USING DIF TO INVESTIGATE WHETHER VISUALLY IMPAIRED LEARNERS CAN OUT PERFORM LEARNERS WITH SIGHT IN EXAMINATIONS: THE CASE OF THE 2018 PSLCE EXAMINATION IN ENGLISH IN SELECTED PRIMARY SCHOOLS IN MALAWI

MASTER OF EDUCATION (TESTING, MEASUREMENT AND EVALUATION) THESIS

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MA Ed.(Testing Measurement and Evaluation) Thesis

By

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DECLARATION

I, the undersigned, hereby declare that this thesis, entitled Using Differential Item Functioning to investigate whether visually impaired learners can outperform learners without sight problems in examinations. The case of the 2018 PSLCE Examination in English in selected primary schools in Malawi**,** is my own original work which has not been submitted to any other institution for a similar purpose. Acknowledgements and reference citations have been made where other people's work has been used.

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Full Legal Name

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Signature

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Date

CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

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DEDICATION

This thesis is dedicated to the Kumalambo and Josiah Families.

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ABSTRACT

The purpose of this study was to investigate whether visually impaired learners (those with sight problems) can outperform learners without sight problems in Primary School Leaving Certificate of Education (PSLCE) examination. This purpose was arrived at after identifying the knowledge gap in literature. The literature review showed that no study was carried out on whether or not visually impaired learners can outperform learners without sight problems in PSLCE. The focus was on the 2018 English Paper (Multiple Choice Section) using Differential Item Functioning (DIF) detection procedure.The research design followed quantitative approach which is under positivist paradigm. One of the assumptions used was multicollinearity, this is when predictors are measuring the same thing twice. Results of the data analysis after checking for multicollinearity using collinearity diagnostics, showed the Variable Inflation Factor of 3.773 which was not greater than 10 indicating no multicollinearity in the predictors. Finally the results of the data analysis when checking for outliers using P-P plots showed that almost all the predicted and observed points were linear. This meant that there were no outliers in the data. The study was undertaken to find out whether DIF detection procedures could be achieved in the 2018 PSLCE English Paper items and determine the group of learners affected by DIF. The learners were selected using stratified sampling and primary schools were selected using random sampling. Thus from a group of 400 learners 200 were learners without visual problems and another 200 were visually impaired learners. Data was analyzed using (SPSS). Results showed that performance of learners without visual problems in English was higher than that of visually impaired learners. This meant that learners without visual problems consistently outperformed the visually impaired learners and the type of DIF was Uniform. Furthermore, this showed that visually impaired learners were disadvantaged. Results of the study point to the recommendation that examining bodies need to consider adopting Differential Item Functioning analysis to enhance examination equity, fairness and quality.

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ABBREVIATIONS

CEED	Central East Education Division
CTT	Classical Test Theory
CWED	Central West Education Division
DR	Doctor
DIF	Differential Item Functioning
Ha	Alternate Hypothesis
Ho	Null hypothesis
IQ	Intelligence Quotience
IRT	Item Response Theory
MANEB	Malawi National Examinations Board
PSLCE	Primary School Leaving Certificate of Education
SEED	South East Education Division
SHED	Shire Highlands Education Division
SPSS	Statistical Package for Social Scientists
STEM	Science and Technology and Mathematics Teachers
TST	True Score Theory
USA	United States of America
UK	United Kingdom
VIF	Variable Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Chapter Overview

This Chapter provides background to the study, statement of the problem, purpose of the study, research objectives under study, hypothesis, significance of the study, theoretical framework of the study, limitations, delimitations of the study, definition of operational terms used, and chapter summary.

1.2 Background to the study

Examinations are biased against certain type of people, for instance, in terms of physical disability, socio economic status, gender and geographical location (Baker, F. 2001). Test items are biased if they do not function in the same way across two or more different groups with the same level of ability.

Based on the research report conducted by Buzick, H. et al (2011), in which researchers used learners without visual impairment (regular learners) in the reference and learners with visual impairment in focal groups, it was observed that the mean score for the focal groups was lower than the reference groups for 66% of the comparisons. 48% of those comparisons involved studying the impact of accommodation.

Item impact is evident when examinees from different groups have different probabilities of answering an item correctly since there are real differences between the participating groups in the underlying ability which the item is measuring .On the other hand, item bias occurs when examinees from one group are less likely to respond to an item correctly than examinees of another group due to some characteristic of the test item that is not relevant to the purpose of the test.

Zumbo, B.D. (1999) explained that item impact and item bias differ in terms of whether group differences are based upon relevant and irrelevant characteristics of the test. Now the question that needs to be resolved is whether or not the differential performance in PSLCE multiple choice English paper is due to true differences in capabilities of learners without visual impairment and visual impaired learners (impact) or items on the test are biased against visual impaired learners (test bias).

1.3 Statement of the problem

Mbithi, A. (2012) explained that despite efforts to create inclusive learning environments, disparities in academic performance in the learning area of English among other learning areas at PSLCE, JCE and MSCE between visually impaired (those with problems of sight) and those learners without sight problems continue to persist. In agreement with what Mbithi, A. (2012) explained, the press release about the examination results by The 2024 Malawi National Examinations Board (MANEB) showed the outstanding difference between the performance of visually impaired learners and learners without visual impairments. In this context, the large percentage of learners without visual impairments who wrote national examinations passed while the percentage of learners with visual impairments who wrote national examinations and passed was low compared to their colleagues without sight problems. See the Appendix A. There is a need to systematically examine whether visually impaired learners demonstrate a potential advantage in academic achievement compared to their sighted counterparts. This could provide valuable insights into the efficacy of educational accommodations and support systems designed for visually impaired learners. To address this issue comprehensively, it is crucial to employ Differential Item Functioning (DIF) analysis, a statistical method capable of detecting subtle variations in test performance, while considering relevant variables that might influence the outcomes. By doing this study, the researcher aimed at shedding more light on the educational experiences of visually impaired learners to contribute to the development of more equitable learning environments for all students.

1.4 Purpose of the study

The purpose of this study was to investigate whether visually impaired learners (learners with problems of sight) can outperform their counterparts with sight in the 2018 Malawi Primary School Leaving Certificate of Education (PSLCE) Multiple Choice English examination paper.

1.5 Research objectives.

The purpose of the study was accomplished by fulfilling the following main and specific research objectives.

1.6 Main research objective

The main research objective which guided the study was to investigate whether visually impaired learners exhibit a statistically significant advantage in academic performance when compared to learners without sight problems in the 2018 PSLCE English Multiple Choice items.

1.7 Specific research objectives

The following were the specific research objectives for the study

1) To measure the extent to which DIF can be detected in visually impaired learners relative to those with sight or vice versa.in 2018 (PSLCE) multiple choice in English past paper.
2) To determine whether PSLCE English Multiple Choice Items disadvantages visually impaired learners relative to those with sight or vice versa.
3) To establish the type of DIF (Uniform or Non-uniform) detection procedure in visually impaired and the learners with sight in 2018 PSLCE English Multiple Choice past paper items.

1.8 Research hypothesis

The following hypotheses were tested in relation to the research objectives:

a) H0: Differential Item Functioning is the same for the two groups namely learners without sight problems (Reference) and those with sight problems (Focal Group).

In other words, there is no difference in performance between learners without sight problems and visually impaired learners.

b) Ha: Differential Item Functioning is not the same for the two groups (Reference and Focal Groups).

In other words, there is a difference in performance between learners without visual problems and visually impaired learners.

1.9 Significance of the study

The PSLCE results are used to make critical decisions (selection and placement) that determine one's own life chances. Due to this, it is necessary that assessment instruments should be unbiased so as to promote fairness and quality in assessment. Analysis of test instruments for DIF is an important assessment practice.

Results of this study would enable MANEB to use DIF detection procedures so that the quality of test items is improved. This would help in coming up with informed decisions about inclusion or exclusion of some items in the item bank.

Furthermore, the significance of this study is that Malawi has adopted inclusive education as a strategy and the results would help the Ministry of Education including MANEB to ensure that assessments and examinations do not bias against visually impaired learners.
The knowledge obtained from the results of this study would help test developers to carry out item analysis for DIF in order to identify and exclude items that favour a particular group.

1.10 Theoretical framework

Binary Logistic Regression DIF detection method is based on the Classical Test Theory (CTT) which is also called True Score Theory. It is a traditional quantitative approach for

testing the validity and reliability of a scale based on its items (Wiberg, M. 2007). In the Classical Test Theory (CTT) the true score is defined on the examinee's observed test score (Hambleton, R. et al 1989). CTT assumes that each observed score (X) on an instrument is a combination of an underlying True Score (T) on the concept of interest and unsystematic (random) error (E), i.e. X = T+E. It is assumed that the true score, T, would be obtained if there were no errors in the measurement. Hence a person's true score is defined as the expected score over an infinite number of independent administrations of the scale. As such those who use scales do not observe a person's true score, (T), but what they observe is a score (X) (Wiberg, M. 2007). Furthermore, it is assumed that the mean of the distribution of random errors over a hypothetical infinite number of independent administrations of the scale on the same subject is taken to be zero (0). In addition to this, random errors are assumed to be uncorrelated with the true score. There is no systematic relationship between a person's true score and whether that person's observed score has negative or positive errors (Clause et al 1998). Due to these assumptions, in CTT a person's observed score is assumed to be that person's true score.

During test development at MANEB, item developers use test blue prints (tables of specifications) to guide them in terms of content coverage so as to establish content validity. Blue prints also guide test developers to consider all the levels of domains, for example, cognitive, affective, and psychomotor. MANEB involves item developers who are well qualified and experienced teachers and teacher trainers to do item writing.

When the assessment items are administered to the learners, scores are observed which according to CTT Framework, those observed scores are in the form of X = T +E which means that they contain errors. So to overcome these systematic errors, true scores are obtained after infinite number of independent administrations of the test items which is called pre-testing and Malawi National Examinations Board does this so as to have assessment items which are error free.

Karami, H. (2012) pointed out that unlike IRT and other tools binary logistic regression does not need large samples. It uses a minimum of 200 participants per group. It was for

this reason why the researcher chose this tool. Karami H. (2012) explained that CTT too does not need large samples unlike Item Response Theory which demands a sample of not less than 1000 participants per group. Hence the researcher used binary logistic regression and CTT since the number of visual impaired learners in schools was very small. In line with this theoretical framework, the researcher obtained scores from the learners which were a combination of a true score and an error. So according to this theoretical framework no measurement is error free.

1.11 Inclusive Education Policy

Kim, S. (2001) explained that inclusive education policy aims to create an education system that accommodates all learners, regardless of their physical, intellectual, or emotional needs. This policy is designed to ensure that every child has access to quality education and the opportunity to reach their full potential.

Here are some key aspects of the Inclusive Education Policy in Malawi:

1.11.1 Equity and Access

The policy focuses on providing equitable access to education for children with disabilities and those from marginalized groups. This involves removing barriers to education and ensuring that all learners, regardless of their background or needs, can attend school and participate fully (Kim S. 2001). In line with this aspect, the researcher asked the institutions to provide visual impaired learners with braille and large print to those learners with low vision so as to offset the barriers which could prevent visual impaired learners from accessing the assessment items.

1.11.2 Curriculum and Pedagogy

The policy encourages the adaptation of teaching methods and materials to meet diverse learning needs (David et al 2018). This means modifying the curriculum for example phrasing and paraphrasing the sentences which will be given to slow learners, and teaching approaches such as pair work or think- ink- pair share, pens in the middle, jigsaw just to mention a few are used to accommodate different learning styles and abilities in the classrooms.

1.11.3 Infrastructure and Resources

Clause, B.E et al (1998) explained that schools are encouraged to improve their infrastructure to be more accessible, such as building ramps for easy movement of physically challenged learners who use wheelchairs and providing assistive technologies such as hearing aids and embossers to the learners with hearing impairments. Adequate resources are allocated to support learners with special needs.

1.11.4 Monitoring and Evaluation

There is a system in place to monitor the implementation of the policy and evaluate its effectiveness. This includes tracking progress, identifying challenges, and making necessary adjustments to improve inclusivity in schools (Kim, S. 2001).

From the list of the described aspects of the policy of inclusive education in Malawi, the researcher purposively focused on the aspect of equity and access due to the type of study which is quantitative under positivist paradigm.

Overall, the Inclusive Education Policy in Malawi reflects a commitment to ensuring that every child, regardless of their circumstances, has the opportunity to succeed in the educational system.

1.12 Limitations of the study

The study did not involve learners from standard 1 to standard 8 with and without visual impairments due to financial constraints. To address this, the researcher used a sample from the population.

In addition to this, the study did not focus on learners with impairments in both reference and focal groups. For example, to investigate if learners with learning difficulties (LD) can outperform learners with hearing impairments (HI).

