

UNIVERSITY OF EDUCATION, WINNEBA

THE IMPACT OF SCHOOL FEEDING PROGRAM ON EDUCATIONAL  
OUTCOMES IN THE EJISU JUABEN DISTRICT OF THE ASHANTI REGION  
OF GHANA

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Education and Communication Sciences, submitted to the School of Graduate  
Studies, University of Education, Winneba, in partial fulfilment of the  
requirements for award of the Master of Arts (Educational Leadership) degree

OCTOBER, 2016

**DECLARATION**

**STUDENT'S DECLARATION**

I, ADWOA KESEWAA GAISIE, declare that this project report, with the exception of quotations and references contained in published works which have been identified and duly acknowledged, is entirely the result of my own original research work, and it has not been submitted either in part or whole for another degree elsewhere.

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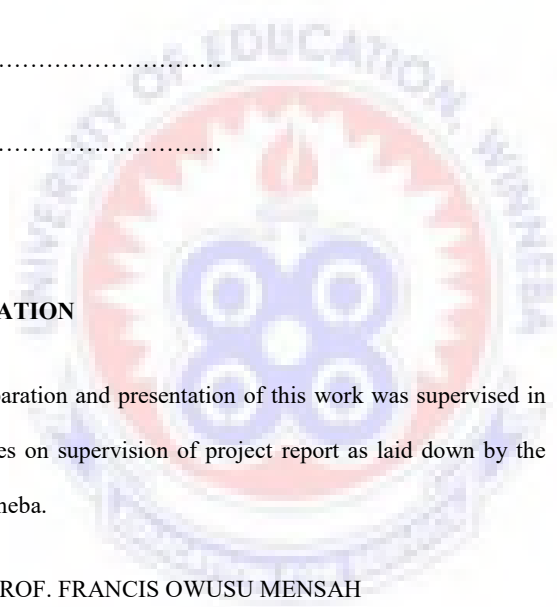
**SUPERVISOR'S DECLARATION**

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines on supervision of project report as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: PROF. FRANCIS OWUSU MENSAH

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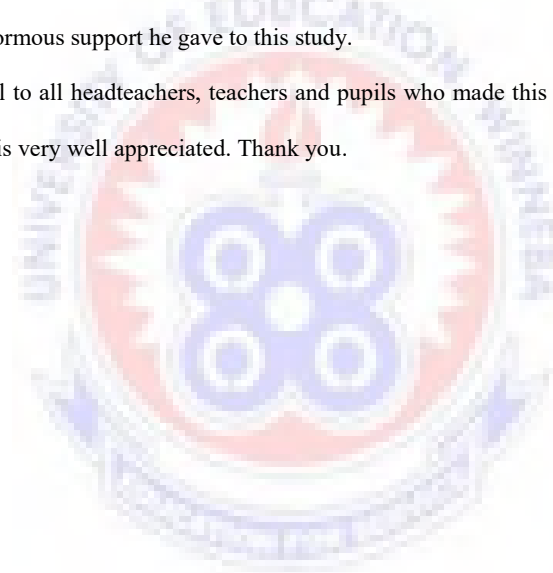
### ACKNOWLEDGEMENTS

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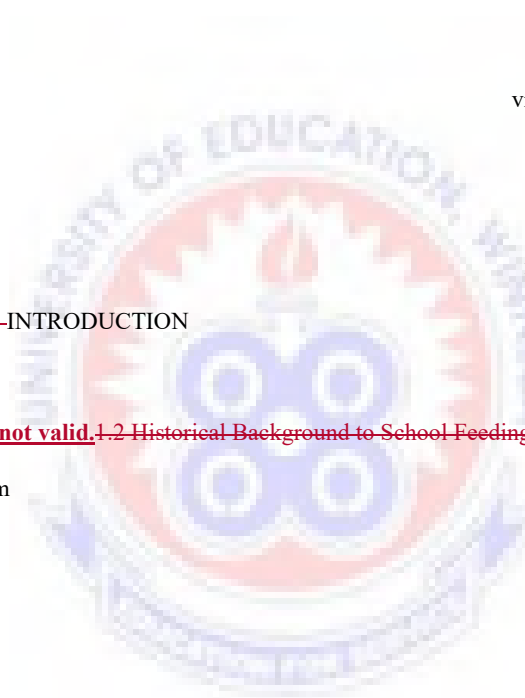
**DEDICATION**

To my husband George Ohene Saforo and my children Kwasi and Adwo Saforo.

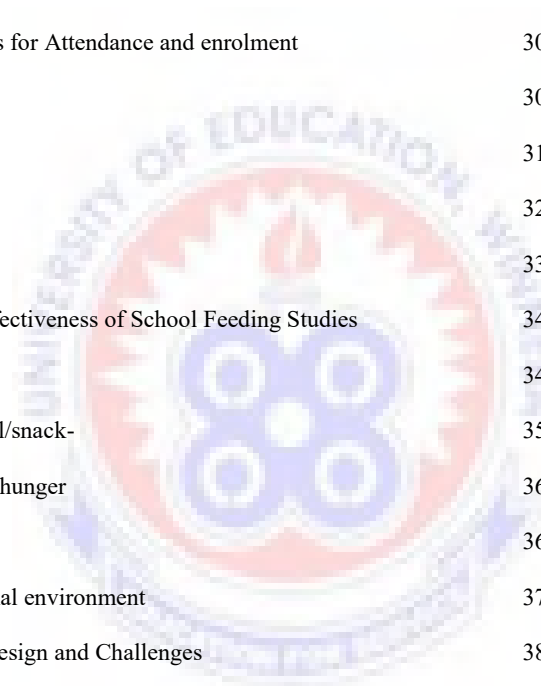


## TABLE OF CONTENTS

CONTENT	PAGE
TITLE PAGE	
DECLARATION	ii
ACKNOWLEDGEMENTS	iii
DEDICATION	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
ABSTRACT	xi
CHAPTER ONE: <del>GENERAL</del> INTRODUCTION	1
<a href="#">1.1 Background to the Study</a>	1
<del>Error! Hyperlink reference not valid.</del> <a href="#">1.2 Historical Background to School Feeding</a>	
<a href="#">1.3.2</a> Statement of the Problem	7
<a href="#">1.4.3</a> Purpose of the Study	8
<a href="#">1.5.4</a> Research Objectives	8
<a href="#">1.6.5</a> Research Questions	8
<a href="#">1.7.6</a> Significance of the Study	8
<a href="#">1.8.7</a> Limitations of the Study	9
<a href="#">1.9.8</a> Definition of Concepts and Terms	9
<a href="#">1.10.9</a> Organisation of the Work	10
CHAPTER TWO: LITERATURE REVIEW	12
2.1 Introduction	12
2.2 School Feeding Programmes	12



2.3 Short-Term Hunger and Learning	13
2.4 Evaluating Effectiveness of School Feeding	17
2.4.1 School feeding on Attendance	18
2.4.2 Mathematics performance	20
2.4.3 Spelling and reading achievement	21
2.4.4 Intelligence-type test scores	22
2.5 Reviewing Methodologies for Attendance and enrolment	30
2.5.1 Retrospective analysis	30
2.5.2 Comparative study	31
2.5.3 Non comparative study	32
2.5.4 Determinants analysis	33
2.6 Confounder Affecting Effectiveness of School Feeding Studies	34
2.6.1 Substitution	34
2.6.2 Energy intensity of meal/snack-	35
2.6.3 Short-term reduction in hunger	36
2.6.4 Study duration	36
2.6.5 Quality of the educational environment	37
2.7 School Feeding Project Design and Challenges	38
2.8 School Retention and Dropout	39
CHAPTER THREE: METHODOLOGY	41
3.0 Introduction	41
3.1 The Study Area	41
3.2 Research Design	42
3.3 Population	43
3.4 Sampling and Data Collection Procedure	43



3.5 Source of Data	46
3.6 Analysis of the Data and Presentation	47
CHAPTER FOUR: RESULTS AND DISCUSSION	48
4.0 Introduction	48
4.1 Results and Discussion	48
4.2 Has school feeding affected Enrolment	48
4.3 Has school feeding affected school Attendance	52
4.4 How has school feeding affected the Academic Performance	58
4.5 General Observations	<del>64</del> 64
CHAPTER FIVE: SUMMARY <del>OF FINDINGS</del> , CONCLUSIONS AND RECOMMENDATIONS	<del>65</del> 65
5.1 Introduction	<del>65</del> 65
5.2 Summary of Findings	<del>65</del> 65
5.2 Conclusion	<del>66</del> 66
<del>5.3 Recommendation for Improved Implementation</del>	<del>69</del> 68
<del>5.3.4 Recommendation for Further Studies</del>	<del>67</del> 67
<del>5.4 Recommendation for Improved Implementation</del>	<del>69</del> 68
REFERENCES	<del>70</del> 69
APPENDIX I	<del>77</del> 76

### LIST OF TABLES

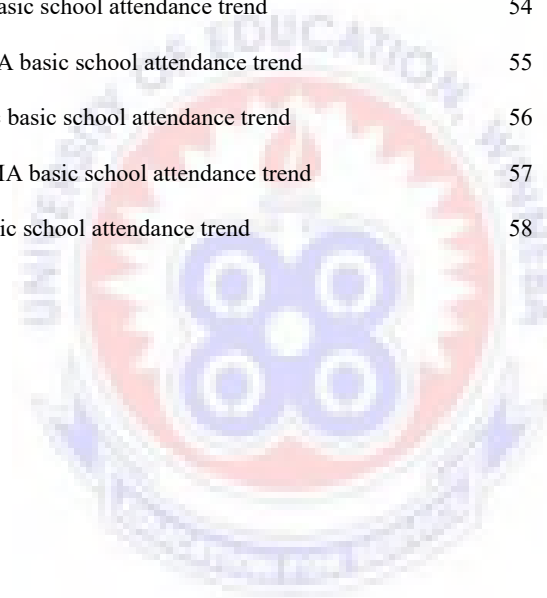
TABLE		PAGE
4.1	Summaries of Literacy Test Scores	59
4.1	Summary of Numeracy Test Score	60
4.2	Independent Sample T Test Result for Numeracy Test Scores	61
3.4	Independent Sample T Test Result for Literacy Test Scores	62





### LIST OF FIGURES

FIGURE		PAGE
3.1	District map of Ejisu Juaben District	42
4.1	Responses of teachers to whether SFP affect parents' choice of schools	49
4.2	Schools enrolment trend	51
4.3	Schools percentage attendances for 5 academic years	53
4.4	Kwamo MA basic school attendance trend	54
4.5	Ampabame MA basic school attendance trend	55
4.6	Juaben Islamic basic school attendance trend	56
4.7	Achinakrom MA basic school attendance trend	57
4.8	Krapa MA basic school attendance trend	58



### LIST OF ABBREVIATIONS

ADRA	Adventist Development Relief Agency
BECE	Basic Education Certificate Examination
CAADP	Comprehensive African Agricultural Development Program
CRS	Catholic Relief Services
FCUBE	Free Compulsory Universal Basic Education
GES	Ghana Education Service
GNCC	Ghana National Commission on Children
GOG	Government of Ghana
GSS	Ghana Statistical Service
ISSER	Institute of Statistical, Social and Economic Research
MDG	Millennium Development Goal
MOE	Ministry of Education
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NSLP	National School Lunch Programme
PTA	Parent Teacher Association
RCT	Randomized Controlled Trials
SBP	School Breakfast Program
SFP	School Feeding Programme
SNV	Dutch Development Agency
WFP	World Food Program



## ABSTRACT

The Ghana school feeding program started in 2005 on a pilot study with one school in each district of the country. Programs such as school feeding are believed to be effective because of its ability to target a specific population which is vulnerable. The research seeks to find out how the school feeding has impacted the educational outcomes such as attendance, enrolment and performance in Ejisu Juaben municipality. The study covered a select group of five schools comparing their enrolment and attendance trends before and after school feeding program. These five schools were selected using convenient sampling. Academic Performance in literacy and numeracy of pupils in the five schools with school feeding were also compared with pupils from three schools not on the school feeding program. The study covered a total of 240 pupils – a third of which were from the non-school feeding schools. The study found that school feeding had positively affected both attendance and enrolment. The pupils on the school feeding program studied performed better on both literacy and numeracy than those not on the school feeding program. On the numeracy test the difference in performance was found to be significant. But require further work using a bigger sample size and a longer study duration to be conclusive on the impact of school feeding on the academic performance generally. It is recommended that school management committee SMC should actively monitor and provide feedback to the feeding program office as the quality and quantity of meals given to pupils as it was observed in all the schools visited the meals were either insufficient or/and the quality substandard.

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## CHAPTER ONE

### **GENERAL INTRODUCTION**

#### **1.1 Background to the Study**

Education is an important tool for the development of individual, the society and the nation at large, for this reason nations all over the world are concerned with the provision of education to their citizens. Most African countries including Ghana see development as closely intertwined with provision of education. That is the more educated their citizens are the higher their ability to deal with problems of development. Ghana has since independence made significant interventions in the educational systems. These include the implementation of the free compulsory universal basic education (FCUBE) which was introduced in 1996. The main aim of the FCUBE was to provide quality education to all children of Ghana. The introduction of the capitation grant scheme was another intervention made in 2007 with the sole aim of abolition fees charged by schools to reinforce the Free and underpin the idea of compulsory education at the basic school. Other interventions to show- up the FCUBE and enhance basic education has been distribution of free school uniforms and exercise books. The provision of warm nutritious meal for under privileged children in sections of the country has also been introduced as a key intervention to enhance education. This program of providing meals to the section of the basic school Children in Ghana is the Ghana school feeding program (The Ghanaian Journal, 2010).

#### **1.2 Historical Background to School Feeding**

The history of school feeding can be traced to the United Kingdom and United States in the 1930s. The scheme at the time was aimed at providing nutrition that will

improve growth in children. The National School Lunch Program (NSLP) Act, in America was signed by President Truman in 1946. This officially authorized the NSLP for the provision of school ~~lunch~~-lunch, although funds had previously been appropriated for over a decade without specific legislative authority. The 1966 Child Nutrition Act expanded the program and added the School Breakfast Program (SBP) on a pilot basis; 1975 legislation made the SBP permanent; and 1998 legislation expanded the NSLP to include reimbursements for snacks served to students in after-school educational and enrichment programs (Schirm & Kirkendall, 2010).

There were various other schemes in the 1940 and 1950s that provided subsidized and or free milk to school going children in the United Kingdom. In the late 1960s and early 1970s this benefit was withdrawn from all, except for those children considered to be particularly needy, an early example of the targeting approach in school feeding.

India also has a long history of school feeding dating back to the 1920s. The Supreme Court of India directed the state governments to provide school feeding in all government assisted primary schools. This was after a coalition of organisations and individual pushed for this directive with the aim of bring education and reducing poverty and hunger (Akanbi, & Alayande, 2011).

Across Africa there has been various school feeding initiative dating back to the 1940. In South Africa they started a programme to supply free milk to white and coloured schools in the early 1930s and 40s. There have been other small scale initiatives by religious bodies-, NGO and civil society organisations before the millennium development goal and the scaling up of the school feeding programs across sub-Saharan Africa.

There are basically two ways to distribute food in the school feeding programs. These are the -on-site school feeding where the school children are fed with meal during the school day. This may include breakfast and /or lunch and/or a snack. The other way the food is distributed to the school children is giving them Take home ration.

