

*Original Paper*

THE EFFECT OF EDUCATIONAL PROJECT ON LEARNERS  
LEARNING OUTCOME IN TWELVE YEARS BASIC  
EDUCATION SCHOOLS: A CASE OF SCHOOL FEEDING  
PROGRAM AS IMPLEMENTED IN RUBAVU DISTRICT,  
RWANDA

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**Abstract**

*The purpose of this study is to help students, parents, secondary teachers, school's kitchen managers and Head teachers to master the methods and their role in encouraging learners to take lunch at school; especially improve student's learning outcomes in twelve years' basic education. The objectives are to assess the influence of food ratios and the timing of the meals on learning outcomes in Twelve Years basic education schools of Rubavu district, to assess the influence of food quality on learning outcomes in twelve years basic education schools of Rubavu district and. The study employed a descriptive research design Questionnaires to enable the researcher to bring out the details of the exact situation on the ground. This study was being done at 4 twelve years basic education located in the Rubavu district targeting 2112 students. Therefore, 336 respondents were the target population of this study and the composition of the participants. To validate and ensure reliability of the questionnaire, a test retest was conducted in a space of two weeks between the test's correlation coefficient using SPSS version 22.0 (V. 22.0) was established and after which necessary adjustments on the content and its reliability was ensured before the main study. In this way, sampling technique was a simple purposive sampling technique was employed in this study, where every participant was given an equal and independent chance to participate. Recommendations of the study were: Government has to mobilize more stakeholders or non-government organization to orient their funds in the implementation of school*

*feeding program, Parents must participate in school feeding program rather than thinking that this program should only be sponsored by government, Government has to develop continuous professional development that are related to the effective implementation of school feeding program and Government should make monitoring and evaluation of school feeding program because some of the school do not put more effort in its implementation.*

**Keywords**

*learning outcomes, school feeding program, Twelve Years Basic of Education and quality of education*

Internationally, the aspiration of all countries in the United Nations is to address the difficulties coming about because of propelling globalization brought about the detailing of the MDGs in the year 2000. In the plan of the MDGs consideration was paid to appetite and neediness as expressed in MDG number1: Eradicate Extreme yearning and destitution. The sub objective figured thusly is: continuously 2015 the extent of individuals who experience the ill effects of craving is split when contrasted with 1990 (UNESCO, 2005) School encouraging projects constitute basic mediations that were presented in various created and creating nations of the world to address the issues of neediness, to fortify school enrolment and improve understudies' execution. (Akanbi, 2013) As right on time as the 1930s, the United States (USA) and the United Kingdom (UK) used FFE to enhance youngsters' wellbeing (Gokah, 2008); these early projects appeared as School Bolstering Programs (SFP), where members were encouraged a supper or a nibble at school.

Then, MINEDUC-funded program that subsidizes meals cooked at secondary schools, hereafter referred to as the Secondary School Feeding Program. The third program is implemented by WFP, providing food a cooked lunch to primary and lower secondary school children, in insecure Districts. The ration is hot meal consisting of beans, fortified maize, vegetables, oil and salt. The free programs combined respond to 10% of all students, nursery school, primary and secondary schools in Rwanda (ESSP 2013/14-2017/18). School feeding programs are an effective mechanism for addressing child nutrition issues, increasing educational enrolment, retention and performance (Dr. Ministry of education, 2019). This research specifically addressed the effect of school feeding program on learning outcome. This means the school completion rate depends on school feeding.

**1. Hypothesis**

There is no significant influence of food ratios and the timing of the meals on learning outcomes in Twelve Years basic education schools of Rubavu district and There is no significant influence of food quality on learning outcomes in Twelve Years basic education schools of Rubavu district.

**2. Empirical Review**

The empirical review means the research that was made in past years about the problem which seems to have the same information. A researcher described them below in detailed about what others have

done. Less developed countries its education is rising on good level (Damon, Glewwe, Wisniewski, & Sun, 2016). Education enrollment in higher education is expanding quickly while around 67 million children who are at the age of enroll primary school are not able to continue 53 % are girls among those numbers while 43% of them are located in sub Saharan Africa (World Food Programme, 2013).