1.13 Delimitations of the study

The study was confined to focusing on multiple choice test items to examinees from both the reference (learners with sight) and focal (learners with problems of sight) groups in detecting DIF.

1.14 Definitions of the operational terms used

Binary logistic regression: It is a statistical method which predicts the probability that an observation falls in one or two categories of binary dependent variable based on one or more independent variables (Clause, et al 1998).

Differential Item Functioning: Zumbo, B. D. (1999) explained about DIF that it occurs when examinees from different groups show differing probabilities of success on the item after matching on the underlying ability that the item is intended to measure.

Focal group: Camilli, G. et al (1994) highlighted focal group as the group which is not favoured by the items.

Item analysis: Zumbo B.D (1999) described item analysis as a set of statistical techniques to examine the performance of individual items.

Item bias: Karami H. (1998) explained about item bias that it occurs when examinees of different subgroups perform differently because of some characteristic of the test item or testing situation that is not relevant to the test purpose.

Odds: Zumbo B.D (1999) pointed out odds as a likelihood of something to occur.

Odds ratio: David H. et al **(2018**) explained that odds ratio is the ratio of an event likely to occur to an event not likely to occur.

Reference group: Hambleton, Swaminathan and Rogers (1991) described reference group as the group of examinees who are favoured by the items.

1.15 Chapter summary

The Chapter described the background of the study, problem statement, purpose of the study, justification for using binary logistic regression. The Chapter also discussed the research objectives, hypothesis, theoretical frame work of the study, significance of the study, limitations and delimitations of the study finally definition of operational terms.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

Chapter two is organized into five major sections. The first section gives a review of related studies. The second section presents a justification for using DIF to investigate whether visually impaired learners can outperform regular learners on 2018 Primary School Leaving Certificate of Education (PSLCE) in English Multiple Choice Past Paper Items. The third section gives subgroups in Differential Item Functioning analysis, DIF detection, last but not the least is the section of the DIF magnitude and finally the Chapter summary

2.2 Review of related studies

This section will provide review of related studies from different countries in the world. Firstly, review will be done on developed western countries, followed by the literature review from the developing countries finally from Malawi.

2.2.1 Review from some western countries

David, H et al (2018) carried out a study on Differential Item Functioning on the sample of 13694 candidates. The purpose of this study was to investigate whether the test items were fair to the two groups namely; reference and focal groups. The study was on both firstly, ethnicity where ethnically white UK Graduates were used as reference group against ethnically non-white UK graduates as focal group, secondly it was focused on gender where male UK graduates which were reference against female UK Graduates as focal groups. DIF was used to test 2773 questions across 14 sittings).

The findings on gender from the study indicated that female UK graduates which is the focal group consistently performed better than male UK graduates which is the reference group.

Furthermore,findings on race / ethnicity indicated that ethnically white students (reference group) outperformed the ethnically non- white students (focal group) (David, H. 2018).
From what was observed, it showed that there was likelihood that members in the focal group could outperform those in the reference group. For example, the comparisons on gender where female UK graduates (focal group) outperformed members in the reference group (male UK graduates). It was therefore against this background that the current research investigated if indeed visually impaired (focal group) learners could outperform learners without visual impairments (reference group).

2.2.2 Review from United States of America

Oliveri, M et al (2018) administered quantitative and verbal reasoning items to the reference and focal groups. For example, they compared: (i) age (24 and younger which is focal group versus 25 and older which is reference group; (ii) Citizenship status (United States of America which is reference group versus non- United States of American citizens which is focal group), (iii) English as the applicant's best language (Yes or No); (iv) intended major field of graduate study (Science, Technology, Engineering, and Mathematics, STEM which is reference group; versus Business, Humanities, Arts and Social Sciences, Non- STEM which is focal group). The purpose of the study was to find out if members in the focal group could outperform their colleagues in the reference group.

2.2.2.1 Results on quantitative reasoning

The findings indicated that USA Citizens scored 15 B (reference group) while non- USA Citizens scored 12B (focal group), on the same citizenship of USA as reference group, they scored 12Cs while non-USA Citizens as focal group scored 17Cs. There were 12Bs in STEM (reference group)and 4Bs in Non-STEM (focal group). On English, Native English (reference group) scored no Bswhile Non- Native English (focal group) graduates scored a single B.

2.2.2.2 Results on verbal reasoning

The performance indicated the 12Bs and 18Cs in reference group (USA Citizenship) and the focal group scored 11Bs and 7Cs (Non – USA Citizenship. On STEM and Non- STEM,

there were 5Bs and no Cs in the reference group (STEM) and 10Bs and 2Cs in the focal group Non-STEM).

The members in the focal group at one instance outperformed their colleagues in the reference group. For example, Non- STEM (focal group) scored 10Bs and 2Cs while the STEM (reference group) scored 5Bs and no Cs. On the other hand, the members in the reference group outperformed their colleagues in the focal group. For example, after analyzing the data on Citizenship, results indicated the 12Bs and 18Cs in reference group (USA Citizenship) and the focal group scored 11Bs and 7Cs (Non – USA Citizenship). The findings in this study are related to the current researcher's objective number 3. To establish the type of DIF (Uniform or Non uniform) that Binary logistic Regression DIF detection procedure is able to detect in 2018 PSLCE English past paper test items. By the virtue of reference group performing better than focal group members as seen above is an illustration of the fulfillment of objective number 3 which was aimed at establishing the type of DIF (Uniform or Non- uniform) displayed.

Buzick, H. et al (2011) carried out a study which was aimed at identifying appropriate DIF detection strategies for students with disabilities. A research report titled 'Recommendations for conducting Differential Item Functioning (DIF) Analysis for students with disabilities based on previous DIF Studies. The purpose of their study was to help ensure that strategies for differential item functioning (DIF) detection for students with disabilities are appropriate and lead to meaningful results.

In their research report on standard administration it was emphasized that studies for DIF compare students under the same testing conditions (Oliveri. M, et al 2018). In order to comply with (Oliveri, M. et al 2018) the study on learners without sight problems versus visually impaired learners used braille to learners with visual impairment so as to remove the barriers in accessing the test instructions. When students are compared under the same testing conditions, the comparison helps to establish that examinees from the reference and focal groups are correctly matched when using an internal matching (Clauser & Mazor, 1998). To ensure uniformity of testing conditions, some students with disabilities took

assessments with accommodations. The testing accommodations were intended to remove barriers to accessing test items due to students' disabilities. The psychometric function of accommodation is to increase the validity of inferences about students with disabilities by offsetting specific disability – related, construct irrelevant impediments to performance. For example, a braille format test allows students who are visually impaired to access items that would be unreadable in paper, or computer format (Karami H. 2001). In line with this, the current researcher, asked the institutions to provide braille to visually impaired learners when administering the questionnaires so as to accommodate visually impaired learners as well as providing large print items to ensure uniformity of test conditions.

2.3 Findings of the study

The comparisons were done which involved students with disabilities in both groups in an attempt to improve matching of the students in the reference and focal groups by comparing groups with similar disabilities.

74% of the comparisons that used students without disabilities in the reference group and students with disabilities in the focal group, had lower observed score means (score averages) for the focal group, among these comparisons, 48% of the comparisons involved studying the impact of accommodations. Of the comparisons in which students with disabilities were in both focal and reference groups, 32% had lower observed score means (score average) for the focal group. Amongthese comparisons, all but one involved studying the impact of accommodation. All comparisons in which the observed score distributions were similar, involved students with disabilities in both the reference and focal groups (Buzick H & Stone E, 2011). The current researcher used learners without visual impairment (reference group) versus visually impaired (focal group) learners whereby braille was used in learners with visual impairment so as to remove barriers of sight which could affect the performance of learners.

2.4 Review from some countries in Africa

2.4.1 Low vision learners in Kenya

Mbithi, A. (2005) in her thesis titled "social and Academic Experiences of Learners with Low Vision in Integrated Primary Schools in Nairobi" carried out a research which was aimed at investigating the impact of social experiences on academic performance of learners with low vision. The researcher used the following objectives: to establish academic performance of learners with low vision in integrated primary schools; determine the impact of social interaction with sighted peers and teachers on academic performance of learners with low vision; the role of family and community in the social experiences of learners with low vision; establish intervention measures by school to enhance social experiences and academic performance and to establish materials and facilities that support learners with low vision by the school. The researcher used descriptive survey research design. She did her study in three primary schools in two districts. The researcher used purposive sampling procedure to select learners with low vision and teachers. The target population was learners with low vision of classes 5, 6 and 7 as well as teachers in these classes and the head teachers. A questionnaire was used to collect data from the learners and teachers and an interview schedule for the head teachers. Data were analyzed using both descriptive and inferential statistics.

It was found that the level of interaction between learners and teachers at the school had the highest influence on academic performance of learners with low vision and that support given by the school, for example, teaching resources and friendly environment influenced academic performance the least (Mbithi, A. 2005).

2.4.2 Review from Uganda

Kibanja, G. et al (2005) carried out a study whose title was "Challenges Faced by Visually Impaired Learners at Mackerere and Kyambogo Universities" which was aimed at investigating the challenges faced by visually impaired learners in Mackerere and Kyambogo Universities. The study followed a cross sectional survey design and involved a sample of 50 respondents which was comprised of visually impaired learners. Data were collected using questionnaires, interviews and document review.

2.5 Findings

The findings indicated that visually impaired learners face a lot of challenges in achieving their academic goals, for example, 10% of the visually impaired learners are slow while brailing dictated notes by the lecturers; 8% of the visually impaired learners find difficulty in writing course work; 6% of them lack machine such as braille, laptops, computers and also examination time or duration is inadequate for proper completion of the tasks.

2.5.1 Differential Item Functioning in Malawi

Studies on Differential Item Functioning done in Uganda were also done by Zimba B. (2018) who was investigating the effect of differential item functioning on gender. This was a replication study from what Jailosi did in 2012. Jailosi study was based on Item Response Theory to find out the effect of Differential Item Functioning on gender, both researchers (Jailosi. J, 2012 and Zimba. B, 2018) focused on Malawi School Certificateof Education Examinations (MSCE) in the learning area of computer science, paper one. So Zimba. B,(2018) did not use Item Response Theory as Jailosi did, instead the researcher used one of the Classical Test Theory methods, for example, Mantel- Haenszel detection procedure. The sample size which was used by Zimba. B, (2018) was 500 learners which was composed of 300 males and 200 females.

The research findings from the study of Zimba, B. (2018) were that category "B" and "C" DIF magnitude was detected in 3 out of 34 items representing 8.82%. Out of the detected items, 66.67% had uniform DIF where as 33.33% had non- uniform DIF. The results revealed that males (reference group) performed better than females by 66.67% which was uniform DIF, on the other hand females (focal group) performed better than males by 33.33% which was non- uniform DIF. So, these findings are in agreement with the current researcher's objective number 3 which was aimed at establishing the type of DIF either uniform or non-uniform which binary logistic regression is able to detect.

Furthermore, Gondwe, M. (2012) carried out a study on gender Differential Item Functioning using Item Response Theory (IRT) on Primary School Leaving Certificate of

Education Examinations (PSLCE) focusing on Mathematics Multiple Choice section. The researcher used sample size of 1630 learners from which 800 were girls and 830 were boys. The findings from the study were that out of 30 multiple choice items, 15 were flagged for differential item functioning. Boys were at an advantage over girls by 10 questions as opposed to5 in favour of girls.

The literature review went as far as checking the outline of topics of Master of Education Dissertations on Differential Item Functioning at University of Malawi, Schoolof Education. The findings were that from the list of documented dissertations from 1983 up to November 2019, no study had been done on differential item functioning focusing on learners with sight (reference group) versus visually impaired (focal group) learners. Furthermore, it had also been shown that no study had used binary logistic regression on learners with sight (reference group) versus visually impaired (focal group) learners in Malawian context. Lastly, research has shown that from 2012 to 2019, Gender Differential Item Functioning studies had been used by a large number of researchers in Malawi. For example, Jailosi, J. (2012) carried out a research to test the items of computer studies for gender differential item functioning (DIF) and found the possible sources of DIF using Likelihood Ratio Test. Secondly, Gondwe, M. (2012) carried out a study in which the researcher was trying to find out if Primary School Leaving Certificate of Education in Mathematics (PSLCE) in Malawi still contain some items that function differentially in terms of gender based on ability levels using Item Response Theory Methods, thirdly, Zimba, B. (2018) did a study in which the researcher was re-examining gender Differential Item Functioning (DIF) in Malawi School Certificate Of Education (MSCE) computer studies examination items using a Classical Test Theory (CTT) – based Mantel – Haenszel (MH) DIF detection procedure.