The take home ration is a foods ration given to the household on condition that the child enrolls in school and maintain a minimum attendance (usually 80%). The ration tend to be grains/cereal and cooking oil. These are given out periodically thus weekly, fortnightly or monthly.

Take home rations are used as a social intervention to address food security and education at the household level for a short-term usually for displaced but structured communities. One of the main reasons for opting for take-home rations are that such programmes are normally less resource-intensive for the implementation and quick as well as easy to roll out.

On-site school feeding guarantees consumption of the nutrition by the intended target group of children. This rationale is underlined by the perception/fear that dry take home rations will be consumed by economically active males or sold to purchase non-essentials such as alcohol.

On-site feeding requires a smaller ration than dry take-home rations which have to be shared and consumed with other children as it would be impossible for the mother to give the food to one child only. Although the on-site school feeding programs may be resource intensive, if foods are sourced locally it provides reliable markets to the farmers (Kazianga, Walque & Alderman, 2009).

On-site School feeding programs may be perceived as providing a higher-profile activity for attracting public and donor government resources than dry take-

home feeding. Most African governments also favour such a visible programme designed to satisfy their own public that the government is taking action to resolve some of the social challenges of the deprived. This may even be used as a political tool.

School feeding programmes (SFPs) have a long history in Ghana. In the 1950s, pupils of several Catholic primary and middle schools were given take-home rations of food aid. The objective was to improve the nutritional status of school children and increase school enrolment and retention. The programme was in line with government policy to accelerate the education and training of Ghanaians to fill job vacancies created by foreigners who had to leave the country after independence.

Over time, WFP and Catholic Relief Services (CRS) became two lead agencies providing School feeding programs in the Country, focusing on the north due to its high incidence of poverty and food insecurity. WFP has been involved in Ghana for 40 years. Other development partners involved in food assistance programmes are: World Vision, Adventist Development Relief Agency (ADRA), Dutch Development Agency (SNV) and SEND. The objectives of the School feeding programs of these organizations are not different from those in the 1950s, except that poverty, food insecurity and gender inequality have become additional concerns for these organizations. The northern regions are relatively poor and rural households, especially women and their young daughters, lack physical and economic access to food. These segments of the society thus have a need to be served by these interventions of these donor agencies.

The Ghana government decided to expand the intervention to cover deprived children in schools country wide. The Ghana school feeding program began in late 2005 with 10 pilot schools, drawn from each region of the country. By August 2006,

it had been expanded to 200 schools covering 69,000 pupils in all 138 districts at the time with a plan to reach a total of 500 schools and 155,000 children by the end of the year. The plan was to scale up the programme gradually to cover 1.04 million primary school and kindergarten children in the most deprived communities and schools of the country by December 2010 (Ghana school feeding annual operational plan, 2010).

By the end of 2010, the program covered over 1.4 million school children across all parts of the country. The program as implemented in Ghana is managed by the local authorities, the district chief executives and the district/municipal/metropolitan assemblies. (Ghana School Feeding Annual Operational Plan 2010)

The Ghana school feeding program is an initiative of the government of Ghana to achieve the millennium development goals on hunger poverty and primary education. It is a response to pillar III of the comprehensive African agricultural development program CAADP of the new partnership for Africa's development NEPAD.

The basic concept of the program was to provide pupils in selected public school in the country with a hot nutritious meal per school day using locally manufactured food stuffs. The goal of the program was to contribute to poverty reduction and food security in Ghana.

The objective was to reduce short term hunger and malnutrition in school children in each school day. Secondly it was to increase school enrolment, attendance and retention. And thirdly it was also to boost domestic food production. By sourcing the item for the Ghana school feeding program meal locally and therefore providing a sustainable market for food production in the communities. These objectives are closely aligned to the millennium development goal on poverty reduction and primary education.

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The Ghana school feeding program is run by a national secretariat which service as a coordinator between all the different ministries as well as the donors and the partners. The school feeding program is under the ministry of local government and rural development at the national level but run by the various municipal, metropolitan and district assemblies.

The district assemblies are responsible for the recruitment and contracting of the Caterers. These caterers work with the school management committee to deliver the service to the school and the children. The caterers are responsible for sourcing the food stuffs and cooking. The caterers submit their invoices of the number of meals delivered on each school day. The payments are done after cross checking any appropriate documents by the district assemblies to the school feeding secretariat for payment to be effected.

Ghana school feeding program has extensive targeting criteria for the selection of beneficiary communities. In several respects, the criteria are no different from targeting criteria used by WFP and other School feeding programs, except that WFP and the others target the north Ghana, while Ghana school feeding program focuses nationally. The criteria include:

- willingness of a community to provide basic infrastructure (e.g. kitchen, store, dining room);
- commitment of the District Assembly, demonstrated by its interest to sustain the programme;
- poverty status of the district and community;
- low school enrolment and/or attendance and gender parity index;
- high drop-out rates;

- low literacy levels;
- presence of planned health and nutritional interventions or expansion of existing ones;
- no participation in an already existing school feeding program;
- poor access to potable water;
- High community spirit and management capability.

Using the above criteria, the Ministry of local government and rural development in conjunction with the ministry of education, working with the district assemblies, developed an initial list of communities and schools that met the criteria of poverty, high drop-out rates and low literacy. The list generally guided the selection of communities and schools across the country (Ghana school feeding annual operational plan 2010).

### **1.3.2 Statement of the Problem**

There are many studies and reviews that examine the effectiveness and benefits of school feeding program. The review by Bundy, Burbano, Gelli, Jukes and Drake (2009), suggests that appropriately designed school feeding program increase access to education and learning and improves children's health and nutrition especially when integrated into a comprehensive school health and nutritional program. Similarly a review by Jomaa, McDonnel and Probert (2011) reveal relatively consistent positive effect of the school feeding program on energy intake, micronutrient status, school enrolment and attendance of Children participating in school feeding program compared to non-participants.

Less is known about the academic performance of schools with school feeding program, it is against this background that this study is designed to find out the

academic performance of school children who are fed under the school feeding program and also find out if indeed the school feeding program have positively affected enrolment and attendance in the Ejisu Juaben District.

#### **1.4.3 Purpose of the Study**

The purpose of the study is to investigate the extent to which school feeding program impact the educational outcomes.

#### **1.5.4 Research Objectives**

The study seeks to:

- 1. Investigate the relationship between the performances of pupils fed under the school feeding program and those who are not fed.
- 2. Establish the extent to which school feeding program affect enrolment.
- 3. Determine how school feeding program affects pupil's attendance.

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#### **1.6.5 Research Questions**

- 1. How has the school feeding program affected pupil's academic performance?
- 2. How has school feeding program affected enrolment?
- 3. In what ways has school feeding program affected pupil's attendance?

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#### **1.7.6 Significance of the Study**

The outcome of this study will bring to bear the extent to which school feeding program has impacted enrolment, attendance and performance in the Ejisu Juaben District. The study will also bring out which aspects of the school feeding program

needs attention so the necessary interventions and corrective measures will be put into place.

Furthermore the outcome of this study will add to the body of knowledge in the School feeding in Ghana.

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### 1.8.7 Limitations of the Study

The scope of the study is delimited to select schools in the Ejisu-Juaben district of the Ashanti Region of Ghana.

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Due to time and resource constraint the study concentrated on basic 4 pupils of the selected schools in the assessment of their academic performance.

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### 1.9.8 Definition of Concepts and Terms

It is important to define some key concepts that have been used in order to clarify the context within which they are being used in this study.

**Academic achievement** refers to a successful accomplishment or performance in a particular subject area. It is indicated as by grades, marks and scores of descriptive commentaries. It includes how pupils deal with their studies and how they cope with or accomplish different tasks given to them by their teachers in a fixed time or academic year (Hawis & Hawes, 1982 cited in Dimbisso, 2009). In order to avoid monotony, different terms such as academic performance, student performance and pupil performance are used in this study. All meant to refer to academic achievement.

**Hunger** refers to a condition in which people lack the required nutrients (protein, energy, and vitamins and minerals) for fully productive, active and healthy lives. Hunger can be a short-term phenomenon, or a longer-term chronic problem. It can have a range of severities from mild to clinical. (WFP 2008)

**Short-term hunger** is a transitory non-clinical form of hunger that can affect short term physical and mental capacity. In this report, it often pertains to school children who have missed breakfast or have walked long distances to school on a relatively empty stomach (WFP, 2008).

**School enrolment** refers to the official number of children recorded as enrolled in a school at the beginning of the school year.

**Out-of-school children** refer to children in the official school-age range who are not enrolled in school.

**School attendance** refers to the measure of the number of pupils who attend school and the amount of time they are present. The terms school attendance and attendance are used interchangeably in this work to refer to school attendance.

#### **1.10.2 Organisation of the Work**

The study is sectioned into 5 chapters. Chapter one is the general introduction revolves around the background of the study statement of the problem, purpose of the study, research objectives, research question, significance of the study limitations and definition of key concepts and terms.

Chapter two presents the review of existing literature. It covers a comprehensive background to school feeding, the impact of nutrition and health on academic performance. It also covers short term hunger, school enrolment and attendance with regards to school feeding.

The details of the research methods which entail the research instruments, sampling size and techniques, methods of data collection and analysis are confirmed to chapter three.

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\_Chapter four considered the presentation of the research results, discussion and the data collected.

\_The fifth chapter entails the summary of the findings from the study conclusions and recommendation.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews work done on the impact of school feeding programme on educational outcomes in various countries. It also reviews some of the key methodology used in the assessment of the impact of school feeding on educational outcomes.

#### **2.2 School Feeding Programmes**

School feeding around the world may have a whole range of specific objectives but the common underlying theme is providing food or nutrition in an educational setting or for education and development. There is a long history of various researches that links nutrition, health and education.

An estimated 200 million children below five years old, the majority of whom live in Africa, fail to reach their potential cognitive development as a result of poverty, poor health and under nutrition (Grantham-McGregor, Chang & Walker 1998). Consequently, these disadvantaged children are prone to perform poorly in school, they subsequently earn lower incomes and are unable to adequately take care of their children; thereby continuing the vicious cycle of poverty which confronts many people in Africa. Recently, the relationship between nutrition, health and educational achievement of children in less developed countries has been of interest to many researchers due to the frequent lowering of academic achievement.

Children who suffer from malnutrition, hunger, or who lack certain micronutrients do not have the same potential for learning as healthy and well-nourished children (Pridmore, 2007). Pridmore further observes that many children

do not enrol on time and in most cases do not complete primary school. In addition, the mechanism by which health and nutrition influence educational achievement is not well established (Galal & Hulett, 2003 cited in Pridmore, 2007). Although it has been indicated that under-nutrition especially in the early childhood stages of life and poor health affects a child's ability to learn from an early age (Mooock, Peter & Joanna, 1983; Pollitt E. 1995), consequently affecting educational achievement.

### **2.3 Short-Term Hunger and Learning**

Short term hunger is transitory non-clinical form of hunger that can affect short-term physical and mental capacity. It often pertains to school children who have missed breakfast or have walked long distances to school on a relatively empty stomach.

Short term hunger as a concept is defined as representing the psychological need to eat food. Another definition of short term hunger is the temporary physical experience of discomfort brought on by the lack of food (WFP, 2008). This is the one factor that is known to influence heavily teaching and learning in all environments. While certain countries or certain segments of the society may have food scarcity and /or long term hunger as an issue, periodic hunger especially for pupils during the school day is a relatively common occurrence around all learning environments globally.

Generally short term hunger is as result of lack of food during a particular period. This may be due to lack of food or insufficient food. In the learning environment short term hunger is known to affect the whole learning cycle as it interfere with the mental and cognitive process of learning. Food is the source of a child's physiological energy. This is needed for all the activities. Lack of food



therefore deprives them of the needed energy to perform all activities including normal physical activity and brain function. Lack of food therefore results in low energy levels of the child which may result in depression, anxiety, and even withdrawal from all events around them. Short term hunger is therefore a critical factor that affects the teaching and learning.

A study of short term hunger in Uganda by Loga (2012), revealed that of the students suffering short term hunger, 42% of the pupils lost concentration; 41% did not understand what the teacher taught; and, 32% dozed in class in the afternoon. This led to low average mark at the end of the term. The pupils who were hungry found various ways to cope with the hunger. The pupils devised ways to cope with hunger which included looking for fruits (28%), begging from friends (18.5%), escaping from school (9%). The last category who escaped and those who went looking for fruits are sometimes unlikely to return to the classrooms. School feeding programs thus targets these and provide a solution to the short term hunger challenges.

A study by Donald Simeon (1998) reviewed two studies that evaluated the school feeding program in Jamaica. The first examined 115 Children aged 12 to 13 years who were enrolled in three classes in a poor, rural school. The study examined the effects of the Jamaican school meal on academic achievement, attendance, and physical growth. The evaluation was conducted among children enrolled in grade 7 in a rural school that was not a participant in the school meal program. The grade 7 children were first divided into 10 classes based on scholastic ability. Those in the three lowest classes were selected for the evaluation, following the assumption that these children were most likely to benefit from the program. These three groups were also the group with the lowest school attendance rates and the highest prevalence of under nutrition. Almost half of these children (who were aged 12-13 y) were

undernourished according to the Well come classification, that is, weight-for-age < 80% of the reference standard.

One class was served the standard school meal at 0900hrs whereas the other two classes served as controls. The outcome variables included school achievement, attendance, and weight gain. After one semester, the class receiving the meal showed improved arithmetic scores and school attendance compared with the control classes; however, they showed no weight gain. The academic improvement remained significant after school attendance was controlled for. It was therefore hypothesized that the gains in arithmetic resulted from the alleviation of hunger in the classroom.

The second study in the evaluation examined the effects of hunger, thus short-term food deprivation, on the cognition of school children. The goal of this study was to determine whether the omission of breakfast adversely affected the cognitive function of Undernourished and adequately nourished children. The other study, conducted in a metabolic ward, examined the effects of missing breakfast on cognitive function in 90 children aged 9 to 10 years and of differing nutritional status. Using a crossover design, the investigators tested each child on two mornings 1 week apart, once after serving them breakfast and second without. Breakfast, consisting of the school Program meal, was served at 0800hrs. When severely malnourished, Stunted, or wasted children received no breakfast, their performance in various cognitive tests deteriorated.

These results indicate that alleviation of hunger was one of the mechanisms by which school feeding improved academic achievement in the previous study. Undernourished children are more likely to benefit from school feeding programs than are adequately nourished children.

Buxton (2010), in a study examines the relationship between nutritional status and some educational indicators using a sample of school-age children drawn from 29 schools in two districts-Mfantseman and Savelugu-Nanton- in Ghana. The study found children in Primary 1 were more likely to be stunted and underweight as compared to children in the upper classes. This has implications where stunted children in lower grades are more likely to end up repeating grades, drop out of school and therefore are more unlikely to complete primary education.

It concluded that a higher proportion of children attending rural schools were more likely to be stunted than those attending schools situated in urban areas although the difference was not statistically significant. It also indicated that stunting malnutrition was responsible for the delayed age of enrolment and this was likely to affect the child's educational performance and retention and completion of primary education. The study goes on to recommend the focussing and ensuring the nutritional health of children under 3 years as that impacts on the education performance.

