



EFFECT OF SCHOOL FEEDING PROGRAM ON ACADEMIC PERFORMANCE OF PUBLIC PRIMARY SCHOOL PUPILS' IN E.P NGARA AND E.P TABA IN GASABO DISTRICT, RWANDA (2020-2022)

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ABSTRACT

*This study aims at investigating the effect of school feeding program on academic performance of public primary school pupils' in E.P Ngara and E.P Taba in Gasabo District, Rwanda (2020-2022). The school feeding program has been one of the best strategies for enhancing the students' academic performance in public primary schools since 2014. The study employed 333 participants sampled from 2 schools in Gasabo district. Among them 163 were males while 170 were females. The study used a correlation and descriptive design. The demographic variables were reported by using frequencies and percentages while the descriptive questions were analyzed by using mean and standard deviation tools of STATA. The relationships between variables were studied by using Pair wise correlation whereas the predictive model was reported by analyzing regression tools of STATA. The results showed the high perception of respondents on School feeding program ($M = 4.16$; $Std. D = 0.32$). The same respondents scored high perception on Students' academic performance ($M = 4.0$; $Std. D = 0.36$). The study demonstrated a strong positive correlation between School feeding program and Students' academic performance ($r = .564^{**}$, $N = 333$, $P = .007$). Finally, the regression analysis results showed that School feeding program predicts the Students' academic performance at the level of 56.4% of variance. From those findings, the study recommends for future researchers to study other factors that contribute to the performance of students such as the teacher and staff morale, gender disparities, and long-term impact on the school feeding program.*

Keywords: Feeding, Home Grown Meals, On-site meal, School, Primary Education, Public school, Student Performance.

I. INTRODUCTION

The study assessed the effect of school feeding program on academic performance of public primary school pupils' in E.P Ngara and E.P Taba in Gasabo District, Rwanda (2020-2022). In 2019, UNICEF, the United Nations Children's Fund, continued to advocate for the right to education as established in the Universal Declaration of Human Rights and the Convention on the Rights of the Child. Moreover, one of UNICEF's perspectives was access to quality education; this means, that all children, regardless of their background or circumstances, have the right to access a quality education. This includes equitable access to education for girls, children with disabilities, those from marginalized communities, and refugees. Quality education can have many meanings (Unterhalter, 2019) but in Rwanda, it is defined as "all children leaving school equipped with the skills, knowledge, attitudes and values needed for Rwanda's economic and social development and for their own further educational and social development" (World Bank, 2011, p. 90). School Feeding Program is the provision of prepared or raw foods to school children and is implemented in two ways: firstly, is in-school feeding food given at school to reduce immediate hunger, and secondly the one to take home as a condition for school attendance (Aliyar et al., 2015, Yendaw & Dayour, 2015). Severe and prolonged hunger affect pupils' admission to school, concentration, behavior during lesson, and learning outcomes (WFP, 2015).

Official estimates show that when the school feeding program was expanded to pre-primary, primary, and secondary school children in 2021, over 3,500,000 students had access to the school feeding program that served one square meal. Not only that, but also the educational managers suggested that motivating teachers and students may be also the factors of successful in the academic journey. With this regard, the Government of Rwanda (GoR) adopted the system of nourishing students at school in order to reduce time consuming during going and back at home for getting food or missing food totally. This decision is a motivational factor of students who may come from low social- economic income families and it is called School Feeding Program (SFP) (MINEDUC, 2021). After SFP has been established, in 2014 in Rwanda, the significant impact on the performance of students was observed. The number of dropped out and absenteeism among students has been reduced. There was an increasing in enrollment of students in schools and the learning process has improved (Sesonga, 2016). According to the Millennium Development Goals (MDGs, 2015) which calls for universal primary education by 2015 Patrinos and al (2002, p4), education is thought to be the central of economic development. It is also viewed as a major contributor to human capital, leading to high productivity and living standards. Primary education is thought to be associated with especially high returns. In fact, primary education is far from universal and this MDG remains elusive. UNICEF (2008; p 18), the agency responsible for tracking progress on this MDG, estimates a net primary school enrollment rate in developing countries of 84 per cent; this is also its estimated average for Rwanda. In the developing world and beyond like Brazil, not only because of their education but the school feeding program has been noted for its nutritional benefits. According to FAO & WFP (2018), School feeding refers to meal provision to school children. World Food Program (2017) stated that School Feeding Programs are far more than food-giving. Regardless a large empirical literature on the relationship between school feeding programs and educational attainment, reviewed in Bundy et al. (2009; p31), there have, to the best of our knowledge, been no large-scale assessments of their causal impact on enrollment (Adelman et al. 2007; p3).

In Ethiopia, one of the countries in the Sub-Saharan region where hunger has been a significant barrier to child education, the country has historically experienced severe famines, often drought-affected rural areas. According to Desalegn (2011), most households usually find it difficult to feed the entire family since their food production falls short of the demand in the household. Consequently, even children must engage in some activities to generate household livelihood. Thus, many children in food-insecure areas remain out of school. In addition, nearly half of all children under five years are stunted, and malnutrition has been associated with school-age children with special needs, again among the highest in the world.