#### 2.1.1 Food Quality and Academic Performance

Generally, interaction between nutrition and education can be understood in three ways (Ahmed, 2004). Firstly, health statuses and nutrition influence the child's learning and his / her performance in school. That is why poor nutrition among children affects their cognitive function and hence reduces their ability to participate in learning activities at school. Secondly, children who are malnourished or unhealthy are unable to attend school regularly and which in turn leads to poor academic performances. Thirdly, hungry children encounter difficulties concentrating and performing complex tasks than those who are well nourished. So, poor children who don't get the basic nutritional building blocks from birth will be unable to learn easily. By the time, studies show that these children grow to primary school age, where most damages have occurred to them and in fact such damages are irreversible. Even if school meals are provided after this critical period, their capacity of learning is much less than what would have been if they were properly fed from infancy (WFP).

It has been argued that school meals increase school participation by improving child nutrition through two links (Gokah, 2008). First, school meals enhance nutrition by enabling children to get more nutrients. Second, enhanced nutrition leads to better educational achievements. The study also reveals that child nutrition, child health and child schooling reflect household preferences in human capital investments in the child; they might be correlated without any direct causal relationship between them. Another study shows how school feeding programs can enhance health by reducing morbidity and illness which hence attract children to school (Tomlinson, 2008).

However, there are conflicting arguments as to whether households adjust the feeding practices of school children at home in response to SFPs. (Adelman, 2008) shows there is no reduction of food at home given to children who participate in SFPs in such a way that those children who benefit from SFP should get less at home. Instead, school meals are additional diets intended to what he or she can get from home. To the contrary, there are counter arguments to such claims.

In response to the school meals, families may also adjust resource allocation among children within the household by taking away some resources from beneficiary children and redistributing them to other members of the household (Gilligan, 2008). As a result, those children from whom resources are taken away will be worse off if the food provided at school is not very useful compared to what they would have had at home.

#### 2.1.2 School Feeding Program and School Participation

Having examined the conceptual relationships between school meals and school participation, this section discusses some of the relevant empirical studies. Most of the writing investigated that for this examination uncover SFP have for sure positive effect on school support as estimated by school

enlistment, class participation, and understudy drop-out-status (Adelman, 2008). Be that as it may, the vast majority of these discoveries depend on exact information acquired from schools where the program was mainstream and has been moderately successfully actualized.

(Tomlinson, 2008) directed a field – think about in Western Kenya preschools in the vicinity of 2000 and 2004 to assess the effects of school sustaining programs on school interest and accomplishment. In this unique situation, preschoolers are characterized as youngsters between ages of 4 and 6 who lived inside a strolling separation of school. They found that youngsters in the treatment amass took an interest 35.9% of the time contrasted with 27.4% in the examination (control) gathering and this distinction was factually noteworthy (2004) The program expanded support of the two kids who were beforehand enlisted (what they call escalated edge) and kids who might have gone to class without the program (broad edge). Since there are solid complementarities between educator attributes and school meal is, they stress that any expansion in school interest without qualified training misses the mark concerning better instructive accomplishment.

Nevertheless, their study was on preschools and hence this may not have much relevance for primary school children. Besides, preschoolers are early-age children and may not have family obligations like many primary school age children might have in poor areas. Thus preschoolers are relatively free of duties that could keep them away from school.

Another study conducted in Jamaica shows that school meals indeed enhance education of beneficiaries (Grantham, 1998). They found that school execution pointers (enlistment, participation, drop-out, and rate, reiteration of evaluations, school fulfillment levels, psychological capacity, and classroom conduct) have all been enhanced in light of school encouragement. This is on the grounds that the arrangement of school suppers diminishes the guardians' cost of sending youngsters to class in this manner, advancing early enlistment and enhancing participation. The vast majority of time youngsters spend on learning in light of school dinners, the more they will learn and the less they rehash school or drop – out.

Opposite to different examinations, they are basic to class dinners and they question on the off chance that they have any positive effect on school support whatsoever. For example world food program helped the school encouraging system (what he calls the standard program) and found that it doesn't expand enlistment at any level contrasted with control schools (on the same page).