In another study by (Kristjansson, Robinson, Petticrew, MacDonald, Krasevec and Janzen, 2007) the main objective was to determine the effectiveness of school feeding programs in improving physical and psychosocial health for disadvantaged school children. According to the study School meals may have some small benefits for disadvantaged children. They recommend further well-designed studies on the effectiveness of how school meals can be undertaken, and that results should be reported according to socio-economic status, and that researchers gather robust data on both processes and carefully chosen outcomes.

Hye-Young, Frongillo, Sung-Sook, Se-Young, Woo-Kyung, Young-Ai, Hye-Sook, Hyun-Sook, Sook-He and Kim (2003), conducted a study to understand the association between dietary behaviours, physical status and socio-economic status

with academic performance in Korean teenagers. The study covered 6,463 boys and girls, in grade 5, 8, and 11. The data was collected using a self-administered questionnaire and the food-frequency form. The respective student's grade point average (GPA), height, weight, and physical fitness score for the year were recorded from the school record and used in the study.

The study found that academic performance of students was strongly associated with dietary behaviours, especially with regularity of three meals. Regular breakfast and lunch were more important in grades 5 and 8, while regular dinner was more related with academic performance in grade 11. Small, positive associations of height and physical fitness to academic performance were also found.

The study also found that relative importance of regularity of meals was greater than that of socio-economic status and physical status in older teenagers. The results of this study suggest that provision of better dietary environment in the schools was important. The general population should be better served with improved education on nutrition to ensure all children at least have 3 regular meals daily.

#### **2.4 Evaluating Effectiveness of School Feeding**

In a large systematic review conducted by Betsy Kristjansson, Kristjansson Robinson, Petticrew, MacDonald, Krasevec, Janzen, Greenhalgh, Wells MacGowan, Farmer, Shea, Mayhew & Tugwell (2006), focused on the role school feeding plays on the physical, and psychosocial health of disadvantaged students. It reviews these studies which evaluated the effectiveness of the school feeding program. The various programs were evaluated based on the objectives for setting up the school feeding programs. Eighteen studies were included in this review; nine were performed in higher income countries and nine in lower income countries

#### 2.4.1 School feeding on Attendance

Reviewing the study by Jacoby, Cueto and Pollitt (1996) they performed descriptive analyses on attendance in Peru. Their study reported significant effects of school feeding on attendance. The review also noted that they were unable to provide standard deviations. In the experimental group who received food, attendance increased by 0.58% while it decreased by 2.92% in the control group of children who did not participate in the school meal. In the first month of the intervention, the attendance of the experimental group was 5.1% higher than that of the control group. The difference in the change between the experimental and control groups was 3.4 %. Their study concluded on attendance that school meals/ feeding had positive impact on school attendance.

Three studies in higher incomes countries reviewed by Kristjansson et al (2006) cites (Paige 1976; Tisdall 1951; Lieberman 1976) all reported that children who received school meals attended school more days per year than children in control groups. Paige found that children who received school meals attended, on average, 2.5 more days per year than children in the control group (significance not reported). Lieberman reported that in the group of children who received school breakfast, attendance increased from 158 to 161 days per year while in the control group, attendance decreased from 158 to 156 days (non-significant). Tisdall found that students who received school lunch attended 1.4 days more than controls (non-significant); it is not clear whether this was over the two-year period of the study, or per year. Tisdall also reported that the rate of absence for medical causes per 1000 pupil days was 36.0 for school lunch children and 39.8 for control children; the rate was only 31.8 per 1000 pupil days among the group of children who regularly attended the school lunch program. While all the cited studies reported an increase in

attendance over the control group they did not state that school lunches were significant in influencing attendance. In a study by Powell, Walker & Grantham-McGregor, (1998) in Jamaica, multilevel analysis using school, class and pupil as fixed parameters and with initial score, sex, grade, and nutrition group as covariates. The study revealed a significant effect of breakfast on attendance for b (unstandardized regression coefficient) = 2.32, s.e. = 0.78,  $p < .05$ ). Powell concluded that children in the experimental group attended school 2.3% more days in the study period than children in the control group. From the 3 studies by Paige (Tisdall and Lieberman in the united states though the school meals impacted school attendance, the impact was not significant. General from the review, lower income countries school feeding had a significant impact on attendance while in higher income countries the impact was not significant.

This difference may be due to the fact that children in higher-income countries had more regular attendance at baseline than those from lower-income countries. It may also be due to the fact that families in lower-income countries were more motivated by the prospects of receiving food. This fits well with the high non-compliance rate observed in many of the North American studies. These studies suggest that the impact of free school meals on school attendance may be greatest in areas of greatest poverty

These studies from both lower income countries and higher income countries all point to the fact that school meals be it breakfast lunch or snack in the studies directly improved attendance. The mechanisms for enhancing attendance may include not only the attraction of a free meal, but also possible effects on immune function that reduce illness and the effect on concentration that may make school more enjoyable.

Improved attendance could mean greater opportunities for learning and mental stimulation and consequently, improved academic performance, more opportunities for social interaction with adults and peers, and possibly, a better attitude towards school. However, it is difficult to say whether the projected 4 to 6 days of increased attendance per year in lower and lower-middle income countries is sufficient to result in such changes.

#### **2.4.2 Mathematics performance**

Some studies on the effectiveness of school feeding evaluated the performance of the students on a mathematic test. One such study reported data measuring change in mathematics performance. Powell et al (1998) used the Wide Range Achievement Test (WRAT), and Whaley used an adapted arithmetic test from the Wechsler Intelligence Scale for Children (WISC). In the 1998 Powell study, multilevel analyses were performed. The predictors of the mathematics test scores included initial score, sex, grade, nutrition group, treatment group, school, class, pupil, and a treatment by grade interaction Powell et al (1998). This study reported a significant effect of breakfast on arithmetic achievement over the seven month period of the study. Children in the experimental group gained significantly more on their mathematics test score than those in the control group; ( $b = 0.71$ ,  $s.e. = .031$ ,  $P \text{ value} < 0.05$ ).

In a similar study in Kenya, Multi-level regression analyses showed that children who were given meat gained 0.17 points per year, ( $s.e = 0.10$ ,  $P \text{ value} < 0.05$ ) in mathematics knowledge than children in the control group (Whaley, Neumann, Sigman, Bwibo, Guthrie, Weiss, Alber & Murphy (2003).

A Control Before and After analysis by Powell, Grantham-McGregor & Elston (1983) and Agarwal, Agarwal, & Upadhyay (1989) in lower income countries on the mathematics achievement of students was studied. The change in mathematics achievement was significantly greater for children who had received school meals than those who did not. An analysis also performed in which Agarwal data was broken down into four nutritional subgroups; results were very similar, showing school feeding having a positive effect in the mathematics score (SMD = 0.44, 95% C.I. = 0.22 to 0.67) (Agarwal 1989). Sensitivity analyses for ICCs of 0.10 and 0.20 made little difference.

#### **2.4.3 Spelling and reading achievement**

Powell et al (1983) covered both spelling and reading ability of the children. Evaluating the effect of school feeding on the student spelling achievement, Multilevel regression analysis performed by Powell et al (1983) showed no difference in change in spelling achievement for the experimental group that received the school meals than for the controls who did not receive the school meals. ( $b = -0.5$ ,  $s.e. = 0.27$ , ns.).

In the study evaluating reading achievement (Powell et al 1983) assessed the effect of school breakfast on reading performance. The analysis demonstrated no difference between children in the experimental groups and those in the control groups combined (SMD = 0.09, 95% C.I. = -0.11, 0.29). Sensitivity analyses made little difference. The study concludes that school meals did not impact the spelling and reading performance with any level of significance.



#### 2.4.4 Intelligence-type test scores

(Whaley et al 2003) used randomised control trial to study the effects of a school snack on fluid intelligence using Raven's Progressive Matrices to assess the intelligence of pupils in Kenya. The study found a significant effect of treatment: children in the group who received meat gained an average of 0.34 points per year on the test more than the control group who were not fed ( $P$  value  $< 0.05$ ).

In the study in a higher income country (Lieberman (1976) cited by Kristjansson et al 2006) reported no difference in magnitude of improvement on Raven's Progressive Matrices and other psychological tests. The other test used in the study included figure copying, making x's, listening attention, and memory for numbers). Another CBA study dating back to 1951 by Tisdall in Canada (cited in Kristjansson et al 2006) reported no significant differences in change in intelligence test scores, school marks, reading and math tests. .

Chandler, Walker, Connolly, Grantham-McGregor (1995) performed a randomized cross-over study of the short-term effects of providing breakfast on four cognitive tasks. This study done in Jamaica report that there was significant effect for verbal fluency ( $P$  value  $< 0.02$ ). The significance varied by the sub category of the nutritional status. For the under nourish ,children interaction had scores (unadjusted for clustering) that were 1.5 points higher after receiving breakfast than when they received the placebo ( $P$  value  $< 0.01$ ). However, breakfast made no difference to the children who were classified as adequately nourished (above - 1 s.d. for weight- for- age). No significant effects of school feeding were found on information processing, visual search or digit span for either well-nourished or undernourished children.

Jacoby et al (1996) studied the short-term effects of school feeding on performance in a battery of psycho educational tests: this 1) the coding subtest from

the Weschler Intelligence Scale for Children, 2) a test of reading comprehension from the Inter-American Series, 3) a test of vocabulary from the Inter-American Series, and 4) a test of functions and abilities related to the math curriculum. An Analysis of Covariance controlling for sex, height-for-age z-score, weight - residual (weight regressed on age and height), Socio economic status, home language, repetition of any grade, and age on entry to school; current enrolment in grade, school nested in treatment group, and interactions between height-for-age and treatment and weight-for-age and height was used. Significant effects were seen for vocabulary only; the main effect of breakfast overall was not significant, but there was a significant interaction between baseline weight-for-age and height and treatment (parameter estimate = 0.37, F = 4.97, P value < 0.05). This interaction meant that the heavier children benefited most from school breakfast. The authors noted that the combination of smaller than average stature and normal weight for height are common among poor Peruvians, and that 'this phenomenon reflects a protracted deficit of critical nutrients due to poor diet and infection' Jacoby et al (1996). Thus he hypothesized that those who were heavier than normal were likely to be of poorer health and less well-nourished than the other children

In a high income country (Shemilt, Harvey, Shepstone, Swift, Reading, Mugford, Belderson, Norris, Thoburn & Robinson (2004), assessed concentration with the Trail Making Test three months after breakfast clubs were initiated in a number of schools where each school decided on meal content. For children in school years 2-11, the time taken to complete the Trail Making Test was significantly shorter in the intervention group at 3 months; the time taken by the intervention group was 3.70 seconds logged and the time taken by the control group was 3.71 seconds. The ratio of adjusted geometric mean was 0.90, 95% confidence interval 0.81 -1.00). It is

important to note that contamination had occurred; by the time of first follow-up, 2 schools randomized to the control group were running breakfast clubs. Furthermore, not all of the 17 schools randomized to the experimental conditions ran breakfast clubs.

Early malnutrition and/or micronutrient deficiencies can negatively affect many aspects of child health and development. School feeding programs are designed to provide food to hungry children and to improve their physical, mental and psychosocial health. According to Wynn (1987) socio-economic differences in nutrition may be one of the most important factors causing socio-economic differences in health and mortality. Global estimates suggest that, in the period 2000-2002, over 852 million people across the world were undernourished (FAO 2004). Many of these were children.

Early malnutrition and/or micronutrient deficiencies can adversely affect physical, mental, and social aspects of child health. Effects on physical health may include underweight, stunted growth, lowered immunity, and mortality. Early malnutrition and/or micronutrient deficiencies have been linked to poorer cognitive functioning (Scrimshaw 1998 cited in Levinger 1996). Short-term hunger can adversely affect attention and interest (Wilson 1983, cited in Levinger 1996). Overnight and morning fasting (e.g. skipping breakfast) has been shown to adversely affect performance on cognitive tasks, particularly for children who are nutritionally at risk (Pollitt 1995).

Various governments and agencies have over the years devised interventions to resolve or reduce the challenges. School feeding programs may help to ameliorate some of these problems. The goals of school feeding programs differ based on the problem in the area it is intended to resolve. often the goals includes relieving short-

term hunger, improving micronutrient status , improving physical growth ,improving cognition and academic performance .These tend to be the objectives in the higher income countries for their school feeding programs. In addition to these objectives, lower income countries because of the large numbers of primary school children who are out of school, school feeding becomes a tool to encourage enrolment and sustain an attendance in schools. Worldwide, 115 million primary school aged children were 'out of school' in 2001/2002; most were from developing countries (UNESCO 2005) Agricultural and community development may be secondary outcomes in developing countries if locally grown food is used in the preparation of the meal for the students

There is some controversy over the effectiveness of school feeding programs. According to the World Food Program "Research and experience show that when food is provided at school, hunger is immediately alleviated, and school attendance often doubles within one year" (WFP 2005a). However, experts at a School Feeding/Food for Education Stakeholders meeting in 2000 concluded that there is little evidence for nutritional benefits of school feeding and that school feeding only enhances learning when other improvements in school quality are made (World Bank n.d.). Macintyre argued that school feeding programs address a symptom, rather than the root causes of hunger and that they may be stigmatizing (McIntyre 1992). In their opinion sustainable family incomes should be prioritised rather than attempting to treat short term hunger at school level.

One important concern in school feeding studies is that, in poor families, the home diet may be reduced for children who are receiving food at school: this is termed 'substitution'. For example, a survey on school feeding in Malawi showed that 77% of children reported that they get less food at home when they receive school meals. This is substantiated by caregivers; 82% of caregivers reported that

substitution was occurring. When there is extra food, it is used to benefit other household members, particularly children (Galloway, 2006).

In July 2002, in order to diminish hunger in the classroom as well as to promote school enrolment and retention rates, the Government of Bangladesh and the U.N. World Food Programme launched the School Feeding Program in chronically food-insecure areas of Bangladesh. School feeding program was the first effort in Bangladesh to provide incentives directly to primary-school children themselves, as opposed to cash or food to parents for sending their children to school. The school feeding program provided a mid-morning snack consisting of eight fortified wheat biscuits to some one million children in approximately 6,000 primary schools in highly food-insecure rural areas, plus four slum areas in Dhaka City. At a cost of U.S. 6 cents per packet of eight, the biscuits provide 300 kilocalories and 75 percent of the recommended daily allowance of vitamins and minerals (Akhter, 2004).

The International Food Policy Research Institute (IFPRI) conducted a comprehensive evaluation of the impact of this School Feeding Program in Bangladesh. The evaluation was based on a number of surveys at the household, school and community levels in addition to achievement tests for the school children, carried out in late 2003.

Some of the major findings were as follows: school feeding program has raised school enrolment by 14.2 percent, reduced the probability of dropping out of school by 7.5 percent, and increased school attendance by about 1.3 days a month. These results were obtained from econometric models that captured the impact of the school feeding program alone, isolating the effects of income and other factors.

An extremely high percentage of mothers report several positive effects of the school feeding program on their children. The mothers interviewed for the study

noted that children's interests in attending school and concentration on studies have increased; and that these children were livelier and happier than before, and their incidence of illness has declined (Akhter, 2004).

