classes mirror real world scenarios, where people with varying abilities work together to solve problems. Students learn essential social skills like communication, teamwork and empathy. Teachers can better assess students understanding and progress, as they see how students interact and learn from each other. Mixed ability classes encourage diverse perspectives and ideas promoting creative problem solving. Mixed ability classes reduce the stigma associated with ability grouping, promoting a growth mindset and encouraging students to take risk. Mixed ability classes prepare students for diverse workplaces, where they will collaborate with people of varying abilities and background. to sum up, by embracing mixed ability classes, physics teachers can create a dynamic and inclusive learning environment that supports the diverse needs of all students.

4.3.5 Perception of observation from physics classes

4.3.5.1 Perception on benefit

1 Improved conceptual understanding

Mixed ability classes were observed to identify and addressing students' preconceptions and intuitive perceptions about physical phenomena can help them to develop more accurate and robust understanding of scientific concepts. By

confronting these perceptual biases through targeted instruction and hands on activities, students can build a deeper appreciation for the underlying principles of physics.

2. improved visualisation and modelling

The use of visual representation such as diagrams, simulation and graphs is common in physics instruction. Interactive simulations promote active learning by encouraging students to manipulate variables, observe outcomes, and draw conclusions. Students become active participants rather than passive recipients of information, leading to better engagement and retention. Simulations provide a bridge between theoretical concepts and real-world applications, making physics more tangible and exciting.

4.4 CHALLENGES

The researcher found out that most of the teachers are worried about having mixed ability students in the classroom. Mixed ability classes are really challenging. So, while facing those problems, teachers need to develop new ideas and while dealing with such problems teachers also become creative in teaching which is interesting and is directly help to develop professional skills of facing problems, sometimes getting new ideas from learners as well. Teaching in a mixed ability class may require more time to address the diverse needs of students. However, teaching often have limited time due to curriculum constraints and other factors.

If there is variety in the classroom, it is very difficult for the teachers to implement their lesson plan because teachers need to take care for each student equally. It is difficult even for the students because those who understand easily feel bored with more explanations, but it is necessary for other students. Hess (2002) has presented some of the challenges that teachers need to face in a mixed level classroom such as, out of control, sometimes trapped with problems in large classroom, it is difficulty to provide for individual learning styles and activating the quite students is difficulty (p. 4-6). Overall, managing mixed ability classes in teaching OLevel physics requires a combination of instructional strategies, classroom management techniques, and a supportive learning environment.

4.5 DISCUSSION

In this section of the study, the researcher combined real world findings and academic insights on management of mixed ability classes in teaching and learning of physics in high school. The project, an assessment of on the management of mixed ability classes in teaching and learning of physics at ordinary level, examines how new methods can blend. We look at how mixed ability learning can make classes more lively and fit different students' learning needs. The problems that the teachers and students might face, like lack of technology were looked into. The literature gives us mixed opinions. Some participants see these issues as big roadblocks.

Research will also suggest ways to solve these problems, based on what the literature says and what has been found in this study. We were kept in mind to guide this discussion. These help researcher to explore the good points, face the challenges, and find solutions. The researcher will compare data with academic theories to see if they match up. As we discuss mixed ability learning in physics, we understand its power to change education. Findings should help teachers, decision-makers, and scholars create a better learning environment for physics

4.5.1 Research question 1.

How do teachers manage mixed ability classes in teaching and learning of O level physics?

Student differentiation

The convergence between the literature and the current research findings on Mixed ability learning is evident. Both underscore the enhanced differentiation. The literature posits that mixed ability learning "encourages active participation" (Krasnova and Shurygin, 2019) and "creates online communities and learning practices" (Powell et al., 2015), which is in harmony with the observed boost in student engagement in physics through the use of interactive content. Furthermore, the research findings offering different levels of support materials and resources, allowing flexible grouping and pacing during activities and assigning tasks and assessment of varying complexity. Inspiring learning environment created by the mix of classroom and online

instruction.

The personalized aspect of blended learning, highlighted by the research, aligns with the literature's advocacy for active participation and collaboration. Thus, the research findings not only agree with but also reinforce the literature's assertions, demonstrating the practical benefits of blended learning in fostering an engaging and motivating educational experience.

