

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE EDUCATION**

**DEPARTMENT OF SCIENCE AND MATHEMATICS EDUCATION**



**Investigating the impact of outdoor learning experiences on student  
outstanding of ecological concepts in Chivi District Secondary Schools**

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**A DISSERTATION SUBMITTED TO BINDURA UNIVERSITY OF  
SCIENCE EDUCATION IN PARTIAL FULFILMENT OF THE  
BACHELOR  
OF EDUCATION HONOURS DEGREE IN BIOLOGY**

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**DEC 2024**

**APPROVAL FORM****BINDURA UNIVERSITY OF SCIENCE EDUCATION**

The undersigned certify that they have read and recommended to the Bindura University of Science Education for acceptance a research project entitled, **“Investigating the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools.”** submitted by

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## DECLARATION

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Signature

### Supervisor

I , W. MUNAKANDAFU, confirm that this dissertation was carried out by this student and submitted for review with my approval.

Signature

A handwritten signature in black ink, consisting of a large, stylized loop followed by several vertical strokes and a horizontal line extending to the right.

## **DEDICATIONS**

We dedicate this study to our family members for enduring loneliness throughout the period of the study.

## **ACKNOWLEDGEMENTS**

We take this opportunity to thank my supervisor, Mr Munakandafa, for the constructive criticism, guidance, patience and support towards this hectic period. We also acknowledge the input from the District Inspector (DSI) as well as staff from the selected schools in Chivi district who participated in this study. We thank you.

## **ABSTRACT**

*This study investigates the impact of outdoor learning on secondary students' understanding of ecological concepts in Chivi District. It assesses initial comprehension, evaluates retention and engagement compared to traditional instruction, and identifies barriers to implementation.*

*Using qualitative methods with 15 participants, findings show that outdoor learning significantly enhances ecological education but faces challenges like teacher confidence and resource limitations. Recommendations include professional development for educators and institutional support for outdoor learning integration.*

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## **CHAPTER 1: INTRODUCTION**

### **1.1 INTRODUCTION**

World wide education is viewed as a tool for the development of any society and the much-needed human capital, hence, the massive investments every independent government makes in the provision of education to its populace regulated by various statutes (Thomas, 2015). The research sought to examine the impact of Outdoor Learning Experiences on Student Understanding of Ecological Concepts in Chivi District Secondary School in Masvingo province, generating intended solutions to this problem as well as looking at the strategies that have been implemented by the government so far in order to enhance outdoor learning. This chapter generally offered the background of the study, statement of the problem, study objectives, research questions, significance of the study, limitations, delimitations, assumptions, as well as definition of key terms.

### **1.2 Background of the study**

Previous research has shown that feeling engaged in schoolwork is crucial for pupils to achieve, but engagement and motivation decline with age in many countries. To address these issues, Katarina, Göranson and Lindgren (2024) conducted an ethnographic study of teaching science subjects through outdoor learning at compulsory school in Sweden. In this study, they explored pupils' experiences of being taught science subjects using outdoor learning. The research was conducted using an ethnographic research design, a useful method for research in this type of environment where a greater understanding of teaching and learning processes is sought, enabling researchers to explore events more deeply. The study took place during one school year and was conducted for pupils in Grade 6 in a school on Sweden's West coast. This study provides unique insights into how these teacher efforts to offer outdoor learning opportunities have improved pupils' willingness to participate. Likewise, there is need for Zimbabwean studies to investigate the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools.

If teachers are to be encouraged to consider teaching outside the classroom as a relevant pedagogical method, research must focus on empirical investigation of the challenges and the benefits (Custers, 2020). When teachers are challenged to expand their subject and methodological competencies to teach successfully beyond the traditional classroom, external partners must also support them through exchange experiences with colleagues and opportunities for methodical freedom (Sahrakhiz, 2018). In this context, taking advantage of pupils' views on the teaching they are offered is important, and something that should be sought after, noting the Convention on the Rights of the Child which gives children extensive rights to be heard and to have their say on issues that concern them (United Nations, 1989). Since there are knowledge gaps in outdoor pedagogical learning for teachers in Zimbabwe and how the content of particular subjects can be learned outside the classroom, a decision was made to undertake a research project aimed at secondary school learners in Zimbabwe-Masvingo, where the teaching of the science subjects (Biology, Physics, and Chemistry) is conducted outdoors. This study aimed to explore experiences of being taught Science subjects using outdoor learning, including the learning they achieved.

Ayotte-Beaudet, Hasni, Vinuesa, Rodrigue-Poulin, Quintela Do Carmo and Beaudry (2024) conducted a study in Canada entitled, *“Impact of outdoor place-based learning on elementary school students' ability to make unsolicited observations about living organisms over time.”* Their research objective was to investigate whether a place-based educational intervention for elementary school students leads to a better ability to make unsolicited observations about living organisms. The study was conducted in the province of Québec, Canada, which resulted in 116 students experiencing the same educational intervention from home. Based on individual telephone interviews, the researchers compared elementary school students' ability to make unsolicited observations about living organisms one week (Group A,  $n = 58$ ) and two months (Group B,  $n = 58$ ) after a place-based educational intervention in their home environment. We developed three emergent categories to analyse students' place-based unsolicited observations about living organisms. They found that elementary school students who learned about living organisms in their home environment made more unsolicited observations about living organisms leading to factual descriptions two months after the end of the learning experience than those who were interviewed one week after the intervention. This study was conducted in Canada and amongst elementary

students which leaves a comparable gap for Zimbabwean studies to focus on secondary school learners.

Demircioğlu, Demircioğlu and Çalik. (2019) conducted a study on teaching Biology in Nigeria. According to that study, the teacher's use of lecture method has been observed to be ineffective in bringing about the right attitude towards the environment and environmental problems. The purpose of that research as to find out what are the effect of outdoor activities and the influence of gender on secondary school students' environmental attitude to Biology. Outdoor activities are educational activities that occur outside the regular classroom activities to create awareness about the environment. The aim as for students to notice the environmental problems caused as a result of a negative attitude towards the environment and the need for a positive attitude instead. The study was carried out using a pre-test, post-test, and a control group. A quasi-experimental design data analysis was undertaken using descriptive statistics and inferential statistics such as analysis of covariance (ANCOVA). The outdoor activities had a significant effect on students' environmental attitude ( $F=5.067$   $P<0.05$ ). Gender also played a significant role in the attitude of students to the environment ( $F=6.939$ ,  $P<0.05$ ). Outdoor activities were observed to have brought about significant attitudinal change in the students. Therefore, outdoor activities are recommended for teaching and learning environmental education in Biology for both genders. In this context, the study was purely quantitative research and conducted in Nigeria and as such there is need for Zimbabwean studies using qualitative methods.

Studies in South Africa by Walan, Mc Ewen and Gericke. (2016) show that it is essential that how we conceive of learning is broadened to include opportunities for learning outside the classroom, in accordance with aspects of Dewey's pragmatist philosophy. This means emphasising the importance of experience and reflection about method and subject matter, i.e., to do and to know, and emotional experience. Teaching needs to be meaningful to pupils as individuals here and now and not just be something they can benefit from in the future; hence teaching outdoors provides great opportunities to embrace Dewey's reasoning (Quay & Seaman, 2018). In addition, when pupils are allowed to reflect and communicate with others based on their own experiences in different outdoor environments relevant to their schoolwork (as emphasised via a sociocultural perspective), we believe it increases their opportunities to connect their experiences to more

scientific understanding (Stapleton and Reif, 2022). That being the case, there is need to use the same theory, pragmatism, to undertake this study on the impact of outdoor learning activities on teaching-learning ecological concepts.

In a study in Zimbabwe, Chimbi (2018) reports that today, school curricula tend not to connect easily with pupils' authentic worlds outside the classroom. According to that study, students in History are engaged in sense making when they are engaged in outdoor learning activities. Therefore, it is argued there is a need for more research supporting the development of teaching practice which strengthens learning outside the classroom. While significant research has been conducted on learning outside the classroom focusing on social and emotional skills, team building, and collaboration, studies that focus on the impact of outdoor learning the content on ecological concepts outside the classroom are much less common.

The importance of ecological education has grown in light of global environmental issues such as climate change, habitat degradation, and biodiversity loss. According to Bang, Marin and Medin (2018) as future stewards of the earth, students must get a solid understanding of ecological concepts in order to engage in sustainable behaviours and make educated decisions. In this environment, traditional classroom instruction frequently falls short of providing the experiential knowledge required for thorough understanding of these difficult topics. Because scholars maintain that traditional approaches to teaching are falling short (Owoyemi, 2017) and Raimi, 2022) there is need for studies which enhances learners learning from outdoor activities.

In the Chivi District, where ecological challenges are particularly acute, effective instructional tactics are essential. The local community faces challenges such as soil erosion, deforestation, and water scarcity, emphasising the need of providing pupils with the information and skills necessary to address these issues. This study examines how outdoor learning affects students' comprehension of ecological concepts and aims to contribute to the development of innovative educational practices that can be implemented in Chivi District Secondary School.

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

Secondary school pupils in Chivi District struggle to grasp and apply ecological principles, which are critical for tackling local environmental issues. According to Arıkan (2021) traditional classroom education frequently emphasises theoretical information above practical. This shortcoming sidelines the use of hands-on experiences required for thorough learning. As a result, students are struggling to make connections between classroom learning and realworld ecological challenges, resulting in a lack of engagement and awareness of crucial environmental issues such as biodiversity loss, climate change, and sustainable practices.

Furthermore, the existing educational framework in Zimbabwe is failing to appropriately incorporate outdoor learning experiences, which have been found to reduce student engagement and retention of ecological information. This gap in educational practice not only inhibits students' comprehension of ecological concepts, but it also impedes their capacity to acquire a sense of responsibility for their surroundings. The situation is exacerbated by the Chivi District community's urgent ecological challenges, such as soil erosion, deforestation, and water scarcity. Without a thorough awareness of these concerns, students may be ill-equipped to contribute to long-term solutions in their communities. As a result, the purpose of this study is to look into how outdoor learning experiences affect students' knowledge of ecological concepts, with the goal of identifying successful teaching practices that can bridge the gap between theory and practice and foster a more environmentally conscious generation.

### **1.4 Purpose of the Study**

The purpose of the study is;

To explore the impact of outdoor learning experiences on student understanding of ecological concepts in Chivi District Secondary Schools.

### **1.5 Objectives of the study**

The study was based on the following research objectives;

- i. To identify the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences.
- ii. To examine the influence of outdoor learning experiences on students' comprehension and retention of ecological concepts compared to traditional classroom instruction.
- iii. To explore how outdoor learning activities affect student engagement, motivation, and interest in ecological topics.
- iv. To find out the barriers faced by facilitators when implementing outdoor learning experiences in the curriculum.
- v. To determine ways of enhancing the integration of outdoor learning into the ecological education curriculum in Chivi District Secondary School.

### **1.6 Main Research Questions**

The study aims to address the following research questions;

- i. What is the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences?
- ii. How do outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction?
- iii. In what ways do outdoor learning activities affect student engagement, motivation, and interest in ecological topics?

- iv. What barriers and facilitators do educators encounter when implementing outdoor learning experiences in the curriculum?
- v. What recommendations can be made to enhance the integration of outdoor learning into the ecological education curriculum in Chivi District Secondary School?

### **1.7 Assumptions**

In conducting this study on the impact of outdoor learning experiences on students' understanding of ecological concepts, several basic assumptions are made:

- It is assumed that students enter the study with differing levels of understanding of ecological concepts, influenced by their prior education, personal experiences, and exposure to environmental issues.
- The study assumes that outdoor learning experiences will positively influence student engagement and motivation, leading to a deeper interest in ecological topics compared to traditional classroom settings.
- It is assumed that hands-on, experiential learning in natural environments will enhance students' comprehension and retention of ecological concepts, making the learning process more effective.
- The study assumes that educators involved in the research will acknowledge the importance of integrating outdoor learning into the curriculum and will be open to implementing such strategies.

- It is assumed that students will be able to connect the ecological concepts learned through outdoor experiences to real-world environmental challenges faced in their community, fostering a sense of responsibility and stewardship.

### 1.8 Significance of the Study

The significance of this study lies in its potential to enhance educational practices and promote ecological awareness among secondary school students in Chivi District. By investigating the impact of outdoor learning experiences on students' understanding of ecological concepts, the study aims to contribute to several important areas:

- **Improving Educational Outcomes.** The findings from this research can provide valuable insights into how outdoor learning can be effectively integrated into the curriculum. This could lead to improved educational outcomes, as students may develop a stronger grasp of ecological concepts through experiential learning.
- **Fostering Environmental Stewardship.** By enhancing students' understanding of ecological issues, the study aims to cultivate a sense of responsibility and stewardship towards the environment. This is particularly significant in a time when environmental challenges are increasingly pressing, and fostering a generation of environmentally conscious individuals is crucial.
- **Informing Policy and Curriculum Development.** The results of the study can inform educators and policymakers about the benefits of outdoor learning, potentially leading to changes in curriculum design that prioritize experiential learning. This could result in more engaging and relevant educational experiences for students.

