PERCEPTIONS OF TEACHERS AND LEARNERS ON THE USE OF MODELS IN THE TEACHING AND LEARNING OF GEOGRAPHY AT GAVHUNGA SECONDARY SCHOOL IN MHONDORO-NGEZI DISTRICT

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Abstract

The study investigates the influence of models in the teaching and learning of geography in secondary schools. The research was contacted at Gavhunga secondary school through triangulation of research methodologies to maximise the strengths of each approach and minimise the weaknesses of both. Convenience sampling technique was used to select a sample for inclusion in the study through primary sources of data; questionnaires, focus group discussions, interviews, systematic observations and experimental assessments. The study as its objectives sought to, firstly identify the type of models used in the teaching and learning of Geography at Gavhunga secondary school, secondly establish the role of models in the teaching and learning of Geography at Gavhunga secondary school and lastly assess the perception of teachers on use of models in the teaching and learning of Geography at Gavhunga secondary school. In the light of these objectives, the research findings indicated that Geography lessons can be delivered with the aid of four main types of models namely scale models, working models, simulation models and maps to supplement diagrams. It was observed that lack of models have a negative impact on the level of learner involvement, participation, attitude, motivation and the general tone of lessons. It was generally noted that the use of models is crucial in the enhancement of understanding which in turn boost motivation and create a favourable learning environment for the learner, facilitating internalisation of concepts or memorisation. Learners also viewed models as a method of learning that makes learning enjoyable as it increases learner activities or participation, improved performance and saves time. To ensure continued availability and use of modes, schools should therefore purchase models while subject teachers should improvise where schools fail to provide models.
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APPROVAL FORM

The undersigned certify that they have read and recommended to Bindura University of Science Education for acceptance a project entitled “Perceptions of teachers and leaners on the use of models in the teaching and learning of geography at Gavhunga secondary school in Mhondoro-Ngezi district”, submitted by Makora Evans in partial fulfillment of the requirements for the Post Graduate Diploma in Education programme.

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HARARE
Dedication

To my wife Sanafi and our son Kunashe Blessed Makora.
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CHAPTER I

INTRODUCTION

In this chapter, the background of the study will be provided to put the readership in a position where they can be able to understand and appreciate the researcher’s push factors towards undertaking of this study. From this section, the reader will also be able to check for the applicability of the research findings as it puts one into full picture of the socio-economic and physical conditions surrounding the study in terms of its delimitations and limiting factors. In this chapter, the researcher spells out the research objectives, research questions and significance of the study to learners, teachers, the school, the researcher and the community at large.

1.1 Background of the Study

The researcher having taught at Gavhunga secondary school for five years observed that learners were failing to concretize some of the geographical concepts. Learners were being streamed on the basis of one’s academic ability. Learners of high aptitude formed the B classes (best classes) while low aptitude learners composed the A class (average classes). The researcher noted with great concern that the general performance of learners in both classes was almost similar. Both classes were operating at below their expected levels. The researcher became interested in finding out if the use of media, particularly models will produce positive results. The writer’s endeavour is to align his aim to that of Brian (1968), who tried to allay the fears of some teachers in the light of his own experience of what models are as well as to examine their potential uses. According to Taiwo (2009), media could be used to supplement the teacher by enhancing his effectiveness in the classroom or to substitute the teacher through instructional media system.
Also the researcher became interested in finding out the role of models in producing a body of knowledge which can be used to clear wrong perceptions related to the use of models in the teaching and learning of Geography.

1.2 Description of the study area

Gavhunga secondary school is in Mhondoro-Ngezi district in Mashonaland west province about one hundred and twenty-five kilometers from Harare. It is a rural day council school with enrolment of around 350 learners. The school has limited resources which might be a contributing factor towards the use or non-use of models at the station. The bulk of learners at the station have a strong rural background and are of low aptitude as evidenced by their grade seven units where the majority got units above twenty-five. This state of affairs makes the use of models to facilitate the teaching and learning of learners crucial. The school is manned by a total of sixteen teachers most of whom are juvenile with an average teaching experience of five years. The limited experience of the teachers may also mean inexperience of the teachers in the use and construction of models.

1.3 Statement of the Problem

The perceptions of teachers and leaners on the use of models in the teaching and learning of Geography at Gavhunga Secondary School have negatively affected the performance of learners. Geography is one of the crucial elective subjects which in most secondary schools command high pass rates of public examinations usually above 50% even in rural day schools. However, against this backdrop, the researcher has not witnessed Geography pass rate above 50% for the past five years of the researcher’s teaching experience at Gavhunga secondary school. Low Geography pass rates at O’Level could be attributed to such aspects as enrolment of high percentages of low aptitude leaners, specialisation of topics and incomplete coverage of the Geography syllabus being too broad. Furthermore, the school lacked a weather station for easy internalisation of concepts relating to weather and climate studies through models. Constrains affecting the performance of learners in Geography as a subject as discussed above constitute the problem in this study.
1.3 **Purpose of the Study**

The study is aimed at developing knowledge base upon which misconceptions will be cleared on the learners’ and teachers’ perceptions on the use of models in the teaching and learning of Geography as a learning area. In the same vein, the study also aim at improving delivery of Geography lessons and concepts by Geography teachers and internalisation of geographical concepts to the general improvement of learner performance in the area of Geography by leaners at Gavhunga secondary school. The aim of the study will be realized through the achievement of the objectives of the study as given below.

The study as its objectives seeks to:

1. Identify the type of models used in the teaching and learning of Geography at Gavhunga secondary school.
2. Establish the role of models in the teaching and learning of Geography at Gavhunga secondary school.
3. Assess the perception of teachers on use of models in the teaching and learning of Geography at Gavhunga secondary school.

1.4 **Research Questions**

1. What type of models can be used in the teaching and learning of Geography at Gavhunga secondary school?
2. What is the role of models in the teaching and learning of Geography at Gavhunga secondary school?
3. What is the perception of teachers on use of models in the teaching and learning of Geography at Gavhunga secondary school.