Scaffolding

Mixed ability learning methods, as discussed in the literature and observed in research findings, offer significant benefits in educational settings. The literature emphasizes the scaffolding learning, which supports lower achieving students, this involve breaking down concepts into manageable steps, modelling problem solving, for example worked examples, step by step instruction and peer assistant learning. This enabling student to control their learning pace.

Cooperative learning

Arranging students into heterogeneous groups can facilitate peer learning. Higher achieving students can mentor and support their peer, while all students develop collaborative skills. This educational paradigm shift is echoed in the literature, with Lalima and Dangal (2017) highlighting its capacity to maintain "cooperative learning across settings," and Tayebinik and Puteh (2012) acknowledging its integral role in instructional modalities. This method's promotion of critical thinking and problem-solving skills is instrumental, as it empowers students to take control of their learning journey and apply knowledge in a contextual manner.

Effectively managing mixed ability O level physics class requires a multifaceted approach. By differentiating instruction, scaffolding support, facilitating cooperative learning, conducting formative assessment and cultivate an inclusive environment.

4.5.2 Research Question 2.

Comparison of research findings on challenges and barriers with related Literature?

The research findings on the challenges of teaching mixed ability classes in physics education resonate with the issues highlighted in the related literature. Curriculum and assessment constraints, rigid curriculum requirements and standardised assessments can make it difficult to significantly differentiate instruction and the need to cover syllabus can limit opportunities for deep, personalised learning. Another barrier is lack of funds and resources, insufficient funding for specialised equipment, teaching materials and professional development, limited access to differentiated resources such as textbooks, worksheets and online learning tools.

The lack of specialised equipment or software mentioned by Becirovic (2023) aligns with the researcher's observation of the technical issues and unreliable resources that disrupt the continuity of learning. Francom (2020) underscores the importance of physics simulations, virtual laboratories, and modelling software, which are critical for an engaging learning experience but are often hindered by high costs and the need for technical proficiency, a challenge that the researcher also noted, in ensuring inclusivity and engagement.

Hamutoglu (2021) emphasizes the need for adequate technical support, which corresponds with the challenges that the researcher found in maintaining student focus and providing clear instructions and scaffolding. Bai and Lo (2018) discuss the necessity of intentional planning for effective collaboration and communication, echoing the researcher's suggestion for more collaborative tools and strategies to overcome the lack of hands-on experiments and peer interaction in online settings.

4.6: SUMMARY

This chapter has highlighted the research findings, gathered from the interviews which were held with the teachers. The next chapter focuses on the summary of the research findings, conclusion and the recommendations. The study sought to explore how teachers manage mixed ability classes at a secondary school level and the effectiveness of management styles employed. Ten form four teachers were interviewed.

Interviewed teachers employed different management styles. Hence, they show different leadership styles. Ability grouping was used by seven teachers. They highlighted that they mix the less able, the average and the high performers in groups. This is very effective in catering for individual differences in a mixed class as in line with the Kounin's group focus and Waxler (2006) group or share technique. Thus, learners become more effective. The less able tend to benefit from the able during group discussion.

Remediation was suggested by three teachers to be a means of catering for slow learners in mixed ability classes but there was no evidence of its use. Teachers tended to keep in track with the most able learners ignoring the slow learners. Dropouts in some subjects and low pass rate are summed up by the teacher's methodology and interaction in a mixed ability classes, Lewis (2008).

The study also reviewed that pedagogy is necessary for effective classroom management. It was acknowledged by the respondent that pedagogical skills are central to accommodate individual differences in a mixed ability class.

A number of challenges were presented by teachers. They said they need for motivation, remediation and supervision was affected by the existence of more less able pupils than able and the teacher-pupil ratios which were very high.

Teachers provided a number of suggestions to use in a mixed ability class. They suggested that a small number of pupils in a class are better for mixed ability classes as this facilitates close interaction and supervision between the teacher and the pupils. Remediation was said to be effective if well implemented with constant follow up. The need to have good instructional skills remained the most important aspect in managing mixed ability classes. Thus, the teacher needs to give clear instructions and use a variety of teaching strategies.

Teachers however were presented not flexible in order to cater for mixed ability classes. They could not differentiate instruction and content. Thus, teachers need to develop good classroom communication skills and to help those with problems to improve their participation, Waxler (2006).