- **Contributing to Academic Knowledge.** The research will add to the existing body of literature on outdoor education and ecological learning, providing empirical evidence that can be referenced by future studies. This contribution is essential for advancing academic discussions around effective teaching methodologies in environmental education.
- **Enhancing Student Engagement.** By exploring the relationship between outdoor learning and student engagement, the study can highlight effective strategies for increasing student motivation and interest in ecological topics. This is vital for creating a more dynamic and interactive learning environment.
- Overall, the significance of this study extends beyond the immediate educational context, aiming to impact broader societal attitudes towards environmental issues and the importance of experiential learning in fostering a sustainable future.

### **1.9 Limitations of the Study**

While this study aims to provide valuable insights into the impact of outdoor learning experiences on students' understanding of ecological concepts, several limitations may affect the research outcomes:

- **Sample Size and Generalizability.** The study may be limited by the size and demographic characteristics of the sample population. If the sample is small or not representative of the broader student population in Chivi District, the findings may not be generalizable to other contexts or regions.
- **Subjectivity in Data Collection.** Qualitative data collected through surveys and interviews may be subject to bias, as students and educators might provide responses influenced by

their personal experiences or perceptions. This subjectivity could affect the reliability of the findings.

- **Variability in Outdoor Learning Activities.** The effectiveness of outdoor learning experiences can vary significantly based on the type of activities conducted, the environment, and the facilitation methods used. This variability may complicate the assessment of their overall impact on student learning.
- **External Factors.** Factors outside the study's control, such as students' prior knowledge, socio-economic background, and environmental conditions during outdoor activities, may influence the outcomes. These external variables could confound the results and make it challenging to isolate the effects of outdoor learning.
- **Time Constraints.** The duration of the study may limit the ability to observe long-term retention of ecological concepts. A short-term study may not capture the lasting impact of outdoor learning experiences on students' understanding and attitudes towards ecology.
- **Potential for Hawthorne Effects.** Students may alter their behavior or responses simply because they are aware they are part of a study. This phenomenon, known as the Hawthorne effect, could lead to inflated perceptions of the effectiveness of outdoor learning experiences.

#### **1.10 Delimitations of the Study**

Delimitations refer to the boundaries set by the researcher that define the scope of the study. In this research on the impact of outdoor learning experiences on students' understanding of ecological concepts, the following delimitations are established focusing on Secondary School Students. The

study is specifically limited to secondary school students in Chivi District. This focus excludes primary school students and higher education institutions, which may have different educational dynamics and learning outcomes.

#### **1.10.1 Geographical Scope.**

The research is confined to Chivi District, meaning that the findings may not be applicable to other regions or countries with different educational systems, cultural contexts, or environmental issues.

#### **1.10.2 Specific Ecological Concepts.**

The study will concentrate on selected ecological concepts relevant to the curriculum, rather than covering the entire spectrum of ecological knowledge. This delimitation allows for a more in-depth analysis of specific topics.

#### **1.10.3 Type of Outdoor Learning Activities.**

The research will focus on particular types of outdoor learning experiences, such as field trips, nature walks, and hands-on ecological projects. Other forms of experiential learning, such as virtual simulations or indoor activities, will not be included.

#### **1.10.4 Time Frame.**

The study will be conducted over a specific academic term, limiting the observation period for assessing the impact of outdoor learning experiences. This timeframe may not capture long-term effects on students' understanding and attitudes.

### 1.10.5 Participant Selection

The study will include only those students and educators who voluntarily participate in the research. This self-selection may introduce bias, as those who choose to participate may already have a greater interest in outdoor learning awareness among students.

### 1.11. Definition of Key Terms

- **Outdoor Learning:** According to Hornby (2020) outdoor learning refers to educational experiences that take place outside the traditional classroom setting. This approach emphasizes hands-on, experiential learning in natural environments, allowing students to engage directly with ecological concepts and the surrounding ecosystem.
- **Ecological Concepts:** Ige (2023) defines ecological concepts as encompassing the fundamental principles and ideas related to the study of ecosystems, including topics such as biodiversity, food webs, ecosystems dynamics, conservation, and the interrelationships between organisms and their environment.
- **Experiential Learning:** According to Aremu & John (2015) experiential learning is a process through which students gain knowledge and skills by engaging in direct experiences. This approach emphasizes active participation, reflection, and application of learning in real-world contexts, making it particularly effective in outdoor education.
- **Student Engagement:** Bilesanmi-Awoderu (2019). States that student engagement is the level of interest, motivation, and involvement that students exhibit in their learning processes. High levels of engagement are associated with increased academic achievement, deeper understanding of content, and a greater likelihood of pursuing further education.

- **Field Trips:** Olatundun (2018) states that field trips are organized excursions to locations outside the classroom, designed to enhance learning by providing students with firsthand experiences related to their studies. These trips often focus on specific themes or topics, such as ecology, history, or culture, and aim to deepen students' understanding through direct observation and interaction.

## **1.12 Organisation of the Study**

The study will be divided into five chapters as follows:

**Chapter one** which is an introductory chapter of the study presents a general introduction and includes the background of the study, the statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitations of the study and delimitations of the study.

**Chapter two** covers literature review on the subject matter as well as the review on the theoretical and empirical framework.

**Chapter three** describes the research methodology used. This includes the research paradigm, research approach, research design, target population, sample and sampling techniques, data collection instruments and procedures, data analysis, ethical considerations and the chapter summary.

**Chapter four** will have two sections. The first one will focus on presenting and analysing data while the second one will dwell on the interpretation and discussion of findings.

**Chapter five** which is the final chapter will have the summary, conclusions and recommendations of the study.

### **1.13 Chapter Summary**

As an introduction to the subject of the research, this chapter dealt with the background of the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools. The chapter defined the problem, set research objectives and questions, explained the significance, scope, limitations and assumptions of the study as well as definition of key terms and organisation of the study. The ensuing chapter provides the basis on which the research was built by reviewing related literature of other researchers.

## **CHAPTER 2: REVIEW OF RELATED LITERATURE**

## **2.0 Introduction**

This chapter of the study presents a review of literature related to the impact of outdoor learning experiences on student understanding of ecological concepts. The key subtopics for this chapter of the study are theoretical framework and literature on outdoor learning activities guided by the research objectives. The rationale for this chapter is linking the present research to studies that have already been conducted in line with the problem being studied. Right at the end, a summary is provided to tie up the loose ends.

### **2.1. Theoretical Frameworks**

The study is informed by pragmatism. John Dewey, an American philosopher and educational reformer who lived from 1859–1952, advocated for outdoor learning. He argued that students should not be given information but instead should experience it for themselves, which requires them to get out of the classroom and enter the real-world (Avci & Gümüş, 2020). Other philosophers who have contributed to the idea of outdoor learning include Rousseau and Comenius (Avci & Gümüş, 2020). Comenius argued that a teacher acts as a guide in the learning process when using outdoor education and Rousseau argued that education should be used to help individuals reason and direct their own lives, which is a main goal and outcome of outdoor education (McGowan, 2015). These theoretical foundations contribute to the current implementation of outdoor education.

According to Ramsey (2023) pragmatism is a philosophical tradition that views language and thought as tools for prediction, problem solving, and action, rather than describing, representing, or mirroring reality. Seigfried (2016) states that the term pragmatism derives its origin from a Greek word meaning to do, to make, to accomplish. So the use of words like ‘action’ or ‘practice’ or ‘activity’. Therefore, pragmatism is a philosophy that focuses on an idea's practical applications, as opposed to its possible merits. When pragmatism is applied to education, it begins to focus instead on life and growth. Students should learn material that has real-life applications and have experiences that encourage them to grow.

Outdoor education is defined as education done about and for the purpose of outdoor education (Kirkpatrick, 2019). By this definition, where learning will take place (outdoor learning environments), subject-content to be taught (issues related to nature and the environment), and the purpose of the activity are literally stated (Looney, C., 2015). According to the Institute for Outdoor Learning, outdoor education, defined as purposeful and planned outdoor experiences (Özür, 2010), does not mean a school trip, school yard or outdoor course. Outdoor education covers a very rich and wide area, from school gardens to an industrial place, from marshes to meadows, forests, shores, lakes, museums to zoos and botanical gardens, parks to natural environments, and trips-observation studies and visits with scientific content (Prouty, Panicucci & Collinson, 2017). Outdoor education is an education that enables the realization of teaching activities in a planned and programmatic way and supports-improves formal education (Saraç, 2017). In this aspect, it departs from informal education (Kan, 2018), which is unplanned, unscheduled, does not require a specific space or learning environment, has no specific goals, is self-realized, has no institutional and systematic structure.

## **2.2. The current level of understanding of ecological concepts**

Outdoor learning has been defined in many ways over the years, but for this paper, we define outdoor learning as “first-hand observation and experience outside the classroom” (Eaton, 1998, as cited in Avci & Gümüş, 2020, p. 173). Students become involved in outdoor learning whenever they leave the confines of the regular classroom and become personally engaged in their learning experience. Outdoor education includes many different settings such as school gardens, meadows, lakes, museums, zoos, and parks (Avci & Gümüş, 2020). While outdoor education usually takes place outdoors, it can still be considered outdoor education when students stay indoors, but leave the traditional classroom to experience new things. The options seem limitless as students and teachers make the world their classroom.

This type of learning is student-centered. According to James and Williams (2017), outdoor education is student-centered because it creates a love of learning and makes learning come alive through real-life contexts. This type of engagement allows students to take charge of their own learning rather than waiting for their teachers to take the initiative. The teachers act as guides facilitating learning for their students, but the students play a much more active role in the learning process as they participate in the hands-on learning that outdoor learning provides for them.

Researchers have found that outdoor learning increased academic performance and increased affective outcomes in the learning process (Meighan & Rubenstein, 2018). Academic outcomes include improvement in academic performance with test scores and positive effects on students' knowledge recall and reading performance (Meighan & Rubenstein, 2018). The affective outcomes include connection with nature, better resilience, and reduced stress (Meighan & Rubenstein, 2018).

### **2.2.1 Academic Outcomes**

One of the academic outcomes is the positive correlation between standardized test scores and outdoor education (Meighan & Rubenstein, 2018). This student-centered approach helps students develop better learning skills to succeed outside of the traditional classroom. When outdoor education is integrated into the curriculum, it improves standardized testing in reading, math, writing, science, and social studies. For example, researchers Fägerstam and Samuelsson (2014) found evidence that teaching mathematics outside instead of inside showed an overall improvement in academic performance. The research concluded that the outdoor setting has an overall impact on the students' learning abilities. Researchers observed that when teachers integrated the environment into their curriculum, students were able to apply their knowledge at a higher level (Meighan & Rubenstein, 2018). Therefore, there is evidence that outdoor education has a positive impact on test performance in many subjects. In this context, conducting local studies on selected students from selected schools in Masvingo province can also be useful to explore the impact of outdoor learning focusing on ecological concepts.

Another benefit to outdoor education is the higher ability to recall information. Teachers have observed that applying the concepts outside increased retention of information (Meighan & Rubenstein, 2018). Avci and Gümüş' (2020) research likewise showed that when students were actively learning by doing something, they were able to recall the information better. These outdoor activities had a positive effect on their level of attainment (Avci & Gümüş, 2020). The researchers concluded that education is a way for students to learn knowledge, skills, and behaviors, not only for the short term but also for the long term, to become good citizens. Outdoor educational activities provide children with the opportunity to apply what they are learning, to succeed both in and out of school. Teaching methods and activities that take place outdoors will create meaningful and long-lasting retainable information (Avci & Gümüş, 2020). Another

academic outcome we see in outdoor education is higher reading performance. A good way schools can develop essential skills for reading comprehension is for students to learn in an outdoor environment. According to Otte et al. (2019), there was a significant positive association between reading outside every week and higher reading levels. Eick (2012) observed that when students completed an inquiry-based assignment in nature, they saw “higher scores in reading comprehension, reading strategies, and reading engagement” (Eick, 2012, p. 13). When students were actively involved in an outdoor learning environment, students had better success in their reading scores. Higher reading performance will help students' comprehension not only in school, but for the rest of their lives. That having been established from foreign studies, there is need for local studies hence the current study.

### **2.2.2 Affective Outcomes**

Mann (2021) reports that one positive effect is children's connection with nature. Students are able to appreciate the world around them as they discover new insights while outside. According to that study, outdoor education has positive impacts on students' connection with nature, social skills, health and wellbeing, and academic attainment. As students go out into the world, they need to be aware of the environment around them. With outdoor activities in learning, students develop more positive environmental behaviors and attitudes (Meighan & Rubenstein, 2018). Students become more aware of the environment around them in how they treat plants and animals. The connection with nature can also be seen in how students want to conserve products, recycle, use water, and be careful not to litter (Meighan & Rubenstein, 2018). Consequently, outdoor education connects students with nature as they gain new knowledge about how to treat the world around them.