1.5 **Significance of the Study**

The research is of paramount importance to the following:

i) **Learners**

The research findings will help in the spicing up of Geography lessons making them both exciting and interesting to the enhancement of understanding of content and improvement of learner performance at the final O’ Level Geography examination.
Learner exposure and experience also aid learners with practical skills of construction of models which might earn them a living after school.

ii) Teachers

Geography teachers will be able to know the power in the use of models in the teaching and learning of Geography at form three. This will improve the resourcefulness of teachers and allow them to crossover to the use of learner centered teaching approaches as a teaching and learning tool of the 21st century where learners actually make models and demonstrate how the models work while the teacher operate as a guide. In the process, the teacher will be left in a better position to influence the school administrators to purchase more models and be able to reduce the number of learners failing Geography.

iii) The School

The school will benefit by having its name on the map through excelling learners in Geography due to use of models during lesson delivery. Good performance in Geography will improve the much needed overall pass rate of the school which in turn lures more learners to come to the school making the school a giant in finances, sport and reputation.

iv) The Community

Excelling learners will be of much benefit to their community since they will have a bright future which will enable them to function in their society. The community will have pride and confidence in their school.

v) The Researcher

The research will be of much benefit to the researcher since it will sharpen his level of knowledge to an outstanding and sound knowledge in the teaching of the subject using models. Also the researcher is going to be a specialist in the teaching of Geography using models.
1.5 Assumptions

Assumptions are statements of what the research believes to be the fact, though not verifiable, may have an influence on the results (Nyawaranda, 2014). In this context the assumption of the writer is that the available time will be adequate for the completion of the research. Secondly, the available financial and material resources would be enough for the project. Thirdly, the responsible school authorities would grant permission for the research to be undertaken. And lastly, the respondents would cooperate during the research by providing the needed information for the success of the project.

1.7 Delimitation of the Study

The study is only restricted to form three learners at Gavhunga secondary school in Mhondoro-Ngezi district in Mashonaland West province. The research was carried out using two classes, form 3A and 3B with a population of 41 and 37 respectively. The research was undertaken over a period of six months from September 2016 to April 2017 since the researcher was attached to the school during third term of 2016 and continued with the research to first term of 2017.

1.8 Limitations

The researcher encountered some of the following problems:

i) Time

The researcher had only one term during his teaching practice hence the time was inadequate to include the experimental and the control groups in the research. The researcher opted to use the available time for the experiment to measure learner performance with and without the use of models. Learner performance without the use of models was obtained by administering pre-tests to the participants on concepts learned devoid of models, this acted as the control experiment. The experimental results were the performance of learners earned after an assessment on the content coverage aided by models.
ii) Financial Constraints

The research lacked support from the school administration so the researcher used the meagre resources available in the researcher’s pocket to finance the project.

1.9 Definition of Terms

Model

The term ‘model’ has been defined differently by different geographers. In the opinion of Skilling (1964), a model is “either a theory, a law, a hypothesis, or a structured idea. Saunders (2007) propounds that a model is a copy of an actual object usually on a smaller scale or a small object, built to scale representing in detail a bigger object or a representation generally a miniature to show the appearance of something. In the opinion of Ackoff (1998), “a model may be regarded as the formal presentation of a theory or law using the tools of logic, set theory and mathematics”. According to Haines-Young and Petch (1986), “any device or mechanism which generates a prediction is a model”. Most of the geographers of the post-Second World War period have widely conceived models as idealized or simplified representation of reality (Monda, 2016). For the purpose of this study, the writer took the meaning of a model from Monda (2016), to agree with the generality of geographers viewing a model as any idealized or simplified representation of reality, these include diagrams, miniatures, videos and pictures. The same view is held by Saunders (2007), who took a model to be a copy of an actual object.

Perception

According to Taiwo (2009), teacher perception refers to the way a teacher view the role of media in classroom teaching or what they feel media can do in teaching-learning process. Taiwo (2009) argues that, the way teacher view the role of media in classroom teaching will to a large extent determine the level and degree of its usage. The Oxford Secondary School Dictionary (2010), defined perception as regarding or understanding something in a particular way especially with the senses. In this study, perceptions will be taken to mean the impression formed which could be favourable or otherwise, depending on specific traits a teacher attribute to media (Taiwo, 2009).
Geography

The content, scope and emphases of Geography have undergone considerable change over the past fifty years, as paradigm has succeeded paradigm and it is highly unlikely that any one definition of the subject would satisfy everyone. According to Michael, W; Simon, R and John, S. (2001), most schools of thought generally agreed that Geography as a discipline comprises the study of the earth’s surface as a home of the human race. Munowenyu (2001), concised Geography as a study of the earth and the different people who live on it. Yeates (1968), argue that Geography is concerned with rational development and testing of theories which explain and predict spatial distribution and location of various characteristics of the earth’s surface. Taffy (1970), said Geography is the spatial organisation expressed as patterns and processes. Given the nature of geography as a discipline, and the fact that it interfaces with a range of other subjects, it is manifestly impossible to select a vocabulary that is in any way exclusive to geography. Hence, for the purpose of this study, Geography will be viewed as the study of man and his surrounding environment. The environment is looked at as the branches of Geography, that is, physical, human, economic, political and social geography which would be easily studied with the use of models.

Researcher

This research will adopt the view of Nyawaranda (2014) who described a researcher as someone who conducts a research for a reason of discovering new, better and effective facts and ideas.

1.13 Summary

The chapter outlined factors contributing to the low Geography pass rates at O’Level at Gavhunga secondary school such as enrolment of high percentages of low aptitude leaners, specialisation of topics and incomplete coverage of the Geography syllabus being too broad and lack of school weather station for easy internalisation of concepts relating to weather and climate studies through models. In the chapter, the purpose of the study and the research questions were outlined together with the significance of the study to the learners, teachers, the school, the community and the researcher. The chapter also outlined the assumptions of the study, its delimitations and limitations in terms of time and financial resources. The chapter ended by defining terms like model, research
and researcher to pave way for the following chapter on literature review. Literature review reflects on the types of models, their role in the teaching and learning of Geography and the general perceptions of teachers and learners on the use of models in the teaching and learning of geography in secondary schools.
CHAPTER II

LITERATURE REVIEW

2.1 Introduction

In this chapter the researcher explores the findings of past studies around the research objectives under study recorded in literature. The framework of this literature review takes a content review approach as it place the study into a big picture and establishing the relevance of the study. In its initial stage, the chapter outlined the available types of models that can aid the teaching and learning process in Geography. In the middle section, the chapter looks at the role that can be played by models to facilitate the teaching and learning of Geographic concepts. In its final stage, the chapter gives an overview of the general perceptions of teachers and learners towards the use of models to enhance Geography lessons. Literature review enables the researcher to check whether there is a match or divergence between the research findings and the provision of literature.

2.2 Types of Models

As described earlier, the term ‘model’ has been used in a great variety of contexts. Owing to the great variety, it is difficult to define even the broad types of models without ambiguity. On the basis of stuff (data) from which they are made, models may also be classified into hardware, physical or experimental models. According to Farrant (2001) there are three types of models namely scale models (these are models which often look like the real thing), diagrammatic models (these are models designed to demonstrate a process or a concept) and working models (these are models that are constructed so that they actually work). A more simple classification of models illustrated with examples has been given by Monda (2016) as follows:
Scale Models

Scale models, also called hardware models, are perhaps the easiest type to appreciate as they are direct reproductions, usually on a smaller scale of reality (Farrant, 2001). Johnson (2007) announced that scale models have long been used to show earth features in scaled down size, for example, a model of a volcano. Scale models may be either static, like the model of a land surface of a geological model, or dynamic, like a wave tank or river flume (Farrant, 2001). Dynamic models are perhaps more interesting and useful in geographical work (Farrant, 2001). The great advantage that a dynamic model has over reality is that the operative processes can be controlled. This allows each variable to be studied separately (Farrant, 2001).