However, during 2015-2016 the country suffered the worst drought in 50 years, with 18 Million of its 100 Million people needing aid, prompting the government to provide food assistance to millions of affected students. In Wolaita Zone, one of the food insecure areas in Ethiopia's Southern Nations, Nationalities and Peoples Region (SNNPR) because the number of chronically food insecure populations aided by productive safety net program for the past years was about 38,773 beneficiaries. In addition, the area is vulnerable to child and maternal malnutrition (stunting, wasting, and underweight), malaria infection, starvation, dependency, drop out of education, migration, and emergency food aid. It implies the existence of socio-economic, demographic, and other factors underlying the poverty and food insecurity problem in the study area (Adimasu, Senbetie & Yoseph 2019). Moreover, Rwanda education sector is faced with many challenges like, hunger, poverty, gender, etc. (UNESCO, 2019). However, one of the main goals of the education policy in Rwanda is to eradicate all causes and barriers that led to those challenges. School feeding program (SFP) is one of the policies meant to eliminate some of the challenges the education system is faced with. The policy is thought to increase enrollment using two main channels. First, it increases the returns to education. Secondly, it improves child nutrition by providing meals at school to foster learning. The problem of absenteeism, drop out, and low Students' academic performance were at high level in this district at the level of provoking the leaders of the country to involve themselves in mobilization for improving the above stated issues.

Finally, the School feeding program has come as one of the solutions to stop absenteeism of students, reduce drop out students, and then improve Students' academic performance.

A. Problem Statement

According to Rwanda Human Development Index, 2021, Rwanda has a low Human Development Index, ranking 165th out of 191 countries and a GDP per capital. This has a significant influence on taxable income which stands proportionate to the public funds available for spending on education. In 2021, Rwanda spend 15, 2% of its national budget on education, making it the sector with the second highest spending. Of this budget, which has significantly increased over the last few years, 44% go to primary education, 32% to secondary and post-secondary education, and 22% to tertiary education (UNICEF, 2020). Their attendance and results are felt and approximately 700,000 children or 18% of the total living in particularly difficult conditions and poverty. In addition, a study on effect of domestic violence on learning effectiveness conducted in Gasabo district by Sikubwabo (2021) found that there are absenteeism, drop out, and low academic performance of students in primary schools of Gasabo district due to the domestic violence. This observation worries local authorities because those students are the ones who will attend 9&12 YBE in the future and if the primary studies are not well completed, it will affect their performance in secondary studies. The SFP has come as one of the solutions to stop absenteeism of students, reduce drop out students, and then improve SAP.

B. Objectives of the Study

This study is sought to:

- Assess the status of the school feeding program in public primary schools in Gasabo District, Rwanda;
- Evaluate the status of students' academic performance in public primary schools in Gasabo District, Rwanda;
- To examine the relationship between the school feeding program and students' academic performance in public primary schools in Gasabo District, Rwanda

C. Hypotheses

Null Hypothesis (H₀): There is no significant relationship between the school feeding program and students' academic performance in public primary schools in Gasabo District, Rwanda.

II. REVIEW OF LITERATURE

A. The concept of school feeding program

School feeding program can off-set the opportunity costs of families, and are particularly effective for increasing the school attendance and participation of vulnerable populations, including nomadic communities (Kinyanjui, 2022). For example, Kenya has implemented this type of strategy since 2009 through the school meals program. The program aims to promote enrolment, attendance, and achievement by providing meals to students from vulnerable localities (Ruto, Gachoya and Ngindiru, 2022). It also stimulates local agricultural production as the food comes from local and small farmers and suppliers (Ruto, Gachoya and Ngindiru, 2022). After six years' experience of school implementation benefiting from WFP's Food Assistance for education, in partnership with the Ministry of Education, the Government of Rwanda is geared towards developing a national school feeding program, taking into consideration the Rwandan context. This approach will have to be community – based and oriented towards sustainability of school feeding by the schools and the surrounding communities. Having several years' experience with school feeding in Rwanda, the Ministry of Education recognizes the significant value it adds to the quality of education provided, particularly in poorer areas. The Ministry wished to build on this experience and consolidate the various government and development partner-assisted initiatives implemented into one comprehensive nationally owned homegrown program, initially targeting the most vulnerable areas of the country, with a gradual scale-up over time to reach national coverage.

The Food for Education aimed at children that hunger and poverty prevent access to school, and when they are in school, to concentrate on their studies. The goal of targeting is to identify and reach families and communities that lack the resources to adequately provide for their school-age children. Joy Miller Del Rosso(1999,p4) School Feeding Program is intended to motivate families to enroll children in school and to ensure more regular attendance, the target group is families whose children are not in school or who are frequently absent. Joy Miller Del

Rosso(1999, p5) Mechanisms and criteria for SFP targeting are similar in many cases to those used for other social programs: economic, geographic, and nutrition status. In addition, specific education criteria such as overall enrollment, female enrollment, absenteeism, or student performance would also be included under some circumstances.