Studies also indicate that health status has implications for attendance, enrolment and retention and drop out. Again, research by (Fentiman, Hall, & Bundy 1999, 2001) suggests that hunger, malaria, headaches and poor eyesight were major causes of absenteeism and dropping out. Health issues were also often gendered, with girls reporting more health-related problems than boys. Painful menstruation, a lack of sanitary facilities and pregnancy were factors leading to both absenteeism and drop-out of adolescent girls (Fentiman, Hall, & Bundy, 1999, 2001).

Fentiman, Hall and Bundy (2001), suggest that health inputs should be targeted towards infants and the first years of primary schooling, 'if interventions are targeted at this stage, enrolment levels rise and the majority of children are reached'. This should be complemented by gender-sensitive programmes that focus on female adolescent health and specific strategies to reach out to those most at risk. Food aid and school feeding programmes have been promoted to encourage educational access, but require more robust studies to clearly establish the link and impact of these interventions on the educational outcomes targeted and expected.

Seidu (2003), investigated the impact of food aid intervention on girls' enrolment, attendance and retention in schools in the East Gonja District of Northern Ghana. He found that although respondents perceived food aid as an incentive for girls to enrol, attend and remaining in school till completion, the most important factor was the awareness of the importance and benefits of girls' education. The study found no statistically significant difference in enrolment before and after food aid. This finding raises questions about the wisdom of investing heavily in school feeding

programmes as a way of improving access to education without attending to other factors, especially health related ones. Poor nutrition and bad health impede student attendance and interfere with their mental development and ability to concentrate in class. Examples:

- Iron deficiency weakens the child's immune system, physical development, cognitive ability and school performance and causes fatigue. More than half of the world's school children are iron deficient.
- Iodine deficiency affects some 60 million school children and is the leading cause of preventable intellectual impairment.
- Intestinal parasites can cause malnutrition, bowel obstruction, internal bleeding—and thus anaemia, low energy, discomfort, and poor attendance and performance. In the worst cases, mental and physical retardation or even death may result. School-age children are the group most affected by intestinal parasites; an estimated 3.3 million children die from intestinal infections each year.
- Vitamin A deficiency can cause respiratory and other infections and blindness. Some 85 million school-age children suffer Vitamin A deficiency.

The Study by Kazianga, et al. (2009), in Burkina Faso examined the hypothesis that School feeding program can improve cognitive functions and academic performance via reduced absenteeism and increased attention and concentration due to improved nutritional status and reduced short-term hunger. Indirectly, by increasing the amount of food available to the household, school feeding programs could improve the nutritional status of household members who are not in school, especially when School feeding program entail take home rations. Overall, School feeding program are appealing because if properly designed and

implemented they lead to increased number of children being enrolled with better academic performances.

The study also used a prospective randomized design to assess the impact of two school feeding schemes on educational and health outcomes of children from low income households in northern rural Burkina Faso. They considered two programs: school meals which provided lunch in school, and take-home rations which provided girls with 10 kg of cereal flour each month, condition on 90 percent attendance rate. Because they relied on a baseline and on a follow up surveys, they were able to use difference in difference regressions to estimate the impact of the program. Moreover, because they had a randomized experiment, they could interpret the estimated impact as causal.

The results show that school feeding programs in this specific context of Agricultural households without an active labour market can increase enrolment, but may fail to improve attendance and academic performance for a larger number of children. The study was thus inconclusive on the issue of school feeding program improving performance. It therefore recommended further work into the fine details of some of the areas they studied.

Public basic education in Ghana is tuition free. However, a high non-tuition cost of schooling has been known to discourage some poor households from sending their children to school. Several studies have shown that the indirect and direct costs of schooling (including school levies, fees are one of the major causes of non-attendance to school (MOYS/UNICEF, 1992/93; Oduro 2000 cited in oduro 2010). According to Oduro (2000), the high cost of schooling is often the most frequent reason cited for non-attendance. The three largest expenditure items facing



households are the cost of providing food and clothing, school levies and registration costs (Oduro, 2000).

## **2.5 Reviewing Methodologies for Attendance and enrolment**

Various Authors have used 4 methods to evaluate the impact of School feeding on the issue of attendance and enrolment. These four methods are as follows

### **2.5.1 Retrospective analysis**

This involves the measurement of the change in attendance and enrolment when school feeding program is permanently or temporarily discontinued. The major weakness of this method is that if the program suspension is perceived as temporary it will not exert the same kind of influence on attendance as a total discontinuation. Thus the program is treated as an independent variable with enrolment and attendance as the dependent variables. The other weakness is that the setting for the evaluation is not planned as the data collected is evaluated to show the impact. There may be other intervening measures that would come to play or that may explain the trends.

A study by CARE (1975) international school lunch program in The Dominican republic in 1978 covered over 20,000 children throughout the country. During the transition from the donor funded care program to the government funded program, there was a sudden termination as the government program could not take off as planned. A Study by Gall Eckroad and Stanfield (1982) examined the impact of this termination on the primary schools attendance and enrolment in Santiago a rural part of the country. They found the decline by 23.4 percent. Further investigation into the reason for the decline was attributed to the termination of the school lunch

program. The authors concluded. "in the aggregate it appeared a quarter of the children who would have been in school had dropped out."

This method has not yielded results in which decision makers can have the confidence to base their decisions on. Most fail to use enrolment ratios based on solid demographic data. The lack of data on the contextual variables that might affect school's enrolment and attendance was not considered. They also do not report longitudinal changes. Because of this inherent weakness in this type of study and the inconclusive nature of the results and findings they do not lend support for the hypothesised relationship between school feeding program, attendance and enrolment (Levinger, 1986).

### **2.5.2 Comparative study**

This method compares school attendance and enrolment data among school feeding program and non-school feeding program schools to discover the relative impact of the school feeding program on the dependent variable. Mostly the comparison is based on impressionistic data rather than actual school feeding program records, this kind of study also assumes that the school feeding program and non- schools can be compared. When the targeting of schools occur it is reasonable to assume that the major differences between school feeding program and non-school feeding programs in terms of such determinants of attendance such as socioeconomic status, teacher quality, distance from pupils homes are accounted for to do a good comparison. Various studies have used this method and they are sometimes inconclusive although the reason for the lack of clear cut evidence varies.

A study in Orissa (India) using this method obtained data on enrolment, attendance and participation for 23401 schools. The enrolment ratios, absenteeism and

dropout rates were compared for School with school feeding program and non-school feeding program schools. Based on this survey and other records, the Schools were further regrouped to make them comparable. The study concluded that school feeding program did seem to affect enrolment positively particularly for lower primary. In some areas there was a small decrease in absenteeism reported by the study. Other locations where the study was undertaken reported substantially high attendance in the school feeding program schools than the non-school feeding program schools. These findings the authors explained could be attributed to the well targeted school feeding program in their implementation to have the desired results.

Three shortcomings of these methods mar the usefulness of the findings. The third limitation of this study was the failure to examine the variance in school enrolment. The enrolment was reported as an absolute number rather than enrolment ratio. The second weakness was the construction of the samples of school feeding program and non-school feeding program schools. Their comparability is also an issue as there may be other underlying issues that may contribute to the trend. The third limitation of this study was the failure to examine the variance in school enrolment, attendance and dropout rates. The study also used a tight control group and careful statistical analysis in their choice of schools to be compared. They also used a case study type of analysis to probe trends. Example interviewing students to find out the reason for their absenteeism.

### **2.5.3 Non comparative study**

This methodology attempts to gauge the importance of school feeding program on attendance and enrolment for a group of schools with the use of control group or comparative frame work. This method relies on impressionistic testimonies

from teachers concerning changes, in the attendance and enrolment. Most of the studies which use this method fails to provide systematically for a control group the conclusion seem to be in line with the believe and perception of the respondents or conventional wisdom. The impression therefore allows for only cursory review and not a robust study and critic of such work.

A study by USAID in Ghana in `1981 on the food for peace program used this methodology. They reported that these observations from the respondents who were program managers and teachers their impressions. Children attended school when there were meals and that illness was reduced. They also remarked that they felt that the children were able to pay more attention to their lessons .Thus facilitating the learning process. The teachers have reported that often many children came to school without breakfast and or lunch which affected their ability to study. These findings seem to be in line with conventional wisdom and not backed by and collaborating data that can be tested. Their feeling and impression are rather subjective and could be heavily influenced by their believes.

#### **2.5.4 Determinants analysis**

This method of evaluating the school enrolment and attendance looks at all the factors that affect school attendance and enrolment. School feeding program is not the only factor considered, Nutrition and performance and its relationship to attendance is also evaluated. In a study by Balderston, Alan Wilson, Freire & Simonen (1981) describes the link between education and nutrition. In that study in Guatemala, school feeding program was not the factor considered. It looked at all the various determinants of attendance and enrolment.

The study by Berkeley cited in Levinger (1986) in northern Guatemala, finds the major determinant of enrolment as the need for the child's help, the parents' perception of education, and the child's apparent competence and performance. These three factors that the study found as the major determinant also had various underlying factors that influenced it. These underlying factors include family size and income, educational background of parent, distance from school to home amongst others.

In another study by Moock et al (1983) his objective was to determine how individuals' parental, household and community variables affect the probability of the child being enrolled in school. Height for age as a measure for chronic malnutrition appear to be the best single predictor of whether a child was enrolled in school or not. The influence of nutritional status variables appear to be greater for boys than girls.

## **2.6 Confounder Affecting Effectiveness of School Feeding Studies**

Various studies have looked at school feeding measuring particular or a group of variables that are influenced by school feeding or school meal or snack. There are a number of factors that could have impacted on effectiveness. This section provides details on a few of them. It is important to note that although potential confounders are looked at individually, the reality is much more complex and confounders are likely highly intertwined.

### **2.6.1 Substitution**

One important concern in school feeding studies is substitution. In poor families, to spread limited resources, the home diet may be reduced for children who are receiving food at school. In two studies that assessed substitution (Jacoby et al

1996), the net increase in energy realized by the children was less than half of that provided by school feeding (breakfast and lunch). In the Kenyan study, the net increase was 140 out of 239 calories for the meat group (experimental group). Children who were given the 'milk' and 'energy' supplements actually showed net decreases of more than 100 calories. This may reduce the effectiveness of school feeding programs on children's growth and cognitive performance. Therefore, experts recommend that the amount and composition of food should be sufficient to overcome this problem. It may be that a mid-morning meal could help prevent substitution since it would be seen as a snack, not a meal by the parents therefore giving the child a full meal at home after school.

Interestingly, the results from another Kenyan Study (Whaley et al 2003) suggest that parents of control children may compensate for the fact that their children don't get fed at school. Over the 24 month period of the study, energy increase for the children in the control group increased by nearly 200 calories. They report that this finding may be peculiar to this particular study.

#### **2.6.2 Energy intensity of meal/snack-**

There is a differing energy intensity in the meals/snacks of school feeding meals/breakfast/snacks /lunch. It seems logical that the energy intensity provided by school meals would impact on outcome. As long as the energy intensity of the meals (quantity/quality) is not similar, its impact on the measured outcome targeted will greatly be affected.

Various studies reviewed do not report on compliance. The student compliance is the level of student involvement in the school meals and level of participation in the measurement of the variable. Once compliance can be carefully

monitored and reported, the true impact on the intervention can be evaluated making room for the level of discrepancy the compliance imposes on the variables.

The lack of compliance shown in several studies in high income countries suggests that school feeding programs in higher income countries should take measures to increase compliance. Timing of the meal may be important in high income countries; it seems logical that students would be less likely to attend school breakfast (which means leaving home early) than they would be to attend lunch or a snack session.

### **2.6.3 Short-term reduction in hunger**

It has been known that short term hunger influence educational outcomes. Evidence from Pollitt (1995) shows that short-term relief of hunger through breakfast can improve performance on cognitive tasks carried out on the same morning. Thus, in long-term studies, it is quite important to control for this by giving a meal to all children on the day of testing. In that way, researchers can determine whether results are due to the long-term effects of providing food rather than simply to immediate improvements as a result of morning feeding. Studies assessing the impact of feeding on outcomes such as intelligence, neuropsychological functioning, and academic achievement should consider controlling for the effects of hunger by feeding children in both the intervention and control groups on the days of testing.

### **2.6.4 Study duration**

The duration of the study affects what and how the variables are studied. For variables like weight, height, and bone mass, intelligence etc. there is a minimum time within which any treatment will be affected to show any significant effect. The Du

study (Du 2004) was as long as 24 months and showed large changes in height, but similar durations of 23 months Neumann (2003) had smaller effects. It is possible that the very large changes shown in the Du study were due to factors other than study duration (e.g. compliance and addition of calcium).

The interval between feeding and cognitive testing may also prove to be an important variable. It is expected that feeding would have immediate, but short-lived effects on cognitive processes such as processing speed and attention. Measurement of these functions should occur within minutes or hours of the feeding in order to quantify these changes. In contrast, feeding programs of a longer duration, such as months to years would be required to effect improvements on language, learning or academic tests and the interval between feeding and testing is less important when measuring these functions.

For growth, one would expect to see effects on weight with shorter study durations, and effects on height only with longer durations. Studies that assessed growth were generally of long duration; the shortest was seven months. In reviewing the results, it is difficult to discern any clear pattern by duration of the study.

#### **2.6.5 Quality of the educational environment**

The quality of the educational environment plays an important role in learning. For example, (Levinger 1996) noted that quality of instruction, teacher quality, and quality of the learning materials can play an important role in improving children's capacity to learn. There is some evidence for this in a sub-study of the Chandler et al (1995) study. Here, improvements in behaviour were only seen in one school that was 'adequately equipped and organized'. Chang Walker, Himes, Grantham-McGregor (1996) speculated that when classroom conditions were conducive to learning, the



extra energy provided by breakfast could result in improved behaviour. However, when the atmosphere for learning was poor, this extra energy could not be channelled appropriately.

### **2.7 School Feeding Project Design and Challenges**

The commonest reason for failure was that the Programme was built around a misguided theory (such as correcting a nutritional deficiency that did not exist) but other reasons may also apply.

Food offered is not consumed, or provides too little of the missing nutrient. Studies that piloted different supplements until they identified one that was readily consumed or that let children choose from a menu were, in general, more likely to improve growth. Very poor children rarely rejected food in any form, and in these studies the supplement generally had a significant effect. In contrast, those trials with adequate nutrients but less impact on growth generally documented incomplete consumption, sometimes because the children did not attend the meal.

In one pilot study, 25% of children rejected a cows' milk supplement even when it was chocolate flavoured, strongly suggesting lactose intolerance. Use of a specially formulated low lactose milk supplement refined in response to the children's feedback on its palatability had a significant effect on growth. Most trials in this review provided at least 15% of the recommended daily allowance of energy to the intervention group. Two studies that provided considerably less than 15% of the recommended daily allowance had no significant effect on weight. However, a study targeting calcium deficiency in teenage girls, which provided less than 15% of the recommended energy levels, did show a positive effect on the primary end point of

height gain, suggesting that targeted correction of micronutrient deficiency may be effective Mook et al (1983).

## **2.8 School Retention and Dropout**

Most attention is focused on enrolment and attendance and not much is given to retention and dropouts. A few studies have looked at this issue in detail. These studies have focussed mainly on the trends and pattern. In Benin, for example, the primary school completion rate in 2005 was 62 percent, although it increased steadily from 38 percent in 2000. In the Democratic Republic of Congo, the primary school completion rate in 2007 was 51 percent, which was the same completion rate for the country in the early 1990s. In Bangladesh, the primary school completion rate has remained around 60 percent since 2001.