Following the conclusions made from observations on DIF studies done in the world and the observations made on DIF studies done in Malawi, the researcher therefore investigated whether visually impaired (those with sight problems) learners can outperform learners without sight problems using binary logistic regression so as to bridge the gap. The other

reason for proposing to investigate this DIF was to add more knowledge in the academia which was there undiscovered yet.

2.6 Justification for using Differential Item Functioning

Basing on the review of research findings done in a number of countries, there is not much researchdone on investigating whether visually impaired learners can outperform learners without visual impairment using Binary Logistic Regression. In addition to this, little is known about the effects of differential item functioning on learners without visual impairment (reference group) versus visually impaired (focal group) learners. In view of this, the researcher would like to carry out a study on the specified group of learners mentioned above using binary logistic regression so as to bridge the gap in literature.

2.7 Subgroups in Differential Item Functioning analysis

There are at least two groups, i. e. focal (F) and reference (R) groups in any DIF study (Clauser & Mazor, 1998). The focal group, a group of minorities which is considered as potentially disadvantaged which is visually impaired learners. On the other hand, the group which is considered as potentially advantaged by the test items is called reference group, in this study, it learners without visual impairment (Karami, 2012.

2.8 Differential Item Functioning detection (DIF)

Lord, F.M (1980) realized that when establishing the validity of score inferences, the important issue is to assess the fairness of the test by analyzing DIF. This is a procedure used to determine if the test items are fair and appropriate for assessing the knowledge in a specific learning area (subject) across similar groups of testees (Zimba B, 2018). DIF statistical techniques are based on the principle that if different groups of testees, e. g. learners without visual impairment (reference group) and visual impaired (focal group) learners are matched on the same level of ability, then they should perform similarly on individual test items regardless of group membership (Zumbo, B.D, 1999). The presence of DIF, signals that factors related to group membership affect the probability of correct response and threaten fair assessment of test items. Therefore, mechanisms have been developed so as to detect DIF with the intention of improving equity in testees who have the

same ability on the continuum of variation that the item is measuring (Kim. S 2001). Zumbo B.D et al (1999) states that there are two approaches for examining bias namely: judgmental and statistical. The judgmental approach is subjective in that it relies on the expert judges' opinion to select biased items. Despite their subjectivity, the method is still being used in screening items foritem bias to complement statistical methods which are objective. Nevertheless, Zimba; B. et al (2018) urges researchers to use statistical techniques because of this method's defensibility.

2.9 Magnitude of Differential Item Functioning

Zumbo, B.D. (1998) explained that in most cases, it is not sufficient to just rely on the fact that all statistically significant items are displaying DIF because statistical power plays havoc on one's ability to detect effects. It is along this line of thought that the researcher would like to show the magnitude of DIF in this study.

Measuring the magnitude of DIF follows, the same strategy as the statistical hypothesis testing except that one only works with the R- squared values at each step. An examination of both the 2-df Chi- square test in this method of logistic regression and a measure of effect size is needed to identify DIF (Zumbo, B.D. 1999). Without an examination of effect size, trivial effects could be statistically significant when DIF test is based on a large sample size (Zumbo B. D, 1999).

For an item to be classified as displaying DIF, the 2-df Chi-square test in logistic regression has to have a p- value of less than or equal to 0.01 and the Zumbo, B.D. effect size measures must be at least an R- Squared of 0.130 (Zumbo B. D,1999). So when an item has been identified as displaying DIF, the sources of that DIF must be investigated to see if it is measuring factors which are irrelevant to the construct, once it is seen that it is measuring factors which are irrelevant to the construct then it is removed from the item bank.

2.10 Chapter summary

This Chapter reviewed the literature of related studies and found that no studies were done on visual impaired learners versus learners with sight using a methodology of binary

logistic regression. It is therefore for this reason that the researcher would like to bridge the gap which was there in the academia by conducting a study on the mentioned learners so as to bring new knowledge to the academia. This chapter also presented justification for investigating Differential Item Functioningusing Binary Logistic Regression, presented subgroups in DIF and discussed the magnitude of DIF detection.

CHAPTER THREE

METHODOLOGY

3.1 Chapter overview

This Chapter describes the choice of the paradigm for the study and its justification, research design for the study, data source, data collection instruments, research population and participants,sample and sampling techniques, data analysis, validity and reliability of data collection instruments, ethical considerations and chapter summary.

3.2 Research paradigm

Paradigm is a conceptual lens through which the researcher examines the methodological aspects of the research to determine research methods that will be used and how the data will be analyzed (Hambleton, R. 1989)). Furthermore, Wiberg, M. (2007) explained a paradigm as a basic belief system and theoretical framework with assumptions about (1) ontology, (2) epistemology, (3) methodology and (4) methods. In other words, it is the researcher's way of understanding the reality of the world and studying it. Paradigms are important because they provide beliefs and dictates, which for scholars in a particular discipline, influence what should be studied, how it should be studied, and how the results of the study should be interpreted (Karami, H. 2012).

Furthermore, Paradigms are central to research design, because they impact on the nature of the research question; that is, what is to be studied. In designing the research study the principle of coherence can be preserved by ensuring that the research question and methods used fit logically within the paradigm (David, H.et al 2018). According to Camilli, G. et al (1994), the paradigm of study provides the frame and the structure of the study, and guides the researcher's actions.

The study fell under the positivist paradigm which was proposed by August Comte (1798-1857). The positivist paradigm defines the world view to research which is grounded in what is known as scientific method of investigation. It is used to search for cause and effect relationships in nature.This paradigm was chosen as preferred world view for search, which tries to interpret observations in terms of facts or measured entities (Clause, B. et al 1998). Research located in this paradigm relies on deductive logic, formulation of hypotheses, testing those hypotheses, offering operational definitions and mathematical equations (models), calculations, extrapolations and expressions to derive conclusions. It aims to provide explanations and to make predictions based on measurable outcomes (Wiberg, M. 2007). In this study, the researcher would be interested in predicting whether learners with visual impairment would outperform those without sight problems given the same conditions and all factors controlled.

3.3 Justifications for using positivist paradigm

The positivist paradigm of exploring social reality is based on the idea that one can best gain an understanding of human behaviour through observation and reason. According to the positivist paradigm, true knowledge is based on experience of senses and can be obtained by experiment (www.intgrty.co.za>2016/07/19). Basing on the research topic which was aimed at using Differential Item Functioning to investigate whether visually impaired (those with problems of sight as focal group) learners can outperform learners without problems of sight as reference group in 2018 PSLCE English Multiple Choice past paper items using binary logistic regression, the researcher used positivist paradigm and involved learners of different abilities, for example, some were learners without problems of sight and others were visually impaired learners. Data was obtained by experimentation as learners were put in two different groups (reference and focal), performance was observed and recorded.

In this study, the researcher has focused on four components of a positivist paradigm namely, ontology, epistemology, methodology and methods. To begin with, Lord, F. (1980) described ontology as the nature of the researcher's beliefs about reality, how it exists and what kind of knowledge can be known about it. The ontological position of

positivists is that of realism. Positivists believe that like the natural world, in the social world, there is a cause – effect relationship between phenomena and once established, they can be predicted with certainty in future. In line with this study, the work of independent variables for example Total Scores, Vision and interactions of the Total Scores and Vision would help to predict the dependent variable which is performance.

Secondly, the epistemological position of positivists is that of objectivism (the belief that there is single truth) (Kim, S. 2001). In this study, the researcher would come in as objective observer to study phenomena that exists independently of the researcher and would not affect or disturb what would be observed. The positivists believe that there is one truth. Zumbo, B.D et al (1999) explained that positivists believe that there are laws governing social phenomena,and by applying scientific methods, it is possible to formulate these laws and present them throughfactual statements. For example, the formulation of binary logistic regression model helps to predict the occurrence of the dependent variable.

Thirdly, the positivist methodologies depend much on experimentation, formulation of hypothesis,the approach to analyze data is deductive (Hambleton, R. K. et al 1989). In line with this study, experimentation (investigation) was done by putting learners in two groups (reference group for learners without sight problems and focal group for visually impaired learners) and manipulate the independent variables so as to see if there will be an effect on the dependent variable (performance).

Lastly, positivists carry out research using quantitative methods to generate information (Lord, F. 1980). With this in mind, the researcher was guided by this to use quantitative methods when doing the study.

3.4 Research design

The study followed purely quantitative approach. This quantitative approach used a positivist belief that social environment is real and constant regardless of setting and time (Camilli, G. et al 1994). This approach demands objective discovery of truth which can be obtained after carrying out a research that is characterized by the traditional criteria of

internal and external validity, reliability, objectivity and generalizability (Gondwe, M. 2012). So it is simple for the quantitative researchers togive indicators of rigor by presenting a relatively straightforward, transparent and methodological account within the standardized set of procedures. The study employed descriptive research design so as to explain sources of DIF.

Baker, F. (2001) described research design as a blue print, an outline for conducting the study in a manner that control will be exercised over factors which can interfere with the validity of the results. It was through this school of thought that the researcher obtained answers from the research objectives which guided the study.

This study used a positivist paradigm to identify and analyze DIF in learners with sight (reference group) versus visually impaired (focal group) learners using binary logistic regression in the 2018 Primary School Leaving Certificate of Education (PSLCE) Examinations of English Past Paper Multiple Choice Items which were dichotomously scored.

3.5 Justification for using Binary Logistic Regression for DIF detection.

The Binary Logistic Regression was used because the nature of the data which was collected was binary especially looking at the scoring format which is pass or fail in the multiple choice items. Furthermore, the procedure was used to predict about the occurrence of an event. So amongst all the methods used in Differential Item Functioning, for example, Item Response Theory (IRT), Mantel- Haenszel (MH) only Binary Logistic Regression is used to predict the occurrence of events. For example, to predict whether learners will pass (1) or fail (0) the examinations(Statisticssolutions). The rest only detect the presence of Differential Item Functioning (DIF) in the test.

The following are some of the justifications for using Binary Logistic Regression besides the ones explained above:

Firstly, logistic regression is used when the data has one or more independent variables, which can be either continuous (an interval or ratio variable) or categorical (i.e. an ordinal

or nominal variable). Examples of continuous variables include revision time (measured in hours), intelligence(measured using IQ scores), examination performance (measured from 0 to 100), weight (measured in kilograms), examples of ordinal variables include Likert items (e.g. a 7 – point scale from strongly agree to strongly disagree), and examples of nominal variables include gender (e.g.two groups: male and female). Ethnicity (e.g. Three groups: Caucasian, African American and Hispanic), Personality (introversion and extroversion, learners without visual problems and visual impairment). In this study, the focus was on learners without visual problems (reference group) versus visually impaired (focal group) learners according to the data (Zumbo B.D, 1999).

Secondly, there should be independence of observations and the dependent variables should be mutually exclusive and exhaustive categories. This means that the observation may fall on pass or fail, observation cannot fall on pass and fail at the same time. In line with this study, the odds of success are orthogonal (completely independent) to the odds of failure. These can happen without influencing one another. The dependent variable in this case is performance (pass or fail) which is binary.

Binary Logistic Regression is useful for situations in which the researcher wants to be able to predict the presence or absence of a characteristic or outcome based on values of a set of predictor variables. It is similar to a linear regression model but is suited to models where the dependent variable is dichotomous (binary). Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model (Camilli, G. et al 1994). Along this line, the researcher would like to predict the odds of success of visually impaired learners.

Hambleton, R. et al (1989) explained that binary logistic regression is used when dependent variable is binary (dichotomous) having two levels (pass, fail). Here the relationship between independent variables (predictors) and the dependent variables is no longer linear but non-linear. So log of oddsis used to model the non- linear relationships which involves the data which is binary (dichotomously scored items).

The other justification was that the researcher would like to predict the probability of single categorical outcome. In this case the categorical outcome is success which may fall under two categories for example pass or fail.

3.6 Assumptions of Binary Logistic Regression

This section highlights the assumptions of binary logistic regression, to begin with, multicollinearity, this is when independent variables are strongly correlating to each other. When this is observed, it means that the predictors (independent variables) are measuring the same thing so one of them has to be removed to avoid repetition.

The second one is that binary logistic regression is used when dependent variable is binary (dichotomous) having two levels (pass, fail) (David, H. et al 2018). Here the relationship between independent variables (predictors) and the dependent variables is no longer linear but non-linear.

3.7 Data and Data Source

Zumbo, B. D (1999) described data as information which is obtained when carrying out an investigation. The researcher used a 2018 PSLCE past paper of English Multiple Choice items as a questionnaire for collecting data. The structure of the data which was collected comprised of scores from multiple choice items from visually impaired and learners with sight which was binary (dichotomously scored). This data was very significant because it fitted to both the research topic as well as the research objectives.