In general it appears that School Feeding Programme targeting is best done at the level of the school, or based on some other criteria - e.g., location - rather than on individual selection. The coverage of School Feeding Programs will depend on how many resources are available for programs and on the size of the problem that the program is intended to address. The school feeding program aims to improve basic education, especially by increasing enrollment, attendance and academic achievement. School feeding also contributes to reducing drop in areas of high food insecurity GUY (2006;p4). It aims to reduce the access to education disparities where they result from a gender gap, and it can also seek to address other disparities (urban, rural, and inter-regional). WFP's goal is not to substitute its resources to government resources. At the beginning, the objectives were the general improvement of the nutritional status of children and the fight against malnutrition. Over the years, research has shown that malnutrition among school-age children is the result of many factors, and is not limited to energy intake. In addition, these studies revealed the complex relationship between health, nutrition and education. As per, MINEDUC (2013, p2). The main objectives of School Feeding Program in Rwanda are: To ensure adequate nutritional intake for pre-primary and primary school-aged children, with a focus on the poorest and most food insecure areas; reduce disparities in pre-primary and primary education through improving enrolment, attendance, and completion rates and reducing dropouts and create a structured demand for agriculture production, with a significant portion procured from smallholder farmers.

To attain the above objectives, MINEDUC has devised a targeting strategy as part of the scenario creation in the cost analysis recently undertaken. It defines priority areas for intervention and a road-map for scale-up by ranking all thirty districts of the country in order of vulnerability. Vulnerability rankings were defined by creating a composite score made up of three equally weighted indicators. The indicators utilized were: the prevalence of chronic malnutrition; the prevalence of impoverished households and the prevalence of households with unacceptable food consumption. The districts were then classified into vulnerability levels. MINEDUC (2013,p4). The main channel for the WFP is the public primary schools extern-ship. SFP is to distribute to students a meal or snack on school days. The meals are encouraged to attend the school which is reflected by an increase in enrollment, especially for girls, in places where hunger and malnutrition are rife. According to the WFP report (2006, p3) In Bangladesh, a school feeding program covering 6000 schools increased the enrollment rate of 14.2%. Following World program "Living for education" enrollment increased by an average of 10.4% and 11.7% for girls in 4000 schools surveyed. Other studies have found that such programs have also had positive results, for example in the Andean regions of Peru in 1996, Malawi in 2002 and India in 1999. FAO (2000, p 27) states that WFP provides 38 years of highly nutritious meals to school children in poor countries around the world. With the support of national governments, local authorities, directly uses this food aid to bring the children to school in areas where enrollment rates are particularly low.

WFP establishes partnerships in schools with parents, teachers and officials whose mobilizes time, equipment and when it proves possible financial contribution. In this context, the associations of parents of schoolchildren turned out to be the element of community participation. In general, the community provides essential personnel such as cooks, kitchen helpers, monitoring agents, or its finance the recruitment of external providers. It can also participate in various ways to know how to build a basic canteen room, assist at the time of delivery and storage of food, helps the canteen by in-kind contributions.

B. Concept of Academic performance

The ability of a student to complete a task is considered as performance in education. The task completion results could be positive or negative. Academic performance in private universities is undulating between first and third classes, rare in public universities. If the result is positive, it indicates that the student performs brilliantly or excellently, but on the other hand, if it is negative, it indicates woeful performance. Student performance is an outcome of a rigorous evaluation through examination or other assessment methods (Balogun et al. (2021).

C. Theoretical Review

➤ *Maslow's hierarchy of needs*

Abraham Maslow's theory suggests that students' basic physiological needs, such as food and nutrition, must be met before they can focus on higher-level needs, including education. School feeding programs help fulfill this foundational need, potentially improving students' ability to learn. Motivation has the following functions: motivates, energize and sustain behavior. It energizes the behavior of the organisms and arouses it for action .It also sustains behavior for longer periods in the activity. In Maslow's hierarchy of needs, the physiological needs must be met. That children need food in the right quality and quantity. Food is necessary because it builds, protects and repairs the body. The malnutrition and its effects on brain development have tremendous implications on child performance. Poorly fed children are more exposed to disease infections and emotional frustrations as compared to well fed children.

➤ *Nutrition theory*

This theory posits that providing students with nutritious meals through school feeding programs can improve their cognitive development, concentration, and overall brain function. Proper nutrition is essential for optimal brain growth and function, which can positively affect academic performance.

D. Empirical Review

➤ School Feeding Program and Pupils' performance in Africa

School feeding programs constitute critical interventions that have been introduced in many developed and developing countries of the world to address the issue of poverty, stimulate school enrolment and enhance pupils' performance. In developing countries, almost 60million children go to school hungry every day and about 40 percent of them are from Africa. Providing school meals is therefore vital in nourishing children. Parents are motivated to send their children to school instead of keeping them at home to work or care for siblings (Akanbi, 2013). The introduction of the school feeding is traced to the Millennium Development Goals (MDGs) initiative and several conferences held thereafter by African leaders which aimed to tackle issues, such as peace, security, good economic, political and corporate governance and to make the continent an attractive destination for foreign investment. Some of these developments include the 'New Partnership for African Development' which according to the blueprint is a pledge by African leaders, based on common vision and a firm and shared conviction, to eradicate poverty and to place their countries on the path of sustainable growth and development and, at the same time, to participate actively in the world economy and politics. Also, the 'Comprehensive African Agriculture Development Program' and the 'Millennium Hunger Task Force' among others were initiatives which were designed to link school feeding to agricultural development through the purchase and use of locally produced food (Bundy et al, 2009).