Maps

A map is defined by Karpilo (2007) as a representation, usually on a flat surface, of a whole or part of an area designed to describe spatial relationships of specific features that the map aims to represent. According to Farrant (2001), maps are the models that are most familiar to geographers. They are a special type of scale model which become increasingly abstract as the scale becomes smaller (Farrant, 2001). A large-scale map loses much of the detail of the landscape although it can show buildings, roads and other features of this size accurately. As the scale is reduced the information becomes more symbolic and can no longer be shown true to scale; even more detail must be omitted (Farrant, 2001). The map can, however, give an indication of the relief by means of contours, hill shading and hachures; this is missing from the simple vertical air photograph (Farrant, 2001). Another advantage which maps also have over reality is that they show a very large area simultaneously, so that mutual space relationships can be much more easily appreciated and compared than on the ground (Farrant, 2001).

Simulation and Stochastic Models

Simulation means imitating the behaviour of some situation or process by means of a suitably analogous situation or apparatus, especially for the purpose of study or personal training (Farrant, 2001). Stochastic means: randomly determined or that which follows some random probability distribution or pattern, so that its behaviour may be analyzed statistically but not predicted precisely (Farrant, 2001). Simulation and stochastic models have been developed to deal with dynamic situations rather than with a static
state shown on a map (Farrant, 2001). This type of model simulates particular processes by means of random choices, hence the term ‘stochastic’, one which is connected with chance, occurrences (Farrant, 2001). It can be illustrated by its application to drainage development (Farrant, 2001).

**Analogue Models**

In the analogue models, instead of using limitations of the original or symbols to represent it, the feature being studied is compared with some completely different feature by means of an analogy (Farrant, 2001). An analogue model uses a better known situation or process to study a less well-known one. Its value depends on the researcher’s ability to recognize the element common to two situations. These elements constitute the positive analogy; the dissimilar or negative analogy and the irrelevant or neutral analogy are ignored (Farrant, 2001).

**Theoretical Models**

Farrant (2001) provided that theoretical models can be divided into two categories. The conceptual models provide a theoretical view of a particular problem allowing deductions from the theory to be matched against the real situation (Farrant, 2001). This can be exemplified by the theoretical consideration of the effect of a rising and falling sea level upon the coastal zone if certain specific conditions are fulfilled (Farrant, 2001). It is assumed that wave erosion is the only process operating, that waves can only erode rock to certain depth of the order of about 13 metres (40 feet) and that the waves erode a wave-cut platform to a certain gradient below which they cannot operate effectively. It is also assumed that the initial coastal slope is steeper than this gradient (Farrant, 2001).

The second type of theoretical model is associated with the word ‘theory’, when this is used to denote the overall framework of a whole discipline (Farrant, 2001). The framework must not be too rigid or it will cramp the growing edges of the subject, where the most exciting work is going on (Farrant, 2001). The ideal is a flexible framework that can contain a wide variety of geographical endeavour and yet give it coherence and purpose (Farrant, 2001). Models are particularly valuable in this context as they are often common to all branches of the subject and so help to give it unity (Farrant, 2001).
Working and Diagrammatic Models

Farrant (2001) explained diagrammatic models as models designed to demonstrate a process or a concept in form of diagrams while working models are models constructed so that they actually work.

In the study, the writer is interested in finding out more on the types of models that geographers can put to use to clarify geographical ideas.

2.3 The Role of Models in the Teaching and Learning of Geography

In the opinion of Monda (2016), Geography is a discipline which deals with the interpretation of complex man-nature relationship. In geography, we examine location, landforms, climate, soils, natural vegetation and minerals’ spatial distribution and their utilization by mankind which lead to the development of cultural landscape (Monda, 2016). Moreover, geography is a dynamic subject as the geographical phenomena change in space and time. The subject matter of geography, i.e. the complex relationship of man and environment can be examined and studied scientifically by means of hypotheses, models and theories (Monda, 2016). The basic aim of all models is to simplify a complex situation and thus render it more amenable to investigations. In fact, models are tools which allow theories to be tested. A more restricted view of models is that they are predictive devices (Monda, 2016). Modeling in geography is, therefore, done due to the following reasons.

Firstly, a model-based approach is often the only possible means for arriving at any kind of quantification or formal measurement of unobserved or unobservable phenomena (Monda, 2016). Models help in estimations, forecasts, simulations, interpolation and generation of data. The future growth and density of population, use of land, intensity of cropping, migration pattern of population, industrialization, urbanization and growth of slums may be predicted with the help of such models. These are very useful in the forecast of weather, change of climate, change in sea level, environmental pollution, soil erosion, forests depletion and evolution of landforms.

Secondly, Geographical data are enormous and with every passing day these data are becoming more and more difficult to understand. Modeling is undertaken for structuring, exploring, organizing and analyzing the obtained enormous data through discriminating pattern and correlation (Monda, 2016).
In addition, alternative models can be used as ‘laboratories’ for surrogate observation of systems of interest which cannot be observed directly, and for experimenting and estimating the effects and consequences of possible changes in particular components and also for generating future scenario of evolution and end states of system of interest (Monda, 2016). Romizsowski (1998) points out that model reflect real world things that are related in subject matter being discussed. Models help in improving the understanding of causal mechanism, relationships between micro and macro properties of a system and the environment (Monda, 2016). Kasambira (2002), cited in Corbetta (2000), argues that models seek to inform the learner or expose facts to them and he was supported by Cagne (2000) who propounded that for learning to take place there must be a noticeable change than can be observed and measured. He argues that the use of models allows learners to capture key ideas and points, thus when learners understand certain concepts, they become motivated to research more on concepts (Cagne, 2000). Farrant (1991) as cited in Biswas (2007) pointed out that models increase learners’ knowledge. Artsteer (2015) put forward that the use of models makes lessons more memorable. Lastly, models help in the building of theories, general and special laws (Monda, 2016). With this hint, the researcher is interested in getting an in-depth understanding of the role of models in the teaching and learning of Geography.

2.4 The Perception of Teachers on Use of Models in the Teaching and Learning of Geography

In the opinion of Taiwo (2009), teacher perception means an evaluation of teachers’ views of the role of models in the teaching and learning Geography in secondary schools. The way teachers view the role of models in the learning process will to a large extent determine the level and degree of its usage (Taiwo, 2009). Teacher forms an impression which is favourable or otherwise, depending on specific traits teacher attribute to models (Taiwo, 2009). Teacher perception of models is predicted upon what they feel models can do in teaching-learning process (Taiwo, 2009).