Another positive outcome of outdoor education is better resilience (Mann, 2021). Psychological resilience aids in dealing with trauma, adversity, and stress in hard situations (Booth & Neill, 2017). Students can develop resilience as they are pushed outside of their comfort zones in outdoor environments as outdoor education provides students with challenging and reflective experiences (Booth & Neill, 2017). Outdoor programs will help students with better confidence and resilience as they learn to work with other students and communicate (Ramírez & Allison, 2023). In a study involving 126 teenagers, Hayhurst (2023) found that after a 10-day experiential outdoor learning voyage, resilience increased in the students participating. This illustrates the positive impact outdoor learning can have on a student's resilience. Resilience will not only benefit students in the

present but also in future difficult situations with school, family, and friends. There is a comparable gap for Zimbabwean studies on selected students from Masvingo province selected schools.

Depression and stress are serious factors affecting students of all ages today, and one way to combat this in school is with outdoor education. Research has found that connecting students with outdoor learning contributes to reducing stress and coping with depression (Avci & Gümüş, 2020). This is because being outside produces a more relaxing environment to facilitate student learning (Mygind, 2018). Students will benefit immensely as they learn to cope with stress at a young age. As students participate in outdoor learning, they can feel a sense of relief (Mann, 2021).

Outdoor learning improves students' mental health and well-being. Therefore, the current study was based on investigating the impact of outdoor learning experiences on student understanding of ecological concepts in Chivi District Secondary Schools.

#### **2.4. Outdoor learning experiences and students' comprehension and retention of ecological concepts**

Drawing on empirical studies and expert opinions, it argues that outdoor classrooms provide unique opportunities for students to connect with nature, enhance their understanding of ecological concepts, and develop a sense of responsibility towards the environment.

##### **2.4.1 Active learning**

Studies show that Outdoor learning experiences play a key role in enhancing students' comprehension of ecological concepts. According to a study by Achor, Ogbaba and Samuel (2014) in Nigeria, learners benefit a great deal when they learnt about nature outside their classrooms. The study reveals that teaching in which the student takes an active role in the learning process, learns by doing, living, firsthand and the knowledge learned is permanent, is the most effective method in education. In another study, Borsos, Boric and Patocskai (2018) in Croatia report that learners involved in outdoor activities are actively involved. In fact, it is argued that knowledge must be learned through first-hand observation and experience outside the classroom in order to enrich,

enliven and complete the curriculum. The studies concur that students gain a great deal from outdoor activities but still there is need for Zimbabwean studies to explore outdoor learning experiences can have an impact on students' comprehension and retention of ecological concepts.

#### **2.4.2 Environmental Awareness and Stewardship**

Caner (2019) conducted a study into outdoor learning in the British Columbia's public schools and reported that outdoor learning activities is the basis for environmental awareness as well as stewardship. The study was conducted amongst Biology students at junior secondary school. The study maintains that experiencing nature firsthand instills a sense of appreciation and responsibility for the environment. Through outdoor education, students learn about ecosystems, biodiversity, and sustainability in a tangible way. This firsthand knowledge fosters a lifelong commitment to environmental conservation and stewardship, preparing students to become informed and engaged citizens who can address pressing environmental challenges. In this context, there is need from studies to explore the impact of outdoor learning amongst secondary school students from Masvingo province in Zimbabwe.

#### **2.4.3 Holistic Learning**

In a study in Singapore, Gilbertson, Bates, Ewert and McLaughlin (2016) reported that outdoor education is a best methods and strategies for enhancing holistic learning in students. This study was conducted with primary school learners using observation and interviews with educators. The findings for that study show that outdoor education encourages a holistic approach to learning by integrating various subjects such as science, geography, history, and physical education. Whether studying the geological formations of a national park, conducting experiments in outdoor laboratories, or exploring historical landmarks, students gain a multidisciplinary understanding of

the world around them (Foran, 2018). This interdisciplinary approach enhances critical thinking skills and promotes a deeper comprehension of complex concepts. In this context, comparable studies are therefore pertinent

#### **2.4.4 Health and Well-being**

Ahmad (2024)'s study reports that spending time outdoors has numerous health benefits, both physical and mental. According to that study, when the teachers engaged students in outdoor activities, they promote physical fitness, reduce stress, and improve overall well-being. This shows that by incorporating outdoor education into the curriculum, schools can support students' holistic development by encouraging regular physical activity and providing opportunities for relaxation and reflection in natural settings. These study findings complement Cetin and Metin (2023) study on the study of History. That study explored the effects of visiting cemetery and martyrdom to the academic success of students in formation of historical knowledge and consciousness. The findings maintain that students' awareness of phenomenon is enhanced due to outdoor learning. These studies were not on ecological concepts which leaves a gap for comparable studies.

### **2.5. Ways in which outdoor learning activities affect student engagement, motivation, and interest in ecological topics**

#### **2.5.1 Experiential Learning**

It is well documented that the effect of outdoor learning is considerable particularly on the learners. In a study conducted amongst secondary school students, Eaton (2018) reported the cognitive and affective of learning in outdoor education on students from New York City. According to that study, outdoor education emphasizes experiential learning, allowing students to learn through

direct experience and hands-on activities. Whether navigating through a forest, conducting field research, or participating in team-building exercises, students develop valuable life skills such as problem-solving, collaboration, and resilience (Donaldson and Donaldson, 2019). These immersive learning experiences foster personal growth and self-confidence, empowering students to overcome challenges and adapt to new environments. In this context, the effect of outdoor learning on student engagement cannot be denied hence the need for local studies to document local findings on the impact of outdoor learning on ecological concepts comprehension.

### **2.5.2 Enhanced creativity and motivation**

Dillon (2022) conducted a study on Science, the environment and education beyond the classroom. The study was conducted in London amongst students from secondary school. The study findings show that nature has long been recognized as a source of inspiration for creativity and innovation. By immersing students in natural environments, outdoor education stimulates curiosity, imagination, and creativity. Whether sketching landscapes, writing poetry, or designing ecofriendly solutions, students are encouraged to think creatively and explore new ideas. This creativity is essential for addressing complex challenges and driving innovation in a rapidly changing world. These findings were reached based on European studies which leaves a comparable gap for African-Zimbabwean studies focusing on ecological concepts.

### **2.5.3 Empowering Students**

In a study in Zambia, James and Williams (2017) conducted a study entitled, “*School-based experiential outdoor education: A neglected necessity*,” The study was conducted with secondary school students who were given chances for engagement in outdoor learning activities in Science.

The study findings show that immense value of outdoor education in enhancing students' learning experiences and holistic development. In a similar study, Kaleli (2018) documents the effects of field works on the academic achievement of students in the teaching of the tenth class. By incorporating outdoor learning opportunities into teaching-learning, it was reported that educators empower students to explore the great outdoors and reap the benefits of experiential education. That being the cases, educators can support students in maximizing the advantages of outdoor education and hence local-Zimbabwean studies are pertinent.

## **2.6. Barriers facilitators encounter when implementing outdoor learning experiences in the curriculum**

Although this student-centered approach to learning has many positive outcomes it does come with its share of challenges. Researchers have found challenges in implementing outdoor education into the school in terms of accessibility and logistics.

### **2.6.1 Teacher Accessibility**

Many challenges of outdoor learning have been found concerning accessibility, including issues such as funding, transportation, and teacher ability (Meighan & Rubenstein, 2018). Teachers have been kept from applying outdoor education to their own teaching style because they have not been able to gain access to the necessary space or resources due to a lack of funding (Meighan & Rubenstein, 2018). If the outdoor learning can take place on school grounds, then the teachers do not have to worry about transportation, but if the school grounds are insufficient for what the teacher has in mind, then the additional challenge of finding and funding transportation is introduced. Another obstacle that arises when trying to implement outdoor education is the fact that many teachers are not very confident in their ability to implement outdoor education into their own teaching style (Mann, 2021). This lack of confidence could be attributed to the fact that outdoor learning is an approach that may be newer to them, and they have not been trained in this style of learning. The lack of teacher confidence to teach this way proves to be a challenge, as it

leads to a shortage of teachers willing to teach outdoors. The difficulties that arise due to funding, transportation, and teacher ability make it so outdoor learning is not completely accessible for all teachers and students.

### **2.6.2 Logistics**

Other logistical challenges to outdoor learning have been found, including planning time and safety/liability (Meighan & Rubenstein, 2018). Part of the risks that may be included in outdoor education are the weather conditions, which also affect how much planning is involved in outdoor education (Meighan & Rubenstein, 2018). Teachers have to make sure that whatever they plan can be done in any type of weather, or they have to be prepared with a back-up plan if their plan cannot be done in a certain type of weather condition. With these additional risks present, teachers may be more nervous while teaching, which can influence the overall effectiveness of their instruction (Almarode, Fisher, Frey and Hattie. (2018). The addition of logistical obstacles to outdoor learning may make outdoor learning less appealing to teachers. In this context, there is need to explore the impact of outdoor learning hen teaching ecological concepts.

### **2.7 Summary**

This chapter has reviewed related literature on the impact of outdoor activities=learning in teaching-learning. Throughout these studies it can be noted that the strategy of teaching through outdoor activities is widespread because of a number of reasons in education. The challenges encountered in use of outdoor activities in teaching and learners has been explained as documented in literature. The theoretical framework for the study has been provided explaining how pragmatism as a theory underpins teaching from outdoor activities. The next chapter focuses on research methodology



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter explains the research methodology for the study investigating the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools. The researcher in the subsequent chapter discusses the research approach, research design, as well as the population of the study, sample and sampling procedures for the current study in this chapter. The research instruments, data collection procedure in addition to the data analysis procedure are also provided in this chapter. Finally, the chapter also discusses the ethical considerations reflected on in carrying out the study.

### **3.2 Research paradigm**

The researcher used interpretivism. According to Creswell (2018) interpretivism is based on the belief that human behavior is multilayered and it cannot be determined by pre-defined probabilistic models. A human behavior is quite unlike a scientific variable which is easy to control which explains why the research proposes to adopt the interpretivist paradigm to investigate the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools. Human behaviors are affected by several factors and are mostly subjective in nature. Therefore, interpretivistic believe in studying human behavior in the daily life rather than in the controlled environment and will be used in the study.

The interpretivist paradigm was most appropriate for this study; since the focus was on investigating the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools. This will elicit the lived experiences of the participants. The interpretive paradigm allows researchers to see the world through the eyes of the participants' views and experiences. The interpretive paradigm investigator uses those experiences to develop and interpret his knowledge from obtained facts when looking for answers for research (Nguyen & Tran 2015). Examples of data collection techniques that yield qualitative data include open-ended interviews with varying degrees of structure (standardized open-ended interviews,

semi- standardized open-ended interviews and informal conversational interviews), observations, field reports, personal notes and documents. Even though interpreters gather mainly qualitative data from respondents, interpretive researchers can also use methods that generate numerical quantitative data; for example, a questionnaire (Adil & Khalid, 2016).

### **3.2 Research approach**

The researcher used the qualitative research methodology. Cohen and Manion (2018) say qualitative researchers follow a more constructivist worldview and are predominantly interested in collecting and analysing narrative data using open-ended (holistic) procedures. Qualitative researchers are pragmatic, collect narratives from participants, employing and making inferences as answers to their research questions by integrating the inferences gleaned from their qualitative findings.

The research methodology and research paradigm of this study was based in the interpretivist paradigm. The interpretive paradigm allows a researcher to look at the world via the respondents' perspectives and views and to create and analyze their understanding from data collected (Maree, 2016). Interpretivism helps researchers to investigate their culture through analyzing people's perception. Interpretivism is inclusive since it accepts several points of view from various classes of different people in which it typically tries to understand a given context. The interpretive paradigm's central assumption is that truth is socially constructed (Creswell, 2019). Based on the above realities, this research required to discover the educational involvement of learners in outdoor learning activities in teaching ecological concepts by collecting data from learners, teachers and principals.

#### **3.2.1 Research design**

The researcher used a case study within the qualitative research design since qualitative methods are used. Research design is a blueprint that simply sets out the research goals (questions/hypotheses) and methods (tools and techniques for data collection and analysis) in a concise and transparent way (Cohen and Manion, 2018). Within the practical constraints of location, time, money, and the researcher's availability, design is primarily concerned with the aims, uses, purposes, intentions, and plans (Asenahabi, 2019). A researcher's ideas are reflected in the research design. It alleviates frustration by tying the research together with a structure plan that

demonstrates how all of the primary components of the study work together to answer the research questions. The study design is the strategy and procedures for the study providing the overall data collection framework. It provides the comprehensive steps of the study and provides instructions on systematic techniques for sampling, sample size, methods for data collection and processes for data analysis. To evaluate the information gathered through questionnaires, interviews and observations, the study used a descriptive survey design with a mixed-methods research approach. In a descriptive research study, the researcher selects the sample participants and administers the data collection instruments to collect the data (Creswell, 2019).