The following subsections are some of the literature in relation to the three aspects of school participation (school enrollment, class attendance and student drop-out) that will be discussed.

### **3. Methodology**

The researcher used correlation research design method. This comprises using questionnaire in collecting data from the respondents. In collecting data, questionnaires distributed to the concerned populations that carefully was chosen by the researcher. The researcher used a case study because it is an effective way of collecting data in a short period of time. As recommended by Kothari (1985), this method is effective since it is used to narrow down a very broad field of research into one easily researchable topic. This

study was undertaken into the population found in the Rubavu district but considering different categories found in the study area; this study was done at 4 twelve years' basic education located in the Rubavu district targeting 2112 respondents including parents who are involved in school feeding committee, learners, and staff members (head teacher, DOS and Teachers).

#### 4. Findings

This section presents the findings of the study on two specific objectives addressed. Each objective, descriptive statistics (mean and standard deviation).

##### 4.1 The Effect of Food Ratios and Timing of Meals on Learning Outcomes

The respondents were asked to provide the answers to the statements given about food ratios and timing of meals, descriptive statistics of their answers is presented in the table 8 below.

**Table 1. Descriptive Statistics on Food Ratios and Timing of Meals**

| Statements   | N          | Min  | Max  | Mean          | Std             |
|--|------------|------|------|---------------|-----------------|
| In this school students changes the type of foods  | 336        | 1.00 | 5.00 | 4.0060        | 1.42052         |
| In this school foods quantity served to the students depending on classes                                | 336        | 1.00 | 5.00 | 4.2173        | 1.17834         |
| In this school food quantity served to Students depending on ages  | 336        | 1.00 | 5.00 | 4.2976        | .98986          |
| In this school students get satisfied with the food served to them                                       | 336        | 1.00 | 5.00 | 4.3661        | 1.12499         |
| In this students takes lunch on constant time  | 336        | 1.00 | 5.00 | 4.0655        | 1.28662         |
| In this school giving leaners sufficient food increase their academic performance                        | 336        | 1.00 | 5.00 | 4.1815        | 1.24340         |
| This school has enough food store  | 336        | 1.00 | 5.00 | 4.0417        | 1.43664         |
| In this school students take breakfast on scheduled time   | 336        | 1.00 | 5.00 | 4.1220        | 1.36042         |
| In this school parents provide school feeding contribution to supplements reserved money for the program | 336        | 1.00 | 5.00 | 4.1429        | 1.32388         |
| In this students get enough time for lunch   | 336        | 1.00 | 5.00 | 4.0744        | 1.32838         |
| <b>Overall</b>   | <b>336</b> |      |      | <b>4.1515</b> | <b>1.269305</b> |

Source: research data.

Note. Strongly Disagree = [1] = **Very Low mean**; Disagree= [1-2] =**Low mean**; Neutral= [2-3] =**moderated mean**; Agree= [3-4] =**High mean**; Strongly Agree= [4-5] = **Very High mean**.

The results in Table 8, show the opinions of respondents about different statements defining food ratios and timing of meals. These statements have effect on learning outcomes. Considering the mean from responses, it is clear that statements are in the following category: high mean. The results in all these categories show that the respondents agreed with the statements related to the food ratios and timing of meals on learning outcomes. Statements with very high mean are: In this school students changes the type of foods ( $\mu=4.0060$  and  $STD=1.42052$ ), In this school foods quantity served to the students depending on classes ( $\mu=4.2173$  and  $STD=1.17834$ ), In this school food quantity served to Students depending on ages ( $\mu=4.2976$  and  $STD=0.98986$ ), In this school students get satisfied with the food served to them ( $\mu=4.3661$  and  $STD=1.12499$ ), In this students takes lunch on constant time ( $\mu=4.0655$  and  $STD=1.28662$ ), In this school giving leaners sufficient food increase their academic performance ( $\mu=4.1815$  and  $STD=1.24340$ ), This school has enough food store ( $\mu=4.1220$  and  $STD=1.43664$ ), In this school students take breakfast on scheduled time ( $\mu=4.1220$  and  $STD=1.36042$ ), In this school parents provide school feeding contribution to supplements reserved money for the program( $\mu=4.1429$  and  $STD=1.32388$ ), In this students get enough time for lunch ( $\mu=4.0744$  and  $STD=1.32838$ ). The overall mean indicated that majority of respondents strongly agreed that food ratios and timing of meals have significant influence on learning outcomes as indicated by ( $\mu=4.1515$  and  $STD=1.269305$ ).