Over the years, many research studies have pointed out various external deterrents for the utilization of models. The major deterrents reported were budget difficulty in obtaining materials, lack of modeling classroom facilities and lack of trained modeling
personnel (Higgins & Moseley, 2001; Richardson, 1996; Windschitl & Sahl, 2002). Taiwo (2009) claimed that, it must be noted that perception can be influenced by the personality characteristics of the perceiver and the features of the thing/object perceived. Unfortunately, in any perception study, one is not sure which has more control over the other (Simonsen & Dick, 1997).

Known obstacles to successful model integration include funding, equipment, lack of time, lack of knowledge and teachers’ philosophy (Hardy, 1998; Lam, 2000, Simonsen & Dick, 1997). Resistance to adopting full utilisation of models stem from teachers’ existing teaching beliefs (Norton, McRobbie, & Cooper, 2000). For adoption to be successful teachers must be willing to change their role in the classroom (Hardy, 1998). When models are used as a tool, the teacher becomes a facilitator and students take a proactive role in learning. Often, this change of teaching philosophy and methods focuses on learners-centered teaching and constructivist teaching practices (Rakes, Flowers, Casey, & Santana, 1999). In fact, successful integration of models into teaching depends on transforming teachers’ belief and philosophy concurrently (Windschitl & Sahl, 2002). Baren (2011) argues that with the use of models the role of the teacher shifts from an instructor to a facilitator whereby learners complete learning on their own and at their own pace thereby making classroom management to become increasingly difficult. The researcher suspects poor classroom management on the part of the teacher as one of the key drivers forcing teachers to opt not to use models because they demand high classroom management skills.

Tylor (1986) as cited in Biswas (2007) argues that models require time to construct. According to the researcher, preparation of models calls for total commitment and willingness to go an extra mile on the part of the teacher if models are to be made available, a virtue that lacks in most teachers.

Model construction is a specialized skill and not all teachers’ are capable of producing good materials and some teachers may even lack the skills and are not capable of making quality models (Biswas, 2007). To the researcher, for this reason, teachers would rather avoid producing models for fear of constructing sub-standard and embarrassing material to the loss of the teacher’s integrity and prowess from the learners. The researcher feels this as a matter of concern affecting especially the female teachers involved in the
teaching and learning of Geography influenced by the personality characteristics of the perceiver as pointed out by Taiwo (2009).

Furthermore, use of models become extremely time consuming since it allows learners to take charge and control of their learning, a situation not compatible with race for the completion of the syllabus to prepare learners for the public examinations (Hardy, 1998; Lam, 2000, Simonsen & Dick, 1997).

However, evidence abounds that what teachers said were their reasons for not using models were not true (Zepp, 2005; Scrimshaw, 2004; Sugar, Crawley & Fine, 2004; Cohen, 1996; Hubbord, 1999). Johnson (2007) commended that models can and do cause great frustration to those uninitiated in their use. It is however, the interest of this research to unearth the perception of teachers and learners on the role of models in geography.
CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

The focus of this chapter is to make a clear outline of the writer’s approach to the study. In its initial stages, the chapter defines the term research design before making special reference to triangulation as the selected approach for the study. The strengths of triangulation will be discussed to justify its relevance in the study. The chapter also aims at describing and justifying the questionnaire, interviews and observations as the data collecting instruments to be used in the investigation. Issues to do with the selected sampling technique will be highlighted with specifications of the delimitations of the study.

3.2 Research Design

Conflict between quantitative and qualitative paradigms has led to the creation of the triangulation of paradigms which makes it possible to apply both qualitative and quantitative research in one study. Field and Schreier (2001) viewed this triangulation as complementary and interrelated. In the study the researcher employed triangulation to maximise the strengths of each approach and minimise the weaknesses of both. Nyawaranda (2014) advised that in the combination, qualitative and quantitative researches can borrow methodological and theoretical approaches from each other.

The research being qualitative in nature since it is dealing with social phenomena that are dependent on the human mind took the researcher as the chief research instrument. Data was collected using qualitative means that included systematic observation, interviews and focused group discussions. Qualitative data collection tools enabled the researcher to investigate the non-observable human qualities that move human behaviour such as internal ideas, feelings, opinion, motives, perceptions, attitudes and views. Qualitative data collection tools enabled the generation of information
presentable in form of detailed thick descriptions, and direct quotations for the consumption of the general public.

The research also adopted these methodological aspects from quantitative research, such as sampling techniques, experimentation and questionnaires as a data collection tool. Sampling was needed so as to select a sample size in accordance with the available financial and time for inclusion in the research. The relevance of and experimental tests got their relevance in the generation of statistical descriptions presentable in form of tables and graphs. The statistical aspect adopted from the qualitative research made the study more objective thereby strengthening the validity and reliability of the research findings.

3.3 Population of the Study

Best (1998) puts population as a group of individuals with one or more characteristics in common which are of interest to the researcher. Gay (2011) postulates that a population is just a general term for the larger group from which a sample is selected or a group to which the researcher would like to generalize the results of the study. Borg and Gall (1983) postulates that a population is a group to which the researcher plans to apply the probable outcome of his/her findings. Figure 3.1 below is the diagrammatic representation of the relationship between the population and a sample.

![Diagram](image.png)

**Figure 3.1: The Population, Target Population and a Sample**

The researcher in this case, has directed his study to Gavhunga secondary school in Mhondoro-Ngezi district with a total population of 351 learners. The research focuses
on the learners of Geography O’Level as the target group with a population of 157 learners. Nyawaranda (2014) described target population as a more restricted part of that population from which the sample might be drawn as shown on the diagram above.

3.4 Sampling and Sampling Technique

According to Nyawaranda (2014), sampling is the process of choosing or selecting a fraction of the total population from which inferences would be made for the total population. To infer is to generalise results of a subset on the total population, that is, taking characteristics of the sample and assume that they are just as good as the characteristics of the total population (Nyawaranda, 2014). The purpose of sampling is to determine parameters or characteristics of the whole population (Nyawaranda, 2014). The researcher used convenience sampling technique to select a sample for inclusion in the study (Gay 2011). Convenience sampling or availability sampling is the selection and inclusion of the easiest units to access (Best 1998). Best (1998) added that convenience sampling involves selection of any group of units into a sample. Though the method tends to be biased, according to Nyawaranda (2014), it would be ideal to use convenience sampling when firstly, the population is just too large that it is impossible to include every individual and secondly one wants to detect relationships among different phenomena as is the case in this study. Nyawaranda (2014) adds that the technique is also fast and inexpensive. The method becomes appropriate considering that the study period was limited to one term only with very little resources at the researcher’s disposal.