Cohen and Manion (2019) state that in social studies, the case study is a research method in which a phenomenon is investigated in its real-life context. It is an empirical inquiry and research strategy that is based on an in-depth investigation of a group, event, or individual to explore the underlying principles causes. A case can be anything that a researcher wants to investigate which can include a person, a group, an event, a decision, a policy, period, institution, or any other system that can be studied historically (Creswell, 2013). The schools that have been selected as the case study are three selected schools from Chivi district in Masvingo province.

### **3.3 Population and sampling procedures**

The following section provides an explanation on the population and sampling procedures for the study;

#### **3.3 1 Population**

The term population refers to a collection of all components or parts (Creswell, 2013). According to Cohen and Manion (2013), the term population refers to a group of persons, objects or items upon which the researcher selects the sample. Therefore, the term population refers to the whole group of people the researcher focuses on prior to employing a sample. The population for the study include a total of 9 school administrators, 90 teachers and 3000 learners with from the selected secondary schools.

#### **3.3.2 Sample**

Creswell (2013) defines a sample as a group of people, objects, or items selected from a large population for measurement. Cohen and Manion (2018) define a sample as the respondents in a study. Therefore, a sample is the number of people a researcher selects to participate in a study.

The sample for the study include a total of 3 school administrators, 6 teachers and 9 learners from the three schools.

The researcher used purposive sampling for the selection of participants for the study. Creswell (2018) defines sampling as the comprehensive a process for choosing participants for the study. Chiromo (2019) states that sampling is selecting part of a population for a research study. Therefore, sampling refers to the process of choosing a number of individuals to participate in a study.

The selection of school administrators was based on purposive sampling. Creswell (2018) defines purposive sampling as choosing respondents based on their knowledge or skills, features, position of authority within an organisation or attributes. Chiromo (2019) states that purposive sampling refers to the method of choosing members from a population to represent the group in a study.

Therefore, purposive sampling entails selecting participants using the researcher's discretion so that the participants fit the required criterion. A total of 3 school administrators from the study setting were selected using the purposive sampling technique because of their being responsible for managing teaching using outdoor learning activities from respective schools.

The selection of teachers and learners was primarily random sampling. A simple random sample is a subset of individuals (a sample) chosen from a larger set (a population) in which a subset of individuals are chosen randomly, all with the same probability. It is a process of selecting a sample in a random way. Each subset of k individuals has the same probability of being chosen for the sample as any other subset of k individuals (Creswell, 2018). A simple random sample is an unbiased sampling technique. Simple random sampling is a basic type of sampling and can be a component of other more complex sampling methods. All the teachers and learners from the schools selected had an equal chance of being selected. A total of 6 teachers and 6 learners were selected this way after cards were circulated for them to pick.

### **3.4 Data collection**

The researcher used focus groups, the interviews and closed and open ended questionnaires. These are explained below;

### **3.4.1. Interview guide for science teachers**

The researcher used interviews to gather data from the school administrators. Baron (2019) defines an interview as a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular situation. Holt et al (2018) defines an interview as a two-way conversation initiated by the interviewer to obtain data from a respondent. Therefore, one can define interviews as a research instrument for data gathering between the interviewer and the interviewee. The reason for interviewing these participants was that they are the school administrators who are in charge with ensuring the use of outdoor learning activities in the secondary school. Moreover, interviewing provided to be an exhaustive data gathering tools hence the use of this technique in data gathering. This is a data collection technique that involves the oral questioning of respondents, either as individuals or as a group (Blanche, Durrheim & Painter, 2019). The interviews were conducted in a form of individual interviews and were guided by open-ended questions.

The standardized open-ended interview is extremely structured in terms of the wording of the questions (Turner, 2017). This open-endedness allowed the participants to contribute as much detailed information as they desired concerning the administrators' perspectives with regard the use of outdoor learning activities in teaching ecological concepts at secondary school level. This is supported Creswell (2019) saying interviews allow the researcher to ask probing questions as a means of follow-up. Standardized open-ended interviews are likely the most popular form of interviewing utilized in research studies because of the nature of the open-ended questions, allowing the participants to fully express their viewpoints and experiences (McNamara, 2019).

The participants were asked identical questions, but the questions were worded so that responses were open-ended providing a clear picture on the use of outdoor learning activities in teaching ecological concepts at secondary school level in the study setting.

The selection of interviews as data gathering instruments was based on the fact that they are cost effective in terms of time and money as supported by Cohen and Manion (2018). The technique of personal interviewing is undertaken in order to reach the objectives since it is the most versatile and productive method of communication and enable spontaneity.

#### **3.4.2. Questionnaires for science teachers**

The questionnaires were meant for the majority of the educators teaching Science subjects who participated in the study. According to Gateway (2015) questionnaires are a list of questions planned to extract certain facts from recognized groups of people. Stebbing (2017) posits that questionnaires are a set of prudently created questions to provide systematic data on a particular subject. Therefore, the researcher used questionnaires to extract information that was relevant for the study into the use of outdoor learning activities in teaching ecological concepts at secondary school level.

Questionnaires gave respondents both close ended and open ended questions. Questions kept the respondents' minds focused on the subject. Close ended questions required "YES" or "NO" responses only whereas open ended questions allowed the respondents to air their views without restrictions. This allowed deeper analysis and consideration of the questions such that more detail was obtained.

Questionnaires supplemented interviews where the concerned person could not be approached verbally. This technique required all the respondents to write something rather than just to say, "YES" or "NO". Stebbing (2017) says that questionnaires are completed freely and in privacy.

This implies that the learners answered questions without fear of intimidation and victimization and were assured anonymity. The data provided by the questionnaire was easy to tabulate and analyze. The researcher also opted for the questionnaire because it was not time consuming since a number of copies of the questionnaire were dispatched towards the derived sample.

However, the questionnaire did not give the researcher time to explain questions and some of the respondents who were careless ended up losing the questionnaires hence resulting in a low return rate. To overcome these challenges, the researcher instructed the respondents to answer all the questions provided on the questionnaire.

### **3.4.3. Science teacher Focus Group Discussions**

The researcher also used focus group discussion as data gathering tool to collect qualitative data concerning the use of outdoor learning activities when teaching ecological concepts at secondary school. Creswell (2018) says a focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. A focus group is a research method that brings together a small group of people to answer questions in a moderated setting. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas.

According to Cohen and Manion (2019) focus groups are ideal for gaining deeper, more meaningful insights into who your audience is, how they behave, and what factors motivate their purchasing decisions. They save time, allow you to measure reactions (not just opinions), and are easily replicated across groups and locations.

### **3.5. Credibility and trustworthiness**

With regard to the qualitative approach, the researcher needed to reflect on the trustworthiness of the research, which comprises four key elements, namely, credibility, transferability, dependability, and conformability (Creswell, 2012). These are explained below;

#### **3.5.1 Credibility**

Credibility refers to trust in the data's accuracy as stated as well as the researcher's systematic and detailed interpretation. It includes carrying out the analysis in a way that improves the credibility of the data's results over time and conditions. Credibility is determined by how well the researcher demonstrates the interpretation of research methods and how well the methodology is applied to data collection and data analysis by the researcher. Three distinct but related elements are included in the credibility of a qualitative investigation: a) robust methods for doing fieldwork that generate high-quality data that is consistently evaluated with regard to credibility issues; b) the researcher's reputation, which depends on preparation, experience, track record, rank, and self-presentation; and c) a philosophical conviction in the importance of qualitative study, i.e., a fundamental recognition of qualitative methods of naturalistic research, inductive analysis, purposeful sampling, and holistic thought (Ferdinand, 2019).

In this study, the researcher's supervisor was very experienced and conversant with qualitative research and believed in value of qualitative inquiry. The supervisor fulfilled this important role in approving this research which focused on the use of outdoor learning activities in teaching learning ecological concepts at secondary school level.

#### **3.5.2 Transferability**

Transferability is shown by demonstrating that the sample represents the target population equally as well as by demonstrating that the participants in the sample have the skills, experience and expertise required to provide information in that discipline or area, and that the target population will find the subject to be relevant.

Therefore, if other researchers want to consider whether the samples fairly represented the target population that they had the knowledge, the experience and expertise necessary to provide information on the topic, they could compare the results from the new study to those of the original study (Ferdinand, 2019).

### **3.5.3 Dependability**

Dependability is shown by having simple, detailed and sequential explanations of all processes and procedures, such that each of them can be faithfully replicated by another researcher. Therefore, different researchers can use the study as a source for the study would provide clear and detailed procedures and methods (Ferdinand, 2019).

In this study, to ensure dependability, the research process was clearly documented; the research analysis and findings were supported by those of an objective co-coder; and the whole study was continuously checked and reviewed by the supervisor of this research to ensure that it was fair and ethical especially as it involved teachers, principals and learners from the selected secondary schools.

### **3.5.4 Confirmability**

Confirmability is a level of objectivity or the extent with which the participants form the results of a study and not the prejudice, inspiration, or concern of the researcher. External audits, an audit trail, triangulation, and reflexivity are the strategies for establishing confirmability (Irene & Albine, 2018).

- External audits include the review of both the method and result of the research study by a researcher not involved in the research process. The aim is to determine the accuracy and evaluate whether or not the data supports the observations, interpretations and conclusions.
- An audit trail is a clear summary of the research measures taken from the start of a research project to the development and reporting of outcomes. There are papers that are kept with respect to what was done in an investigation.
- In order to generate understanding, triangulation requires using several data sources in an investigation (Irene & Albine, 2018).

- Reflexivity is an attitude of systematically engaging in the sense of the creation of information, particularly focusing on any bias or choices of the researcher, at any point of the research process.

A researcher's context and status will affect what they want to investigate, the approach of investigation, the techniques considered most suitable for that kind of purpose, the findings considered most suitable, and the presentation and dissemination of findings (Irene & Albine, 2018).

### **3.6. Data collection procedure**

Two days before the set date of the administration of the questionnaire, the samples were randomly selected from the schools' sampling frames. The place and date of the data collection was based on mutual agreement between participants and the researcher. On the day of administration, the researcher gathered the participants in one room, provided briefings, assured them of confidentiality and distribute the booklet. During data collection from deaf learners, the researcher was assisted by other educators at the school. As the directions on the questionnaires were selfexplanatory, the participants were expected to respond independently. If any one of them had any concern, the researcher identified the issue privately to the individual. The respondents have been then provided with the consent form so that they could write their signatures and hand back to the researcher after they have responded to the questionnaires.

In the interview process, there are some techniques that researchers need to be considered in using interview as a research tool. These techniques deal with interview planning, interview process, and data recording (Creswell, 2014). The researcher carefully arranged the interview in preparation for the interviews, which included agreeing on what kind of data the interview could provide. With the consent of the participants, the interviews were recorded. In conducting interviews, the interviewer tried to create a conducive and non-threatening atmosphere where the interviewees would feel relaxed. In this environment they would develop a sense of comfort in the relationship and trust with the interviewer.

### **3.7. Ethical Considerations**

The study is focussing on real life situations of educational contexts hence there is need to strictly observe ethical issues and implications. The participants signed informed consent forms and the

information was summarised and given to the participants to re-affirm. Musaazi (2017) suggests that ethics implications are to develop scientifically acceptable research protocols that are worth the participants' time and have reasonable chance to of yielding meaningful findings, to protect the rights of the participants, to report results fairly and accurately as well as to cooperate with colleagues and share research data.

### **3.7.1 Privacy**

The researcher considered privacy as an ethical guideline for the study on the transition of Deaf learners from primary to secondary school. According to Gray (2019), researchers should ensure privacy of data collected. The research will not invade the privacy of the participants in order to elicit information or to obtain data and through the use of face-to-face interviews, the idea of privacy was guaranteed throughout the study. The research ethics of privacy was ensured through conducting interviews in the comfort of the administrators' offices.

### **3.7.2 Anonymity**

The researcher adhered to the research principle of anonymity. According to Cohen and Manion (2018) anonymity refers to people not telling their own names so that they are not easily identifiable. The researcher used pseudonyms for participants such as A1, A 2., A3 etc in that way. This enhanced issues of anonymity in the study as possible.

### **3.7.3 Protection from harm**

The researcher also adhered to research ethics called protection from harm or beneficence. According to Boateng (2019) the concept of beneficence refers to the 'Do no harm' philosophy and attempts to maximise benefits for the research project while minimising risks to the research subjects. According to Oats (2018) the aim of beneficence is to benefit others and balance good results over potential harm. The researcher ensured the protection of the participants during fieldwork.