These large numbers of children who dropout without acquiring the most basic skills in their brief schooling experience become a drain on the community and the nation. Ampiah et al (2010), cites a number of reasons for the large dropouts. This includes school condition as well as person and family situation.

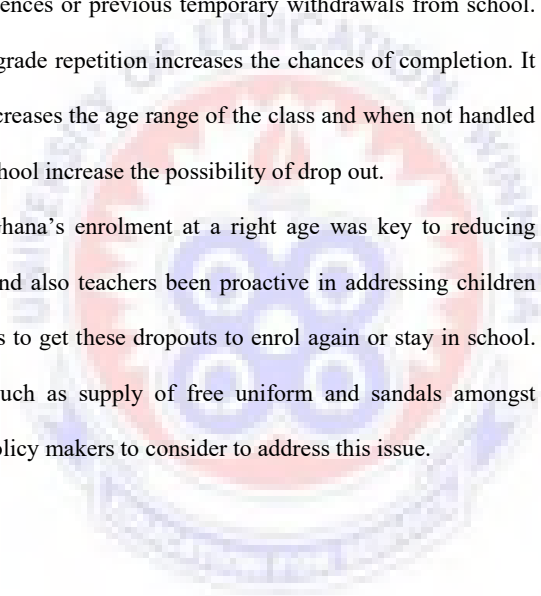
Overcrowded classrooms coupled with insufficient teaching and learning material and under qualified teachers were some of the factors that were responsible for these dropouts. Also cited in his review are other factors such as having children of different ages and abilities mixed together in single classrooms without proper adaptation of teaching methods to improve learning. These un-adapted teaching and learning methods reduce school engagement, such schooling circumstances together with personal and family level factors such as ill-health, malnutrition and poverty, jeopardise meaningful access to education for many children. As a result, many children are registered in schools but fail to attend, while other who attend and

participate but fail to learn, are enrolled for several years but fail to progress and drop out from school.

Various other studies looking at access to education considered the dropout phenomena. They found that often precursors to dropping out, where children could be seen to be at risk or vulnerable to early withdrawal (Lewin, 2008; Ampiah and Adu-Yeboah, 2009).

These include grade repetition, low achievement, over age enrollers and children who have regular absences or previous temporary withdrawals from school. The study is unclear whether grade repetition increases the chances of completion. It is interesting that repetition increases the age range of the class and when not handled well by the teachers and the school increase the possibility of drop out.

The report cited for Ghana's enrolment at a right age was key to reducing dropout increasing retention and also teachers been proactive in addressing children concerns. School feeding tends to get these dropouts to enrol again or stay in school. Other tailored interventions such as supply of free uniform and sandals amongst others are recommended for policy makers to consider to address this issue.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter describes the general approach and specific techniques adapted by the researcher to address the objectives of the research. The chapter will also discuss the study area, the research design, the population, sampling and data collection procedure.

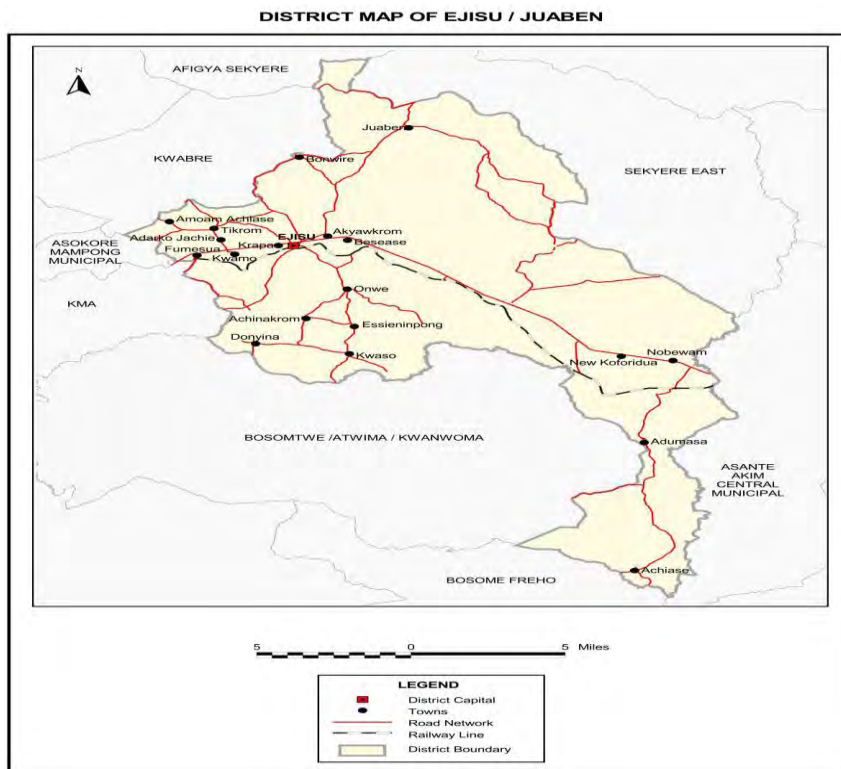
#### 3.1 The Study Area

Ejisu Juaben is one of the 27 districts of the Ashanti region. The majority of the inhabitants are farmers. The population of Municipality, according to the 2010 Population and Housing Census, was 143,762 representing 3.0 percent of the region's total population. Males constitute 47.8% male and females' represent 52.2%. The majority 72.5 percent of the population is rural. The Municipality has a sex ratio of 91.4%. The sex ratio of the Municipality is lower than the regional average of 94. The population of the Municipality is youthful (50.7%) depicting a broad base population pyramid which tapers off with a small number of elderly persons (5.1%). The total age dependency ratio for the Municipality is 81.4, the age dependency ratio for males is higher (86.2%) than that of females (77.2) (Ghana statistical service, 2010)

The literacy rate is quite low in the district. The level of poverty is high and therefore compels many children to work alongside with their parents especially on market days.

Of the population 11 years and above, 87.7 percent are literate and 15.3 percent are non-literate. The proportion of literate males is higher than that of females. Seven out of ten people (73.1%) indicated they could read and write both

English and Ghanaian languages. Of the population aged 3 years and above in the Municipality, 12.9 percent have never attended school, 42.9 percent are currently attending and 44.2 percent have attended in the past (Ghana Statistical Service, 2010).



**Figure 3.1 District Map of Ejisu Juaben District**

Source: GSS 2010

### 3.2 Research Design

A research design is the controlling plan for a research study in which methods and procedures for collecting and analysing information is collected and specified. A design is used to structure the research and also show all of the major parts of the research project. Thus the sampling or group's measures, treatments or

programs and methods of assignment which work together to try and address the central research question. The descriptive design was used for this study because, in the words of Creswell (2005) it is used to answer descriptive question such as, what is happening? How is something happening? Why is something happening? These questions are applicable to the issue under investigation. The researcher investigates the impact of school feeding program on the educational outcomes in Ejisu Juaben district. The specific design is a case study type because the researcher collected and study pupils enrolment and retention, pupils attendance and performance to investigate the role that school feeding plays in the achievement of the population.

### **3.3 Population**

Owusu Kwarteng, Odame and Oppong (2011), citing Lewis and Thornhill (2007), defines population as “a full set of cases from which a sample is taken”. The population for the study comprises head teachers and pupils in the Ejisu Juaben municipal district. Ejisu Juaben is divided into 10 educational circuits. By the end of the 2014/15 academic year there were 96 public primary schools with a total enrolment of 20,744 pupils. Out of these 96 schools 34 schools were beneficiaries of the school feeding program as the time of the research according the statistics desk of the GES Ejisu District.

### **3.4 Sampling and Data Collection Procedure**

A sample is a sub group or a representative selection of a population that is examined or tested to obtain statistical data or information about the whole population. Saunders et al (2007), sampling on the other hand is a process of selecting a group of people items or cases to be used as a representative or random sample. The

researcher used convenient sampling to select eight (8) schools in five educational circuits out of the ten (10) circuits in the district. Five (5) of the schools selected were beneficiaries of the Ghana school feeding program while the other three (3) were not. In these 5 schools with school feeding selected the research studied the enrolment trends, noting when the school feeding begun in each of these schools. The head teacher and some teachers were interviewed in each of the schools on the following:

- i. The impact of the school feeding on enrolment in their school.
- ii. The impact of school feeding on attendance to school
- iii. The impact of school feeding on the pupil's performance.

From each of the five schools selected the researcher used purposive sampling and random sampling techniques to select the teachers interviewed. Purposive sampling was used to select the head teacher of each school as well as the class 4 teachers in each of the schools. Two additional teachers were then selected using simple random sampling to make up the four teacher interviewed in each school.

In these same schools pupils' attendance were studied, using the class attendance register. The attendance was computed as a percentage of the total expected attendance, thus

$$\frac{\text{Total attendance for all pupil in a class} \times 100}{\text{School days} \times \text{number on roll for class}}$$

The total attendance per school term was by the product of the number of school days and the number of pupils enrolled in the class for the term.

These were aggregated for the school to find the schools percentage attendance for the term.

The annual percentage attendance for the school was computed in a similar manner.

These therefore afforded the research to compare attendance across terms and across schools as all the values were computed as a percentage. (*see appendix v*)

**School level annual percentage attendance**

$$\frac{\text{Total attendance for all pupil in school} \times 100}{\text{School days} \times \text{school total enrolment}}$$

Using the percentage attendance gives the research ~~three advantages~~ three advantages over using the raw attendance numbers. It allowed as comparing attendances across schools irrespective of pupils numbers in the schools. This also gave the research the opportunity to have the averages percentage for the school even when not all attendance registers for a class for a year was not available. This method of evaluating the attendance also made it easy to pick out error and outlier on further interrogate them or mark them out as errors in the data collected by the respective class teachers. Computed attendance for this method also exposed the research to some challenges. For small schools a pupil being absent for a day represented a bigger impact on the percentage than the same pupil in a bigger school.

With regards to the performance of pupils, cluster sampling was used to select pupils in basic four .The idea was that they would have been a part of the school feeding for at least two years.

A standardized test for primary four in literacy and numeracy (Mathematics and English) was conducted for pupils in the set of selected school. These schools included five schools in the school feeding program as well as three schools not enrolled unto the school feeding program.

All the test items were selected from the approved GES curriculum for primary four. The test was a set of 30 multiple choice question both for literacy and numeracy. The marks scored were the converted to a percentage score for each pupil.



The data was organized by school and schools average score, mode and standard deviation for the mean tabulated.

The scores for pupils in numeracy were analysed by putting all the school feeding scores together and comparing it with the non-school feeding schools. These were analysed using T test.

The data collection took place in the third term of the 2015/16 years. Third term was selected because the second term was filled with lots of co-curricular activities such as the independent day celebration, sports and cultural activities. In order to get the attention of both pupils and teachers it was ideal to conduct the tests in the third term. Again in order to get the co-operation and assistance of head teachers and teachers, the research involved the district director of education who provided a letter of introduction.

### **3.5 Source of Data**

There were two (2) sources of data used. These were primary and secondary data. The primary source was the first hand information gathered through the use of freshly prepared material. Primary data is made up of new materials collected directly by the research for the purpose of this study. The primary data collected for the study were obtained by interviewing the teachers and a standardised test for the pupils in primary four.

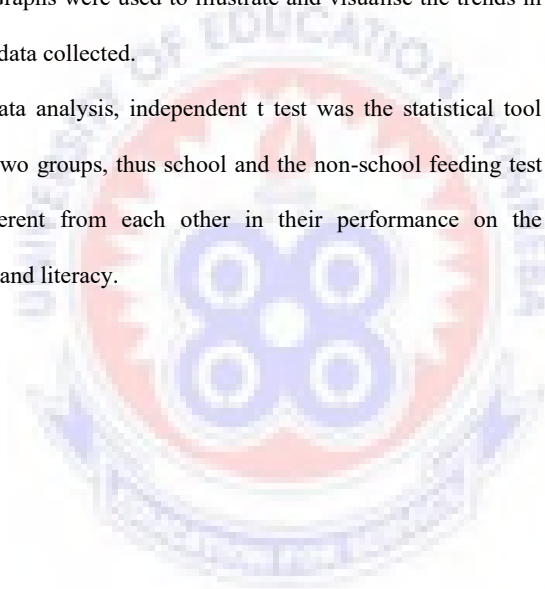
Secondary data is made up of material which has been gathered previously. It has the advantage of being inexpensive in the collection and accessible but sometimes may hide the defects of the collecting institution or tool used. The secondary data used in the study included enrolment data from the district education directorate

(which is unpublished) and attendance registers for the period studied for all schools and admission books for the schools.

### **3.6 Analysis of the Data and Presentation**

Both qualitative and quantitative data analysis were used the qualitative data analysis presented the data as obtained from the source. It gave an accurate picture of the event and sort to explain people's perception and behaviour to enable the researcher draw conclusion. Graphs were used to illustrate and visualise the trends in the enrolment and attendance data collected.

For the quantitative data analysis, independent t test was the statistical tool used to check whether the(2)two groups, thus school and the non-school feeding test scores are significantly different from each other in their performance on the standardised test in numeracy and literacy.



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.0 Introduction**

This chapter presents the results that emerged from the data collection. It will cover a summary of the methodology and they proceed to present the results and discuss the results.

#### **4.1 Results and Discussion**

The study was mainly concerned with school feeding and its impact on educational outcomes. A total of eight schools were selected out of the 72 public basic schools in Ejisu Juaben district of the Ashanti region. The enrolment trends of five schools were studied for the impact of school feeding program. These schools were also studied to understand the impact of school feeding on attendance of pupils.

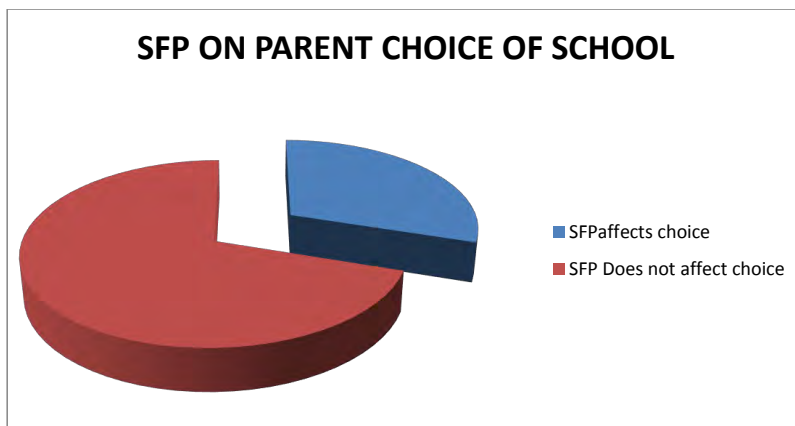
The performances of basic class four pupils from eight schools were also studied to compare pupil's performance in (literacy and numeracy). Five of these eight schools were beneficiaries of the school feeding program while the other three were non-school feeding schools.

#### **4.2 Has school feeding affected enrolment?**

The researcher interviewed a total of 20 teachers. This was made up of the head teacher of the five schools selected as well as three other teachers in each of the respective schools. These teachers were interviewed to give a better insight into the enrolment data received.

Most school feeding programs have targeted an increase in enrolment as part of the objectives. A good number of studies report an increase in the enrolment after

the inception of the school feeding. The research therefore asked the question whether in the opinion of the respondents the presence of the school feeding affected the choice of a school for parents enrolling their wards in a particular school..