A sample is a small number of people that are selected from population and is used for obtaining information that will then be referred to whole population (Gay 2011). Savery (2006) defines a sample as a selection of some units which represents the entire set from which units are drawn. As prescribed by Nyawaranda (2014), the recommended sample size is 30% of the total or target population. In this case, 351 learners will be used as the total population. The researcher is going to use two classes, form 3A and 3B with 78 learners which translate to approximately 22% of the total population. Factors influencing the sample size are cost, time allocation, level of accuracy and the selected sampling technique (Nyawaranda, 2014). In this regard, convenience sampling automatically determined the sample size commensurate to the meagre resources, limited time available and the intend to acquire the general trends and relationships. The
larger the samples, the more the cost, the more the time needed and the more accurate the results.

The form 3B and 3A classes were chosen because the researcher is taking Geography up to form three and the two classes were taken aboard to enable the researcher to assess the impact that models have on low aptitude and high aptitude learners.

3.5 Sources of Data

Nyawaranda (2014) provides that, data can be obtained from primary or secondary sources. Secondary sources are second hand versions like textbooks used to back-up data when primary data is not available. The research is going to rely on the researcher’s documents (previous progress record of marks) as a primary source of the learners’ past performance for comparison and to work as a control. Current learner performance will be obtained through systematic observations, written exercises and questionnaires.

3.6 Ethical considerations

The purpose of interfering with the personal lives of the participants was made clear by the researcher and permission was granted to continue with the research in line with the following ethical considerations.

3.6.1 Confidentiality

The researcher assured the respondents of confidentiality. The respondents were asked not to indicate their names on the questionnaires and assured that the research was purely for academic purpose.

3.6.2 Informed consent and voluntary participation

The researcher explained to the participants that taking part in the research process was by choice and good will without cohesion.
3.7 Research Instruments

Savery (2006) defines instruments as tools used in the collection of data. In this study, the researcher used questionnaires, Focus Group Discussions and systematic observations during research.

**Questionnaires**

Farrant (1980) revealed that a questionnaire is a set of carefully constructed questions designed to improve systematic collection of information on a particular subject. Leedy (1999) contributed that a questionnaire is a written series of questions for the purpose of gathering information from respondents. Thus a questionnaire consists of questions which are answered to get information required. In this study, the purpose of the questionnaire was to get an understanding of learners’ views and feelings when they learn with the help of models as a media.

The researcher was quite aware that the effectiveness of a questionnaire could be weakened by its proneness to issues to do with bias, falsehood and language problems. The use of questionnaires was favoured for their overwhelming strengths as indicated by many scholars. Cohen (2011) admits that questionnaires take less time than focus group discussions and that the researcher may get general overview of attitudes and experiences of many people since they answer the same questions. Also questionnaires would provide enough time for respondents to think and answer freely without the interference of the researcher. In addition, questionnaires act as a primary source of data, ensures consistency (standard questions would be asked to all respondents), large amounts of information would be collected, would be fast and cost effective, could be stored as record for comparisons and results are quickly and easily quantified among others.

The respondents consisted of 49 boys and 29 girls of fifteen and sixteen years of age. The respondents were purely of rural background and of relatively low aptitude as reflected by their grade seven results where the majority obtained units above twenty and a few individuals with less than twenty units. The age and level of education of the respondents allowed for the use of a questionnaire since they could all read and write own their own without much difficulties. In this study, the purpose of the questionnaire was to get understanding of learners’ experience and feeling when they learnt with the
help of models as media. The questionnaire was designed to gather such information as learner attitude towards Geography as a subject in general, the difference made by the vigorous use of models during Geography lessons, views of learners on the continued use of models as teaching media and the perceptions of teachers on the incorporation of models in the teaching and learning of Geography subject. Information obtained from these aspects allowed the researcher to a greater extent to achieve the set objectives.

The questionnaires were distributed using collective administration in person to the two selected classes. According to Nyawaranda (2014), questionnaires can be administered this way to capture audience such as students in a class room or people attending a function. This method was also advantageous in the sense that it ensured good response rate, attitudes were observed, was cheap, efficient and offered the quickest way of collecting data.

**Focus Group Discussions (FGD)**

Savery (2006) defined a focus group discussion as a discussion of six to twelve people guided by facilitator. Savery (2006) added that during the discussion group members talk freely and spontaneously about a certain topic. However, for the purpose of this survey, class groupings were used for the focus group discussions for convenience purpose. To this end, the researcher facilitated two focus group discussions, one for the form 3A class with 41 learners and the other one for the form 3B class with 37 learners from their respective base rooms during their selected geography lessons to gain in-depth learner perceptions, ideas, opinions and views on the role of models in the teaching and learning process. During the focus group discussions, the learners spontaneously responded to questions posed by the teacher during which the teacher captured the views, opinions, feelings and perceptions of the learners with regards to their perception on the use of models to enhance learning.

**Interviews**

An interview is a method of data collection that involves verbal/oral stimulation and collection of verbal/oral responses to generate verbal data (Savery, 2006). The researcher conducted an unstructured or open-ended face-to-face encounter with a colleague who also teaches Geography at Gavhunga secondary school to find out her
perceptions on the use of models and the types of models used in the teaching and learning of Geography.

### 3.7 Data Collection Procedures

#### Pre-test

The researcher carried out the study in the context of Weather Studies in which weather elements were learnt. Humidity, sunshine, temperature and atmospheric pressure were studied first using diagrammatic models only and four formative pre-tests were administered to all form three Geography learners at Gavhunga secondary school. Farrant (1980) explained that pre-test provide factual information on pupils ability and performance. The marks obtained by the pupils were recorded and kept by the researcher.

#### Post-test

After the pre-tests, the researcher introduced working models to facilitate the teaching and learning of the remaining weather elements; rainfall, wind speed, wind direction and clouds. The rain gauge model was available at the school and the writer together with the learners improvised an anemometer and a wind vane and learners were taken outdoors to observe various cloud types and cloud cover. Another set of four formative post-test were administered and records were kept for comparison with the pre-test performance. Farrant (1980) described post-test as a form of assessment carried out when an intervention has been carried out.

#### Observation

Nyawaranda (2014) described observation as a data collection tool that carries extra weight in qualitative researches. Nyawaranda (2014) defined observation as seeing things as they happen. The researcher used hundred and sixty participatory class lesson observations eighty in form3A and eighty in form 3B to note the nature of learner involment, participation, attitude, motivation and the general tone of lessons before and during intervention for the purpose of comparison.
**Questionnaires**

The writer distributed the questionnaires to all form three Geography learners during their spare time, allowed respondents to fill-in their responses before returning them to the researcher. The questionnaire was designed using mainly two types of questions with minimal free response were questions as shown in appendix 1 on page 52. Closed questions and open response-option questions were used to minimise misconceptions offers assistance to respondents that may face challenges to articulate answers in their own words. These types of questions fits well considering that the respondents are young pupils and are of varied ages and levels of aptitude or literacy levels.