### **3.7.4 Voluntary withdrawal**

The researcher also ensured that the participants had opportunities for voluntary withdrawal from the study. According to Cohen and Manion (2018), voluntary withdrawal of participants is the assurance that participants have for voluntary provisions of research data as well as withholding

such information. The researcher clearly explained to the participants this research ethic so that the participants were not forced to provide research data.

### **3.7.5 Avoiding Bias**

It is immoral to be partial to the researcher. There is a distinction between subjectivity and prejudice, but people sometimes confuse the two. Subjectivity stems from the competency, training and educational context of the researcher in both scientific and philosophical perspectives. Bias, on the other hand is when the researcher's intentional attempt is to either expose something disproportionately to its true reality or hide what the researcher has learned throughout the study. Accordingly, it is best to stay away from conducting research if the researcher does not manage his or her bias (Kumar, 2019).

Therefore, without misrepresenting or fabricating any findings in the study process, the researcher attempted by any means to avoid bias and record all the results in a full and truthful way. There was also an opportunity for the interviewed participants to see the transcripts of their interviews. To ensure this issue, the researcher read the transcripts to the participants in order for them to see whether he had captured their views correctly or not.

### **3.8 Data presentation and analysis**

The researcher collected both qualitative data from the respondents and the thematic approach was used. Thematic approach uses themes and, in this case, themes are derived from set research objectives and these are the basis for data analysis and presentation. Data analysis is defined as a process of cleaning, transforming, and modeling data to discover useful information for decisionmaking. The purpose of data analysis is to extract useful information from data and taking the decision based upon the data analysis (Kabir, 2016). Research analysis presents the findings of any institution, entity, or individual's research work being carried out. Research work review requires a given framework and should be carried out very carefully. Before beginning the study, a preliminary understanding of the actual research project is very necessary. Depending on the subject and area of study, the approach to analysis differs, but the framework that forms the basis of the analysis remains the same. For example, the responses for close and open-ended questionnaire items were analyzed first variable by variable. Then, to strengthen the analyses obtained from the questionnaire responses, qualitative data from the interview and observation were analysed by coding and identifying themes. When analysing data (whether from

questionnaires or interviews), the researcher starts by reviewing the research objectives. This allows the researcher to arrange the details and concentrate on the study (Howitt & Cramer, 2017). In order to reinforce the findings obtained from the questionnaire, the researcher first evaluated the quantitative data obtained from the questionnaire and then analysed the qualitative data obtained from the interviews and observations.

### **3.8.1 Qualitative Analysis**

Data gathered from interviews and observation items of participants were analysed qualitatively. Creswell (2012) states that in order to draw inferences, qualitative data analysis requires dismantling, segmenting and reassembling data to shape concrete findings. The investigator took the measures suggested by Creswell (2012) to evaluate phenomenological data in the data review. First it documented and transcribed interviews and observations; then the researcher went through the scripts of the interview and observation and highlighted relevant statements and sentences or quotes that gave an interpretation of how the phenomenon was interpreted by the participants. Secondly, the investigator formed clusters of meaning into themes from these claims. The researcher used the themes in the next step to compose a summary of what was encountered by the participants. The researcher wrote a composite description which presents the nature of the phenomenon.

### **3.9 Summary**

This chapter explored the research design that guided this study. It discussed the research approach and process that was followed in gathering data. A qualitative research approach was used. The study employed a case study design. The methods of collecting data as stated were the questionnaire, the interview and observations. Issues of reliability and validity as well; as credibility and trustworthiness have also been discussed. Finally, the chapter discussed ethical considerations and the following chapter presents the data collected from the field work.

## CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND DISCUSSION

### 4.1 Introduction

This chapter focused on data presentation, analysis, and discussion of the data findings pertaining to the research topic entitled “*Investigating the impact of outdoor learning experiences on student outstanding of ecological concepts in Chivi District Secondary Schools.*” From the questionnaires, interviews, focus groups and observations held with the participants, the following findings were recorded. The research used qualitative research methodology for generating data. The responses are informed by the objective of the study prescribed in the preliminary chapter and are presented in tables, graphs and pie charts.

### 4.2. Data presentation and analysis

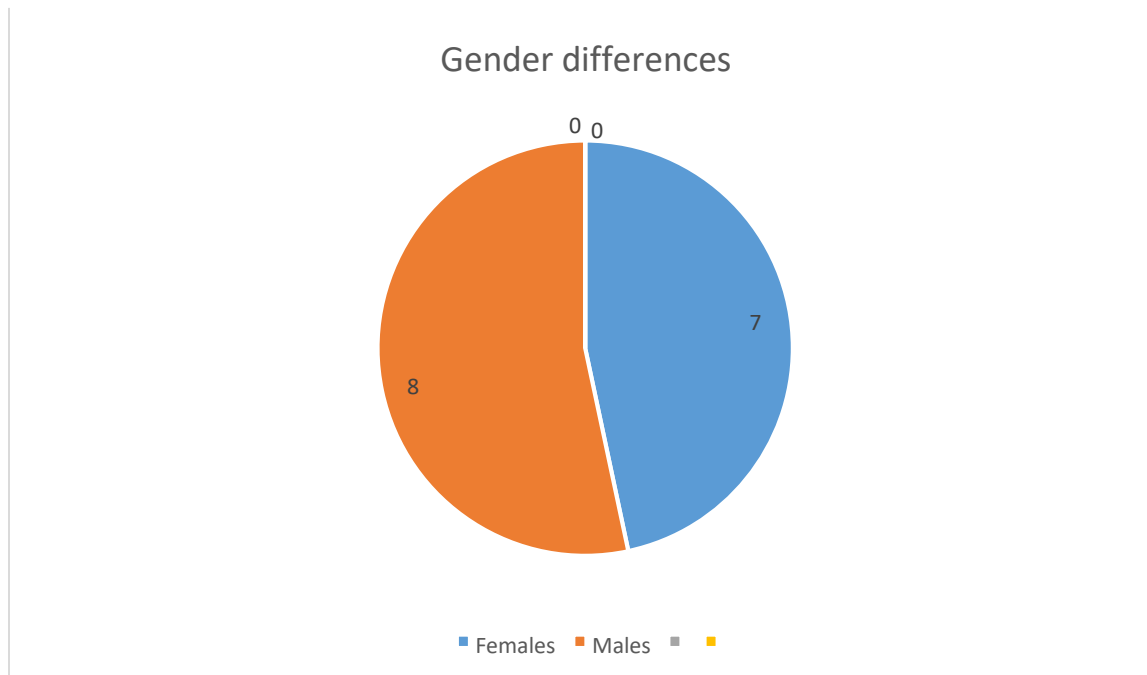
#### 4.1.1 Demographic data

A total of 3 school administrators from the study setting were selected using the purposive sampling technique. A total of 6 teachers and 6 learners were selected randomly to participate in the study. This gives a total of 15 participants altogether. The distribution of participants by their gender is shown below;

**Table 4.1: Distribution of Participants by Gender**

| Gender       | School Administrators | Teachers | Learners | Total     |
|--------------|-----------------------|----------|----------|-----------|
| Male         | 2 (67%)               | 3 (50%)  | 3 (44%)  | 8 (53%)   |
| Female       | 1 (33%)               | 3 (50%)  | 3 (56%)  | 7 (47%)   |
| <b>Total</b> | 3 (100%)              | 6 (100%) | 6 (100%) | 15 (100%) |

From Table 4.1 above, a total of 2 (67.0%) male School Administrators who participated along with 1 (33.0%) female School Administrators. Additionally, 3 (50%) male Teachers and 3 (50%) females Teachers took part in the research. A total of 3 (50%) boys and 3 (50%) girls who were selected as learners took part in the study. The overall number of males is 8 (53%) while that of females is 7 (47%). In Figure 4.1 below, the gender disparities for participants is shown;



**Figure 4.1 Gender differences of the teachers and administrators**

From Figure 4.1 above, it is shown that 7 females and 8 males participated in the research. This signposts a slight imbalance on the contributors henceforth warrants authenticity, reliability and transferability.

#### 4.1.2. Professional Qualifications

**Table 4.2 Professional qualification of respondents by gender (N=9)**

| No. | Qualification | Males | Females | Percentage |
|-----|---------------|-------|---------|------------|
| 1   | Certificate   | 0     | 0       | 0%         |
| 2   | Diploma       | 2     | 3       | 56%        |
| 3   | Degree        | 3     | 1       | 44%        |
| 4   | Total         | 5     | 4       | 100%       |

**Source: Research data (2024)**

The table 4.1 above shows that 5 participants had a Diploma and 4 participants were holders of degrees. The participants have attained a good education and as such their ability to respond to the study questions on the impact of outdoor activities on teaching ecological concepts intelligently and comfortably cannot be underestimated.

#### 4.1.3 Age range of participants

The following table presents the age range for the teachers who participated in the study as obtained from the questionnaires.

**Table 4.3 The age ranges for the participants (N=9)**

| <b>Age range</b> | <b>Number of participants</b> |
|------------------|-------------------------------|
| 20 – 30 years    | 2                             |
| 31 – 40 years    | 3                             |
| 41 – 50 years    | 3                             |
| 51 years & above | 1                             |
| <b>Total</b>     | <b>9</b>                      |

From table 4.2 above, a total of participants is in the range of years between 20 to 30 years of age while a total of 3 participants are in the range of 31 - 40 years of age. It is also shown that a total of 3 of the teachers are in the range 41 – 50 years of age and 1 is 51 years of age and above. These findings show that the majority of the teachers are much older for conducting teaching and learning from a much-informed position which gives credit to the current study into the impact of outdoor activities on teaching ecological concepts at secondary school level.

#### **4.1.4 Response rate**

This section of the study presents the response rate for the participants on questionnaires given. According to The American Association for Public Opinion Research (2017) the term response rate denotes that entire number of respondents who responded to the assigned questions in research divided by total number of those who were eligible. Therefore, response rate refers to the total number of participants who completed the questionnaire divided by the total number of respondents who were given the questionnaires. These were the teachers and school administrators who participated in the study.

**Table 4.4 Response rate by gender (N=12)**

| <b>Total questionnaires given</b> | <b>Males</b> | <b>Females</b> | <b>Total respondents</b> | <b>Percentage</b> |
|-----------------------------------|--------------|----------------|--------------------------|-------------------|
| 4                                 | 6            | 6              | 12                       | 100%              |

The table 4.2 above shows that the response rate for the questionnaire was quite commendable with a 100%. This is an indication that all respondents who comprise 50% (6/12) males and 50% (6/12) females responded to the questionnaire as anticipated.

#### **4.2 Discussion and Interpretation**

This section of the study presents the findings collected from interviews, questionnaires and from observations. Findings are presented based on themes from the research questions and pseudonyms are used to refer to the participants for ethical reasons.

##### **4.2.1. The current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences.**

The study findings show that the educators in the study setting sometimes use outdoor learning activities in teaching ecological concepts. The participants referred to outdoor-based learning practices as key in both taking pace outside of traditional classrooms. Concerning the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences;

**Teacher A:** *Outdoor learning activities connect children with nature. Outdoor learning activities are supportive to science learning compared to classroom-based instruction for most students.*

From the above findings, it is clear that outdoor learning activities are sometimes being implemented in the teaching-learning process for ecological concepts teaching. Ayotte-Beaudet, Berrigan, Deschamps, L'Heureux, Beaudry and Turcotte (2023) state that teachers understood themselves as key initiators for outdoor learning. They agreed that whether and how often teachers implement outdoor learning depends on their interest, skills and preparedness. They acknowledged that outdoor learning is not everyone's cup of tea. However, teachers also noted that interest in and commitment to outdoor learning depends on the larger context, such as the support for outdoor learning in the education system, the quality of the natural and built environment around school, and support and buy-in from families, colleagues, and school administrators.

#### **4.2.2. How outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction.**

##### **4.2.2.1 Enabling active and experiential learning**

It was reported from the study that outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction through enabling an active and experiential learning amongst the learners. The participants maintained that the idea of place-based learning is frequently associated with experiential learning. The following was said by one of the participating school administrators during fieldwork;

*The learners are acquainted with the conditions of the local community, physical, historical, economic, occupational, etc., in order to utilize them as educational resources. Outdoor learning experiences provides experiential learning as a way for students to learn directly through hands on experience. With outdoor learning, students can engage in scientific investigations such as doing scientific observations, asking questions, or conducting experiments. All these outdoor learning experiences can have an enormous influence on students' comprehension and retention of ecological concepts compared to traditional classroom instruction.*

From the above findings, it is clear that outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction by enabling active and experiential learning. Arikan (2021) stresses the importance of school principals to advocate for outdoor learning and communicate its value for learning to the larger school community. This shows that once educators put time for the outdoor learning activities, the learners can actually learn through active participation during outdoor learning which is considered a walking field trip.