3.8 The Raw Data

The data used in this research was randomly sampled from different institutions, refer to appendix G. The total marks for English Test was 40 (see Appendix G), the codes used in the table in that appendix G were as follows: Vision with code 1 (reference group) represents learners without sight problems, vision with code 2 (focal group) represents visually impaired learners, The code 0 in performance meant that the examinee failed the test and the code 1 in performance meant that the examinee passed the test. Learners in the focal group are being represented by the identity numbers ranging from 1 up to 200 which

meant that there were 200 participants in the focal while those in the reference group were ranging from 201 up to 400 meaning that there were 200 participants too. See the appendix G.

3.9 Data Collection Instrument

Data collection is the process in which researchers gather information which is needed to answer research problem and data collection instrument is a device used to collect information (Zumbo, B.D. 1999). The instruments include: tests, questionnaires and interviews (Lord, F.1980). In the current study, the questionnaire that was used to collect data was the past paper of 2018 PSLCE English paper of Malawi national examination (see Appendix B) which was administered to the stratified sample of learners in the respective primary schools. This paper of English Multiple choice was purposively chosen during the proposal stage. The questions on the paper were modified to suit learners with problems of sight, for example, some questionnaires were made of large print and others were brailed (see Appendix C), then the visual impairment specialist was asked to transcribe to braille for learners with visual impairment to use and transcribe the braille back to English for easy understanding during marking. In addition to this, learners with problemsof sight were given extra time when responding to the items.

3.10 Validity and Reliability of Data Collection Instruments

Validity and reliability of an instrument is a key requirement in any research. Karami, H (2012) described validity as how well the measured variables capture the targeted concept of measurement whereasreliability was defined as the consistency of an instrument to produce stable results. Firstly during test development at MANEB, item developers use test blue prints (tables of specifications) to guide them in terms of content coverage so as to establish content validity. Blue prints also guide test developers to consider all the levels of domains, for example, cognitive, affective, and psychomotor. MANEB involves item developers who are well qualified and experienced teachers and teacher trainers to do item writing. Since the examination paper (data collection instrument) was developed by MANEB it was assumed to be valid and bias free (reliable). As a result no pre-testing was done. The items were also standardized through moderation by MANEB.

3.11 Research Population and Participants

David, H. et al (2018) explained research population as the totality of all subjects that conform to a set of specifications, comprising the entire group of persons that is of interest to the researcher and to whom the research results can be generalized. The research population for this study was made up of some of the 2021 examinees to whom the past paper of 2018 PSLCE was administered who were learners without sight problems (reference group) versus visually impaired (focal group which was made up of learners with sight problems). The number of primary schools in Malawi which accommodates both visually impaired and learners with sight is twelve and it is this number which constituted a population. These Primary Schools were taken as a population because they handle learners who are visually impaired as well as learners with sight which is in line with the research topic. This study focused on learners with total blindness as well as those with low vision and the other learners without sight problems.

Research participants are individuals or group of individuals about whom the researchers conducting research obtains data through interaction with the persons for identifiable private information (Zumbo, B. D. (1999). In this study, research participants were some of the 2021 PSLCE examinees to whom the past paper of 2018 PSLCE of English multiple choice was administered.

3.12 Sample and Sampling Techniques

A sample is a portion or subset of the research population selected to participate in a study, representing the research population (Kim, S. 2001). Institutions which were used in this research were chosen using random sampling technique. The random sampling of schools where visual impaired learners and learners without sight problems are accommodated was chosen with intention of having equal likelihood of schools to be picked and represented. Stratified sampling of learners was also done in the random sampled schools in order for the learners to have equal likelihood of being picked and represented in the sample. The randomized six sampled schools were as follows: Montfort Primary School in Chiradzulu District, Nkope Hill Primary School from Mangochi District. These were from South West Education Division. Primary schools from Central East Education Division were: Salima

L.E.A Primary School from Salima District, Chilanga Primary School from Kasungu District. The schools from Central West Education Division were: Malingunde Primary School from Lilongwe Rural, Nsiyaludzu Primary School from Ntcheu District. Literature mostly recommends a sample which is large enough so as to represent the population under study. Karami, H. (2012) explained that logistic regression and the Mantel- Haenszel statistics gained particular attention because the two methods can be used in detecting differential item functioning (DIF) in small sample sizes. For instance, Zumbo, B.D. (1999) pointed out that 200 participants per group are needed and this is not a remarkable sample size compared to Item Response Theory (IRT) which requires 1000 learners per group. In this study, the researcher used a sample of 400 participants from which 200 were learners without sight problems (reference group) and the other 200 participants were learners with sight problems (focal group) as the study fell under the theoretical framework of Classical Test Theory (CTT).

3.13 Data Analysis

Data analysis refers to the process of applying statistical techniques to describe, condense and recap, and evaluate data (Clause, B. et al 1998). In DIF analysis, there are a number of statistical software packages that are used. In analysis of DIF when employing an approach of binary logistic regression, some of the software packages used are LORDIF, Statistical Package for Social Scientists (SPSS) and Stata (Wiberg, M. 2007).

Data analysis was done in two stages, firstly assumptions of outliers were checked using P– P plots in order to fit the model to the data.Secondly, the data was analyzed using Binary Logistic Regression DIF detection procedures using the software of Statistical Package for Social Scientists (SPSS). The researcher purposively used hierarchical strategy to ensure control over the independent variables (predictors) to be included in the model unlike the empirical strategy (Forward and Backward methods) where the system decides which predictors to be included or removed from the model.

3.14 Ethical Considerations

Research ethics must be given a priority because they ensure the rights and privacy of the subjects participating in data collection process to be protected (Clause, B.E., Mazor, K. M. (1998). In this research, ethical considerations were observed and followed, for example the researcher used confidentiality and informed consent to the participants.

On informed consent, permission was sought from various District Education Managers to collect data in their schools, see Appendix E.

On confidentiality; when collecting data, the participants used numbers on top of each and every page of the answer script for identification.

Furthermore, The University of Malawi (School of Education) served the researcher with an introductory letter which was used for seeking permission from various institutions for data collection (see Appendix D).

3.15 Chapter summary

The Chapter discussed the following aspects: research paradigm as positivist which emphasizes objectivism in its approach, research design as quantitative, data and data source where the researcher used dichotomously scored items from visually impaired learners and learners without sight problems, data collection, sampling techniques for example random sampling and stratified sampling, data analysis which was done by using a software called Statistical Package for Social Scientists (SPSS), validity and reliability of data collection instruments and finally ethical considerations.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF THE RESULTS

4.1 Chapter Overview

This chapter has checked some of the assumptions of binary logistic regression, presented results of the study and discussed the findings with reference to research objectives presented in chapter 1 finally chapter summary.

4.2 Checking Assumptions of Binary Logistic Regression

Multicollinearity was checked by the use of collinearity diagnostics, where Tolerance and Variable Inflation Factor (VIF) were used (Zumbo, B.D. 1999). Under Variable Inflation Factor (VIF) the values were not greater than 10, for example the value of VIF in Table 1 is 3.773 which is indeed not greater than 10, as it is, and this meant that there was no multicollinearity which meant that the independent variables were not correlating each other highly. (Hambleton, R. et al 1989) explained that multicollinearity is observed when the values of VIF is greater than 10.

Table 1: Showing Multicollinearity of Predictors

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.256	.056		-4.552	.000		
	TOTAL SCORES	.021	.003	.338	7.286	.000	.265	3.773
	VISION	.567	.046	.572	12.307	.000	.265	3.773

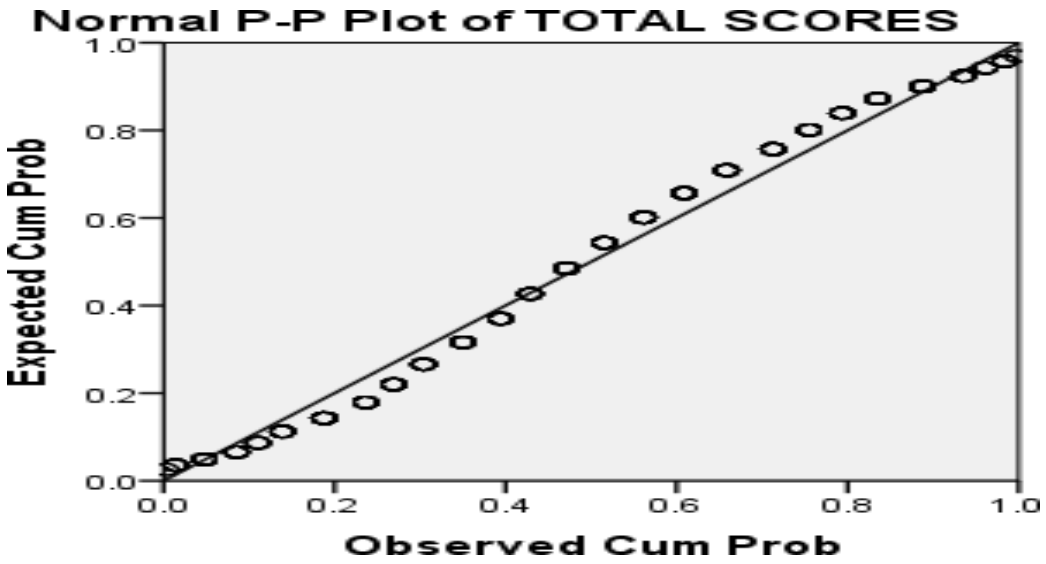
When there was no multicollinearity between predictor variables meant that the predictor variables (independent variables) were not measuring the same thing twice. In addition to this, when the predictor variables were measuring the same thing twice then the results could be false and this could have negative impact on the interpretation of results. Furthermore, under VIF, both independent variables namely Total Scores and Vision had value of 3.773 which was not greater than 10. Again, this meant that the predictors were not strongly correlating to each other (no multicollinearity).

The other assumption was that binary logistic regression is used when dependent variable is binary (dichotomous) having two levels (pass, fail) (Lord, F. 1980). Here the relationship between independent variables (predictors) and the dependent variables was no longer linear but non-linear.

The last assumption was, outliers; to check for outliers, Mahalanobis distances, scatterplot, standardized residuals, P-P Plots and boxplots are used (Zumbo, B.D 1999). The researcher had purposively used P – P Plot to see if the data contained outliers. See the output in Table 2.

Table 2 shows the spread of the predicted and observed scores on the P – P Plot. There is a small difference between the predicted (expected) and observed scores, the scores have formed a line from the bottom left up to the right corner. They are almost linear.
This shows that there are no outliers in the data.

Table 2 : P-P Plot Showing Outliers



4.3 Discussion of Results of the Data Analysis

This section has discussed about fitting the model to the data using block 0, contingency table for Hosmer and Lemeshow Test, Classification Table and Omnibus Test. Finally, it has also discussed about research findings in relation to the research objectives and research hypotheses.

4.4 Fitting the Model to the Data

Table 3: Block 0 (Model 0) with no predictors

	Observed		Predicted		
			PERFORMANCE		Percentage Correct
			FAIL	PASS	
Step 0	PERFORMANCE	FAIL	0	175	.0
		PASS	0	225	100.0
	Overall Percentage				56.3

Table 3 presented a model having no independent variables (predictors). The function of this model 0 above was to serve as a benchmark for comparing results from other blocks (models) where independent variables (predictors) were used. For example, where predictors were used for instance Total Scores, Vision and theinteraction of Total Scores and Vision, the odds of success of learners without visual impairment will be observed as well as those of visually impaired learners, unlike in block 0 (model 0) where no predictors were used. This block 0 (model 0) having no independent variables (predictors) was indicating the prediction of 56.3% accuracy, see the table 4.3 above. This meant that the model could give aprediction of performance even in the absence of predictors but this prediction will be comparedwith the ones obtained from blocks (models) 1 to 3 which will involve the use of independent variables (predictors) thereafter decision will be made to see which model gives true prediction.

Table 4: Model Data Fit

Contingency Table for Hosmer and Lemeshow Test

		PERFORMANCE = FAIL		PERFORMANCE = PASS		Total
		Observed	Expected	Observed	Expected	
Step 1	1	34	34.788	1	.212	35
	2	41	41.254	1	.746	42
	3	38	37.050	1	1.950	39
	4	33	34.141	9	7.859	42
	5	22	19.659	20	22.341	42
	6	7	5.092	28	29.908	35
	7	0	1.818	36	34.182	36
	8	0	.744	37	36.256	37
	9	0	.305	39	38.695	39
	10	0	.151	53	52.849	53

The contingency Table of Hosmer and Lemeshow Test is used to check if the model adequately fits the data. The model adequately fits the data when there is no difference between the expectedand the observed score. For example, in the table above the expected failure of learners was 34.788 and the observed failure was 34, from this it can be concluded to say that the difference is very small. Again on the performance as pass, the expected score is 52.849 and the observed score is 53, see the table 4.4 above, on this one the difference between predicted and observed scores is very small which can be concluded to say that there is no difference between the predicted and the observed scores, therefore the model adequately fits the data. When the differences between the predicted and observed scores is large, then it is concluded to say that the model does not fit the data.