**Focus Group Discussions (FGD)**

Savery (2006) defined a focus group discussion as a discussion of six to twelve people guided by facilitator. Savery (2006) added that during the discussion group members talk freely and spontaneously about a certain topic. However, for the purpose of this survey, class groupings were used for the focus group discussions for convenience purpose. To this end, the researcher facilitated two focus group discussions, one for the form 3A class with 41 learners and the other one for the form 3B class with 37 learners from their respective base rooms during their selected geography lessons to gain in-depth learner perceptions, ideas, opinions and views on the role of models in the teaching and learning process. During the focus group discussions, the learners spontaneously responded to questions posed by the teacher during which the teacher captured the views, opinions, feelings and perceptions of the learners with regards to their perception on the use of models to enhance learning.

**Interviews**

An interview is a method of data collection that involves verbal/oral stimulation and collection of verbal/oral responses to generate verbal data (Savery, 2006). The researcher conducted an unstructured or open-ended face-to-face encounter with the School Head, The Deputy Head, the Head of Department and a colleague who also teaches Geography at Gavhunga secondary school to find out their perceptions on the use of models and the types of models used in the teaching and learning of Geography.
3.8 Data presentation and analysis

All questionnaires were numbered to eliminate omission and repetition errors before entry. Responses were coded and arranged thematically. Thick descriptions and descriptive statistics were also used and tables and figures developed for graphical representation and visual comparison with the aid of Microsoft excel. Frequencies and percentages were used to characterise performances during the experimentation process.

3.9 Summary

In the chapter triangulation approach was used for the study, that is, qualitative and quantitative designs complemented each other to maximise the strengths of each approach and minimise the weaknesses of both. The research focused on 78 form three Geography learners at Gavhunga secondary school in Mhondoro-Ngezi district with a total population of 351 learners translating to 22% of the total population. The researcher used convenience sampling technique to select a sample for inclusion in the study. The research relied on primary sources of data through the use of questionnaires, focus group discussions, interviews, systematic observations and experimental assessments during research. In the following chapter the collected data was subjected to data analysis techniques that include organisation and summarising the data for presentation in form of thick descriptions, statistical descriptions, tables and graphs.
CHAPTER IV

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The main aim of this chapter is to present collected data in form of figures, text, tables and graphs. Presented data will also be analysed by way of organising and summarising the data into usable information. The chapter will also discuss the trends obtained from the analysis and draw conclusions on the perceptions of teachers on the use of models in the teaching and learning of Geography in secondary school.

4.2 Data Presentation Process

Types of models used in the teaching and learning of Geography at Gavhunga secondary school.

At Gavhunga secondary school the Geography department comprises of only two teachers that include the writer and another one teacher. The researcher therefore inquired the type of models used in the teaching and learning of Geography at Gavhunga secondary school from a colleague. The information was gathered in an unstructured interview with the teacher. In her response, the teacher indicated that Geography lessons can be delivered with the aid of models such as scale models which she said can be exemplified by a model globe in her office which can be likened to the model globe shown in figure 4.1.
The interviewee identified working models as another type of models that can be used in the teaching and learning of Geography. For a working model, the interviewee refereed to the pieces of a rain gauge kept in her cabinet similar to the one in figure 4.2.
As she continued, the participant said that maps are also models usable in the teaching and learning of Geography. With reference to maps, the participant pointed to a world map and maps of Africa and Zimbabwe hanging on the walls in her office. She added that maps could be classified as thematic, administrative and topographical maps. Shown on figure 4.3 is an example of a schematic map.

![Figure 4.3: Schematic map](image)

Furthermore, from the discussion held with the interviewee, it also emerged that, simulation models are another type of models that can be used in the teaching and learning of Geography. The respondent indicated that, a scale model globe can be turned to imitate earth’s rotation about its tilted axis as shown in figure 4.4 below. The interviewee highlighted that in most cases simulation models work with Information and Communication Tools (ICT) especially computers.
From the discussion held with Mrs Mugwagwa, four types of models were identified, that is maps, scale models, working models and simulation models. The models named were relatively few as compared to the list obtained in the literature review section were seven types of models were identified which included analogue, thematic and diagrammatic models (Farrant 2001). Although the researcher gained knowledge on the possible types of models that can enhance Geography lessons, the limited knowledge of the types of models the respondent provided that can be used in the teaching and learning of Geography partially gave indication of the negative perceptions of teachers toward the use of models in the teaching and learning of Geography.

**Role of models in the teaching and learning of Geography at Gavhunga secondary school.**

The researcher observed the nature of learner involvement, participation, attitude, motivation and the general tone of lessons before and during intervention for the purpose of comparison and made the estimations shown in Table 4.1.

**Table 4.1: Observed learner involvement, participation and motivation and tone before and after intervention**

38
Learner involvement | Sample size | Before intervention | After intervention |
--- | --- | --- | --- |
78 | 0% | 80% |
Participation | 78 | 11.5% | 100% |
Motivation | 78 | Low | High |
Learning environment/tone | 78 | Boring | Exciting |

From observation, the researcher arrived at the estimations shown in Table 4.1 which indicate that lack of models have a negative impact on the level of learner involvement, participation, attitude, motivation and the general tone of lessons. What the researcher observed concurred with literature which described the role of models as an approach which often provides a means for arriving at any kind of quantification or formal measurement of unobserved or unobservable phenomena (Monda, 2016).

Table 4.2: Questionnaire response analysis

<table>
<thead>
<tr>
<th>Sample class</th>
<th>Target respondents</th>
<th>Actual respondents</th>
<th>% respondents rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forms 3A and 3B</td>
<td>78</td>
<td>78</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.2 shows that 78 questionnaires were distributed to form three learners at Gavhunga secondary school and were all returned giving a response rate of 100%. A 100% response rate was achieved through the use of collective administration of questionnaires in person to the selected sample. Thus, the response rate can be used to measure the extent to which the collected data can be deemed valid and reliable for public consumption.
<table>
<thead>
<tr>
<th>Questions</th>
<th>Sample</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you consider registering Geography at your final examination?</td>
<td>78</td>
<td>YES</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>8</td>
</tr>
<tr>
<td>2. Do you think Geography should be taught and learnt using models</td>
<td>78</td>
<td>YES</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>3. Why do you think models are important in the teaching and learning of Geography?</td>
<td>78</td>
<td>Enhances understanding</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Makes learning enjoyable</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improves memorisation</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saves time</td>
<td>76</td>
</tr>
<tr>
<td>4. What do you think can be done to improve the availability of models in schools?</td>
<td>78</td>
<td>Schools should purchase some</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improvisation</td>
<td>73</td>
</tr>
</tbody>
</table>