➤ School Feeding Program and Pupils' Performance in Nigeria

Nigeria happened to be one of twelve (12) pilot countries invited to implement the program. So far, Nigeria, Cote d'ivoire, Ghana, Kenya and Mali commenced the implementation of the school feeding program. As a result, the Federal Government came up with the Universal Basic Education Act in 2004, which provided the enabling legislative backing for the execution of the Home Grown School Feeding and Health Program. Towards the realization of the objectives of the Universal Basic Education program and the central role of nutrition, the Federal Ministry of Education launched the Home Grown School Feeding and Health Program in 2005. The overall goal of the School Feeding Program in Nigeria is to reduce hunger and malnutrition among school children and enhance the achievement of Universal Basic Education. Osun was among the twelve (12) States selected to begin a phased-pilot roll out implementation of the program. Although The Home Grown School Feeding and Health Program were launched, it did not receive attention until the change of government in the State in November, 2010. Subsequently, the new administration, under the leadership of Ogbeni Rauf Aregbesola convened an education summit headed by Professor Wole Soyinka. The summit's objective was to critically examine the problems hampering growth and progress of education in the State and to proffer workable solutions. At the end of the Summit, recommendations were made towards repositioning education in Osun State which among others included the School Feeding Program transformation. Thereafter, a comprehensive review of the old school feeding program was undertaken. The Program was re-packaged and christened "Osun Elementary School Feeding and Health Program – O' meals" It was formally launched in the State on 30th April, 2012 with

the pupils in Grades 1-3 of the Public Primary Schools in the State being fed with one meal per day (Ministry of Education, 2014).

➤ **School Feeding Program and Pupils' Performance in Rwanda**

School feeding forms part of the Government of Rwanda Programs, the National Strategy for Transformation (NST1-7YGP), the Education Sector Strategic Plan, Food Security and Nutrition policy, the School Health Policy, the Multi-sectorial Strategy to Eliminate Malnutrition, and is recognized as an effective targeted safety-net by the social protection sector in the social protection sector strategy in the country. In addition, the GoR tried also to increase in number of school infrastructures where they are needed. Note that for some schools did not have enough classrooms, dining halls, kitchens, libraries, and latrines. Those missing infrastructures are now being constructed by the GoR in collaboration with World Bank (Ashimwe, 2020). For dining halls, some schools are using classrooms for taking meal at lunch time (Buningwire, 2021). This practice reduces hygiene in classrooms and affects time for studying by cleaning where food were taken, sometimes the first hour after lunch is lost for these reasons which may impede SAP. However, the academic performance of students is also influenced by motivated and qualified teachers, the availability of teaching materials, such as books, computers, and teaching aids. It is also motivated by the available and enough science and computer laboratories which may be connected to the internet. According to Vision 2020, Rwanda is committed to reaching "Universal Education for All" in line with SDG 4: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The objective is to have all infants and young children fully achieve their developmental potential (MINECOFIN (2012). The National Strategy for Transformation (NST1-7YGP 2017-2024) highlights the eradication of Malnutrition through enhanced prevention and management of all forms of malnutrition (Republic of Rwanda (2017). Furthermore, in the Education Sector Strategic Plan (2018/19 – 2023/24) the Government aims at strengthening school nutrition program, drawing upon community participation and creating a national HGSF program. One of the key strategic directions of the National Food and Nutrition Policy aims at improving food and nutrition in schools. The strategy calls for sustaining and expanding existing school feeding programs, and further recommends that emphasis be placed on bringing on line and rapidly expanding new approaches to school feeding including the large scale Home Grown School Feeding program (MINALOC, MINISANTE, MINAGRI (2014). The need for strengthening the ongoing school feeding programs is further reiterated in the National School Health Policy. Finally, the 11th National Leadership Retreat held in Gabiro (2014) recommended "putting in place mechanisms enabling implementation of the school feeding program in 12-year basic education in collaboration with parents. The 16th national leadership retreat recommended revamping the implementation school feeding program.

➤ **Research gaps**

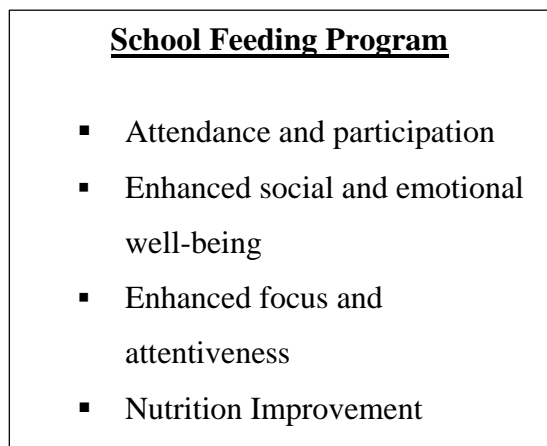
School feeding program was practiced in many other countries. The study conducted on SFP in Tanzania by Maijo (2018), has demonstrated a significant effect of this practice on the academic performance of students who have been in this program. This impact was shown in reducing