#### **4.2.3. Ways in which outdoor learning activities affect student engagement, motivation, and interest in ecological topics.**

##### **4.2.3.1. Building awareness of the place of nature and living organisms**

The study findings show that outdoor learning activities affect student engagement, motivation, and interest in ecological topics through building awareness in learners concerning nature and living organisms. The participants contented that outdoor learning exposes learners to nature and get to know the living organisms in nature. The following was said by the participants concerning outdoor learning activities affect student engagement, motivation, and interest in ecological topics;

**Teacher:** *School-based outdoor learning provides a unique opportunity to study the relationships within ecosystems, as nature itself can be explored. Places explored by students provide added value for studying the mechanisms of interactions between species, which often present challenges for students and for teachers. Outdoor settings can help students to generate scientific observations and explanations of ecosystems, especially since many students have difficulty recognizing how animals interact with plants.*

From the above findings, it is clear that outdoor learning activities are the basis for building awareness of the ecological roles of living organisms in nature. Higgins, Nicol & Ross (2016) agree with the study findings. The study findings show that outdoor learning activities affect

student engagement, motivation, and interest in ecological topics through building awareness in learners concerning nature and living organisms.

#### **4.2.3.2 Increasing achievement in science**

It is also apparent from study findings that outdoor learning activities affect student engagement, motivation, and interest in ecological topics by increasing achievement in science. The teachers that participated concurred that outdoor learning is key to higher scores in science and when learning ecological concepts. The following was said by the teachers concerning how outdoor learning activities affect student engagement, motivation, and interest in ecological topics;

**Teacher A:** *Educational interventions that expose students to nature lead to better retention of knowledge, higher scores on standardized tests, and better grades. As an enhanced context strategy, it has the potential to be supportive of student achievement, for many students including children from disadvantaged families.*

**Teacher B:** *Students who learn from outdoor activities can achieve better results in class exercise and in tests.*

From the above findings, it is clear that outdoor learning activities are key in increasing achievement in science. According to Glackin (2016) outdoor learning activities motivate learners to achieve better results.

#### **4.2.3.3. Providing more authentic learning experiences.**

The study findings show that outdoor learning activities affect student engagement, motivation, and interest in ecological topics providing more authentic learning experiences to the learners. The teachers and administrators revealed that an outdoor place-based approach should be considered as providing a third space for science education at school, that is, a space that bridges school practices and students' lives. The following was said by school administrators concerning how outdoor learning activities affect student engagement, motivation, and interest in ecological topics;

**School Administrator A:** *Schools' immediate surroundings can be used as an extension of the classroom to make abstract knowledge concrete through direct observations. For instance, students can engage in science field activities such as soil analysis, sky observations, and species identification.*

From the above findings, it is clear that outdoor learning activities offer the learners practical experiences as they learn concepts about ecology. This shows that learners gain a great deal of skills from outdoor learning activities. Christie, Higgins, King, Collacott, Kirk & Smith (2019) state that this means that teachers should undergo professional development, mentoring, and training in outdoor learning as it is critical to help teachers build a repertoire of outdoor teaching skills, gain expertise, and build confidence in teaching outdoors.

#### **4.2.4. Barriers encountered when implementing outdoor learning in the curriculum.**

Study findings show that all students have a right to the benefits of nature engagement and from outdoor learning as they learn ecological concepts at secondary school level. However, the participants revealed that there are a variety of factors that can stand in the way, from seemingly random factors like the weather, to systems and policies that affect access to nearby nature, or costs to travel to quality teaching-learning space.

##### **4.2.4.1. Teacher confidence**

The study findings show that teacher confidence related problems affect the use of outdoor learning approaches in teaching ecological concepts at secondary school level. The teachers which participated revealed that teachers may lack confidence in teaching outdoors. This can be due to teacher training and professional development programs that do not include outdoor learning. The following was said by participating teachers.

**Teacher D:** *Communication problems when using outdoor activities is a real challenge for teachers as they teach concepts on ecology. Teachers may have difficulty communicating what learning objectives have been addressed. Moreover, the biggest challenges when it comes to education outside the classroom remains the evaluation and assessment. When activities outside the classroom are part of the curriculum, it is easier to evaluate the benefits of them. Education outside the classroom encompasses some aspects which are not measurable (e.g. social and interpersonal skills or empathy, affective skills or feeling).*

**Teacher E:** *Fear of children hurting themselves which may present teaching-learning problems. There may be a fear of children hurting themselves.*

Issues of teacher confidence are key in teaching and has been shown to have an influence on a number of pedagogical experiences. This is in line with Salmi, Kaasinen & Suomela (2016) who states that Confidence can be an initial barrier to facilitating outdoor learning. Reduced confidence could be due to a lack of knowledge about outdoor learning pedagogical approaches (Christie et al., 2015). As I discussed in my first blog post, you can use your interests and strengths to help build the foundation for your future practice. Humans learn by connecting the past with new experiences (Boud, 2023). Developing a pedagogical approach that suits you will encourage a comfortable and sustainable future use of outdoor learning (van Dijk-Wesselius et al., 2020).

#### **4.2.4.2. Curriculum requirements**

It is also apparent from study findings that curriculum requirements hinder the use of outdoor activities in teaching ecological concepts at secondary school level. The school administrator who participated in the study contented that school curriculum requirements may limit opportunities for outdoor learning. The following was said by the school administrator;

*The curriculum seems rigid, leaving limited time for activities to be organised outside the classroom. In the study setting, as a good example, outdoor activities are compulsory every day, 30 minutes in the morning before break and 30 minutes after break time, except if the lesson is a theory lesson. But situation is different in other schools where outside activities look like a waste of curricular time.*

From the above findings, it is clear that curriculum requirements are key in ensuring that outdoor learning activities are implemented in teaching-learning ecological concepts. Demircioğlu, Demircioğlu and M. Çalik (2019) who report that curriculum requirements should not hinder use of learner centered pedagogy during lessons. There is therefore, need for educators to prioritize use of outdoor learning activities as they teach ecological concepts at secondary school level.

#### **4.2.4.3. Time, resources, and support**

In the use of outdoor activities in teaching ecological concepts, the participants cited several challenges. These challenges included shortages of time, resources, and support. The following was said by the participating school administrators;

**School Administrator A:** *At teachers' level, it seems that **time restrictions** are one of the biggest challenges. Teachers are sometimes overloaded with administrative tasks in complement to teaching activities and consequently, if they want to organize an outdoor activity, they are obliged to use their personal time.*

From the above findings, it is clear that resources are a barrier to the use of outdoor learning activities. Custers (2020) states that collaborating with other teachers to plan outdoor learning can also help build confidence, not to mention the usefulness of sharing resources and ideas. Therefore, working with other enthusiastic colleagues when planning outdoor learning is beneficial. However,

it is essential to note that to create an outdoor learning culture within an organisation effectively, the school's management team must nurture and support their teachers' energy and enthusiasm.

At an individual level, teachers' implementation of outdoor learning is embedded into the supports and structures for outdoor learning that are provided at the school, district, and higher governing levels. In addition, teachers can use additional strategies to support continuous and sustainable outdoor learning in schools. Coventry, Brown, Pervin, SBrabyn, Pateman, Breedvelt, Gilbody, Stancliffe, McEachan and White (2021) state that this includes planning curricular teaching through an outdoor lens (e.g., what part of the curricular content can be taught outside?), creating habits and outdoor learning routines with students (e.g., visiting the same outdoor learning space on a regular basis), and using outdoor learning as a platform for teaching through an emergent curriculum in which learning plans are made flexibly and spontaneously in response to and upon observation of student's interests and needs.

#### **4.2.4.4. School-related barriers**

The study findings show that school related barriers hinder facilitators when implementing outdoor learning experiences in the curriculum. It was revealed that schools can play an important role in providing increased access to nature for children. The educators are a school factor and the following was said by one of the School Administrators who participated in the study;

*Personal skills of teachers are also very important when organising outdoor activities. First of all, teachers need skills in class organisation and management, keeping in mind that it is different to supervise students outside than inside the classroom. Sometimes, additional teachers are needed to help or escort, when there are students with disabilities, for instance. Teachers' initial and continuous development also makes a good difference in this regard. Teachers need to be trained in self-assessment, self-confidence, motivation, interactive and innovative pedagogical models.*

From the above findings, it is clear that outdoor learning has far reaching benefits for children, teachers, communities and society. This is also supported by Acosta & Hutchison (2017) who report that outdoor activities raise the world's happiest children. This is also in line with emerging research which shows that outdoor learning can improve children's social-emotional functioning and behavioral health, increase physical activity (Boud, 2023). This shows that outdoor learning activities enhances academic learning and cognitive functioning, and increase motivation for learning in lessons involving ecological concepts at secondary school.

The findings above show that schools can present many barriers which hinder teachers implementing outdoor learning activities as they teach ecological concepts. This is in line with Zangori and Forbes (2015) multiple benefits of doing so are well-documented in the literature. Also documented in the literature, however, are various spatial, cultural, and social barriers to children's active engagement with nature through school-related activities (Walan, Mc Ewen and Gericke, 2016). These include such challenges as lack of teacher skill, confidence or comfort teaching outdoors; lack of resources to support nature-based programming or transport to outside learning spaces; and curricular pressures.

#### **4.3 Summary**

The chapter above presented the data and findings from the study into use of outdoor learning activities in teaching concepts in ecological concepts at secondary school level. This chapter discussed and analyzed the findings of the research gathered through during field work. The findings concludes that outdoor learning activities are key in ensuring teaching-learning amongst secondary school learners on ecological concepts. The next chapter outlines the conclusion, summary and recommendations.

## **CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter serves as the culmination of the research on investigating the impact of outdoor learning experiences on student understanding of ecological concepts in Chivi District Secondary Schools. It begins with a summary of key findings derived from the study. Conclusion and finally, recommendations for further research are proposed, setting the stage for the conclusion of the research endeavor.

### **5.2 Summary of Research Findings**

The study was an investigating the impact of outdoor learning experiences on student understanding of ecological concepts in Chivi District Secondary Schools. The findings for this study showed that there are a number of benefits accrued from learning ecological concepts from outdoor learning activities at secondary school level. The study was undertaken in Zimbabwe at three (3) schools in Chivi district.

The first chapter of the researcher presented the statement of the problem, the research questions and the significance of the study. The study was prescribed to benefit important educational stakeholders. The research objectives included;

- i) To find out the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences.
- ii) To examine the influence of outdoor learning experiences on students' comprehension and retention of ecological concepts compared to traditional classroom instruction.
- iii) To explore how outdoor learning activities affect student engagement, motivation, and interest in ecological topics.

iv) To find out the barriers faced by facilitators when implementing outdoor learning experiences in the curriculum.

vi) To recommend ways of enhancing the integration of outdoor learning into the ecological education curriculum in Chivi District Secondary School.

The researcher reviewed literature related to outdoor learning activities in teaching ecological concepts in the world and narrowed down to regional literature and then to the Zimbabwean context. The literature review showed the rationale for enhancing the teaching and learning of ecological concepts through outdoor learning activities at secondary school level. The literature review shows that scholars concur that there are a number of factors that affect or influence the teaching and learning of ecological concepts using outdoor learning activities at secondary school level. In fact, the purpose of the literature review for this study was to establish the position of this research on use of outdoor learning activities in teaching ecological concepts at secondary school level in Zimbabwe and to establish the knowledge gap. The literature review adopted a funnel approach as international studies were reviewed along with regional and then national studies on use of outdoor learning activities in teaching ecological concepts across the education system.

In Chapter three of the study, the sample for the study was justified to include a total of 3 school administrators from the study setting and a total of 6 teachers and 6 learners. This gives a total sample of 15 participants altogether. The researcher justified the research design and the research methodology for this study in Chapter 3. The sampling methods- used to select the research participants was primarily purposive sampling, and random sampling techniques. The research was principally a qualitative method. The researcher utilised interviews and questionnaires as well as observation as data gathering techniques. Moreover, data presentation of the research findings was also provided. In chapter four, the researcher highlighted the results obtained from the participants. The researcher interpreted the data presented and also analysed the data. The data was presented on tables and graphs as well as on pie charts while utilising the thematic approach to data analysis. The study findings show that outdoor-based outdoor learning for teaching-learning ecological concepts is taking place in the study setting. The outdoor learning activities are involving any type of environment, geared towards learning in accordance with pedagogical intentions defined by the teacher. Outdoor learning activities includes increased physical activity or promoting mental health

and well-being. The study also shows that outdoor school-based learning connects children with nature as they learn ecological concepts at secondary school level. With an approach integrating nature in the outdoors, both natural environment and elements is becoming a context for academic learning. The findings also show that outdoor learning activities is supportive science learning than classroom-based instruction for a broader range of students.