Table 4.3 shows that about 89.7% of the selected sample was willing to sit for a Geography examination in their final year as reflected by responses to question 1. Question 2 indicated that learners were impressed by the experiences made by the use of models in the teaching and learning of Geography. The whole group under investigation therefore unanimously advocated for continued use of models in all Geography lessons. From the table, responses to question 3 seem to have covered a wide variety of the role of models in the teaching and learning of Geography at Gavhunga secondary school. All the 78 learners agreed to the fact that the use of models is crucial in the enhancement of understanding which in turn boost their motivation and create a favourable learning environment for the learner. Apart from facilitating internalisation of concepts or memorisation, learners also viewed models as a method of learning that makes learning enjoyable as it increases learner activities or participation and improved
performance. From table 4.3, about 97.4% of the learners accepted that the use models also saves time in the sense that, ideas are simply made clear by models with little explanations and agony. In response to question 4 that was assessing their views on ways to ensure availability of models in schools, 93.6% of the leaners advised subject teachers to improvise make-shift models to ease learning were schools lack the capacity to provide. Over the years, many research studies have pointed out various external deterrents for the utilization of models. The major deterrents reported were budget difficulty in obtaining modeling materials (Higgins & Moseley, 2001; Richardson, 1996; Windschitl & Sahl, 2002). The entire group challenged schools to purchase the needed learning aids in form of models. The level of concern expressed by the learners on the complacence of some schools and teachers to guarantee the availability of models in schools reveals that learners sincerely appreciate and cherish the role played by models in the teaching and learning of geography.

The researcher administered four revision exercises to the learners after learning humidity, sunshine, temperature and atmospheric pressure with the use of traditional models in form of diagrams twined with explanations. After the pre-test the teacher introduced scale and working models to complement diagrams in the study of rainfall, wind speed, wind direction and clouds and another set of four revision tests were given. The marks obtained in the pre-test and post-test were as follows:

<table>
<thead>
<tr>
<th>List of learners</th>
<th>Pre-test marks</th>
<th>Post-test marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test 1 %</td>
<td>Test 2 %</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>57</td>
<td>63</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>35</td>
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<tr>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>55</td>
<td>58</td>
</tr>
<tr>
<td>8</td>
<td>61</td>
<td>72</td>
</tr>
<tr>
<td>9</td>
<td>42</td>
<td>45</td>
</tr>
<tr>
<td>10</td>
<td>49</td>
<td>38</td>
</tr>
<tr>
<td>11</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>12</td>
<td>33</td>
<td>27</td>
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<tr>
<td>13</td>
<td>24</td>
<td>15</td>
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<tr>
<td>14</td>
<td>67</td>
<td>59</td>
</tr>
<tr>
<td>15</td>
<td>44</td>
<td>38</td>
</tr>
<tr>
<td>16</td>
<td>12</td>
<td>07</td>
</tr>
<tr>
<td>17</td>
<td>72</td>
<td>86</td>
</tr>
<tr>
<td>18</td>
<td>28</td>
<td>34</td>
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<tr>
<td>19</td>
<td>39</td>
<td>29</td>
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<tr>
<td>20</td>
<td>81</td>
<td>86</td>
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<tr>
<td>21</td>
<td>09</td>
<td>11</td>
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<tr>
<td>22</td>
<td>17</td>
<td>17</td>
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<td>23</td>
<td>21</td>
<td>23</td>
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<td>24</td>
<td>46</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>50</td>
<td>53</td>
</tr>
<tr>
<td>26</td>
<td>48</td>
<td>41</td>
</tr>
</tbody>
</table>
The trend that can be noted from table 4.4 shows that for the four revision exercises administered after learning without models recorded an average of ten learners who passed in each of the four tests in form 3B. The majority of the learners failed, taking for instance learners numbered 1, 3, 5, 6, 9, 11, 12, 13, 15, 16, 18, 19, 21 – 24, 26, 28 - 34 and 36 failed all their exercises, a situation which could be attributed to failure by most learners to concretize concepts delivered theoretically without visualization aided by models. After the intervention, another set of four exercises were given and in each case the average number of learners passing the tests dramatically rose to thirty. Only four learners numbered 16, 21, 22 and 23 failed all their tests but registered a marked improvement in the grades of their scores. For instance, the grades of learner 22 rose from between 17% - 24% to a range between 36% - 48%. The recorded improvement
could be attributed to the fact that the use of models assisted in a big way to motivate and sink concepts into the minds of learners. Conclusion was drawn that, models are a powerful tool that played a significant role in the improvement of performance and pass rate.

Table 4.5: Form 3A performance for the pre-test and post-test

<table>
<thead>
<tr>
<th>List learners of learners</th>
<th>Pre-test marks</th>
<th>Post-test marks</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Test 1 %</td>
<td>Test 2 %</td>
</tr>
<tr>
<td>1</td>
<td>03</td>
<td>06</td>
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<tr>
<td>2</td>
<td>12</td>
<td>07</td>
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<tr>
<td>3</td>
<td>20</td>
<td>11</td>
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<tr>
<td>4</td>
<td>41</td>
<td>52</td>
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<td>5</td>
<td>15</td>
<td>19</td>
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<td>02</td>
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<td>29</td>
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<td>30</td>
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<td>31</td>
<td>02</td>
<td>07</td>
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<tr>
<td>32</td>
<td>02</td>
<td>12</td>
</tr>
</tbody>
</table>
From table 4.5 it appeared that, the general pass rate also increased from an average of two learners passing per test before the intervention to an average of eight learners passing after the intervention. Though the overall pass rate remained low, there is evidence that the majority have however benefited as reflected by a general increase in their performance marked by the scores that have shifted from ranges below twenty to ranges below forty.
Figure 4.5: Summary of pre-test and post-test performance for forms 3B and 3A