student’s absenteeism, increasing in examinations performance, and enhancing their enrollment in the given program of studies (MINEDUC, 2021). In the same line, Adroque and Orlicki, (2013) demonstrated that SFP has enabled student’s performance in Argentina, the country that has chronic problems of malnutrition. Amber Gove (2016), has examined the impact of school feeding programs on educational outcomes; where he reviewed other literature assessing the impact of school feeding programs on educational outcomes, focusing on enrollment, attendance, and academic achievement. According to Carolina T. Avellaneda (2017), a research has been done on school feeding and learning achievement; Evidence from Indore, India. Her study explores the relationship between school feeding programs and learning outcomes in India. In Rwanda, according to Ndayisaba (2022), the school feeding program has been one of the best strategies for enhancing the students’ academic performance in 9&12 YBE schools since 2014. The issue of students’ academic performance (SAP) is a pre-occupation of countries and their stakeholders in education. The country that wants to improve its economy and sustainable development invests more in its educational system in order to get skilled human capital (Ndayisaba, 2022). After reviewing other literature, the researcher observed that there has been no sufficient study on the effect of school feeding program on the academic performance of students, particularly on primary students. In my own opinion, the primary students are the ones will be prepared to go to junior and senior high and so there is a need to do research on how the school feeding program affect their academic performance.

E. Conceptual Framework

According to Bas Swaen & Tegan George (2022), a conceptual framework illustrates the expected relationship between your variables. It defines the relevant objectives for your research process and maps out how they come together to draw coherent conclusions. Moreover, Conceptual frameworks are often represented in a visual format and illustrate cause-and-effect relationships.

Independent Variable (I.V)



Dependent Variable (D.V)

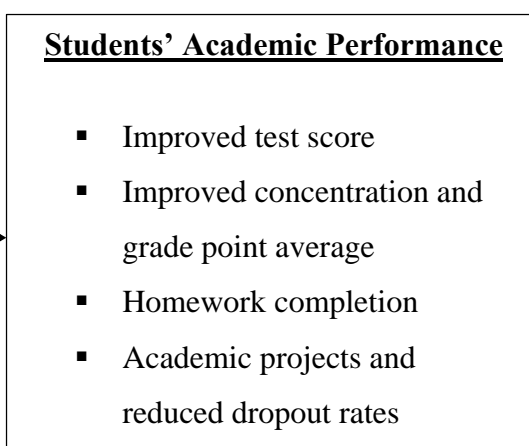


Fig 1: Conceptual Framework

Source: Researcher design, 2023

III. MATERIALS AND METHODS

A. Research Design

This study used a correlation design. This design is according to Rutberg and Bouikidis (2018) correlation design studies the relationship between two variables. In this study, the researcher examined the relationship between school feeding program and students' academic performance in public primary schools in Gasabo District. In addition, the study adopted a descriptive design with mixed methods. The descriptive design was set to establish scores for individual items of school feeding as well as establishing the effect of school feeding on academic performance of pupils in primary schools. However, the qualitative approach was needed because studies such as ways of people's lives, behaviors, emotions and feelings as well as organizational functions and social movements, among others, are better studied in ways that generate data, which are mainly qualitative. Therefore, it helped in discovering the views, feelings and experiences of especially the pupils, teachers, head teachers and parents regarding the relationship between the school feeding program and academic performance. Doing so, the researcher assessed if there is a causal relationship between SFP and SAP. This design helped the researcher to obtain the accurate and reliable measurements that allowed him to conduct an analysis of data statistically (Queirós, Faria, & Almeida, 2017).

B. Sampling Procedures

In this regard, the study adopted the Yamane's formula for sample size calculation as quoted by Isaac & Michael (2018), which is computed as follow (we shall detail and demonstrate the sample size of selected respondents with their respective schools and areas once we will be authorized to get on the field for data collection process). The formula is labeled as below:

$$n = \frac{N}{1 + Ne^2}, \text{ Where:}$$

n: Is the sample size

N: Is the target population for participants

e: Is the Margin of error (e = 5% = 0.1).

For examples, let us speculate that the population target for the study will be 2000 respondents who have benefited from the school feeding program over the period of the study.

Therefore, the sample becomes;

$$n = \frac{N}{1 + Ne^2} =$$

$$n = \frac{2000}{1 + 2000 (0.05)^2}$$

$$n = \frac{2000}{1+5} = \frac{2000}{6} = 333.3 = 333 \text{ respondents}$$

➤ *Data Collection Procedures*

During data collection the researcher used different techniques and tools of data collection, these include;

- *Documentation*

This tool was used in data collection especially in literature review and data analysis. It was used purposely in analyzing the historical background of the problem, how that problem is improving and how it is presently. This was done by reading textbooks, journals, institution records or reports, notice from Internet, primary and secondary data from respondents E.P. Ngara & E.P. Taba schools.