**Figure 4.1: Interview Responses of Teachers to Whether SFP Affect Parents' Choice of Schools**

From the Figure 4.170% of the respondents (teachers) interviewed believed that school feeding was not a factor that influenced the choice of school for their wards. When asked a follow-up question whether the withdrawal of school feeding will affect enrolment in their respective schools, 15 of the 18 representing 83.3% indicated that it will be affected.

Examining the responses by school all the 4 respondents from the Ampabame basic school indicated that in their opinion about twenty or more pupils will be negatively affected by the withdrawal of the school feeding in their school and that these 20 or so pupils were likely to drop out.

In Kwamo MA basic school, three respondents said that the withdrawal of school feeding program will not have any significant impact on enrolment. They

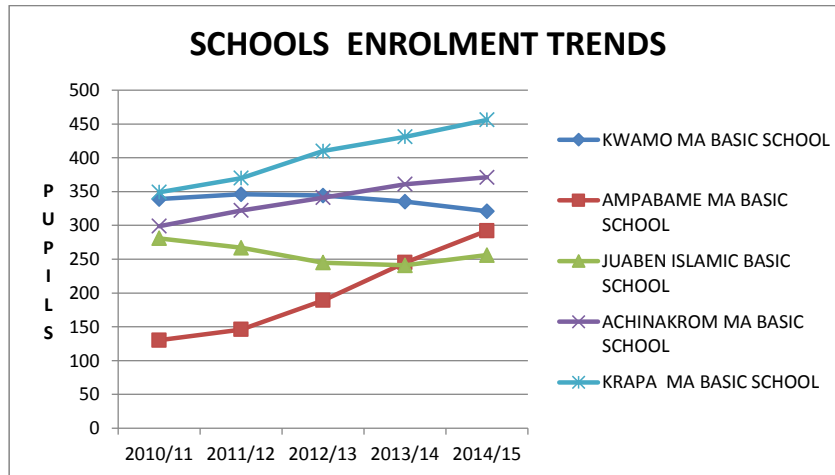
further added that the quality and quantity of food served was not good enough. They observed that while students ate the meals served by the school feeding program, they were not dependent on it. They further indicated that a good number of the pupils did not eat the meals served due to the quality of the food.

They also indicated that most pupils who were withdrawn from their schools were mostly taken to a private or a better academically performing school.

The interview also ranked the top three factors that they believed affected the choice of schools for parents. The three top factors that came up in all the teachers interviewed were academic record of school, proximity of school to home, teachers and quality of school infrastructure.

For the teachers of the only Islamic school studied all the teachers indicate the educational unit was likely to be the foremost factor before proximity and quality of the school infrastructure. It was interesting that teachers indicated that due to religious reason some pupils were commuting from nearby communities to attend the particular religious school.” Students came as far away as Damakrom about 4 km each day. This is the only public Islamic basic school in the Juaben area.” The research noted the only other private Islamic basic school was in Effiduase another 15 km away in the Sekyere West district.

The Figure 4.2 shows the enrolment data for the (5) five schools studied.



**Figure 4.2: School Enrolment Trend**

From the observations of the trends in the graph it can be seen that in Kwamo MA and Juaben Islamic basic school enrolment drop in 2015/16 academic year despite the school feeding program.

In Juaben Islamic basic school teachers could not offer any reason responsible for the reduction in their enrolment observed. The head teacher indicated that the school had moved into a new school building. This caused some pupils especially those in the lower primary and preschool to drop out due to the distance to the new location. The new school buildings coupled with the implementation of the school feeding, it was expected to result in an increase in schools enrolment. This was however not the case.

The Kwamo MA enrolment decline observed was explained by the head teacher as a movement of pupils to other private schools in their communities. “we have lost some of our good pupils to private school especially riverside academy and others” These private schools academic performance on the BECE had been high and

parents were opting for those other school. The school feeding thus did not maintain or increase the enrolment of pupils as was expected.

All the (3)three other schools experienced increase in their enrolment. In Achinakrom MA basic school there was a marginal increase in the school's enrolment over the (5) five years studies representing a 24 percent of the (5)five years. This is about five percent increase every year over the (5) five years studied. When the school feeding program was introduced in the 2013/14 academic year, the enrolment increased.

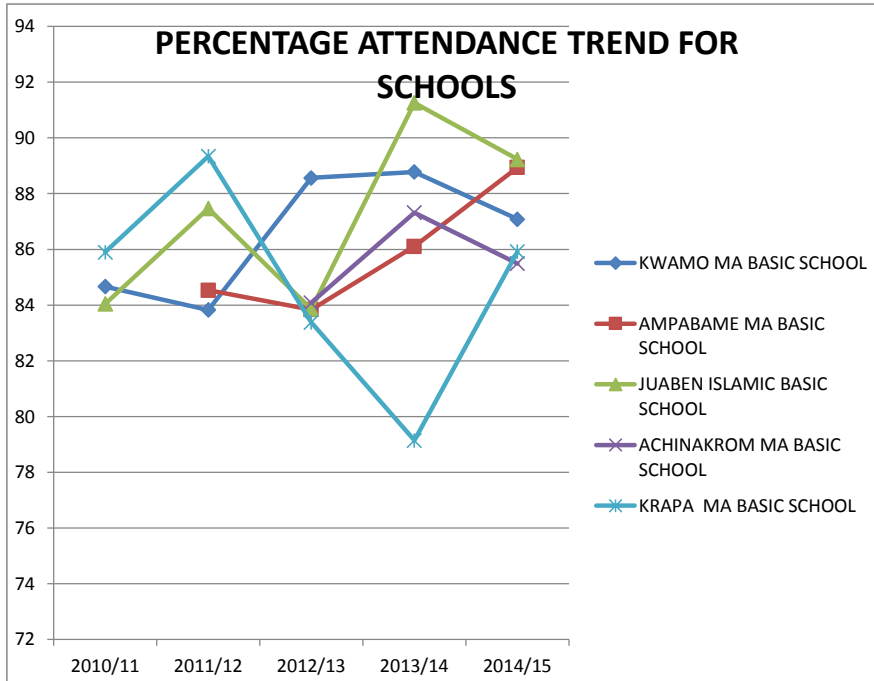
#### **4.3 Has school feeding affected school attendance?**

The attendance data were all complied from the attendance records of the archived class registers for the schools for the academics years studied.

The percentage attendance was calculated as follows

$$\frac{\text{Total attendance for all pupil in school}}{\text{School days} \times \text{school total enrolment}} \times 100$$

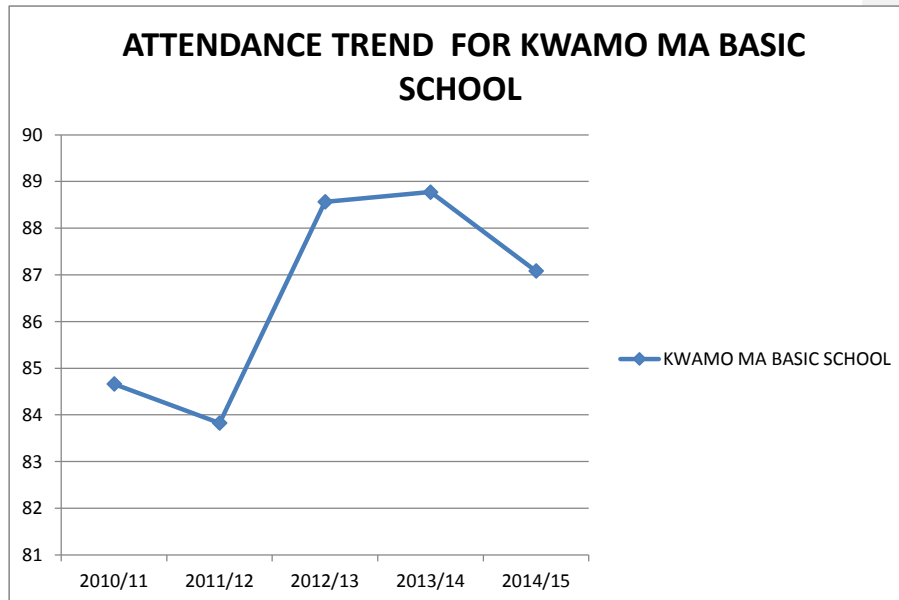
From the policy of school feeding, it was expected that the school attendance would increase or at least stabilize after years of implementation of the programme. School feeding program therefore was to retain pupils in school and therefore increase attendance or reduce absenteeism. The observed trends



**Figure 4.3: Schools Percentage Attendances for 5 Academic Years**

For Kwamo MA basic school, school feeding began in the 2013/14 academic year. The percentage attendance for the two years after the start of the implementation of school feeding was high for the first year to about 89% and a subsequent dropped by 1.8%. In the interviews to understand which other factors were at play in the high percentage attendance. The head teacher stated “our partnership with the opportunity international the NGO has changed our school for the better.”. The teachers in the school also mentioned that they had a literacy program by JICA (Japanese International cooperation agency) and Opportunity International. This program the teachers mentioned has had a very positive impact on student’s motivation and therefore increased and maintained attendance.

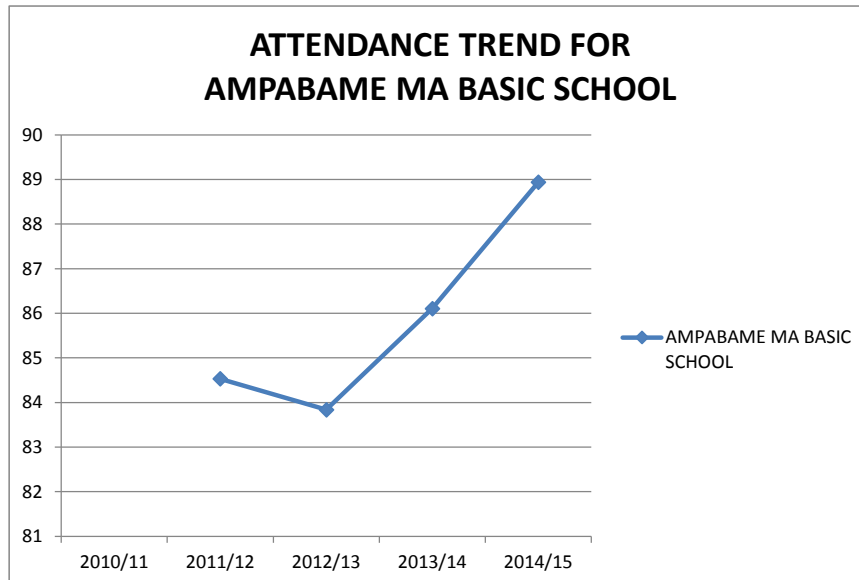




**Figure 4.4: Kwamo MA Basic School Attendance Trend**

Teachers responding to the question of how many pupils will be adversely affected if the school feeding program was withdrawn, respondents for the Kwamo School indicated that less than 20 pupils will be affected. From the Ghana statistical services report (2012) the socio economic background was higher for the Kwamo Township and therefore the parents and pupils will be less dependent on the school feeding to supplement the meals.

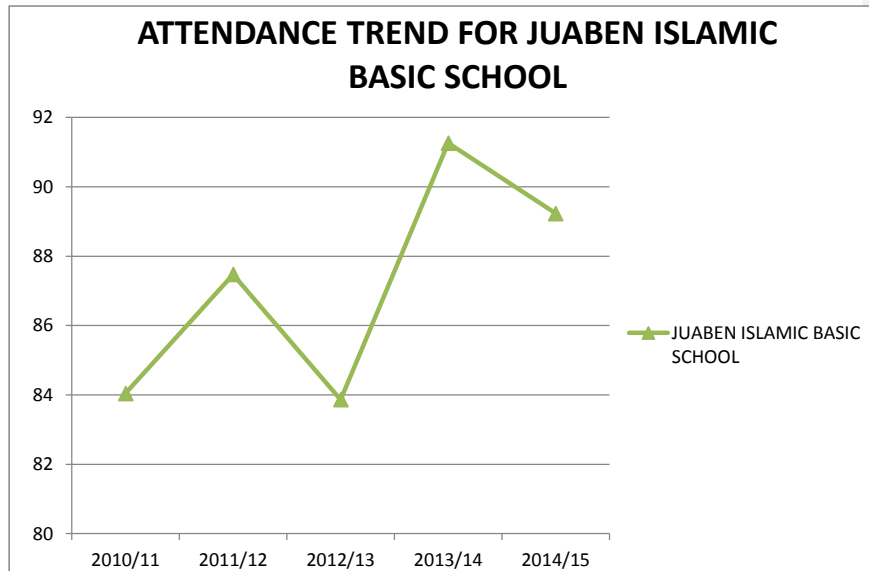
School feeding is observed to have impacted positively on attendance in Ampabame MA basic school. The school was established in 2010/11 academic year with the preschool and primary one and increase in by an additional class each academic year.



**Figure 4.5: Ampabame MA Basic School Attendance Trends**

The percentage attendance increased after a drop in the 2012/13 academic year. The school feeding programme was started in 2012/13 academic year. This indicated that from the start of the program the percentage attendance for the school continued to increase as observed on the graph (figure 4.4). In the interview with the head teacher and two other teachers they mentioned that the withdrawal of school feeding would affect both enrolment and attendance.

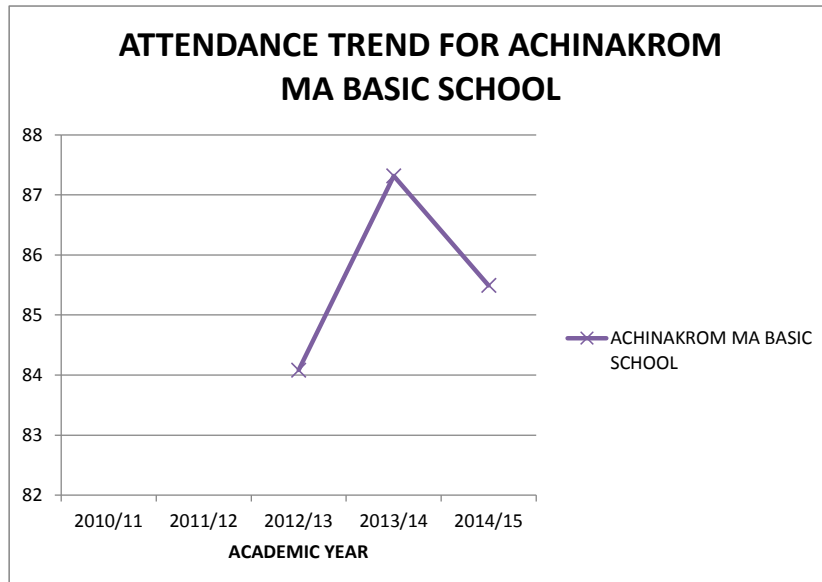
Though the infrastructure in the school was good, the community was a peri-urban and incomes of the parents seem to be relatively low (GSS 2010). The quality of the meals served in the school was observed by the researcher to be the best among all the schools visited. Hence the positive effect on school attendance.