Figure 4.5 shows in summary form the visual impact of models on the performance of learners as per investigation on the form 3B and 3A classes at Gavhunga secondary school. Pre-test bars show pass rates obtained before the use of models while post-test bars indicate the performance after the use of models. This trend was directly attributed to the ability of models to clarify concepts, increase understanding and improve memorisation. The findings were seen to fit well in the literature surrounding the topic under investigation as it pointed out that, models help in improving the understanding of causal mechanism, relationships between micro and macro properties of a system and the environment (Monda, 2016). Kasambira (1995), cited in Corbetta (2000), argues that models seek to inform the learner or expose facts to them and he was supported by Cagne (2000) who propounded that for learning to take place there must be a noticeable change than can be observed and measured. He argues that the use of models allows learners to capture key ideas and points, thus when learners understand certain concepts, they become motivated to research more on concepts (Cagne, 2000). Farrant (1991) as cited in Biswas (2007) pointed out that models increase learners’ knowledge. Artsteer (2015) put forward that the use of models makes lessons more memorable.
The researcher facilitated form 3A class and form 3B class focus group discussions separately to gain in-depth learner perceptions, ideas, opinions and views on the role of models in the teaching and learning process. From the discussions held in both classes it emerged that all learners appreciated the role played by models in terms of helping them understand concepts and abstract ideas, long term memory of learnt ideas, facilitating hands on approach to education, introducing them to a possible life-skill that could earn them a living even after school. One of the girl participants said, ‘models like earth globes help us to visualize what the teacher would be explaining’. Learners indicated that the use of models made learning easier, enjoyable and motivating and all learners revealed that they would be interested to sit for Geography final examination if examination fees were not a limiting factor. For instance, one boy said, ‘madiagrams anoita kuti tikurumidze kunzwisisa’. Learners were able to outline the general overview of the role of models in the teaching and learning process without plunging into the nitty-gritties of how modeling achieves the desired results. Contrary to these findings, literature went a step further to show how models work towards the interpretation of complex man-nature relationship, scientific study of hypotheses and theories (Monda, 2016). According to literature, modeling in geography is also done for the reasons that include quantification or formal measurement of unobserved or unobservable phenomena, estimations, forecasts, simulations, interpolation and generation of data through building of theories, general and special laws (Monda 2016). Deliberating on the possibilities to ensure continued use of models, learners challenged schools to purchase models for the good of the learner experiences and urged class teachers to improvise for the benefit of the learner. Learners also blamed the non-utilisation of models in schools on the perceptions of subject teachers who view construction of models as time consuming and taxing while leaners also believed that some teachers lacked the required model construction skills like cartographic skills.
Perception of teachers on use of models in the teaching and learning of Geography at Gavhunga secondary school.

An interview contacted by the researcher with one of the Geography teachers showed that, the major deterrents in her opinion were budget difficulties in obtaining materials, lack of modeling classroom facilities and lack of trained modeling personnel. She added that, known obstacles to successful model integration include funding, equipment, lack of time, lack of knowledge and teachers’ philosophy. She went on to say, “Resistance to adopting full utilisation of models stem from teachers’ existing teaching beliefs.” The teacher made it clear that the successful adoption of models on the teaching and learning of Geography rests upon the good will and readiness of teachers to change their role in the classroom where the teacher becomes a facilitator and students take a proactive role in learning. In a statement, the interviewee called for the total transformation of teaching philosophy, beliefs and methods that should focus on learners-centered teaching and constructivist teaching practices. The interviewed teacher suspected poor classroom management on the part of the teacher as one of the key drivers forcing teachers to opt not to use models because they demand high classroom management skills. In her argument, the participant admitted that models require time, commitment, expertise and willingness to go an extra mile to construct if models are to be made available, a virtue that lacks on most teachers. She stressed that, “Model construction is a specialized skill and not all teachers’ are capable of producing good materials and some teachers may even lack the skills and are not capable of making quality models”. “One would rather avoid produce a model, than to make a sub-standard and embarrassing thing”, she said with laughter. In her concluding remarks, the interviewee ended by admitting the fact that, the use of models becomes extremely time consuming since it allows learners to take charge and control of their learning, a situation she described as incompatible with race to complete the syllabus to prepare learners for the public examinations.

4.3 Summary

The chapter discussed the trends from the findings and drew conclusions on the perceptions of teachers on the use of models in the teaching and learning of Geography in secondary school. The information was gathered by the researcher by through
questionnaires, observation, interviews, focused group discussion and pre-test and post-test. The research findings indicated that Geography lessons can be delivered with the aid of four types of models namely scale models like model globes, working models like rain gauge, maps like administrative and topological maps and such as the rotating model globes can be turd to imitate earth’s rotation about its tilted axis. Data was presented in form of reports, diagrams, maps, summary tables, thick descriptions and graphs. The summary of findings, the general conclusions and the recommendations against negative perceptions of teachers and learners and the continued use of models remained the preservation of the final chapter of the document.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The research findings indicated that Geography lessons can be delivered with the aid of four types of models namely scale models like model globes, working models like rain gauge, and maps like administrative and topological maps and such as the rotating model globes can be turd to imitate earth’s rotation about its tilted axis. It was observed that lack of models have a negative impact on the level of learner involvement, participation, attitude, motivation and the general tone of lessons. It was generally noted that the use of models is crucial in the enhancement of understanding which in turn boost the motivation and create a favourable learning environment for the learner, facilitating internalisation of concepts or memorisation. Learners also viewed models as a method of learning that makes learning enjoyable as it increases learner activities or participation, improved performance, saves time. To ensure continued availability and use of modes, learners advised subject teachers to improvise. Schools were challenged to purchase the much needed learning aids in form of models.

5.2 Conclusions

It can be concluded that, in the study of geography, the successful delivery of lessons hinges on the constant and varied use of models such as scale, simulation, working models and maps. Models were noted to have tremendous power to simplify and clarify Geographical concepts, make learning and teaching easier for both learners and teachers respectively. From the research, model have proved to be a form of media that enhances learner comprehension of abstract and complex ideas, promote learner pro-activeness in the teaching and learning process, ensures learner motivation, improves learner
performance and prepares learners for possible future carriers especially in the model construction industry.

### 5.3 Recommendations

Against the deterrents to the adoption of the collective and constant use of models as reported in this write-up, the writer drew up these recommendations:

- Regulatory authorities should make the use of models mandatory in the teaching and learning of Geography.
- Geography teachers should be staff developed through workshops/ seminars towards the improvement of use of models and model construction skills.
- Schools should prioritise the purchase of models to ensure continued availability of models for the learners.
- The teacher training institutions should equip pre-service teachers with practical skills in order to fully make use of models effectively in their lessons.
- School heads should be entrusted with the task to monitor Geography lesson delivery to ensure all time utilisation of models.
- Awareness campaigns should be organised to effect philosophical change on the part of the teachers from teacher centered approaches to learner centered approaches.
Appendix 1

Questionnaire administered to learners

Please tick in the box to indicate your response

1. Sex  M  F

2. Do you consider registering Geography at your final examination?
   YES  NO

3. Do you think Geography should be taught and learnt using models?
   YES  NO

4. Why do you think models are important in the teaching and learning of Geography?
   Please tick in the box(s) to indicate your response(s)
   Enhances understanding  Makes learning enjoyable
   Improves memorisation  Saves time
   Others (Specify)

5. What do you think can be done to improve the availability of models in schools?
   Please tick in the box(s) to indicate your response(s)
   Schools should purchase some  Improvisation
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