- *Interview guide*

This is a list of questions or issues that were explored in the course of an interview. It is prepared to make sure that essentially the same information is obtained from a number of people by covering the same material. The interview guide was used as the main tool in data collection by researcher where the researcher interacted with different respondents. The researcher set predetermines questions, putting in mind the objectives of the study and research questions. The researcher asked the questions, listened to, and recorded the answers from the respondents and additional relevant questions were asked. This was done through concentration, being attentive and the researcher waited for the respondents to finish answering. Interviewing becomes an art and science requiring skill, sensitivity, concentration, interpersonal understanding insight, mental acuity, and discipline. According to Creswell (2014: 25), interview is asking questions from the research and getting answers from participants in a study. Using interview has several advantages as listed below; The interviewer decides on how to use the limited time available for the interview: interview guide helps make interviewing different people more systematic and comprehensive by delimiting the issues to be discussed in the interview; it is useful in conducting group interviews and keeps the interaction focused and it can be used to both illiterate and literate respondents and they can be asked in their language (Kinyarwanda, for i.e.).

- *Questionnaire*

A questionnaire is a series of questions asked to individuals to obtain statistically useful information about a given topic (Roopa and Rani (2020). In my understanding, when properly constructed and responsibly administered, questionnaires become a vital instrument by which statements can be made about specific groups or people or entire populations. This study used questionnaires which were distributed to the participants. The questionnaire helped to gather qualitative and quantitative data concerning the topic. Both open and close-ended types of questions were prepared and distributed.

C. Data Analysis Methods

Qualitative data and quantitative data from data collection instruments were summarized in the frequencies, means and percentages and all data collected were analyzed with the use of Statistics and Data (STATA 15.0).

➤ *Correlation Analysis*

Correlation analysis is a statistical method utilized to examine the relationship between school feeding indicators and students' academic performance. It quantifies the extent to which changes in one variable are linked to changes in another variable. The primary objective of correlation analysis is to determine if there is a statistical connection between variables and, if so, to measure the strength and direction of that connection (Johnson & Brown, 2012). Correlation coefficients range from -1 to +1, where a value of +1 denotes a perfect positive correlation (both variables increase together), -1 represents a perfect negative correlation (one variable increases while the other decreases), and 0 signifies no correlation (no relationship between the variables) (Jones, 2009).

➤ *Regression Analysis*

The objective of conducting regression analysis in this study was to understand and quantify the relationship between school feeding program indicators and students' academic performance variables. The analysis aims to examine the effect of attendance, social and emotional well-being, enhancing focus and attentiveness, and nutrition improvement variables on students' academic performance, as well as predict future outcomes based on these relationships. By utilizing regression analysis, the study identified the nature, direction, strength, and significance of these relationships.

IV. RESULTS AND DISCUSSIONS OF FINDINGS

A. Correlation Analysis

Table 1: Pair wise correlation of school feeding program indicators and student academic's performance

Variables	(1)	(2)	(3)	(4)	(5)
(1)Academic performance	1.000				
(2) attendance	0.676*	1.000			
	(0.000)				
(3) Nutrition Improvement	0.612*	0.679*	1.000		
	(0.000)	(0.000)			
(4) Enhancing focus and attentiveness	0.652*	0.692*	0.602*	1.000	

	(0.000)	(0.000)	(0.000)		
(5) Social and Emotional well-being	0.668*	0.723*	0.644*	0.635*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	

Note: The asterisk * denotes significance of variables' relationship at the 1% level

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Table 2: Primary six Students' performance in National Exam before and after school feeding program

Schools	school feed program	Number of pass	number of fail	Total	% of students passed national exam
1st school	Before(2020/2021)	107	11	118	90.6
	After(2021/2022)	115	08	123	93.4%
2nd School	Before(2020/2021)	150	29	179	83.7
	After(2021/2022)	153	8	161	94.4

The data presented in Table 2 demonstrates the academic performance of primary six students in two schools prior to and following the introduction of a school feeding program. Each school is represented in separate columns, and each row shows the performance before and after the implementation of the feeding program. For the first school, in the 2020/2021 academic year prior to the feeding program, 118 pupils took the national exam. Of these students, 107 passed, resulting in a pass rate of 90.6%, while 11 failed. Following the introduction of the feeding program in the 2021/2022 academic year, the number of passing pupils increased to 115, with 8 failing. The total number of students taking the exam also rose to 123, leading to a higher pass rate of 93.4%. In the second school, before the feeding program during the 2020/2021 academic year, 179 pupils took the national exam. Among these students, 150 passed, while 29 failed, creating a pass rate of 83.7%. Once the feeding program was implemented in the 2021/2022 academic year, the number of passing pupils rose to 153, with 8 failing. At the same time, the total number of students decreased to 161, resulting in an improved pass rate of 94.4%. In conclusion, based on the information presented in Table 4.5, the feeding program had a positive effect on the academic performance of primary six students in both schools. The higher pass rates accomplished after the installation of the program suggest its efficacy in enhancing student performance in the national exam.