Table 5: Model Data Fit

	Observed		Predicted		
			PERFORMANCE		Percentage Correct
			FAIL:	PASS	
Step 1	PERFORMANCE	FAIL	175	0	100.0
		PASS	24	201	89.3
	Overall Percentage				94.0

a. The cut value is .500

When data is analyzed using binary logistic regression, there are three methods used namely: forward, backward and hierarchical methods. In forward method, the system adds some of the predictor variables in the model which are important, in the backward method, the system removes some of the weak independent variables (predictors). While in the hierarchical method the researcher has control over the choice of the predictors (independent variables) to be included in the model. So, the researcher used the hierarchical method with the intention of having control over the independent variables. Hierarchical method has three models which are produced namely; model 0 (block 0) this is the model without the predictors, model 1 (block 1), this model has one independent variable (predictor), model 2, this is the model with two independent variables(predictors) and model 3, has three independent (predictors) variables namely, Total Scores, Vision and the interaction of the two predictors. The classification table provides an indication about how well the model is able to predict the correct category, see table 4. 5 above. Values in this block (model) are compared to the values in block 0 (model 0) to see whether there is an improvement when the independent variables (predictors) are added in the model. According to the model above, it is giving prediction of 94% accuracy. The model without predictors (block 0)shows the prediction of 56.3 %, this shows that there is significant improvement in fit over block 0 (model 0 that is the model without the predictors) where no predictors were used.

When the predictors are added in the model, the classification table gives a prediction of 94% accuracy about the performance of learners without sight problems versus learners with sight problems during data analysis.

Table 6 is illustrating model data fit using Omnibus Test of Model Coefficients.

Table 6: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	373.144	1	.000
	Block	373.144	1	.000
	Model	373.144	1	.000

This table was taken from block 1: This is the block (model) in hierarchical strategy which made use of one independent variable during data analysis of binary logistic regression.

Table 7: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	34.310	1	.000
	Block	34.310	1	.000
	Model	407.454	2	.000

This table was taken from block 2. This is the block (model) in hierarchical strategy which made use of two independent variables during data analysis of binary logistic regression.

Table 8: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	9.691	1	.002
	Block	9.691	1	.002
	Model	417.145	3	.000

Table 8 was taken from block 3: This is the block (model) in hierarchical strategy which made use of three independent variables during data analysis of binary logistic regression. The Omnibus Test is a Chi – Square Test which establishes the good fit of the model to the data if and only if the p-value is 0.000 or 0.002. When that happens, it is an indication that it is statistically significant and is an indication of good model data fit (Zumbo, B .D. 1999). Looking at the tables above from blocks (models) 1 to 3, all the p- values are 0.000 or 0.002 showing statistically significance which means that the model fits the data. This also means that there is significant improvement in fit over block 0 (model 0) which has no independent variables (predictor).

When the p – value is 0.000 and 0.002 showing that the model fits the data, then we reject the alternate hypothesis which states that the data does not fit the model and hold on to the null hypothesis which states that the data fits the model well. The 3 which is seen in the column of degrees of freedom (df) represents number of model in this respect it is model 3, likewise in the column of df in the block 2, there is 2 which represents number of the model which is model 2 thesame applies to block 1 of Omnibus test of model coefficient. Block 1 above is representing modelwith one independent variable, block 2 is representing model 2 with two independent variables finally block 3 is representing model 3 having three independent variables.

Table 9 and Table 10 are illustrating the model data fit using Hosmer and Lemeshow Test

Table 9: Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	8.216	8	.413

This table was taken from block 1, the p-value shows not statistically significant. Hosmer-Lemeshow test works in a different way from the Chi- square in that when the p-values are not significant as it is in the table above, the value which is not significant is an indication that the model fits the data. Hosmer Lemeshow test uses non significance of the model to indicate good model data fit unlike Omnibus tests explained above.

Table 10: Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	4.367	8	.823

This table is from block 2. The p-values shows not statistically significant to indicate good model fit.

Table 11: Hosmer and Lemeshow Test

This table was taken from block 3.

Step	Chi-square	Df	Sig.
1	4.277	5	.510

Hosmer and Lemeshow Test is a Chi – Square test which seeks the non – significance of the modelin order to establish good model data fit. In other words, it seeks the significance of the model in order to establish that the model does not fit the data well. (Zumbo, B.D. 1999). Looking at the p – values above in the tables 10 and 11, they are all greater than 0.05 showing

non –significance of the model hence indicating good model data fit. Unlike Omnibus test which establishes the good model data fit if it is statistically significant but Hosmer and Lemeshow test indicates good model data fit if the model shows non- statistically significance.

4.5 Discussion of Research Findings with Reference to Study Objectives

4.5.1 Accomplishment of objective No.1

To measure the extent to which DIF could bedetected in visually impaired learners relative to those with sight or vice versa.in 2018 (PSLCE) multiple choice in English past paper.

Table 12: Variables in the Equation of odds ratio and log of odds

		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	TOT	.296	.053	30.615	1	.000	1.344	1.210	1.493
	VISION(1)	3.732	.808	21.312	1	.000	41.747	8.562	203.552
	Constant	-8.021	1.220	43.253	1	.000	.000		

Table 12 shows the dependent variable (outcome variable, criterion) was dichotomous (binary) having two levels (1, 0) Where 1 was representing pass or yes and 0 was representing failor no. So the relationship between predictors and dependent variable was non-linear. The researcher wanted to predict the probability of the target group in this respect learners with visual impairment passing examinations. To model the relationship between predictors and probabilities falling into the target group, therefore log of odds and odds ratio were used since the relationship was non-linear. It was not correct to be saying that for every 1unit increase in the predictor (total scores) the change in raw scores increased

by 0.296. Likewise, for every 1unit increase in predictor (vision referring to learners without sight problems whose code was 1) the change in raw scores increased by 3.732. Since the relationship between predictors and the dependent variables was non-linear. Instead, log of odds or logit and odds ratio were used to model the non-linear relationship (Karami, H. 2012).

From Table 12, it was observed that for every 1unit increase in the predictor variable in this respect total scores, the log of odds increased by 0.296 and for every 1unit increase in the predictor variable (learners without sight problems), the log of odds increased by 3.732. This indicated that the log of odds (3.732) for regular learners was higher than the log of odds (0.296) for visually impaired learners. This explained that learners without sight problems had more log of odds of performing better than visually impaired learners whose log of odds was less.

From the column of Exp(B) which was the column of odds ratio, for every 1 unit increase the independent variable (the Total Scores) moved up the odds of excelling increased by 1.344 times.This meant that the odds of passing the examinations increased by 1.344 times. Furthermore, from the same column, it was also observed that learners without sight problems had the odds of 41.747 times more likely to pass examinations than the visually impaired learners.

In addition to this, the p- values of the predictors (Total scores and Vision) were both statistically significant having the p-values of 0.000 in each case. From the table above, the extent to which DIF was detected was 41.747 times more likely than the visually impaired learners. The results from the table above clearly indicated that the test items were favouring one subgroup which was learners without sight problems, this was an indication that test items were functioning differentially. These results in this study are in agreement with other research findings which indicated that visually impaired learners face a lot of challenges in achieving their academic performances (Kibanja, G. et al 2005). For example, 10% of visual impaired learners in Mackerere University were slow while brailing dictated notes by their lecturers, also examination time though they were given extra time, still it

was not enough for proper completion of tasks. This contributed to their low performance as compared to learners without sight problems.

4.5.2 Accomplishment of objective No 2

To determine the group (focal or reference) which the DIF in PSLCE in English Multiple choice items disadvantaged.

According to Table 12 above**,** in the column of standardized scores {Exp (B)}, it showed the predictor variable of Vision coded 1. This code was standing for learners without sight problems. In that column {Exp (B)} there were odds of 41.747. This meant that learners without sight problems (those in the reference group) had odds of 41.747 more likely to perform better than the learners with problems of sight. This odds ratio showed that there was uniform DIF displayed which meant that items favoured learners without sight problems and that learners with visual impairment (those in the focal group) were disadvantaged. From these results above, we rejected the null hypothesis {H0: Differential Item Functioning was the same for the two groups (Reference and Focal Groups) .In other words, there was no difference in performance between learners without visual impairment and visually impaired learners)} in favour of alternate hypothesis **(**Ha**:** Differential Item Functioning was not the same for the two groups (Reference and Focal Groups).

In other words, there was a difference in performance between learners without sight problems and visually impaired learners). Therefore learners without sight problems outperformed the visually impaired learners. These results were in agreement with what was reported in literature that members in the reference (USACitizenship) outperformed their colleagues in the focal group (Non- USA Citizenship)(Oliveri, M. et al (2018)).

These results from the binary logistic regression where it was evident that the learners without sight problems performed better in an examination than those learners with sight problems were in agreement with the Classical Test Theory which states that every observed score contains an error. Diagrammatically it can be represented as follows: True

Score = Observed Score + Error which could be diagrammatically represented as follows: T = X +E.

4.5.3 Accomplishment of objective No. 3

To establish the type of DIF (Uniform or Non-Uniform) that Binary Logistic Regression DIF detection procedure was able to detect in PSLCE English Paper with a section on multiple choice items.

Results in Table 12 in the column of unstandardized scores (Column B), the predictor Vision (1) had a value of 3.732. The Vision with code 1 was representing learners without sight problems. The value of Vision (1) showed that for every 1 unit increase in the predictor variable in this respect learners without sight problems, the log of odds increased by 3.732. This showed that the log of odds (3.732) for learners without sight problems was higher than the log of odds (0.296) for visually impaired learners. This explained that learners without sight problems had more log of odds of performing better than visually impaired learners whose log of odds was less. The fact that learners without visual problems had more log of odds of performing better than visually impaired learners showed the presence of uniform DIFbetween the two groups.

Chulu, B.W. (2018) explained that the theoretical framework of Differential Item Functioning (DIF) is used to measure the amount of intelligence (theta) in people. For example in learners without sight problems and those with visual impairment, in males and females (Gender DIF) just to mention a few. Furthermore, Chulu, B.W (2018) explained that DIF studies are carried out to see if the reasoning capacity of visually impaired learners is the same as those learners without sight problems. When carrying out the study, the researcher considered the aspect of inclusive education called equity and access. Following this aspect the researcher provided visual impaired learners with braille and large print to those with low vision. This was done to remove the barriers which could prevent visual impaired learners from accessing the assessment items.

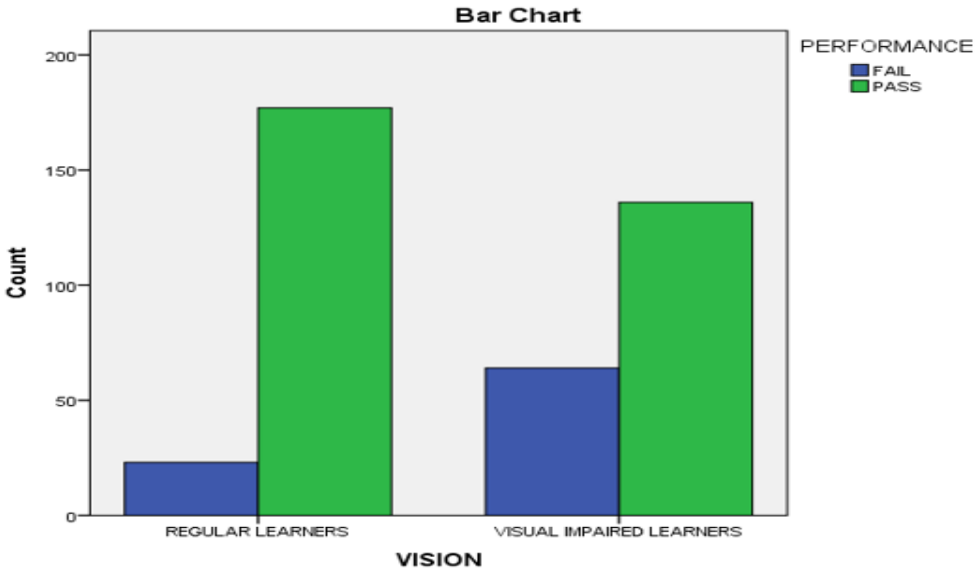
Despite all these efforts of removing factors which could prevent visually impaired learners from performing better in the assessment items still the results showed that learners without problems of sight performed better than those learners with sight problems. This is therefore an indication that the reasoning capacity of learners without sight problems was higher than their colleagues with sight problems.