**Figure 4.6: Juaben Islamic Basic School Attendance Trends**

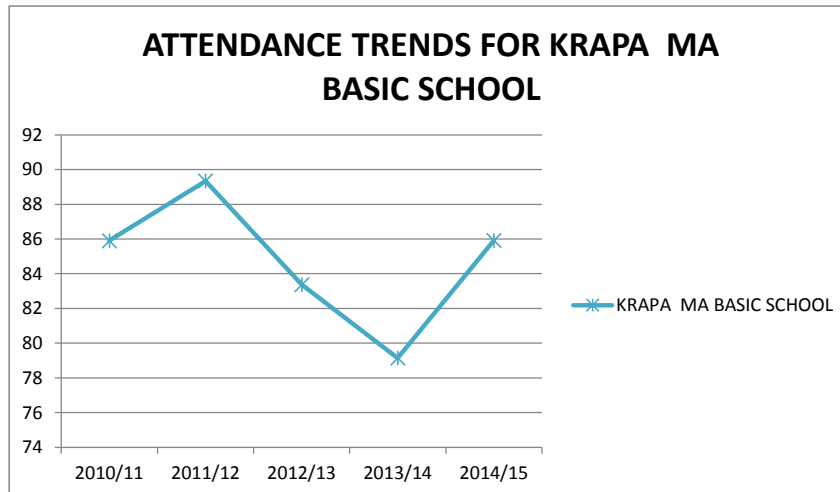
Juaben Islamic basic school feeding began in 2011/12 academic year. In the academic year the school feeding begun, there was an increase in the percentage attendance by 3.5% over that of the previous year. In the 2012/13 academic year there was a drop to 84.04 % which is below the preschool feeding levels.

The interviews found that the attendance drop could be explained by the relocation of the school to a new premise. The headteacher stated “our lower primary and pre-school kids” Following the relocation of the school a lot of the lower primary school pupils absented themselves from school especially in the rainy season. Subsequently the mosque and the community put in place improved access and improved advocacy that increase attendance and enrolment.



**Figure 4.7: Achinakrom MA Basic School Attendance Trend**

In Achinakrom MA basic school attendance data was unavailable for the 2010/11 and 2011/12 academic years. School feeding begun in 2012/13 academic year. The start of the school feeding brought along with it an increase in the school's percentage attendance. There was about a 3% increase in the percentage attendance but dropped by 2.3% in the 2014/15 academic year. The interview could not find any reason for the varying trends in the attendance data observed. The research however picked up a relatively lower attendance in the month of June 2014. This the research presumed to be due to heavy rainfall at the time of the year.



**Figure 4.8: Krapa MA Basic School Attendance Trend (data source appendix)**

In Krapa MA basic school, the school feeding program started before the period of the research. The school was one of the selected schools for the pilot study of the school feeding program in 2006. The fluctuation in the percentage the research observed could have been due to the relocation of the school. There was however not enough information as the relocation happened over a three year period, the head teacher had been changed and the archived records for most of the class registers requested were unavailable.

#### **4.4 How has school feeding affected the Academic Performance**

According to Stanley Twain (2011), academic performance of pupils is affected by 4 main groups of factors. These include the student/pupil related factors, teacher related factors, school related factors and the family related factors. These factors interact in a very complex way to impact on the academic outcomes of students. Based on these complex interactions of factors the research approached this study in a comparative manner. By comparing pupils in a school feeding program to

those of a non-school feeding program it is assumed all the other factors are cancelled out. The performance can thus be similar or significantly different.

The pupils were assessed by administering a standardized test in numeracy (mathematics) and literacy (English language). The test comprised of 30 multiple choice questions for each of the test subjects which the basic four pupils were to take in one hour. The test score for each pupil was assessed over 30 and converted into a percentage score. The results of the academic performance by school as obtained are tabulated in table 4.1. The summary of the schools performance showing the average score, mode score, standard deviation and variance as well as number of pupils in each school is shown in the table below. The performance was split into literacy and numeracy.

**Table 4.1: Summary of Literacy Test Scores**

LITERACY					
<i>SCHOOL</i>	<i>AVERAGE SCORE (%)</i>	<i>MODE SCORE (%)</i>	<i>COUNT</i>	<i>STD</i>	<i>VARIANCE</i>
KWAMO MA BASIC SCHOOL	75.35	93.33	38.00	13.90	193.30
AMPABAME MA BASIC SCHOOL	77.44	76.67	30.00	10.77	116.06
JUABEN ISLAMIC BASIC SCHOOL	43.19	40.00	24.00	10.78	116.18
ACHINAKROM MA BASIC SCHOOL	50.63	43.33	32.00	18.53	343.36
KRAPA MA BASIC SCHOOL	53.13	36.67	33.00	20.05	401.98
JUABEN PRESBY BASIC SCHOOL	57.00	60.00	20.00	15.56	242.11
EJSU PRESBY BASIC SCHOOL	59.19	70.00	28.00	28.90	835.04
EJSU EXPERIMENTAL BASIC SCHOOL	44.71	30.00	29.00	17.28	298.48

**Table 4.2: Summary of Numeracy Test Score**

<i>SCHOOL</i>	<i>AVERAGE SCORE (%)</i>	<i>MODE SCORE (%)</i>	<i>COUNT</i>	<i>STD</i>	<i>VARIANCE</i>
KWAMO MA BASIC SCHOOL	75.09	93.33	38	13.59	184.64
AMPABAME MA BASIC SCHOOL	69.40	70.00	30	21.41	458.28
JUABEN ISLAMIC BASIC SCHOOL	73.33	56.67	24	12.77	162.96
ACHINAKROM MA BASIC SCHOOL	61.46	70.00	32	14.19	201.35
KRAPA MA BASIC SCHOOL	62.93	60.00	33	10.69	114.31
JUABEN PRESBY BASIC SCHOOL	55.17	60.00	20	14.12	199.42
EJISU PRESBY BASIC SCHOOL	53.43	52.00	24	34.26	1174.06
EJISU EXPERIMENTAL BASIC SCHOOL	49.43	60.00	28	16.89	285.11

On the literacy test Ampabame and Kwamo basic school had the average scores over 70% with 24 and 38 pupils respectively. These two schools were both on the school feeding program. The two (2) schools with the lowest averages were Juaben Islamic and Ejisu experimental basic schools. The two schools scored an average score of below 50% on the literacy test.

Interviewing teachers on the role of the meals in the academic performance and the teaching and learning in the classroom. All the teachers interviewed accepted that short term hunger of their pupils was a factor that hindered the learning process in their respective classes. Short term hunger as it is known has a documented effect that is known to impair learning of children. It is also known to decrease pupil's

concentration, affect pupils understanding, and in some cases even result in the pupils dosing off during lessons. Loga, Dorcas Elizabeth (2012)

Of the 20 teachers interviewed, only 30% of the teachers interviewed observed an increased activity level and pupil participation in the class after the lunch break. A large majority representing 70% did not notice a difference in their pupil's participation and activity level. When asked whether the teachers have special or particular lesson or subjects used to fill these periods, after the lunch break. It was noted that most teachers indicated the afternoon lessons were filled with one of the following subjects, ICT, creative art, religious and moral education. These lessons were one of the subjects which engendered a high level of participation of pupils. The roles of the teachers in most of these lessons were facilitation of student's experiences and sharing their opinions rather than communicating idea and knowledge to the pupils.

The scores of the pupils in the school feeding was compared with those of the non-school feeding in both literacy and numeracy using the independent T test assuming equal variance.

**Table 4.3: Independent Sample T Test Result on Numeracy Scores**

	<i>SFP</i>	<i>NON SFP</i>
Mean	68.387	59.722
Variance	199.618	283.490
Observations	155	72
Pooled Variance	226.084	
Hypothesized Mean Difference	0.000	
Df	225.000	
t Stat	4.041	
P(T<=t) one-tail	3.660E-05	
t Critical one-tail	1.652	



As shown in Table 3, the mean test score for the pupils in the school feeding program was 68.3 whereas 59.7 was obtained in the non-school feeding pupils. Table 3 further shows that a statistically significant difference existed in the mean test scores for school feeding pupils at the 0.05 level of significance between school feeding pupils scores and non-school feeding,  $t(232) = 3.660E-05$ ,  $p < 0.05$ . Results therefore show that the school feeding had a significant impact on the numeracy test scores and the impact on the test score was positive. This results is similar to the findings of the study by Powell et al (1998) in Jamaica and Whaley et al (2003) which studied the effect of school breakfast on the mathematic and logic tests.

They explained that the meals served had the effect of solving short term hunger, that translated into improved attention and hence the improved scores observed. The other studies also recommended that on the days of the test all pupils had to be provided with meals to cancel out the effect of the short term hunger on the test day.

**Table 4.4: Independent T Test Result for Literacy Test Scores**

	<i>SFP</i>	<i>NONSFP</i>
Mean	61.13	57.01
Variance	428.85	386.14
Observations	157	77
Pooled Variance	414.86	
Hypothesized Mean Difference	0.00	
Df	232.00	
t Stat	1.45	
P(T<=t) one-tail	7.40E-02	
t Critical one-tail	1.65	

On the literacy test pupils on the school feeding averaged a score of 61.1 while their counterparts on the non-school feeding average a score of 57.0%. An independent t test was used to check the impact of school feeding on the literacy test scores  $t(232)=1.65$   $p=0.074$  with school feeding not having any significant impact on the test score at a 0.05 level of significance. This thus means that the school feeding test scores were similar to that of the non-school feeding. Although the school feeding recorded a higher mean test score. The difference was not statistically significant to make an inference on school feeding impacts on the literacy test scores.

The data was checked for its suitability to use the test as it was noted the sample for school feeding was twice as much as the non-school feeding. The non-school feeding score recorded for both numeracy and literacy were both normal/bell distributions making it easy to simulate and use it in the T test analysis.

It was noted that some of the pupils tested could not read. The pupil's inability to read seems to have influence the scores achieved by the pupils on both tests. Teachers interviewed also indicated the scores achieved would have been better if the questions were read to them.

Based on the model by Powell et al (1998) that school meals reduced short term hunger, improved attention and thus enhanced learning, it would be expected the pupils in the school feeding would have the a significantly higher test scores. This was however not the case. The pupils on the school feeding had a higher score and that could be attributed to the effect of the meals improving attention and learning as explained in the Powells study.

The pupil's inability to read seems to have influence the scores achieved by the pupils on both tests. Teachers indicated the scores achieved would have been better if the questions were read to them.

Only 20% of teachers indicated that attention and class participation of pupils was observed to increase after the lunch break. Most teachers reported no changes in the pupil participation and interest in their respective classes. It could be possible that the effect of eliminating short term hunger and its attendant effect on attention and learning affects the results.

#### **4.5 General Observations**

- The pupil's inability to read seems to have influence the scores achieved by the pupils on both tests. Teachers indicated the scores achieved would have been better if the questions were read to them.
- Teachers and School management committees were not involved and did not have any records of their concerns of food quality or hygiene of the food served.
- Teachers expressed the concern that the caterers were linked with political figures that may exact power against them if they complained about some breeches in the feeding of the pupils under the Ghana school feeding program.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The preceding chapter has presented the results of the study and the discussion. This covered the impact of school feeding program on enrolment and attendance on the selected schools in the Ejisu Juaben district of the Ashanti region of Ghana. The chapter also discussed the impact of the school feeding program on performance by comparing it with performance of non-school feeding pupil's. This chapter focussed on the key findings of the study, recommendations and conclusions.

#### 5.2 Summary of Findings

70% of teachers interviewed believed school feeding program did not influence parent on choice of school to enrol their wards.

All teachers believed the withdrawal of school feeding was likely to affect school attendance negatively in their respective schools.

All teachers interviewed accepted short term hunger affected teaching and learning in their schools but only 30% observed increase participation and activity after lunch(school feeding lunch).

Enrolment was observed to increase with the inception of school feeding but inconclusive as to it being caused by school feeding.

Attendance trends seem to increase with school feeding inception but noted other factors such as relocation of school, weather, influencing the increase trends expected.

From the data collected school feeding had a significant effect on numeracy scores recorded for school.

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## 5.2 Conclusion

Evidence from this study reveals that the enrolment of the schools studied went up over the period of study. There was a significant increase in almost all the schools the very year the school feeding began in the respective schools. The study also found that there were other factors that came along with school feeding which might influenced this increase. These factors included the provision of new school blocks, new furniture as in Achinakrom MA. Though the rise in enrolment was not by a huge percentage, it was consistently for all the five schools.

The percentage attendance was observed to have increase for the schools with the school feeding studied. It was -observed the school meals -was insufficient and not as well organised as it was expected, it still prove to have had a positive impact on attendance. The relocation of schools to new sites was noted to have affected the schools attendance especially in the first year of relocation. The other factors beyond school feeding which affected attendance were only recorded as -the teacher opinions.

The impact on school feeding on performance (cognitive skill and abilities) of pupils in this study found that was -pupils from the school feeding performed better in numeracy test than those in the non-school feeding group. The difference in the performance was significant as observed. The reason for this could not be wholly attributed to school feeding. According to Stanley Twain (2011) .There are four facts that affect pupil's performance, these include pupil factors, and teacher related factors, family related factors and the school related factors. The research assumed that all these factors remained fairly even across the eight schools studied.

Pupils on the school feeding also performed better than those not on ~~the school~~the school feeding on the literacy test. Though the performance was better the

difference in the mean scores for the two groups was not significant on the literacy test

The pupil's inability to read seems to have influenced the scores achieved by the pupils on both tests. Teachers indicated the scores achieved would have been better if the questions were read to them.

Only 20% of teachers indicated that attention and class participation of pupils was observed to increase after the lunch break. Most teachers reported no changes in the pupil participation and interest in their respective classes.

#### 5.4.3 Recommendation for Improved Implementation

Based on the inception model created to run the school feeding program, there has been various departure from the model therefore affecting the smooth implementation of the program. To enhance the program implementation I will recommend the following:

1. The school management committee SMC should actively monitor and provide feedback to the feeding program office as the quality and quantity of meals given to pupils as it was observed in all the school visited the meals was either insufficient or/and the quality substandard.
2. Stakeholders should explore the possibility of pre-financing the program as local caterers due to lack of funds produced insufficient and sub-standard meals and still get paid a full value for delivering these substandard meals.
3. Schools should manage the recorded keeping and archiving of records. Most schools could not produce attendance record beyond 3 years due to poor storage and archiving. Where the records were provided they were not stored well so the data could not be retrieved.

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~~Schools should manage the recorded keeping and archiving of records. Most schools could not produce attendance record beyond 3 years due to poor storage and archiving. Where the records were provided they were not stored well so the data could not be retrieved.~~

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#### **5.3.4 Recommendation for Further Studies**

From Pollitt, et all (1998), Loga ~~E-D~~(2010) and based on findings of this study, it was clear that short term hunger of pupils was an issue teachers agreed it affected the teaching and learning. Ghana school feeding as part of the objectives hopes to resolve this problem of short term hunger. From the finding of this work it is also apparent that pupils on the school feeding performed significantly better on the numeracy test than their counterparts not on the school feeding. This is in line with the findings similar Powells study in Jamaica which stated the short term hunger influences mathematics and other logical test scores.

♦ I recommend a further study that looks at short term hunger among primary school pupils and to what extent it affects teaching and learning in the Ejisu Juaben.

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♦ I also recommend a broad study that looks at the impact of school feeding on attendance trends. What other factors are the major on pupil's attendance in Ghana?

♦ Finally a long term study that tracks the influence of school feeding on academic performance involving a bigger sample that monitors —academic performance over at least one year.