It is also apparent from study findings that outdoor learning activities affect student engagement, motivation, and interest in ecological topics by increasing achievement in science. The participants concurred that outdoor learning is key to higher scores in science and when learning ecological concepts. School-based outdoor science education can be beneficial for students' learning. Educational interventions that expose students to nature lead to better retention of knowledge, higher scores on standardised tests, and better grades. As an enhanced context strategy, it has the potential to be supportive of student achievement, for a broad range of students including for children from disadvantaged families.

The effectiveness of outdoor learning activities in teaching ecological concepts observed in this study. The findings show that outdoor education in teaching-learning ecological concepts at secondary school level can positively impact learners, even in the short term. While numerous studies have highlighted the long-term benefits of outdoor education, this research underscores the immediate positive effects it can have on learners learning ecological concepts. However, certain gaps remain unaddressed in this study, particularly regarding the long-term effects of outdoor education on learners' academic performance and overall development.

This study examined the use of outdoor learning activities in teaching ecological concepts at secondary school level. It appeared from the study that school teachers' perceptions of barriers and supports for outdoor learning in school uncovered four domains: teacher characteristics (teacher skills, experience and confidence, motivation and commitment), systemic support in schools and school districts (school heads' support, school schedule, policies, curriculum, funding and resources), Most of these barriers and supports align with those identified in previous international studies. The current study findings add to the limited research on barriers and supports for outdoor learning when teaching-learning ecological concepts at secondary school in the public schools in Zimbabwe.

### 5.3 Conclusion

Based on the findings outlined above, the conclusion of the study regarding the use of outdoor learning activities in teaching-learning ecological concepts at secondary school in Chivi district in Masvingo province can be summarized as follows:

- **Positive Attitudes towards Science Learning:** The study revealed a prevailing positivity among educators and learners towards the teaching-learning of ecological concepts from outdoor learning activities. This positive outlook underscores the recognition of outdoor learning activities in teaching ecological concepts at secondary school level as a valuable strategy for enhancing engagement, creativity, and learning experiences.
- **Problems to use of outdoor learning activities in teaching-learning:** Despite the perceived benefits, several barriers hinder the effective use of outdoor learning activities in teaching ecological concepts at secondary school level. Limited access to technology, inadequate training for educators, and concerns regarding digital distractions emerged as prominent challenges that need to be addressed.
- **Innovative Pedagogical Approaches:** Educators demonstrated a strong willingness to use outdoor teaching-learning pedagogical strategies to overcome barriers and promote effective teaching and learning. This proactive approach highlights the importance of fostering a culture of innovation and collaboration among educators, learners, and stakeholders.
- **Potential Impacts on Learning Outcomes:** The study identified promising impacts of use of outdoor learning activities in teaching ecological concepts at secondary school level on creativity, engagement, and learning outcomes for learners. Interactive and hands-on learning experiences facilitated through outdoor learning activities led to heightened levels of creativity, critical thinking, and collaboration among learners.

### 5.4 Recommendations

**5.4.1 For educators:** Given the positive attitudes towards use of outdoor learning activities in teaching-learning ecological concepts at secondary school and the willingness to explore

innovative pedagogical approaches, educators should actively seek out professional development opportunities to enhance their use of outdoor learning activities skills and pedagogical strategies. This could involve participating in workshops, online courses, or peer-to-peer learning communities focused on integrating or using outdoor learning activities in teaching ecological concepts. Additionally, educators should collaborate with colleagues to share best practices, resources, and lesson ideas for use of outdoor learning activities into their teaching practices. By continuously improving their skills and knowledge in use of outdoor learning activities, educators can create more engaging and impactful learning experiences for secondary school learners.

**5.4.2 For educational institutions:** Educational institutions should prioritize investment in the use of outdoor learning activities in teaching to ensure equitable access to learning for all learners. Furthermore, institutions should establish policies and guidelines to support use of outdoor learning activities in teaching, including allocating dedicated time and space for educators to plan and implement outdoor learning lessons. By fostering a supportive environment and providing necessary resources, institutions can empower educators to effectively use outdoor learning activities into their teaching practices.

Moreover, based on an overarching vision, specific actions can be taken to support outdoor learning in secondary schools, including building supportive policies, school structures and practices that facilitate outdoor learning. Supportive policies include year-long parental consent forms for outdoor learning trips and recommending a minimum amount of time classes spend in outdoor learning every week.

**5.4.3 For Policymakers:** Policymakers play a crucial role in shaping the broader educational landscape and facilitating systemic change towards use of outdoor learning activities in the teaching-learning process. To this end, policymakers should advocate for policies and funding initiatives that prioritize use of outdoor learning activities at secondary school level. This could involve allocating funding for research and development of innovative strategies and tools tailored to the needs of secondary school learners, as well as incentivizing schools to adopt outdoor-enhanced teaching practices through grants or funding programs. Additionally, policymakers should prioritize use of outdoor learning activities and training for educators as part of broader professional development initiatives. By prioritizing outdoor learning activities in policy agendas, policymakers can support the development of a more practical based learners.

**5.4.4 For Community Stakeholders:** Community stakeholders, including parents, caregivers, and local organizations, can play a supportive role in promoting use of outdoor learning activities at secondary school level. They can advocate for increased access and use of outdoor learning activities and resources within their communities, as well as support initiatives aimed at providing hands on approach to learners. Additionally, community stakeholders can collaborate with educational institutions to organize extracurricular activities, workshops, or events that incorporate outdoor learning activities and promote creativity and innovation in science education. By actively engaging with the community, stakeholders can contribute to creating a more inclusive and supportive learning environment for secondary school learners to learn from outdoor learning activities.

**5.4.5 For continued research:** Lastly, continued research is needed to further explore the longterm impacts of use of outdoor learning activities in science education on learning outcomes, creativity, and engagement amongst secondary school learners. Researchers should conduct longitudinal studies to assess the sustained effects of use of outdoor learning activities in teaching ecological concepts over time, as well as comparative studies across different contexts and populations to identify best practices and strategies for effective implementation. Additionally, research should focus on emerging outdoor learning activities and innovative pedagogical approaches to inform evidence-based practices and policy decisions. By advancing our understanding of the potential benefits and challenges of use of outdoor learning activities in teaching-learning, research can inform future initiatives aimed at enhancing practical education for secondary school learners.

## REFERENCES

Almarode, J., D. Fisher, N. Frey, and J. Hattie. (2018). *Visible Learning for Science: What Works Best to Optimize Student Learning*. Thousand Oaks.

Amos, R., and M. Reiss. (2022). “The Benefits of Residential Fieldwork for School Science: Insights from a Five-Year Initiative for Inner-City Students in the UK.” *International Journal of Science Education* 34 485–511. Available at <https://doi.org/10.1080/09500693.2011.585476>. Accessed 10 December 2024

Angeloudi, A., G. Papageorgiou, and A. Markos. (2018). “Primary Students’ Argumentation on Factors Affecting Dissolving.” *Science Education International* 29. 127–136.  
[\(Open in a new window\)Google Scholar](#)

Arikan, K. (2021). “A comparison of indoor and outdoor biology education: What is the effect on student knowledge, attitudes, and retention?” *Journal of Biological Education* 1–19.

Ayotte-Beaudet, J.-P., F. Berrigan, A. Deschamps, K. L’Heureux, M.-C. Beaudry, and S. Turcotte. (2023). “K-11 teachers’ School-Based Outdoor Education Practices in the Province of Québec, Canada: From Local Initiatives to a Grassroots Movement.” *Journal of Adventure Education and Outdoor Learning* 1–14.  
<https://doi.org/10.1080/14729679.2022.2164787>.

Bang, M., A. Marin, and D. Medin. (2018). “If Indigenous Peoples Stand with the Sciences, Will Scientists Stand with Us?.” *Proceedings of the American Academy of Arts and Sciences* 147: 148–159.

Ben-Zvi Assaraf, O., and N. Orion. (2019). “A Design Based Research of an Earth Systems Based Environmental Curriculum.” *EURASIA Journal of Mathematics, Science & Technology Education* 5 47–62.

Bermudez, G. M. A. (2017). “Sociocultural Variables That Impact High School Students’ Perceptions of Native Fauna: A Study on the Species Component of the Biodiversity Concept.” *Research in Science Education* 47 203–235.

Bevins, S., and G. Price. (2016). “Reconceptualising Inquiry in Science Education.” *International Journal of Science Education* 38: 17–29.

Biggs, J. (2019). “What the Student Does : Teaching for Enhanced Learning.” *Higher Education Research & Development* 18: 57–75.

Blatt, E., and P. Patrick. 2014. “An Exploration of Pre-Service Teachers’ Experiences in Outdoor ‘Places’ and Intentions for Teaching in the Outdoors.” *International Journal of Science Education* [36\(open in a new window\)](#) ([13\(open in a new window\)](#)): 2243–2264.

<https://doi.org/10.1080/09500693.2014.918294>.

Braun, T., and P. Dierkes. (2019). “Evaluating Three Dimensions of Environmental Knowledge and Their Impact on Behaviour.” *Research in Science Education* 49: 1347–1365.

Braund, M., and M. Reiss. (2016). “Towards a More Authentic Science Curriculum: The Contribution of Out-Of- School Learning.” *International Journal of Science*

*Education* 28: 1373–1388. Retrieved on 10 December 2024 from

<https://doi.org/10.1080/09500690500498419>.

Camasso, M. J., and R. Jagannathan. (2018). “Nurture Thru Nature: Creating Natural Science Identities in Populations of Disadvantaged Children Through Community Education

Partnership.” *The Journal of Environmental Education* 49: 30–42. Article 1.

Carrier, S. J., L. P. Tugurian, and M. M. Thomson. (2023). “Elementary Science Indoors and Out: Teachers, Time, and Testing.” *Research in Science Education* 43: 2059–2083.

Carr, E. C., & Worth, A. (2001). The use of the telephone interview for research. *Nursing Times Research*, 6(1), 511-524.

Chimbi, G.T. (2019). Resurgence of Large Class Sizes and Pedagogical Reform in 21st Century Secondary School History Classrooms. *International Journal of Research in Business and Social Science* (2147-4478)

Collis, J. & Hussey, R. (2013). *Business Research: A practical guide for undergraduate and postgraduate students*, second edition. Basingstoke: Palgrave Macmillan.

Creemers, B. P. M. & Kyriakides, L. (2012). *Improving Quality in Education: Dynamic Approaches to School Improvement*, London and New York: Routledge.

Creswell, J. W. (2019). *Research design: qualitative, quantitative, and mixed method approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage Publications Inc.

Cohen and Manion (2019). *Doing research in the real world* (2nd ed.). Thousand Oaks, CA: Sage Publications Inc.

Cooper, H., B. Nye, K. Charlton, J. Lindsay, and S. Greathouse. (2016). "The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review." *Review of Educational Research* 66: 227–268.

Coventry, P. A., J. E. Brown, J. Pervin, S. Brabyn, R. Pateman, J. Breedvelt, S. Gilbody, R.

Stancliffe, R. McEachan, and P. L. White. 2021. "Nature-Based Outdoor Activities for Mental and Physical Health: Systematic Review and Meta-Analysis." *SSM – Population Health* 16:100934.

Custers, E. J. F. M. (2020). “Long-Term Retention of Basic Science Knowledge: A Review Study.” *Advances in Health Sciences Education*: 109–128.

Demircioğlu, H., G. Demircioğlu, and M. Çalik. (2019). “Investigating the Effectiveness of Storylines Embedded within a Context-Based Approach: The Case for the Periodic Table.” *Chemistry Education Research and Practice* 10: 241–249.

<https://doi.org/10.1039/b914505m>.

Denscombe, M. (2022). *Ground Rules for Good Research*, Maidenhead: Open University Press.

Duke, D.L., & Trautvetter, S. (2021). *Research in schools*. Washington, DC: National Clearinghouse for Educational Facilities.

Eberbach, C., and K. Crowley. (2019). “From Every day to Scientific Observation : How Children Learn to Observe the Biologist’s World.” *Review of Educational Research* 79: 39–68.

<https://doi.org/10.3102/0034654308325899>.

Field, A. (2023). *Discovering Statistics Using IBM SPSS Statistics*. 4th ed. Thousand Oaks, CA: Sage Publications Ltd.

Finn, K. E., Z. Yan, and K. J. McInnis. (2018). “Promoting Physical Activity and Science Learning in an Outdoor Education Program.” *The Journal of Physical Education, Recreation & Dance* 89: 35–39. <https://doi.org/10.1080/07303084.2017.1390506>.

Frey, N., D. Fisher, and J. Hattie. 2017. “Surface, Deep, and Transfer? Considering the Role of Content Literacy Instructional Strategies.” *Journal of Adolescent & Adult Literacy* 60:

567–575. <https://doi.org/10.1002/jaal.576>.

Giamellaro, M. (2017). “Dewey’s Yardstick: Contextualization As a Crosscutting Measure of

Experience in Education and Learning.” *SAGE Open* 7: 1–11.