Table 13: Predictor (vision) and dependent variable (performance)

		PERFORMANCE		Total
		FAIL	PASS	
VISION	REGULAR LEARNERS	23	177	200
	VISUAL IMPAIRED LEARNERS	64	136	200
Total		87	313	400

Table 13 shows that number of learners without visual impairment who took part in responding to the assessment items of English Multiple Choice paper was 200, from this number 177 learners passed the test while 23 learners failed the test. Furthermore, the number of learners with visual impairment who took part in responding to the assessment items was 200, from this number 136 learners passed the test while 64 learners with visual impairment failed the test. Looking at the figures of learners who passed the test both in learners without visual impairment and with visual impairment (177 learners without visual problems and 136 learners with visual impairment), it is evident that more learners without visual impairment passed the test as compared to the learners with visual impairment. Hence learners with visual impairment were disadvantaged. This showed that items favoured the learners without visual problems.

Table 14: Performance of learners with and without visual impairment



The Table 14 shows that 177 learners without visual impairments passed the test which was represented by the highest green bar and 136 learners with visual impairments passed the test which was represented by the lower green bar. From these figures shown above more learners without visual impairments passed the test and those with visual impairments who passed the test were less.

Hence there were more failures in learners with visual impairments (illustrated by the highest blue bar) and few number of learners without visual impairments failed the test (illustrated by the short blue bar). This is an indication that learners with visual impairments were disadvantaged by the test items.

4.6 Chapter summary

This chapter discussed the assumptions of binary logistic regression for example, outliers and multicollinearity. Checked assumptions of Binary Logistic Regression. Furthermore, it discussed the model data fit to see if the data fits the model, discussed research findings with reference to study objectives. The research findings indicated that the log of odds (3.732) for learners without sight problems passing examinations was higher than the log of odds (0.296) for visually impaired learners passing examinations. This implied that learners

without sight problems outperformed their colleagues with sight problems in the examinations.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS FOR FURTHER STUDIES

5.1 Chapter Overview

This Chapter provides, summary of the results, implications of the study, recommendations to MANEB, and recommendations for future research.

5.2 Summary of the Results

The DIF detection procedure was able to detect statistically significant Uniform DIF in PSLCE English Multiple Choice Items. However, the results did not show Non – Uniform DIF. This meant that one subgroup (reference group which was the group of learners without sight problems) consistently outperformed the focal group which was the group of learners with sight problems. The results had also shown that Binary Logistic Regression DIF detection method was more conservative in the detection of DIF in learners without problems of sight and visually impaired learners in the 2018 PSLCE English Multiple Choice Items.

Finally, this method mentioned above worked effectively supporting what was reported in literature that Binary logistic Regression procedure works very effective even with small samples of about 200 per group (Karami, H. 2012).

5.3 Implications of the Study

The results from this study have implications on test quality. Examination results from MANEB are used for making important decisions regarding certification, placement and selection. The results are also an indicator of the quality of test items as produced by MANEB. For this reason, a complete evaluation of test quality may be required and must include a proper evaluation of all the test items to ensure that all the test items are assessing only skills which are identified as part of the domain being tested and should avoid

extraneous factors which are irrelevant to the construct (Karami, H. 2012). It is imperative that all the test items should be fair to all the learners from all the subgroups of the test population. Furthermore, it is necessary for item writers to develop test items and subject them to pilot studies which should include proper item analysis for DIF so that the selected items for administration are free from differential functioning.

5.4 Recommendations to the Malawi National Examinations Board (MANEB)

Hambleton (2006) recommended that, after formal judgmental review of a measuring instrument and DIF analysis, a feedback of the findings should be given to the item developers of the instrument for future use. As such, the following recommendations could be considered by MANEB:

- Should consider conducting DIF analysis on test items for visual and learners without sight problems at PSLCE and other national examination levels for example, Junior Certificate of Education and Malawi School Certificate of Education.
- Should also consider conducting DIF on examination items for other subjects. Zumbo, B. D. (1999) had indicated that, because some tests are imperfect, they, in fact, may contain some items which measure extraneous factors that are irrelevant ɒ the construct. MANEB should provide accessible test formats such as braille or large print to ensure equal access for visual impaired learners.

5.5 Recommendations to the Ministry of Education

- Should encourage and promote inclusive education where learners with visual impairments will access their education

5.6 Recommendations for Future Research

The following are recommendations for future research:

- Using DIF on test items to investigate whether socio economic status affects the performance of learners in a classroom.

- Using DIF on test items to investigate whether learners with Learning Difficulties (LD) (Focal group) can outperform their colleagues with Hearing Impairments (Reference group) in an examination.

5.7 Chapter Summary

This Chapter discussed the results of data analysis using Binary Logistic Regression DIF detection procedures on visually impaired learners as focal group versus learners without sight problems as reference group. It also discussed the implications of the study where it was highlighted that there was a need to have proper evaluation of all the test items because test items play a great role in making important decisions regarding selection and certification just to mention a few. It further discussed the recommendations to MANEB where three issues were highlighted; firstly, urging MANEB to adopt conducting DIF analysis on test items, last but not the least, advantages of Binary logistic regression when analyzing data and lastly extending the use of DIF to other subjects apart from English. Finally the Chapter discussed recommendations for future research where two areas were suggested for someone to conduct the study.

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APPENDICES

Appendix 1: Press release of national examination results by Malawi National Examination Board (Maneb)

THE MALAWI NATIONAL EXAMINATIONS BOARD

PRESS RELEASE

16TH SEPTEMBER 2024

2024 MALAWI SCHOOL CERTIFICATE OF EDUCATION (MSCE) EXAMINATION RESULTS

The Malawi National Examinations Board (MANEB), in conjunction with the Ministry of Education, has released the 2024 Malawi School Certificate of Education (MSCE) Examination Results.

Candidates are awarded a Malawi School Certificate of Education (MSCE) if they satisfy either of the following conditions:

a) Obtain a pass in **six (6)** subjects including English, with a credit pass in at least one of them.

Or

b) Obtain a pass in **five (5)** subjects including English, with a credit pass in at least **three (3)** of them.

1. Out of the **177,434 candidates** that sat for this examination, **97,222** have passed. This represents **54.79%** pass rate.

2. Out of the **92,686 male** candidates that sat for this examination, **56,415** have passed. This represents **60.87%** pass rate.

3. Out the **84,748 female** candidates that sat for this examination, **40,807** have passed. This represents a **48.15%** pass rate.

4. Out of the **734 Special Needs Education (SNE)** candidates that sat for this examination, **411** have passed. This represents **55.99%** pass rate.

5. Out of the **346 male SNE** candidates that sat for this examination, **206** have passed. This represents **59.54%** pass rate.

6. Out of the **388 female SNE** candidates that sat for this examination, **205** have passed. This represents **52.84%** pass rate.

7. Out of the **105,344 internal** candidates that sat for this examination, **62,865** have passed. This represents **59.68%** pass rate.

8. Out of the **23,029 external** candidates that sat for this examination, **9,544** have passed. This represents **41.44%** pass rate.

9. Out of the **49,061 ODL** candidates that sat for this examination, **24,813** have passed. This represents **50.58%** pass rate.

10. Out of the **2,817** candidates that sat for this examination at **National** secondary schools, **2,722** have passed. This represents **96.63%** pass rate.

11. Out of the **5,542** candidates that sat for this examination at **District Boarding** secondary schools, **4,913** have passed. This represents **88.65%** pass rate.

12. Out of the **4,272** candidates that sat for this examination at **City Day** secondary schools, **3,501** have passed. This represents **81.95%** pass rate.

13. Out of the **3,542** candidates that sat for this examination at **District Day** secondary schools, **2,435** have passed. This represents **68.75%** pass rate.

14. Out of the **40,435** candidates that sat for this examination at **Private** secondary schools, **24,944** have passed. This represents **61.69%** pass rate.

15. Out of the **49,103** candidates that sat for this examination at **Community Day** secondary schools, **24,412** have passed. This represents **49.92%** pass rate.

16. The top **ten (10)** performing education districts in descending order are: **Zomba Urban** (61.97%), **Mzuzu City** (61.87%), **Karonga** (61.13%), **Dowa** (60.05%), **Chitipa** (59.81%), **Nkhotakota** (59.07%), **Dedza** (58.94%), **Phalombe** (57.05%), **Ntchisi** (57.02%) and **Nkhatabay** (56.71%).

17. The bottom **ten (10)** performing education districts, in ascending order are: **Machinga** (47.93%), **Thyolo** (49.66%), **Lilongwe City** (50.37%), **Lilongwe Rural East** (51.31%), **Neno** (51.40%), **Mchinji** (51.51%), **Nsanje** (51.99%), **Mangochi** (52.00%), **Ntcheu** (52.11%), **Balaka** (52.81%) and **Lilongwe Rural West** (52.95%).

18. The performance of Education Divisions in descending order is: **North** (58.61%), **Central East** (57.79%), **South West** (54.32%), **South East** (53.79%), **Shire Highlands** (52.98%) and **Central West** (52.22%).

19. The **top ten (10) schools** based on percentage of candidates with distinctions in descending order are: **Lilongwe Islamic** (Lilongwe Rural West, **47.34%**), **Loyola Jesuit** (Kasungu, **47.01%**), **Marist (Pvt)** (Dedza, **45.48%**), **Mtendere** (Dedza, **41.95%**), **St Kizito Seminary** (Dedza, **41.07%**), **Nkhatabay (40.83%), Likuni Boys** (Lilongwe Rural West, **40.71%**), **Ludzi Girls** (Mchinji, **38.87%**), **Chaminade Marianist Pvt** (Lilongwe Rural West, **36.89%**), and **Pius XII Seminary** (Chiradzulu, **35.86%**).

20. The **bottom ten (10) schools** based on **pass rate**, all with **0%** distinctions, in ascending order are: **Vision Pvt** (Lilongwe City, **0.00%**), **Chivumbe Community** (Blantyre Rural, 0.00%), **Ntalala Community** (Machinga, 7.69%), **Good Choice Pvt** (Chikwawa, **9.09%**), **Blessings Foundation Pvt** (Thyolo, **10.34%**), **Blessings Pvt** (Thyolo, **10.53%**), **Kalonga II Community** (Lilongwe Rural East, **11.11%**), **Maczale Academy** (Mzimba North, **13.33%**), **Dr Alli Makalani Academy** (Mangochi,**13.33%**) and **Ngerenge Community** (Karonga, **13.33%**).

21. The **top ten (10) National Schools** based on percentage of candidates with distinctions in descending order are: **Loyola Jesuit** (Kasungu, **(47.01%**), **Mtendere** (Dedza, **41.95%**), **Nkhatabay** (**40.83%**), **Likuni Boys** (Lilongwe West, **40.71%**), **Dedza (39.13%**), **Ludzi Girls** (Mchinji, **38.87%**), **Chaminade** (Karonga, **33.84%**), **St Mary's** (Zomba Urban, **30.25%**), **St Patrick's** (Chiradzulu, **27.21%**) and **Lilongwe Girls** (Lilongwe City, **27.20%**).

22. The **bottom ten (10) National Schools** based on percentage of candidates with distinctions in ascending order are: **St Micheal's Girls** (Mangochi, **12.08%**), **Stella Maris** (Blantyre Urban, **14.52%**), **Robert Laws** (Mzimba South, **16.54%**), **Mlanda Girls** (Ntcheu, **16.83%**), **Kaseye Girls** (Chitipa, **17.28%**), **Nkhamenya Girls** (Kasungu, **18.51%**), **Likuni Girls** (Lilongwe West,**19.36%**), **Mzuzu Government** (Mzuzu City,

19.49%), **Blantyre** (Blantyre Urban, **21.45%**), and **Malosa** (Zomba Rural, **21.57%**).

23. The **top ten (10) City Day Schools** based on percentage of candidates with distinctions in descending order are: **Chichiri** (Blantyre Urban, **11.09%**), **Katoto** (Mzuzu City, **10.58%**), **Ndirande Hill** (Blantyre Urban, **9.64%**), **Bwaila** (Lilongwe City, **8.57%**), **Soche Hill** (Blantyre Urban, **8.02%**), **Luwinga** (Mzuzu City, **7.42%**), **Bangwe** (Blantyre Urban, **7.22%**), **Chinsapo** (Lilongwe City, **6.93%**), **Chipasula** (Lilongwe City, **6.78%**), and **Njamba** (Blantyre Urban, **5.95%**).

24. The **bottom eight (8) City Day Schools** based on percentage of candidates with distinctions in ascending order are: **Mbidzi** (Lilongwe City, **1.14%**) **Mlodza** (Lilongwe City, **1.63%**), **Kabwabwa** (Lilongwe City, **1.97%**), **Chibavi** (Mzuzu City, **2.06%**), **Likangala** (Zomba Urban, **2.67%**), **Malindi** (Zomba Urban, **3.26%**), **Mkwichi** (Lilongwe City, **3.62%**), **Zingwangwa** (Blantyre Urban, **5.31%**).