#### **5.4 Recommendation for Improved Implementation**

~~Based on the inception model created to run the school feeding program, there has been various departure from the model therefore affecting the smooth implementation of the program. To enhance the program implementation I will recommend the following:~~

- ~~• The school management committee SMC should actively monitor and provide feedback to the feeding program office as the quality and quantity of meals given to pupils as it was observed in all the school visited the meals was either insufficient or/and the quality substandard.~~
- ~~• Stakeholders should explore the possibility of pre financing the program as local eaters due to lack of funds produced insufficient and sub standard meals and still get paid a full value for delivering these substandard meals.~~

~~Schools should manage the recorded keeping and archiving of records. Most schools could not produce attendance record beyond 3 years due to poor storage and archiving. Where the records were provided they were not stored well so the data could not be retrieved.~~



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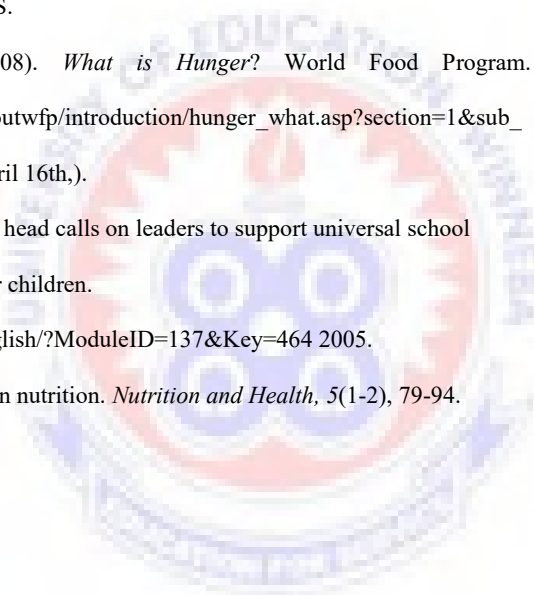
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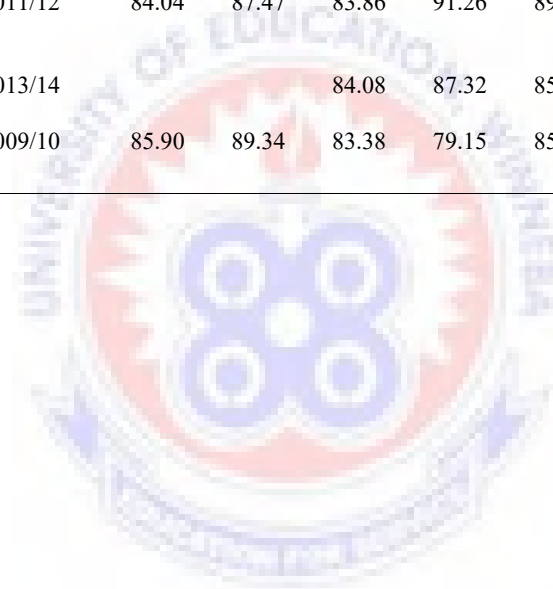
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**APPENDIX I****Table 1****PERCENTAGE ATTENDANCE  
PER ACADEMIC YEAR**

SCHOOL	FEEDING START YEAR	2010/11	2011/12	2012/13	2013/14	2014/15
KWAMO MA BASIC SCHOOL	2013/14	84.66	83.83	88.57	88.78	87.08
AMPABAME MA BASIC SCHOOL	2012/13		84.53	83.84	86.10	88.94
JUABEN ISLAMIC BASIC SCHOOL	2011/12	84.04	87.47	83.86	91.26	89.23
ACHINAKROM MA BASIC SCHOOL	2013/14			84.08	87.32	85.49
KRAPA MA BASIC SCHOOL	2009/10	85.90	89.34	83.38	79.15	85.92



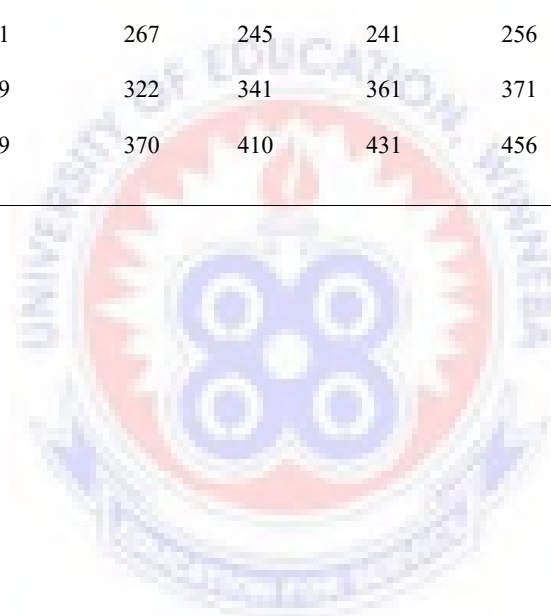


## APPENDIX II

Table 2

## ENROLMENT

SCHOOL	2010/11	2011/12	2012/13	2013/14	2014/15
KWAMO MA BASIC SCHOOL	339	346	344	335	321
AMPABAME MA BASIC SCHOOL	130	146	189	245	292
JUABEN ISLAMIC BASIC SCHOOL	281	267	245	241	256
ACHINAKROM MA BASIC SCHOOL	299	322	341	361	371
KRAPA MA BASIC SCHOOL	349	370	410	431	456



**APPENDIX III**

**UNIVERSITY OF EDUCATION, WINNEBA**

**SCHOOL OF GRADUATE STUDIES**

**INTERVIEW GUIDE FOR THE TEACHERS AND HEAD TEACHERS**

1. Do parents consider school feeding in the choice of schools for their wards? (yes/no)
2. What do you think parents consider in the choice of school for their wards?
  - Feeding program
  - Academic record of school
  - Proximity of school
  - Educational unit (Methodist, Presby, Islamic)
  - School infrastructure
  - Others
3. Has there been any other intervention which has attracted pupils rather than school feeding? (yes/no)
4. If any what are these?
5. If school feeding was withdrawn will it affect enrolment in your class or school? (yes/no)
6. In your opinion how many pupils do you think would be negatively affected if the school feeding program was withdrawn?
7. Does hunger affect the teaching and learning in your class? (yes/no)
8. Do you observe a change in pupil's participation and activity after the meal break?
9. To what extent does hunger affect the performance in general?
10. Do you think the pupil's performance on the tests administered would change if the questions were read to them?
11. Do you have any special/ particular lessons taken after the lunch break?
12. How do you observe the participation of pupils on these lessons after the lunch break?
13. What changes would you recommend to the school feeding program to better serve its purpose?

**APPENDIX IV**  
**UNIVERSITY OF EDUCATION, WINNEBA**  
**SCHOOL OF GRADUATE STUDIES**

**TOOL FOR DATA COLLECTION ON ATTENDANCE**

SCHOOL		ATTENDANCE								
		2012/13			2012/13			2012/13		
		first			second			third		
		enrolmen	sch days	attendance	enrolmen	sch days	attendance	enrolmen	sch days	attendance
CLASS	1									
	2									
	3									
	4									
	5									
	6									
	<b>TOTAL</b>									
PRE-SCHOOL	KG 1									
	KG2									
<b>SCHOOL TOTAL</b>										

**APPENDIX V**  
**NUMERACY TEST**

**SUBJECT: MATHEMATICS**

**CLASS: BS 4**

**TIME: 1HR**

Answer questions in this section. Each question is followed with Options lettered A - D. Choose and circle the correct Answer.

1. 
$$\begin{array}{r} 165\text{g} \\ 231\text{g} \\ +200\text{g} \\ \hline \end{array}$$

(A) 559g (B) 569g (C) 596g (D) 566
2. 1 Kilogram=?  
 (A) 10,000gram (B) 1,000grams  
 (C) 100grams (D) 10grams
3.  $200 \square 4 = 50$   
 a. + b. - c.  $\times$  d.  $\div$
4. 3minutes=?  
 (A) 60seconds (B) 120seconds  
 (C) 180seconds (D) 240seconds
5. 
$$\begin{array}{r} 125 \\ \times 20 \\ \hline \end{array}$$

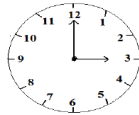
(A) 250 (B) 2,500  
 (C) 25,000 (D) 250,000
6. How many weeks are there in a year?  
 (A) 51weeks (B) 52weeks  
 (C) 53weeks (D) 54weeks
7. What is the 2nd month of the year?  
 (A) February (B) May  
 (C) June (D) August
8.  $\frac{1}{2}$  Kilogram  
 (A) 200g (B) 250g (C) 500g (D) 550g

9.  $4424 \square 4244$   
 A > B. < C. = D.  $\neq$

10. A four sided figure is called  
 A. Triangle B. Quadrilateral  
 C. Circle D. Square

11.  $222 \times 2 = \square$   
 A. 444 B. 424 C. 442 D. 344

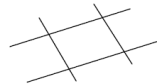
12. What says the time?



- (A) Half past 1 (B) Quarter past 1  
 (C) Quarter to 1 (D) Three O' clock

13. If 1hour is 60minutes, half an hour gives how many minutes?  
 (A) 20minutes (B) 30minutes  
 (C) 40minutes (D) 50minutess

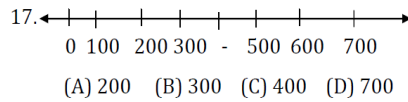
14. How many points of intersections are seen in these intersecting lines?



- (A) 2 (B) 3 (C) 4 (D) 5

15.  $60 \div 2 = ?$   
 (A) 10 (B) 20 (C) 30 (D) 40

16. What is the name given to a five sided figure?  
 (A) Triangle (B) Nonagon  
 (C) Pentagon (D) Heptagon



18. What is the number name for the numeral 248?  
 (A) Two hundred and forty-eight  
 (B) Twenty-four and eight thousand  
 (C) Two hundred and eight four  
 (D) Two thousand and four

19.  $20,000 + 7,000 + 500 + 80 + 3$   
 (A) 27,583 (B) 20,758  
 (C) 20,538 (D) 20,000

20. 
$$\begin{array}{r} 2,362 \\ + 1,417 \\ \hline \end{array}$$
  
 (A) 3,669 (B) 3,362  
 (C) 3,417 (D) 3,779

21.  $2 \times 9 = ?$   
 (A) 17 (B) 18 (C) 19 (D) 20

22.  $10 \times 9 = ?$   
 (A) 80 (B) 90 (C) 100 (D) 110

23. 4 weeks = ?  
 (A) 1 month (B) 2 months  
 (C) 3 months (D) 4 months

24.  $80 \div 10 = ?$   
 (A) 6 (B) 7  
 (C) 8 (D) 9

25.  $16 \div 4 - 12 \div 3$   
 (A) > (B) < (C) = (D)  $\neq$

26.  $\frac{1}{10} + \frac{2}{10}$

- a.  $\frac{1}{10}$       b.  $\frac{3}{10}$       c.  $\frac{10}{3}$       d.  $\frac{6}{10}$

27. Esi left her house at 6:00am; she got to her school at 7:25am. How long did she take to get to her school?

- (A) 1 hour 25 minutes  
 (B) 1 hour 30 minutes  
 (C) 1 hour 35 minutes  
 (D) 1 hour 40 minutes

28.  $300\text{g} \square 150\text{g}$   
 (A) > (B) < (C) = (D)  $\neq$

29.  $18 + 7 = 18 + \square$   
 (A) 7 (B) 8 (C) 9 (D) 10

30.  $4 \square 3 = 12$   
 (A) + (B) - (C)  $\times$  (D)  $\div$

**APPENDIX VI****LITERACY TEST**

---

SUBJECT: ENGLISH LANGUAGE

CLASS: FOUR (4)

TIME: 1 HR

**SECTION A**

Answer all the questions under this section. Each question is followed by three options lettered A – D choose and circle the correct answer.

Read the passage below and answer the question that follows.

Once upon a time, crocodile and fish were great friends. One day they took part in a dancing competition. All the animals were excited to see the two river creatures on the stage. It was crocodile turn to dance. He tried hard to make the spectators happy but scaly back could not move to the rhythm of the drum. He wriggled his waist but he only succeeded in striking the ground with his tail. "Fish, it's now your turn", announced Ananse the master of ceremony. Fish stepped onto the stage and took a short carefully steps. He jumped, then somersaulted, ended on his back and shook his short tail. He danced beautifully and there were cheers all over the place. Fish was declared the winner of the competition.

Answer the following questions.

1. What are the names of the two river creatures in the story?
  - a. Crocodile and frog
  - b. Crocodile and tiger
  - c. Lion and tiger
2. Who was the first to step on the dance floor?
  - a. Fish
  - b. Crocodile
  - c. Lion
3. What prevented crocodile from not dancing very well?
  - a. It's fins
  - b. Tail
  - c. Scaly back
4. What kind of competition did they took part?
  - a. Singing competition
  - b. Dancing competition
  - c. Eating competition
5. Who was declared as the winner of the competition?
  - a. Ananse
  - b. Crocodile
  - c. Fish

**Put "and", "or", "but" in the correct position**

6. Saforo..... Kwasi are brothers.
    - a. And
    - b. But
    - c. or
  7. They voted for him..... she did not win.
    - a. But
    - b. And
    - c. Or
  8. You are either with us.....with them.
    - a. Or
    - b. But
    - c. And
-

- 
9. Mr. Arhin went to the lorry station early ..... he did not get a ticket.
- And
  - or
  - But

10. We waited patiently..... calmly.
- And
  - Or
  - But

**Choose the correct form of the verb to fill the spaces .**

11. My sister .....reading.
- love
  - loves
  - loving

12. The girls..... Melodiously.
- Sing
  - Sings
  - Singing

13. Vivian and Sarfo..... to school every day.
- go
  - goes
  - going

14. They ..... to obey authority.
- refuse
  - refuses
  - refusing

15. The preacher never ..... angry when people criticize him.
- get
  - gets
  - getting

**Write the correct possessive pronoun at the space provided**

16. I have done mine. When are you going to do .....
- you
  - your
  - yours

17. This book belongs to Kwaku. It is.....
- his
  - me
  - mine

18. He is a friend of .....
- Mine
  - You
  - yours
  - d

19. Mr. Ansah and his family have a beautiful house. That house is .....
- His
  - Theirs
  - Ours

20. This book belongs to them. It is.....
- yours
  - theirs
  - his
-

**Choose the correct adverbs to complete these sentences.**

21. The teacher taught as patiently.  
a. Patiently  
b. The teacher  
c. Taught
22. Kofi can do work easily.  
a. Easily  
b. Kofi  
c. Work
23. Stay outside the room  
a. Room  
b. Outside  
c. stay
24. John went to church yesterday.  
a. Went  
b. John  
c. Yesterday
25. Ama is sleeping upstairs.  
a. Upstairs  
b. Sleeping  
c. Is

**Change the verb in bracket to the past tense**

26. We (go) to church yesterday.  
a. Gone  
b. Went  
c. Goes
27. Yankah (dance) at the party yesterday.  
a. Danced  
b. Dancing  
c. Dance
28. The President (tell) them about his experience.  
a. Telling  
b. Told  
c. Tells
29. Your mother (give) you some money.  
a. Give  
b. Gave  
c. Given
30. The farmer (take) a parcel.  
a. Take  
b. Taken  
c. Took
-