<https://doi.org/10.1177/2158244017700463>.

Gay, L.R., Mills, G.E. & Airasian, P.W. (2021). *Educational research: Competencies for analysis and applications*. Upper Saddle River: Pearson.

Gill, J. & Johnson, P. (2017) *Research Methods for Manager* (2nd edition), London: Paul Chapman.

Glackin, M. (2016). “‘Risky fun’ or ‘Authentic science’? How teachers’ Beliefs Influence Their

Practice During a Professional Development Programme on Outdoor

Learning.” *International Journal of Science Education* 38: 409–433.

<https://doi.org/10.1080/09500693.2016.1145368>.

Guerrero, G. R., and M. J. Reiss. (2020). “Science Outside the Classroom: Exploring Opportunities from Interdisciplinarity and Research–Practice Partnerships.” *International*

Hattie, J. (2019).

*Visible Learning: A Synthesis of Over 800 Meta-Analyses Related to Achievement*.

London: Routledge.

James, J. K., and T. Williams. (2017). "School-Based Experiential Outdoor Education: A Neglected Necessity." *Journal of Experiential Education* 40: 58–71.

<https://doi.org/10.1177/1053825916676190>.

Jordan, C., and L. Chawla. (2019). "A Coordinated Research Agenda for Nature-Based

Learning." *Frontiers in Psychology* :766. <https://doi.org/10.3389/fpsyg.2019.00766>.

Kapon, S., A. Laherto, and O. Levrini. (2018). "Disciplinary Authenticity and Personal Relevance in School Science." *Science Education* 102: 1077–1106. <https://doi.org/10.1002/sce.21458>.

King, D., and S. M. Ritchie. (2022). "Learning Science Through Real-World Contexts." In *Second International Handbook of Science Education*, edited by B. J. Fraser, K. Tobin, and C. J. McRobbie, 69–79. Springer Netherlands. [https://doi.org/10.1007/978-1-4020-9041-7\\_6](https://doi.org/10.1007/978-1-4020-9041-7_6).

Kuo, M., M. Barnes, and C. Jordan. (2019). "Do Experiences with Nature Promote Learning? Converging Evidence of a Cause-And-Effect Relationship." *Frontiers in Psychology* 10: 1–9. <https://doi.org/10.3389/fpsyg.2019.00305>.

Lacoste, Y., K. Dancause, P. Bernard, and T. Gadais. (2021). "A Quasi-Experimental Study of the Effects of an Outdoor Learning Program on Physical Activity Patterns of Children with a Migrant Background: The PASE Study." *Physical Activity and Health* 5: 236–249.

<https://doi.org/10.5334/paah.133>.

Louv, R. (2015). *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*.

Chapel Hill, NC: Algonquin Books of Chapel Hill.

McCain, M., and Mustard, J.F. (2019). *Survey: The research design*. Toronto, Canada:

Publications Ontario.

Meighan, R. & Rubenstein, T. (2018). “Pathways, Philosophies, and Pedagogies: Conversations with Teacher Educators About Place-Based Education.” *Canadian Journal of Environmental Education* 23 (1): 33–49.

Miller, N. C., S. Kumar, K. L. Pearce, and K. L. Baldock. (2021). “The Outcomes of Nature-Based Learning for Primary School Aged Children: A Systematic Review of Quantitative Research.” *Environmental Education Research*, 1–26.

Moseley, E. L. (2019). “Some Suggestions for Outdoor Science Teaching.” *The Elementary School Journal* 26: 58–66. <https://doi.org/10.1086/455829>.

Musaazi, J.C.S. (2022). *The Theory and Practice of Educational Administration*. London and Basingstoke: Macmillan press limited.

Oates, B. J. (2016). *Research in education*. *European Journal of Information Systems*, 15

Norwood, M. F., A. Lakhani, and E. Kendall. (2021). “Teaching Traditional Indoor School

Lessons in Nature: The Effects on Student Learning and Behaviour.” *Landscape and*

*Urban Planning* 206: 103963. <https://doi.org/10.1016/j.landurbplan.2020.103963>

Oswald, T. K., A. R. Rumbold, S. G. E. Kedzior, and V. M. Moore. (2020). “Psychological Impacts of “Screen time” and “Green time” for Children and Adolescents: A Systematic Scoping Review.” *Public Library of Science ONE* 15: e0237725.

<https://doi.org/10.1371/journal.pone.0237725>.

Pekmez, E. (2018). “Primary School Students Views About Science, Technology and Engineering.” *Educational Research & Reviews* 13: 81–91. Retrieved 10 December 2024  
<https://doi.org/10.5897/ERR2017.3429>.

Perkins, D. N., and T. A. Grotzer (2020). Focusing on Dimensions of Causal Complexity to Achieve Deeper Scientific Understanding. 23.

Potvin, P., and A. Hasni. (2014). “Analysis of the Decline in Interest Towards School Science and Technology from Grades 5 Through 11.” *Journal of Science Education and Technology* 23: 784–802. <https://doi.org/10.1007/s10956-014-9512-x>.

Remmen, K. B., and M. Frøyland. (2020). “Students’ Use of Observation in Geology: Towards ‘Scientific observation’ in Rock Classification.” *International Journal of Science Education* 42: 113–132. <https://doi.org/10.1080/09500693.2019.1704914>.

Rivera Maulucci, M. S., B. A. Brown, S. T. Grey, and S. Sullivan. (2014). “Urban Middle School students’ Reflections on Authentic Science Inquiry: Students’ reflections on authentic science inquiry.” *Journal of Research in Science Teaching* 51: 1119–1149.

Rivet, A. E., and J. S. Krajcik. (2018). “Contextualizing Instruction: Leveraging students’ Prior Knowledge and Experiences to Foster Understanding of Middle School Science.” *Journal of Research in Science Teaching* 45: 79–100.

<https://doi.org/10.1002/tea.20203>.

Rowley, J. (2012). Conducting research interviews. *Management Research Review*, Vol 35 (3/4).

Trier-Bieniek, A. (2012). Framing the telephone interview as a participant-centred tool for qualitative research: a methodological discussion. *Qualitative Research*, 12(6), 630-644.

DOI: 10.1177/1468794112439005.

Sadler, T. D. (2019). “Situated Learning in Science Education: Socio-Scientific Issues As Contexts for Practice.” *Studies in Science Education* 45: 1–42.

<https://doi.org/10.1080/03057260802681839>.

Sasson, I., and Y. J. Dori. (2015). “A Three-Attribute Transfer Skills Framework – Part II:

Applying and Assessing the Model in Science Education.” *Chemistry Education Research and Practice* 16: 154–167. <https://doi.org/10.1039/C4RP00120F>.

Slingsby, D. (2016). “The Future of School Science Lies Outdoors.” *Journal of Biological Education* 40: 51–52. <https://doi.org/10.1080/00219266.2006.9656013>.

- Stapleton, S. R., and K. Reif. (2022). “Teaching Outside As Third Space: Toward School Science That Acknowledges Student Ecological Expertise.” *Environmental Education Research* 28 1373–1390. <https://doi.org/10.1080/13504622.2022.2087862>.
- Stevens, J. P. (2019). *Applied Multivariate Statistics for the Social Sciences*. 5th ed. New York: Routledge.
- Thomas, H. (2015). “Thinking About Systems: Student and Teacher Conceptions of Natural and Social Systems.” *System Dynamics Review* 23: 285–311.
- Walan, S., B. Mc Ewen, and N. Gericke. (2016). “Enhancing Primary Science: An Exploration of teachers’ Own Ideas of Solutions to Challenges in Inquiry- and Context-Based Teaching.” *Education 3–13*, 44: 81–92.
- Zangori, L., and C. T. Forbes. (2015). “Exploring Third-Grade Student Model-Based Explanations About Plant Relationships within an Ecosystem.” *International Journal of Science Education* 37:2942–2964.

## **APPENDIX I : INTERVIEW GUIDE FOR SCHOOL ADMINISTRATORS**

**BINDURA UNIVERSITY OF SCIENCE EDUCATION FACULTY**  
**OF SCIENCE EDUCATION**  
**DEPARTMENT OF SCIENCE AND MATHEMATICS**  
**INTERVIEW GUIDE FOR SCHOOL ADMINISTRATORS**

We are students in the Faculty of Education at the Bindura University of Science Education studying for a Bachelor of Education Degree. We are carrying out a study on the use of outdoor learning activities in teaching-learning ecological concepts at secondary school. We are kindly asking you in carrying out my research by responding to the following questions. Your responses will be treated as highly confidential and solemnly used for educational purposes and full responded anonymity is granted.

### **SECTION A**

#### **PERSONAL DATA**

1. (a). Gender (tick where applicable)

|                          |                          |
|--------------------------|--------------------------|
| Male                     | Female                   |
| <input type="checkbox"/> | <input type="checkbox"/> |

(b) Age

.....  
(c) Highest professional qualification  
.....

### **SECTION B**

- vi. What is your understanding of the term outdoor learning activities?
- vii. What are the examples of outdoor learning activities suitable for learners at secondary school level?
- viii. What is the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences?
- ix. How do outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction?
- x. In what ways do outdoor learning activities affect student engagement, motivation, and interest in ecological topics?
- xi. What barriers and facilitators do educators encounter when implementing outdoor learning experiences in the curriculum?
- xii. What recommendations can be made to enhance the integration of outdoor learning into the ecological education curriculum in Chivi District Secondary School?

## APPENDIX II : QUESTIONNIARE GUIDE FOR TEACHERS

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

## DEPARTMENT OF SCIENCE AND MATHEMATICS

## **QUESTIONNAIRE GUIDE FOR TEACHERS**

We are students in the Faculty of Education at the Bindura University of Science Education studying for a Bachelor of Education Degree. We are carrying out a study on the use of outdoor learning activities in teaching-learning ecological concepts at secondary school. We are kindly asking you to carry out my research by responding to the following questions. Your responses will be treated as highly confidential and solemnly used for educational purposes and full anonymity is granted. You are therefore, kindly requested to complete the questions below. All information provided will be treated with confidentiality and will be used only for the purposes of this study. There is no need for you to write your name. Your co-operation will be greatly appreciated.

Thank you.

**Instruction:** Please tick the answer that best answers the corresponding question and provide answers where there is a gap.

1. Sex;            male [    ]            Female [    ]
2. Age group; 20-25 Years [    ]    26-30 Years [    ]    31-35 Years [    ]    Over 40 Years [    ]
3. What is the grade/form you are teaching? Form1 [    ]    Form 2 [    ]    Form 3 [    ]    Form 4 [    ]  
[    ]    Other [    ] Specify...

4. What is the meaning of the term outdoor learning activities?

.....  
.....

5. For how long have you been teaching at the school?

.....  
.....

2. Do you get enough assistance from your administrators to implement outdoor learning activities?

.....  
.....

7. How often do you implement outdoor learning activities in your teaching-learning process?

.....

8. Did you undergo a comprehensive training in use of outdoor learning activities?

.....

9. Comment on how outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction?

.....  
.....  
.....

10. In what ways do outdoor learning activities affect student engagement, motivation, and interest in ecological topics?

.....  
.....

11. What are the problems use of outdoor learning activities in teaching ecological concepts at secondary school?

.....  
.....

12. What do you think can be done to effectively implement outdoor learning activities in teaching-learning ecological concepts at secondary school?

.....  
.....

**Thank you**

### **APPENDIX III: FOCUS GROUP DISCUSSIONS FOR TEACHERS**

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE EDUCATION**

**DEPARTMENT OF SCIENCE AND MATHEMATICS**

**FOCUS GROUP DISCUSSIONS FOR TEACHERS**

Dear Respondents

We are students in the Faculty of Education at the Bindura University of Science Education (Masara Talent, Mhona Tonderai and Madzvamuse Silence) studying for a Bachelor of Education Degree. We are carrying out a study on the use of outdoor learning activities in teaching-learning ecological concepts at secondary school. We are kindly asking you in carrying out my research by responding to the following questions. Your responses will be treated as highly confidential and solemnly used for educational purposes and full responded anonymity is granted. You are therefore, kindly requested to complete the questions below. All information provided will be treated with confidentiality and will be used only for the purposes of this study. There is no need for you to write your name. Your co-operation will be greatly appreciated.

**Thank you**

- i. What is your understanding of the term outdoor learning activities?
- ii. What is the current level of understanding of ecological concepts among secondary school students in Chivi District before participating in outdoor learning experiences?

- iii. How do outdoor learning experiences influence students' comprehension and retention of ecological concepts compared to traditional classroom instruction?
- iv. In what ways do outdoor learning activities affect student engagement, motivation, and interest in ecological topics?
- v. What barriers and facilitators do educators encounter when implementing outdoor learning experiences in the curriculum?
- vi. What recommendations can be made to enhance the integration of outdoor learning into the ecological education curriculum in Chivi District Secondary School?

**Thank you**