25. The **top ten (10) performing District Boarding Schools** based on percentage of candidates with distinctions in descending order are: **Machinga** (**21.52%**), **Luviri** (Rumphi, **4.5%**), **Kasungu** (**3.08%**), **Lisumbwi** (Mangochi, **2.94%**), **M'mbomba** (Ntchisi, **2.67%**), **St Ignatius of Loyola** (Chitipa, **2.46%**), **Chikwawa** (**2.44%**), **Chayamba** (Kasungu, **2.27%**), **Chipoka** (Salima, **2.07%**) and **Salima** (**2.06%**).

26. The **bottom ten (10) performing District Boarding Schools** based on percentage of candidates with distinctions in ascending order are: **Magawa** (Mchinji, **0.20%**), **Gawani** (Mulanje, **0.37%**), **Mayani** (Dedza, **0.40%**), **Mitundu** (Lilongwe East, **0.43%**), **Mchinji** (**0.45%**), **Dowa** (**0.47%**), **Likoma**, (**0.58%**), **Madisi** (Dowa, **0.65%**), **Ntchisi** (**0.69%**) and **Rumphi**, (**0.70%**).

27. The **top ten (10) performing District Day schools** based on percentage of candidates with distinctions in descending order are: **Malombe** (Mangochi, **8.26%**) **Domasi Demonstration** (Zomba Rural, **7.21%**), **Nalikule Demostration** (Lilongwe East, **6.81%**), **Kang'oma** (Lilongwe Rural East, **6.60%**), **Dzumila** (Chikwawa, **5.96%**), **Michesi** (Phalombe, **5.96%**), **Bzyanzi** (Dowa, **5.75%**), **Mtakataka** (Dedza, **4.99%**), **Chambe** (Mulanje, **4.61%**) and **Maghemo** (Karonga, **4.50%**).

28. The **bottom ten (10) performing District Day Schools** based on percentage of candidates with distinctions in ascending order are: **Mwansambo** (Nkhotakota, **0.00%**), **Lozi** (Nkhotakota, **0.83%**), **Nachitheme** (Ntcheu, **0.85%**), **Chingale** (Zomba Rural, **1.00%**), **Mbenjere** (Machinga, **1.06%**), **Mzenga** (Nkhatabay, **1.07%**), **Walemera** (Nkhotakota, **1.15%**), **Thekerani** (Thyolo, **1.20%**), **Nguludi** (Chiradzulu, **1.40%**), and **Chimwalira** (Zomba Rural, **1.56%**).

29. The **top ten (10) performing Community Day Schools** based on percentage of candidates with distinctions in descending order are: **St. Charles Lwanga** (Balaka, **11.90%**), **Chichiri Reformatory** (Blantyre Urban, **9.55%**), **Mzambazi** (Mzimba North, **9.09%**), **Lirangwe** (Blantyre Rural, **8.87%**), **Masuku** (Mangochi, **8,16%**), **Iponga** (Karonga, **6.10%**), **Lisale** (Nkhatabay, **7.81%**), **Machinga** (Machinga, **7.81%**), **Thimalala** (Mzimba North, **7.32%**) and **Mzuzu Prison Reformed** (Mzuzu City, **6.93%**).

30. The **bottom ten (10) performing Community Day Schools** based on **pass rate**, all with **0.0% distinctions**, in ascending order are: **Chivumbe** (Blantyre Rural, **0.00%**), **Ntalala** (Machinga, **7.69%**), **Kalonga II** (Lilongwe East, **11.11%**), **Ngerenge** (Karonga, **13.33%**), **Ehehleni** (Mzimba South, **14.29%**), **Kapiri** (Dedza, **14.71%**), **Unyolo** (Mzimba South, **14.71%**), **Dziwe** (Blantyre Rural, **15.56%**), **Khombwe** (Blantyre Rural, 15.63%) and **Kachokolo** (Kasungu, **16.00%**).

31. The **top ten (10) performing Private Schools** based on percentage of candidates with distinctions in descending order are: **Lilongwe Islamic** (Lilongwe West, **47.34%**), **Marist** (Dedza, **45.48%**), **St Kizito Seminary** (Dedza, **41.07%**), **Chaminade Marianist** (Lilongwe Rural West, **36.89%**), **Pius XII Seminary** (Chiradzulu, **35.86%**), **James Chiona Catholic High School** (Blantyre Urban, **34.73%**), **Zomba Catholic** (Zomba Urban, **32.46%**), **Mlare Seminary** (Lilongwe East,

31.94%), **Ekwendeni Girls** (Mzimba North, **31.23%**) and **Dedza Girls Islamic** (Dedza, **30.25%**).

32. The **bottom ten (10) performing Private Schools based** on pass rate, all with 0.0% distinctions, in ascending order are: **Vision** (Lilongwe City, **0.00%**), **Good Choice** (Chikwawa, **9.09%**), **Blessings Foundation** (Thyolo, **10.34%**), **Blessings** (Thyolo, **10.53%**), **Maczale Academy** (Mzimba North, **13.33%**), **Dr Alli Makalani Academy** (Mangochi, **13.33%**), **God's Power** (Lilongwe Rural West, **14.29%**), **Dzukani** (Machinga, **14.29%**), **ETF** (Zomba Urban, **14.81%**) and **St Moses** (Chikwawa, **17.95%**).

33. The **top ten (10)** subjects based on percentage of distinctions in descending order are; **Additional Mathematics (22.24%), Technical Drawing (19.85%), French (19.40%), Bible Knowledge (17.84%), Computer Studies (9.00%), Religious and Moral Education (8.20%), Business Studies (7.61%), Mathematics (7.33%), Woodwork (7.25%)** and **Creative Arts (6.67%).**

34. The **bottom ten (10)** subjects based on percentage of distinctions in ascending order are: **Clothing and Textiles (0.0%), Metal work (0.0%), Chichewa (0.21%), English (0.27%), Social and Life Skills (1.02%), Biology (1.98%), Agriculture (2.02%), Home Economics (2.10%), History (4.59%)** and **Geography (4.99%).**

35. Examination centres and candidates will access their results **online**. **Examination centres** will be able to access results through their **e-Registration Portal**. The results will be available in downloadable PDF documents. The centers are further advised to download results from the portal by **22nd September 2024**.

Individual **candidates** or their parent/guardian will be able to access results online using the following link **https://maneb.malawi265.com/examresults/**. To ensure security, a candidate's results will be retrieved using the correct examination number and date of birth.

36. All candidates wishing to query their results should do so in writing through the heads of schools where they registered for the examination.

37. Candidates wishing to **remark** their MSCE results should collect and fill forms from their respective schools.

38. All queries should reach MANEB by **16th October, 2024.** After this date no further queries will be considered.

Prof Dorothy Nampota
EXECUTIVE DIRECTOR

Appendix 2: 2018 Primary School Leaving Certificate of Education question paper for English

Questions 34 to 35.

In each of the following questions, choose the word **(A,B,C or D)** that **best completes the proverb.**

34. One man cannot fight a _____.
- A. Dozen
- B. Unit
- C. Gross
- D. Set

35. A sleeping _____ never catches a rat.
- A. Snake
- B. Dog
- C. Cat
- D. Pig

Questions 36 to 40.

In each of the following questions, choose the letter **(A,B,C or D)** that gives the **correct type of the underlined clause and its function.**

36. Tawina realized that the boys were stealing bananas.
- A. Noun clause, object of "realized'
- B. Adverb clause, modifying 'realized'
- C. Adjective clause, qualifying 'Tawina'
- D. Noun clause, in apposition to 'Tawina'

37. When she wakes up, Naomi prepares to milk her cows.
- A. Noun clause, subject of 'prepares'
- B. Noun clause, in apposition to 'Naomi'
- C. Adjective clause, qualifying 'Naomi'
- D. Adverb clause, modifying 'prepares'

38. All things which had been stolen were recovered.
- A. Noun clause, object of 'were recovered'
- B. Adjective clause, qualifying 'things'
- C. Adverb clause, modifying 'were recovered'
- D. Noun clause, in apposition to 'things'

39. This is the time when we take our meals.
- A. Adjective clause, qualifying 'time'
- B. Adverb clause, modifying 'is'
- C. Noun clause, object of 'is'
- D. Adverb clause, modifying 'this is'

40. I write my homework before I go to bed.
- A. Adverb clause, modifying 'write'
- B. Adjective clause, qualifying 'homework'
- C. Noun clause, object of 'write'
- D. Noun clause, in apposition to 'homework'

END OF PAPER

Appendix 3: Showing modified paper (Large Print)

THE MALAWI NATIONAL EXAMINATIONS BOARD

2018 PRIMARY SCHOOL LEAVING CERTIFICATE EXAMINATIONS

ENGLISH (100MARKS)
SUBJECT NUMBER: P052

WEDNESDAY, 16 MAY
TIME ALLOWED: 40 MIN

TIME FOR VISUALLY IMPAIRED LEARNERS: 50MINUTES.

1

SECTION D. (40 MARKS).

Questions 1 to 13.

Instructions:

In each of the following questions choose the word(s) (A, B, C, or D) that best complete(s) the sentence.

1. We have been _____ this school for eight years.

   A. To C. on

   B. With D. at

2. We will pass examinations_____ good grades.

A.By C. on

B. With D. at

3. The sick child leaned _____ the wall.

A.Against C. around

B. Besides D. Towards

4. The guard saved the girl _____ drowning.

3

A. For C. From

B. Off D. on

5. The head teacher did not turn_____ for the meeting.

A. Up C. in

B. on D. on

6. Lonjezo wrote a report_____ what he had observed.

A.To C. For

B. At D. On

4

7. The two girls divided the sweets _____ them.

A. Between C. among

B. From D. After

8. People are murmuring _____ the delay

A. About C. From

B. With D. For

9. I do not think there is any truth _____ that story.

5

A. About C. From

B. For D. In

10. _____ of locusts destroyed the crops.

A. Herd C. Crowd

B. Flock D. Swarm

11. I am sure they _____ if you ask them

A. Come C. Were coming

B. Came D. Will come

12. The dog _____ bitten me if I had not seen it

A. Should have C. May have

B. Will have D. Would have.

13. We are very sure we _____ win the game.

A. Will C. Can

B. Must D. May

Questions 14 to 26

In each of the following questions choose the correct part of speech

14. Beni <u>did</u> all the household chores.

A.Conjunction C. Verb

B. Preposition D. Pronoun

15. We all rushed <u>towards</u> the lake to see the new ship.

A. Adverb C. Adjective

B.Preposition D. Conjunction

16. He is <u>always</u> troublesome in class.

A. Preposition C. Adjective

B. Verb D. Adverb

17. They are discussing the <u>issue</u> in the head teacher's office.

A. Noun C. Adjective

9

B. Adverb D. Verb

18. I will ask her <u>if</u> she comes.

A. Pronoun C. Preposition

B. Conjunction D. Pronoun

19. We must help <u>ourselves</u> first

A. Pronoun C. Adverb

B. Adjective D. Noun

20. <u>After</u> she had eaten, she fell asleep.

A. Preposition C. Pronoun

B. Conjunction D. Adverb

21. Do you need any help?

A. Adverb C. Verb

B. Adjective D. Noun

22. All late comers were asked to water the flowers.

A. Noun C. Adverb

B. Verb D. Adjective

23. I <u>often</u> meet him at the market.

A. Adverb C. Verb

B. Adjective D. Noun

24. Talumba sit <u>behind</u> me in class.

A. Preposition C. Adjective

B. Adverb D. Conjunction

25. Nobody will agree to what you are saying.

A. Adjective C. Adverb

B. Pronoun D. Noun

26. Every year we have an open day at our school

A. Verb C. Noun

B. Adjective D. Adverb

Questions 27 to 31

In each of the following questions, choose the correct question tag (A, B, C or D) for the statement.

27. They asked us to forgive her, _____?

A. Didn't they C. Did they?

B. Do they? D. Don't they?

28. He often come to school early, _____?

14

A. Is he C. Isn't he

B. Doesn't he D. Don't he

29 .The children were taken to the clinic_____?

A. Were they C. Did they

B.Weren't they

D. Didn't they

30. Mrs Phiri went abroad_____?

A. Didn't she C. Wasn't

15

B. Did she D. Was she

31. The bus broke down on its way to Blantyre, _____?

A. Was it C. Did it

B. Didn't it D. Wasn't it?

Questions 32 to 33.

In each of the following questions, choose the word

that (A. B.C or D) that best completes the simile.