CHAPTER FIVE:SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter focused on the interpretation and discussion of the findings. Conclusions have been made basing on the research findings. The chapter also gave some recommendations which are based on the findings of the study.

5.2: SUMMARY

this project investigated effective strategies for managing mixed ability classroom in the teaching and learning of physics. The study was conducted in two secondary schools over the course of 2024 academic year. The key findings include: implementing a range of teaching methods and learning activities to cater for students with diverse learning needs and abilities was crucial, this includes use of

visual aids, hands on experiments, collaborative group work and individualised support.

Offering range of resource materials, from simplified explanations to more advanced theoretical discussion is a fundamental approach to address the learning needs of students in mixed ability classes, the chapter 2 also highlighted the importance of ongoing assessment and feedback to inform the differentiation process. Teachers regularly monitor students' progress and adjusted their instructional approaches accordingly, ensuring that the learning experience remained relevant and challenging for all students. By embracing the principles of differentiated instruction, teachers were able to create a more inclusive and engaging physics learning environment that cater to the diverse needs and abilities of students in mixed ability classes.

CONCLUSION

Teaching and learning in mixed ability O Level physics classes presents unique challenges, but also opportunities to foster an inclusive and learning environment. The key is to employ a variety and instructional strategies and differentiation techniques to cater to the diverse learning needs and abilities of the students. Utilizing a range of teaching methods, resources and assessment approach allows students with different learning styles, strengths and weaknesses to access the physics curriculum effectively. Encouraging peer to peer learning and group work can enable students to support one another, learn from diverse perspectives and develop essential collaborative skills. Providing flexible, multi-tiered assessment options enables students to demonstrate their understanding and progress in physics, regardless of their starting point. Offering addition tutoring, remedial sessions, and individualised support for struggling students can help bridge learning gaps and boost their confidence in physics. Emphasizing the importance of effort, perseverance, and continuous improvement, rather than just innate ability, can motivate all students to engage actively in their physics learning.

These findings, reviewed that there are a number of causes of low pass rate of mixed ability classes at both schools. These problems emanated from teachers. Lack of supervision on the pupils was another factor to the low pass rate. Teachers

mainly focused on fast learners and gave them extension work which was the opposite of the slow learners. The findings also reviewed that most teachers use the teacher-centered methods which help to improve both the fast and the slow learners. The success of pupils relies heavily on how the teacher manages the class.

According to the written sources it is important to help students improve their learning techniques and develop their cooperation and collaboration with their peers. This was also something that the teachers mentioned, as they thought small group work and peer work as beneficial for the students. The researcher discovered that it was important for the teacher working in a mixed ability class to create a good atmosphere where the students feel secure, can voice their opinions and ask questions without feeling anxious. One of the most important things for the teacher to aim for is to be clear and structured.

The researcher realized that this essay is only a small investigation. The researcher interviewed ten teachers, and maybe the results would have been different if more teachers were interviewed. Based on the written sources and the answers from the teachers interviewed the research believed my answer to my question would be to have ability groups again in one basic, one middle and one fast group.

The researcher, have conclude that this could be a good solution to the problem. But since this is not available we have to use their method instead then I think my answer to my question is to be structured, set up routines, be very clear, go forward slowly in teaching and bring in students' own interests and ideas and occasionally alter the course book with other resources.

By embracing the diverse of learners in mixed-ability O level physics classes and implementing a range of inclusive teaching strategies, educators can create a supportive and enriching learning environment that enables all students to thrive and reach their full potential in the subject.

However, in a large mixed ability classes, students' unique learning needs may not adequately address, as the teachers' time and resources are divided across the entire class. Lower achieving students may feel discouraged and lose motivation if

they consistently struggle to keep up with the pace of the class. Meanwhile, high achieving students may become bored and disengaged if the curriculum does not sufficiently challenge them.

Additionally, students in mixed ability classes may experience social stigma, bullying, or feeling of inadequacy which can negatively impact their self-esteem and overall well-being. Both advanced and struggling students may not receive the targeted instruction and support they need to reach their full potential, as the teacher must divide their attention across the diverse range of abilities. constantly feeling overwhelmed or unable to keep up with the class can lead to significant frustration and anxiety for struggling learners, which can further hinder their academic progress.