#### 4.2 The Effect of Quality of the Food on Learning Outcomes

The respondents provided the answers to the statements given about quality of the food, descriptive statistics of their answers is presented in the table 9 below.

**Table 2. Descriptive Statistics on Quality of the Food**

| Statements   | N   | Min  | Max  | Mean   | Std.    |
|--|-----|------|------|--------|---------|
| In this school has refrigerant which keeps biodegradable things                    | 336 | 1.00 | 5.00 | 4.0744 | 1.23039 |
| In this school foods served is really well cooked                                  | 336 | 1.00 | 5.00 | 4.3036 | 1.28253 |
| In this students are given food which contain all different categories of vitamins | 336 | 1.00 | 5.00 | 4.0030 | 1.39829 |
| The foods served is clean and has no sand or any other rubbish                     | 336 | 1.00 | 5.00 | 4.0298 | 1.34686 |
| Students are served warm foods   | 336 | 1.00 | 5.00 | 3.7887 | 1.35161 |
| The meals which are served is too tasty  | 336 | 1.00 | 5.00 | 4.1190 | 1.19356 |
| In this schools students are given food which contains minerals                    | 336 | 1.00 | 5.00 | 4.1756 | 1.06594 |
| In this schools learners are given food which contains unsaturated fats            | 336 | 1.00 | 5.00 | 4.6161 | .78317  |

|   |            |      |      |                |                 |
|---|------------|------|------|----------------|-----------------|
| In this school, students are given food which contains proteins   | 336        | 1.00 | 5.00 | 4.6815         | .78972          |
| In this students are given food which contains enough vegetables. | 336        | 1.00 | 5.00 | 4.4077         | 1.08055         |
| <b>Overall</b>  | <b>336</b> |      |      | <b>4.21994</b> | <b>1.152262</b> |

Source: research data.

Note: Strongly Disagree = [1] = **Very Low mean**; Disagree= [1-2] =**Low mean**; Neutral= [2-3] =**moderated mean**; Agree= [3-4] =**High mean**; Strongly Agree= [4-5] = **Very High mean**.

The results in Table 9, show the opinions of respondents about different statements defining quality of food. These statements have effect on learning outcomes. Considering the mean from responses, it is clear that statements are in the following category: very high mean. The results in all these categories show that the respondents agreed with the statements related to the quality of food on learning outcomes. Statements with very high mean are:

In this school has refrigerant which keeps biodegradable things ( $\mu=4.0744$  and  $STD=1.23039$ ), In this school foods served is really well cooked ( $\mu=4.3036$  and  $STD=1.28253$ ), In this students are given food which contain all different categories of vitamins ( $\mu=4.0030$  and  $STD=1.39829$ ), The foods served is clean and has no sand or any other rubbish( $\mu=4.0298$  and  $STD=1.34686$ ), Students are served warm foods ( $\mu=3.7887$  and  $STD=1.35161$ ), The meals which are served is too tasty ( $\mu=4.1190$  and  $STD=1.19356$ ), In this schools students are given food which contains minerals ( $\mu=4.1756$  and  $STD=1.06594$ ), In this schools learners are given food which contains unsaturated fats, In this school( $\mu=4.6161$  and  $STD=0.78317$ ), students are given food which contains proteins ( $\mu=4.6815$  and  $STD=0.78972$ ), In this students are given food which contains enough vegetables ( $\mu=4.4077$  and  $STD=1.08055$ ). The overall mean indicated that majority of respondents strongly agreed quality of the food have significant influence on learning outcomes as indicated by ( $\mu=4.21994$  and  $STD=1.152262$ ).

#### 4.3 Learning Outcomes

The respondents provided the answers to the statements given about quality of the food, descriptive statistics of their answers is presented in the Table 11 below.