32. The beggar was as _____as a church mouse.

A. Thin C. Sad

B. Poor D. Fast

33. The church is as _____ as a asleep

A. Quiet C. Nice

B. Beautiful D. Shy

Questions 34 to 35

In each of the following questions, choose the word (A, B, C, or D) that best completes the proverb.

34. One man cannot fight a _____.

A. Dozen C. Gross

B. Unit D. Set

35. A sleeping _____ never catches a rat.

A. Snake C. Cat

B. Dog D. Pig

Questions 36 to 40

In each of the following questions, choose the letter (A, B.C or D) that gives the

correct type of the underlined clause and its functions.

36. Tawina realized that the boys were stealing bananas

A. Noun clause, object of 'realized'

B. Adverb clause, modifying 'realized'

Adjective clause, qualifying 'Tawina'

20

correct type of the underlined clause and its functions.

36. Tawina realized <u>that the boys were stealing bananas</u>

A. Noun clause, object of 'realized'

B. Adverb clause, modifying 'realized'

Adjective clause, qualifying 'Tawina'

20

D. Noun clause, in apposition to 'Tawina'

37. When she wakes up, Naomi prepares to milk her cows.

A. Noun clause, subject of 'prepares'

B. Noun clause, in apposition to 'Naomi'

21

C. Adjective clause, qualifying 'Naomi'

D. Adverb clause, modifying 'prepares'

38. All things which had been stolen were recovered.

A. Noun clause, object of 'were recovered'

B. Adjective clause, qualifying 'things'

22

C. Adverb clause, modifying 'were recovered'

D. Noun clause, in apposition to 'things'

39. This is the time when we take our meals.

A. Adjective clause, qualifying 'time'

B. Adverb clause, modifying 'is'

23

C. Noun clause, object of 'is'

D. Adverb clause, modifying 'this is.'

40. I write my homework <u>before I go to bed.</u>

A. Adverb clause, modifying 'write'

B. Adjective clause, qualifying 'homework'

C. Noun clause, object of 'write.'

D. Noun clause, in apposition to 'homework.'

END OF PAPER.

Appendix 4: Introductory letter from the University of Malawi in respect of data collection by the researcher

PRINCIPAL
Prof. R. Tambulasi, B.A (Pub Admin), BPA (Hons), MPA, Ph.D

CHANCELLOR COLLEGE
P.O. Box 280, Zomba, Malawi
Telephone: (265) 524 222
Fax: (265) 524 046
E-mail: principal@cc.ac.mw

6th October, 2020

To Whom It May Concern

Letter of Introduction: Newton B. Kumalambo

This letter serves to confirm that **Mr. Newton Kumalambo** is a registered postgraduate student in the Education Foundations Department, of the School of Education, of the University of Malawi, Chancellor College. He is studying under the Master of Education in Testing, Measurement & Evaluation program. He completed his coursework.

As a requirement for completion of his study program, he is conducting a research titled "***Investigating the Effect of Differential Item Functioning in the Malawi National Examinations on Regular (Reference group) Versus Visually Impaired (Focal group) Learners using Binary Logistic Regression: A Case of 2018 Primary School Leaving Certificate of Education (PSLCE) Examination English Paper*** ". This letter serves to request your institution/organization to assist our student to collect the required data.

For any inquiries please contact the undersigned via the following email address: med@cc.ac.mw

Sincerely yours,

UNIVERSITY OF MALAWI
CHANCELLOR COLLEGE
DEPT OF EDU FOUNDATION
2020 -10- 05
P.O. BOX 280
ZOMBA

Chikumbutso H. Manthalu, PhD.
Postgraduate Programmes Coordinator – EDF Department

Appendix 5: Introductory letters to the District Education Managers in various Districts requesting data collection in their Schools

St Joseph's Teachers Training College

Post Office Box 11

Dedza

11th August, 2021

The District Education Manager

Lilongwe Rural West Education Division

Post Office Box ----------

Lilongwe

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

THE PRINCIPAL ST. JOSEPHS TTC 07 NOV 2023 P.O. BOX 11, DEDZA

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOL IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment.

I would like to do data collection at Chilanga Primary School in your district. Attached is a photocopy of my reference letter from University of Malawi authorizing me to do data collection.

I will be very happy if permission will be granted.

Yours faithfully

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

St Joseph's Teachers Training College

Post Office Box 11

Dedza

31st August, 2021

The District Education Manager

Mangochi District Education Manager

Post Office Box ----------

Mangochi

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOL IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment.

I would like to do data collection at Nkope Primary School in your district. Attached is a photocopy of my reference letter from University of Malawi authorizing me to do data collection.

I will be very happy if permission will be granted.

Yours faithfully

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

St Joseph's Teachers Training College

Post Office Box 11

Dedza

11th August, 2021

The District Education Manager

Kasungu District Education Manager

Post Office Box ----------

Kasungu

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOL IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment.

I would like to do data collection at Chilanga Primary School in your district. Attached is a photocopy of my reference letter from University of Malawi authorizing me to do data collection.

I will be very happy if permission will be granted.

Yours faithfully

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

St Joseph's Teachers Training College

Post Office Box 11

Dedza

11th August, 2021

The District Education Manager

Chiladzulu District Education Manager

Post Office Box ----------

Chiladzulu

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

THE PRINCIPAL
ST. JOSEPH'S TTC
07 NOV 2023
P.O. BOX 11, DEDZA

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOL IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

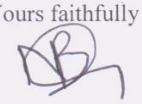
1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment.

I would like to do data collection at Montfort Primary School in your district. Attached is a photocopy of my reference letter from University of Malawi authorizing me to do data collection.

I will be very happy if permission will be granted.

Yours faithfully



Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

St Joseph's Teachers Training College

Post Office Box 11

Dedza

2nd July, 2021

The District Education Manager

Salima Education Office

Post Office Box 175

Salima

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOLS IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment, such being the case I will need Salima Local Education Authority (L.E.A) which has learners with visual impairment

I will be very happy if permission will be granted.

Yours faithfully

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

Emp.No: 073500

St Joseph's Teachers Training College

Post Office Box 11

Dedza

11th July, 2021

The District Education Manager

Ntcheu District Education Manager

Post Office Box ----------

Ntcheu

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOL IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment.

I would like to do data collection at Nsiyaludzu Primary School in your district. Attached is a photocopy of my reference letter from University of Malawi authorizing me to do data collection.

I will be very happy if permission will be granted.

Yours faithfully,

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

Appendix 6: Permission letters from the District EducationManagers in various Districts to collect data in their schools

St Joseph's Teachers Training College

Post Office Box 11

Dedza

2nd July, 2021

THE DIRECTOR FOR EDUCATION, YOUTH & SPORTS
31 AUG 2021
P.O. BOX 98, SALIMA

The District Education Manager

Salima Education Office

Post Office Box 175

Salima

Through: The Principal

St. Joseph's Teachers Training College

Post Office Box 11

Dedza

Dear Sir

A LETTER FOR REQUEST TO COLLECT DATA FOR MY RESEARCH IN THE PRIMARY SCHOOLS IN YOUR DISTRICT

I write to ask for a permission to do data collection for my research as stated above.

I am a post graduate student at The University of Malawi, Chancellor College who is studying for Master of Education in Testing Measurement and Evaluation (Psychometrics).

1

The focus for my intervention is standard 8 primary school learners who are visually impaired and others who have no impairment, such being the case I will need Salima L.E.A. Primary School which has learners with visual impairment

I will be very happy if permission will be granted.

Yours faithfully

Newton Batison Kumalambo

ID: MED-MEV- 01-18

Contact: 099 433 6591

E-mail: newtonkumalambo@gmail.com

Emp.No: 073500

Ref. No. DEM/LLRW/SIP/SIG/MESIP

Communications should be addressed to:
The District Education Manager
Lilongwe Rural West
Phone: 265-01752754
Email.llrwestdem@gmail.com

District Education Manager
P/Bag A94
Lilongwe
MALAWI

21st June, 2021

Newto Batison Kumalambo
St Joseph's Teachers Training College

Dear Sir/Madam,

CONSENT TO COLLECT DATA FOR RESEARCH AT MALINGUNDE PRIMARY SCHOOLS

This letter is written in response to the above subject, in which you asked for permission to collect Data for your research at Malingunde Primary School. In view of this, permission has been granted provided you do not disturb lessons.

DISTRICT EDUCATION MANAGER
LILONGWE RURAL WEST
25 JUN 20
RESOURCE
LILONGWE

F. Yonamu (Mrs)
For:**DISTRICT EDUCATION MANAGER, LILONGWE RURAL WEST**

Malingunde Head
Contact:
0999418680

DATE : 12 TH AUGUST, 2021.

FROM : THE DISTRICT EDUCATION OFFICE, BOX 134, NU

TO : THE HEADTEACHER, NSIYALUDZU PRIMARY SCHOOL.

RE : COLLECTION OF DATA BY MR N. KUMALAMBO

May you allow Mr. N. Kumalambo who came through the Office to ask for permission to collect data at your school.

Please assist him on the information he would like to collect.

Ntcheu District Education Office
The Coordinating PEA
12 AUG 2021

Thank you.

L. MBITE (for the DEYS)

Appendix 7: Showing Raw Data before Analysis

DIV	SCH	VISION	DISTRICT	PERFORMANCE	ID	TOTAL
CWED	NSIYALUDZU SCHOOL FOR THE BLIND	2	NTCHEU	0	001	18
		2		0	002	19
		2		1	003	32
		2		1	004	32
		2		1	005	29
		2		1	006	23
		2		1	007	23
		2		1	008	28
		2		1	009	28
		2		1	010	28
		2		1	011	28
		2		1	012	28
		2		1	013	28
		2		0	014	10

		2		1	015	27
		2		1	016	27
		2		1	017	27
		2		0	018	11
		2		0	019	11
		2		0	020	11
		2		1	021	25
		2		1	022	25
		2		1	023	26
		2		1	024	26
		2		1	025	26
		2		1	026	26
		2		1	027	26
		2		1	028	26
		2		1	029	26
		2		1	030	26
		2		0	031	12
		2		0	032	12
		2		0	033	12
		2		0	034	12

		2		0	035	12
		2		0	036	12
		2		1	037	26
		2		1	038	26
		2		1	039	26
		2		1	040	26
		2		1	041	26
		2		1	042	26
		2		1	043	39
		2		1	044	39
		2		1	045	39
		2		1	046	25
		2		1	047	25
		2		1	048	25
		2		1	049	25
		2		1	050	25
		2		0	051	13
		2		0	052	13
		2		0	053	13
		2		0	054	13

		2		0	055	13
		2		0	056	13
		2		0	057	13
		2		0	058	13
		2		1	059	27
		2		1	060	27
		2		1	061	27
		2		1	062	27
		2		1	063	27
		2		1	064	27
SEED	NKOPE HILL SCHOOL FOR THE BLIND	2	MANGOCHI	1	065	38
		2		1	066	38
		2		1	067	38
		2		1	068	38
		2		1	069	38
		2		1	070	38
		2		1	071	38
		2		1	072	38

		2		1	073	38
		2		1	074	38
		2		1	075	38
		2		1	076	38
		2		1	077	24
		2		1	078	24
		2		1	079	24
		2		1	080	24
		2		1	081	24
		2		1	082	24
		2		1	083	24
		2		0	084	14
		2		0	085	14
		2		0	086	14
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		2		0	100	14
		2		1	101	28
		2		1	102	28
		2		1	103	28
		2		1	104	28
		2		1	105	28
		2		1	106	28
		2		1	107	28
		2		1	108	28
		2		1	109	37
		2		1	110	37
		2		1	111	37
		2		1	112	37

		2		1	113	37
		2		1	114	37
		2		1	115	37
		2		1	116	37
		2		1	117	37
		2		1	118	37
		2		1	119	37
		2		1	120	37
		2		1	121	37
		2		1	122	37
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		2		1	124	23
		2		0	125	23
		2		0	126	23
		2		1	127	23
		2		1	128	23
		2		1	129	23
		2		1	130	23
		2		1	131	23
		2		1	132	23

		2		1	133	23
		2		1	134	23
		2		1	135	23
		2		0	136	15
		2		0	137	15
		2		0	138	15
		2		0	139	15
		2		0	140	15
		2		0	141	15
		2		0	142	15
		2		0	143	15
		2		0	144	15
		2		0	145	15
		2		0	146	15
		2		0	147	15
		2		0	148	15
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CWED	MALINGUNDE SC HOOL FOR THE BLIND	2	LILONGWE	1	166	36
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CEED	CHILANGA SCHOOL FOR	1	KASUNGU	1	241	35

	THE BLIND					
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SHED	MONTFORT SCHOOL FOR THE BLIND	1	CHIRADZULU	1	315	31
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CEED	SALIMA SCHOOL FOR THE BLIND	1	SALIMA	1	370	33
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