Formative assessment was a key strategy used by teachers to continuously monitor students' progress and adjust their instructional approaches as needed. Some of the formative assessment include frequent low stake quizzes, exit ticket, and classroom observation and discussion. The timely and constructive feedback provided to students was a crucial of the formative assessment process. Teachers used variety of feedback methods including verbal feedback during class activities, written comments on student work, highlighting strengths and areas for improvement.

By empowering students to take an active role in their learning, the feedback process helps them to develop a better understanding of physics concepts and ability to self-assess and regulate their own learning.

The research team used both descriptive and inferential statistics to analyse the quantitative data. This included calculating measures of central tendency and dispersion, as well as running statistical tests to determine the significance of the observed differences between the control and the intervention groups. the researcher identified recurring of themes and patterns in the interview transcripts. This allows the researcher to gain deeper understanding of the experiences, perspectives and challenges faced by both teachers and learners in the mixed ability classrooms.

Data presentation analysis and interpretation was critical in informing development of the final recommendations and guidelines for effectively managing mixed ability

classes in O level physics classes. The finding from this study can save as a valuable resource for educators and policy makers looking to implement evidence-based practices for supporting diverse learners in the physics classroom.

5.3: RECOMMENDATIONS

From the research findings, teachers should give remedial and extension work to both slow and fast learners respectively. Teachers should use child-centred methods to improve quality and effectiveness of teaching and learning in mixed ability classes. Teachers should always motivate and encourage the slow and less performing pupils to learn. Democratic management style is useful in managing a mixed ability class hence it must be implemented.

Teachers should utilize a variety of teaching methods, including hands on experiments, demonstrations, interactive simulations, and problem -based learning to cater for different learning styles. Encourage collaboration learning through group activities, projects, and peer to peer teaching. Differentiate instruction by offering tiered activities, scaffolding support and allowing students to demonstrate their knowledge in multiple ways.

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APPENDICES

APPENDIX A: QUESTIONNAIRE COVER LETTER

Bindura University
P. Bag 1020
Bindura
10 May 2024

Dear Sir/ Madam

My name is Toga Jessica a final year student in the department of mathematics and physics at Bindura University. I am kindly requesting if you could kindly fill this questionnaire on a survey towards a research work in partial fulfilment of the Bachelor of Science Honors Degree. This research seeks to give an assessment on management of mixed ability classes in teaching and learning of ordinary physics.

This information is for academic purpose only and will serve no other purpose so please feel free to express your most valued opinions. Thank you for sparing your time. God bless you and your effort.

Yours faithfully

Toga Jessica

Appendix 2: Questionnaire to key staff

Answer the following questions

PLEASE TICK THE APPROPRIATE ANSWER(S)

1. How do you manage mixed ability classes as a physics teacher?
a) All write b) group work c) do now d) assessment

2. What issues are identified as important in teaching this heterogeneous mix of students?
 - a) Cultural background (b) maintain discipline (c) language barrier
3. What adaptations do you make as teachers in these mixed ability classes?
 - a) grade the language accordingly for different levels (b) communicate equally with the whole class.
4. What other strategies can teacher use to foster understanding?
 - a) One to one activities (b) group work (c) motivation(d) rewarding
5. What kind of support you identify as needed?
 - a) Provide best resources possible(b) encourage growth (c) connect with learners

END OF QUESTIONS

THANK YOU

APPENDIX 3: Release Form

P Bag 1020
BINDURA
ZIMBABWE

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

SAMED


BINDURA UNIVERSITY OF SCIENCE EDUCATION

Date:

TO WHOM IT MAY CONCERN

NAME: TOGA J REGISTRATION NUMBER: 61457863

PROGRAMME: HBScEd in Physics PART: 212

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

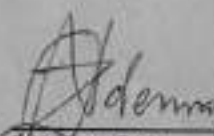
The student has to undertake research and thereafter present a Research Project in partial fulfillment of the programme. The research topic is:

Management of mixed ability classes in teaching and learning of Physics O' level

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

Your co-operation and assistance is greatly appreciated.

Thank you


Ndema (Dr.)
CHAIRPERSON - SAMED