**Table 3. Descriptive Statistics Learning Outcomes**

| Statements  | N   | Min  | Max  | Mean   | Std.    |
|---|-----|------|------|--------|---------|
| In last five years, learners behavior changed               | 336 | 1.00 | 5.00 | 4.1220 | 1.12767 |
| In last five years learners motivation increase             | 336 | 1.00 | 5.00 | 4.0833 | 1.32672 |
| In last five years students' academic performance increased | 336 | 1.00 | 5.00 | 4.0149 | 1.44648 |
| In last five years, learners attendance increased           | 336 | 1.00 | 5.00 | 4.1101 | 1.28937 |
| In last five years, learners repetitions reduced            | 336 | 1.00 | 5.00 | 4.0327 | 1.35893 |

|  |            |      |      |                |                |
|--|------------|------|------|----------------|----------------|
| In last five years, learners performance in national examination increased | 336        | 1.00 | 5.00 | 4.1429         | 1.22796        |
| In last five years, school dropout reduced                                 | 336        | 1.00 | 5.00 | 4.3333         | 1.02603        |
| In last five years, learners performance in school based exams increased   | 336        | 1.00 | 5.00 | 4.0208         | 1.30539        |
| In last five years, learners dodging the school reduced                    | 336        | 1.00 | 5.00 | 4.0030         | 1.16028        |
| In last five years, learners scores increased                              | 336        | 1.00 | 5.00 | 4.0536         | 1.12639        |
| Overall  | <b>336</b> |      |      | <b>4.09166</b> | <b>1.23952</b> |

**Source:** research data.

**Note:** Strongly Disagree = [1] = **Very Low mean**; Disagree= [1-2] =**Low mean**; Neutral= [2-3] =**moderated mean**; Agree= [3-4] =**High mean**; Strongly Agree= [4-5] = **Very High mean**.

The results from Table 11, indicated that the majority of respondents strongly agreed that learning outcomes was increased since the introduction of school feeding program those factors are described as follow: In last five years, learners' behavior changed ( $\mu=4.1220$  and  $STD=1.12767$ ), in last five years' learners' motivation increase ( $\mu=4.0833$  and  $STD=1.32672$ ), In last five years students' academic performance increased ( $\mu=4.0149$  and  $STD=1.44648$ ), In last five years, learners attendance increased ( $\mu=4.1101$  and  $STD=1.28937$ ), In last five years, learners repetitions reduced ( $\mu=4.0327$  and  $STD=1.35893$ ), In last five years, learners performance in national examination increased ( $\mu=4.1429$  and  $STD=1.22796$ ), In last five years, school dropout reduced ( $\mu=4.3333$  and  $STD=1.02603$ ), In last five years, learners performance in school based exams increased ( $\mu=4.0208$  and  $STD=1.30539$ ), In last five years, learners dodging the school reduced ( $\mu=4.0030$  and  $STD=1.16028$ ), In last five years, learners scores increased ( $\mu=4.0536$  and  $STD=1.12639$ ). The overall mean indicated that majority of respondents strongly agreed that learning outcomes was increased since the introduction of school feeding program as indicated by ( $\mu=4.09166$  and  $STD=1.23952$ ).

#### 4.4 Presentation of Findings through Inferential Statistics (Regression Analysis)

This section presents the answers collected from the questionnaires given to the respondents. The answers were transformed into inferential statistics. This involves model summary, the analysis of variance and the regression coefficients, and they are presented in tables below:

**Table 4. Model Summary for Food Ratios and Timing of Meals on Learning Outcomes**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .937 <sup>a</sup> | .879     | .863              | .03616                     |

a. Predictors: (Constant), Food ratios and timing of meals



The results from Table 12, indicated that Food ratios and timing of meals has effect of 87.9% of the variation in learning outcomes as explained by  $R^2$  of 87.9% which indicated that model is good prediction.

**Table 5. Analysis of Variance for Food Ratios and Timing of Meals on Learning Outcomes**

| ANOVA <sup>a</sup> |            |                |    |             |        |                   |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model              |            | Sum of Squares | df | Mean Square | F      | Sig.              |
| 1                  | Regression | .076           | 1  | .076        | 57.848 | .000 <sup>b</sup> |
|                    | Residual   | .010           | 8  | .001        |        |                   |
|                    | Total      | .086           | 9  |             |        |                   |

a. Dependent Variable: Learning outcomes.

b. Predictors: (Constant), Food ratios and timing of meals.