B. Regression Analysis

Table 3: Effect of school feeding indicators used on students' academic performance

Dep. var. student's academic performance	Coef.	St. Err.	t-value	p-value	Sig
attendance	.196	.063	3.13	.002	***
Social and Emotional well-being	.232	.051	4.56	0	***
Enhancing focus and attentiveness	.136	.05	2.74	.007	***
Nutrition improvement	.343	.075	4.57	0	***
Constant	.387	.221	1.75	.081	*
Mean dependent var		4.161			
R-squared		0.564			
F-test		98.792			
Akaike crit. (AIC)		-88.390			

Note: The asterisk *, ** and * denotes significance of variable respectively at the 1%, 5% and 10% level**

The above table 3 explains that, the objective of conducting regression analysis in this study was to understand and quantify the relationship between school feeding program indicators and students' academic performance variables. The analysis aims to examine the effect of attendance,

social and emotional well-being, enhancing focus and attentiveness, and nutrition improvement variables on students' academic performance, as well as predict future outcomes based on these relationships. By utilizing regression analysis, the study identified the nature, direction, strength, and significance of these relationships. The findings from the table 3 indicated that the school feeding program has a positive effect on students' academic performance, specifically through improved attendance, social and emotional well-being, enhancing focus and attentiveness, and nutrition improvement. The R-squared value of 0.564 suggests that these variables explain approximately 56.4% of the variation in students' academic performance. The F-test result of 98.792 and the Akaike crit. (AIC) value of -88.390 provide additional support for the significance of the relationship between the school feeding program indicators used and students' academic performance.

C. Interpretation and Discussion of findings

According to the results in the table 3, the school feeding program indicators used have a significant positive effect on students' academic performance in public primary school in Gasabo District. Initially, the study's hypothesis tested whether the increase in student attendance resulting from the school feeding program had a significant impact on their academic performance. According to the findings in table 3, the student attendance variable had a coefficient of 0.196 with a t-value of 3.13 and a p-value of 0.002, indicating a statistically significant effect. This suggests that for every unit increase in student attendance, their academic performance increases by 0.196 units. Therefore, the participation of students in the school feeding program has a positive influence on their attendance, which in turn affects their academic performance. These findings align with those of Smith et al. (2018), who observed higher attendance rates among students who received regular meals through the program compared to those who did not. Smith et al. attributed this increase in attendance to the provision of nutritious meals, which addressed hunger and provided students with the necessary energy and focus to consistently attend school, ultimately impacting their academic performance. Similarly, Johnson and Hernandez (2019) conducted a study that investigated the impact of a school nutrition program on attendance rates and found a significant increase among participating students. Thus, the provision of regular meals through the program contributes to higher attendance rates, leading to an overall improvement in the academic performance of the students involved.

Secondly, the hypothesis of this study tested whether there is a significant relationship between students' social and emotional well-being and their academic performance within the context of a school feeding program in public primary school pupils Gasabo district. The findings, as presented in Table 4.14, revealed a strong and statistically significant positive correlation between students' social and emotional well-being and their academic performance. The coefficient for the variable representing social and emotional well-being was 0.232, with a t-value of 4.56 and a p-value of 0.000. This suggests that for every unit increase in social and emotional well-being, there would be an estimated increase of 0.232 units in academic performance. These results indicate that by improving students' social and emotional well-being, a conducive learning environment can be created, which in turn positively influences academic performance. This finding aligns with prior research conducted by Anderson et al. (2017), which

demonstrated that students involved in a school feeding program experienced an enhancement in their social and emotional well-being. The provision of nutritious meals not only helped alleviate stress and anxiety but also facilitated positive social interactions and emotional stability among students, resulting in improved academic performance. This connection between the school feeding program and heightened social and emotional well-being is crucial as it has the potential to establish a favorable learning environment that positively affects students' academic performance.

Thirdly, the study tested hypothesis that an enhancing focus and attentiveness has a significant effect on students' academic performance. The results in table 4.14 reveal a significant positive effect of enhancing focus and attentiveness on students' academic performance. The coefficient of 0.136, t-value of 2.74, and p-value of 0.007, support the significance of this finding. The results demonstrate that a one-unit increase in enhancing focus and attentiveness contributes to a 0.136 increase in students' academic performance. This is because providing nutritious meals through the school feeding program enhances students' ability to concentrate and focus during classes, ultimately leading to improved academic performance. These findings align with a study conducted by Robertson et al. (2019), which also reported similar results. In their research, Robertson et al. (2019) observed enhanced focus and attentiveness among students who participated in a school feeding program. This additional study further reinforces the idea that the school feeding program positively influences students' concentration and attention during lessons, thereby enhancing their academic performance.

Additionally, the study tested hypothesis that student's nutrition improvement has a significant effect on students' academic performance. The findings from table 4.14 strongly support the association between nutrition improvement and academic performance, with a coefficient of 0.343, a t-value of 4.57, and a p-value of 0.000, indicating its statistical significance. The findings reveal that every unit increase in nutrition improvement leads to a 0.343 increase in academic performance. These findings emphasize the crucial role of proper nutrition in facilitating optimal academic achievement among students. Another study conducted by Johnson et al. (2020) further supports and strengthens this association. In their research, Johnson et al. (2020) found a significant positive correlation between improved nutrition and academic performance among students. The study demonstrated that students who received adequate nutrition consistently achieved higher academic outcomes compared to those with inadequate nutrition. This supportive study reinforces the notion that nutrition plays a vital role in supporting students' academic success.

V. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

The purpose of this research is to find out the effect of school feeding program on academic performance of public primary school pupils' in E.P Ngara and E.P Taba in Gasabo District, Rwanda (2020-2022). So the research sought to establish the effect of school feeding program on academic performance of students at E.P Ngara and E.P Taba, the extent to which school feeding program contributes to students' academic performance, the effect of school feeding program on

students' performance and to find out the relationship between school feeding program and students' academic performance. Based on the findings, the research found that the school feeding program has a positive effect on students' academic performance in public primary schools in Gasabo District, Rwanda. Specifically, the program is seen as effectively implemented, providing nutritious and balanced meals, and having a positive influence on students' health and well-being. It is also believed to encourage regular attendance, support students' concentration and academic performance, and caters to the dietary needs and preferences of all students. Moreover, parents and guardians, as well as teachers and school staff, express high satisfaction and active involvement in the program. Nevertheless, the overall aggregate mean of 4.57 indicates a positive evaluation of the school feeding program's influence on students' academic performance and engagement.

In summary, the data suggests that the school feeding program in Gasabo District is well-implemented and positively received, contributing to students' well-being and academic performance. In addition, the findings can be interpreted that the status of students' academic performance in public primary schools in Gasabo District, Rwanda is generally positive. The mean scores for all statements range from 4.4 to 4.8, indicating a high level of satisfaction with various aspects of academic performance. The standard deviations are relatively low, suggesting a high level of agreement among respondents. Specifically, the students are perceived to demonstrate a satisfactory level of academic achievement and show noticeable improvement over time. They are actively engaged in their learning, supported by effective instruction from teachers. The curriculum is considered adequate in preparing students for future academic challenges, and the schools provide sufficient resources and materials to enhance student learning. Furthermore, the assessment methods used are seen as accurately measuring student academic progress, while the support services provided effectively address their educational needs. The presence of extracurricular activities is believed to contribute to the holistic development of students. Lastly, the findings can be interpreted that the school feeding program has had a positive influence on students' attendance and motivation to attend school regularly. The mean scores for statements 1, 2, 3, 4, and 5 all range from 4.14 to 4.26, indicating that the majority of students agree or strongly agree that the school feeding program has positively influenced their motivation to attend school regularly, improved their overall attendance and punctuality, reduced barriers to consistent attendance, encouraged them to come to school regularly, and helped them feel more connected to the school community. These findings suggest that the program has had a positive influence on various aspects of attendance and students' perception of their school experience. Based on the above findings, school feeding program ensures children focus on their studies thus improving concentration, learning, cognitive functions, in-class behavior and academic performance. According to Maslow's theory, students' basic physiological needs, such as food and nutrition, must be met before they can focus on higher-level needs, including education. School feeding programs help fulfill this foundational need, potentially improving students' ability to learn. With consideration to this, the study contributes to psychology by providing the physiological needs of students.

B. Recommendations

After realizing the effect of the school feeding program on the academic performance of students, and how it is very important in the daily learning process, environment and performance of the students; some recommendations have been suggested to the various stakeholders involved in education here in Rwanda.

➤ *Recommendation for the Government*

The research found that the school feeding program has a positive effect on students' academic performance so that is why most recommendations will be addressed to the government, mainly education policy makers and stakeholders:

Firstly, Ministry of education should make school feeding program work effectively in all public primary schools. This can be done by making school feeding program one of the major fort heads in the Primary Education in all districts, allocation of funds and provision of adequate meal. This will ensure that all schools have feeding programs. This will not only achieve the Millennium Development Goals (MDG) of school feeding program but also improve the pupils' academic performance.

Concerning the type of food provided, one of the head teachers explained that some children have medical issues so the Ministry of Education have to set a team that will at least know the student medical statue because it disallows some of the students to not participate in the school meal program. This can work through effective monitoring and evaluation of the program.

More to the type of food, the findings show that the school feeding program has a positive effect on students' academic performance so the researcher recommends that the government sustains the funding as it will help the them to achieving target four (4) of the sustainable development goals which talks about equal education; because the researcher found out that teachers also participate in the school meal program and it makes them effective in the classroom in delivering the lessons. This can be done by investing in the home grown food, writing other international partners like FAO, WFP, UNICEF, etc.

➤ *Recommendation for E.P. NGARA and E.P TABA Schools*

E.P NGARA and E.P TABA as some of the beneficiaries of the school feeding program have a big responsibility that is why the researcher has reserved some recommendation specifically for the schools. So they are as follows:

First we recommend a proper management of the school meal so that it may last for the projected time and have a positive effect on the academic performance of the students as the findings have shown its effect. This can be done by through the head teacher taking account of the meal provided per day, monitoring where the meals are kept and making show they are used for its intended purpose.

Based on the findings, students said the school meal did not include breakfast. The researcher recommends that the head teachers lobby with educational stakeholders to include breakfast in the program. For example, even a snacks (tea, bread etc.), as it will prepare them for learning. This can be done through communication to the Ministry for consideration because it is a need.

➤ *Recommendation for Parents*

Parents are one of the important education stakeholders because they are the ones who children's benefit from the program. So the researcher has reserved some recommendations for them as well. They are as follows

The researcher recommends parent to always communicate dietary concerns of his/her child. This can be done by communicating to the school upon enrolment of the child and update the school whether or not the concern has changed.

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