The results of variance analysis in Table 12, indicated regression coefficient as showed that there is significance effect on Food ratios and timing of meals ( $P$  value  $>0.05$ ). Conclusively there is significant influence of Food ratios and timing of meals on learning outcomes. Then, null hypothesis is rejected while alternative is accepted.

**Table 6. Regression Coefficients for Food Ratios and Timing of Meals on Learning Outcomes**

| Coefficients <sup>a</sup> |                                 |                             |            |                           |       |      |
|---------------------------|---------------------------------|-----------------------------|------------|---------------------------|-------|------|
| Model                     |                                 | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|                           |                                 | B                           | Std. Error | Beta                      |       |      |
| 1                         | (Constant)                      | .822                        | .430       |                           | 1.913 | .000 |
|                           | Food ratios and timing of meals | .787                        | .103       | .937                      | 7.606 | .000 |

a. Dependent Variable: Learning outcomes

The results from Table 14, indicated that there was a positive and significant effect of Food ratios and timing of meals on learning outcomes ( $B=0.787$ ,  $P$  value  $>0.05$ ). This explain that one unit of change in Food ratios and timing of meals increases learning outcomes by 0.787 units.

**Table 7. Model Summary for the Quality of the Food on Learning Outcomes**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .888 <sup>a</sup> | .788     | .762              | .04771                     |

a. Predictors: (Constant), QUALITY

The results from Table 15, indicated that quality of the food has effect of 87.9% of the variation in learning outcomes as explained by  $R^2$  of 78.8% which indicated that model is good prediction.

**Table 8. Analysis of Variance for Food Quality on Learning Outcomes**

| ANOVA <sup>a</sup> |                |    |             |        |                   |
|--------------------|----------------|----|-------------|--------|-------------------|
| Model              | Sum of Squares | df | Mean Square | F      | Sig.              |
| Regression         | .068           | 1  | .068        | 29.815 | .001 <sup>b</sup> |
| Residual           | .018           | 8  | .002        |        |                   |
| Total              | .086           | 9  |             |        |                   |

a. Dependent Variable: Learning outcomes.

b. Predictors: (Constant), Quality of food.

The analysis of variance in table16, showed that quality of food has positive and significant influence on learning outcome in in secondary school in Rubavu district ( $F= 29.815$  P value  $>0.05$ ). This indicated that null hypothesis is rejected and alternative one is accepted.

**Table 9. Regression Coefficients for Food Quality on Learning Outcomes**

| Coefficients <sup>a</sup> |                 |                             |            |  |              |        |      |
|---------------------------|-----------------|-----------------------------|------------|--|--------------|--------|------|
| Model                     |                 | Unstandardized Coefficients |            |  | Standardized | t      | Sig. |
|                           |                 |                             |            |  | Coefficients |        |      |
|                           |                 | B                           | Std. Error |  | Beta         |        |      |
| 1                         | (Constant)      | 2.791                       | .238       |  |              | 11.719 | .000 |
|                           | Quality of food | .308                        | .056       |  | .888         | 5.460  | .001 |

a. Dependent Variable: Learning outcomes.

The results in table 17, revealed that there was a positive and significance relationship between Food quality on learning outcomes ( $\beta=0.308$ , p value  $<0.05$ ). This means that a unit of change on quality of food, increases learning outcome by 0.308 units.

## 5. Conclusion

The research concludes that food ratios influences school learning outcome such as providing enough food like quantity and giving them food on time it enhances teaching and learning process. Also by providing quality food to learners, there is improvement of learning outcomes because it contains all nutrients needed by leaner to grow physically and mentally. another aspect required material led to school feeding program to function well as we have seen that once there is that program, there is reduction of drop out, increased school attendance, and increased school enrollment rate.

## 5. Recommendation

- a) Government has to mobilize more stakeholders or non-government organization to orient their funds in the implementation of school feeding program.
- b) Parents must participate in school feeding program rather than thinking that this program should only be sponsored by government.

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