

EFFECT OF FREE DAY SECONDARY SCHOOL PROGRAMME ON STUDENTS' ACCESS TO AGRICULTURE SUBJECT INSTRUCTIONAL MATERIALS IN SECONDARY SCHOOLS IN MBITA SUB-COUNTY, KENYA

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Abstract

The Free Day Secondary School Programme, launched in Kenya in 2008, aimed to promote universal education agriculture subject included by 2015, as outlined in Sessional Paper No. 1 of 2005. This initiative sought to alleviate the financial burden on parents and improve access to vital subjects like agriculture, aligning with the Sustainable Development Goals (SDGs) set for 2030. Despite substantial government investment, access to agricultural instructional materials in public secondary schools within Mbita Sub-County remains alarmingly low, and the underlying reasons for this deficiency are still unclear. Additionally, there is a lack of research exploring the impact of the Free Day Secondary School Programme on agriculture teaching/learning resource availability and its effect on student participation in agriculture classes. The purpose and objective of this study is to fill these gaps by analyzing the effects of the Free Day Secondary School Programme on students' access to agricultural instructional materials and assessing the relationship between these resources and student engagement in agriculture subjects in Mbita Sub-County. Highlighting this relationship is crucial for understanding how improved access to resources can enhance student participation and success in agricultural education. This study was anchored on the Systems theory. A multistage sampling procedure was used to select a sample of 106 respondents comprising of 4 Quality Assurance and Standard Officers, 51 principals and 51 teachers of agriculture from 51 sampled public secondary schools in Mbita Sub County. All the 4 Quality Assurance and Standard Officers within Mbita sub county were picked because all of them could easily be reached by the researcher. A comprehensive cross-sectional survey design was employed, involving 106 respondents from 51 selected public secondary schools. Data were gathered through face-to-face interviews using a pretested semi-structured questionnaire, which achieved a reliability coefficient of 0.08. The instruments for this study were validated by experts from the Department of Agriculture and Environmental studies of Rongo University. The panel ensured that items included in the questionnaire adequately measured the degree to which the data collected would represent concepts that cover content and face validity. The recommendations and suggestions of the experts were used to make the final draft of the instruments. Descriptive statistics, paired t-tests, and correlational techniques were used in the data analysis. The results clearly show that the Free Day Secondary School Program is positively correlated with higher agricultural student enrollment ($t = 17.5826$, $p < 0.0000$), better access to agricultural learning resources ($t = 6.9022$, $p < 0.0000$), and increased agricultural activity participation ($t = 13.1437$, $p < 0.0000$). In light of these compelling findings, it is essential to enact legislation that supports the continuation of the Free Day Secondary School Program. Moreover, the government should prioritize increasing funding to effectively achieve the program's objectives.

Key Words: Free Day Secondary School Programme, Agriculture Subject, Enrollment, Agricultural Facilities, Students Participation in Agricultural Activities.

Introduction

With crucial government subsidies, several countries are making progress in expanding secondary school access to agricultural education. Agriculture subject education is considered a prudent investment that yields substantial societal and private benefits, and it is an essential component of secondary education (Bregman & Stallmeister, 2012). The need for economic development, the encouragement of youth socialization, the provision of individual benefits that aid in the development of human capital, and the rising demand for agricultural education among students are the four main drivers of secondary agriculture investment worldwide (World Bank, 2018).

Investing in education agriculture subject included is vital for fostering economic growth and alleviating poverty. Each additional year of schooling can lead to an approximate 10% increase in wages (Psacharopoulos & Patrinos, 2018; Montenegro & Patrinos, 2023). However, the true value of education agriculture subject included is often overlooked. Learning outcomes were already concerning before the COVID-19 pandemic, and the situation has only worsened due to school closures. Current estimates indicate that 70% of 10-year-olds cannot read and understand a basic paragraph (World Bank et al., 2022). This situation underscores the urgent need for investment in agricultural education to unlock the potential of future generations.

International development agencies and Governments, alongside households, have made vital contributions to address the persistent learning crisis and recover from the educational losses resulting from the pandemic. However, the current funding levels are woefully inadequate relative to the scale of the challenge. A substantial increase in agriculture education funding is crucial to ensure quality education globally and to rebuild essential human capital (UNESCO, 2023).

Typically, governments allocate only 3 to 5 percent of their GDP to education agriculture subject included, which constitutes merely 10 to 20 percent of their total spending. Households, particularly in low- and

lower-middle-income countries (LMICs), shoulder nearly one-third of agriculture education expenses, a significant burden for low-income families (World Bank & UNESCO, 2023).

In Kenya, robust access to agricultural education and training is essential for the success of government development initiatives, achieving the Sustainable Development Goals (SDGs) and Vision 2030 is urgent for enhancing living standards for all citizens (Government of Kenya, 2012). The Kenya Education Sector Support Programme (KESSP) plays a crucial role in this regard, enhancing agricultural education in secondary schools and significantly increasing student enrollment in agriculture courses (Ministry of Education, Science and Technology, 2012).

The launch of the Free Day Secondary School Programme (FDSSP) is pivotal step toward enhancing agriculture educational access in Kenya. The government developed the FDSSP to relieve parents in public secondary schools from the burden of tuition fees and other costs (Ndolo & Simatwa, 2016).

The Free Day Secondary School Programme, launched in Kenya in 2008, aimed to promote universal education agriculture subject included by 2015, as outlined in Sessional Paper No. 1 of 2005. This initiative sought to alleviate the financial burden on parents and improve access to vital subjects like agriculture, aligning with the Sustainable Development Goals (SDGs) set for 2030. Despite substantial government investment, access to agricultural instructional materials in public secondary schools within Mbita Sub-County remains alarmingly low, and the underlying reasons for this deficiency are still unclear. Additionally, there is a lack of research exploring the impact of the Free Day Secondary School Programme on agriculture teaching/learning resource availability and its effect on student participation in agriculture classes. This study intends to fill these gaps by analyzing the effects of the Free Day Secondary School Programme on students' access to agricultural instructional materials and assessing the relationship between these resources and student engagement in agriculture subjects in Mbita Sub-County.

Research Methodology

A cross-sectional survey design was utilized in this study to assess the current situation. Sardana et al. (2019) highlight its importance for evaluating large populations. Zangirolami-Raimundo et al. (2018) indicate that these studies gather data from a population at a single point in time, while Thomas (2023) emphasizes their value in collecting diverse information. This method allows unbiased observation of variables without manipulation and the use of detailed questionnaires and scheduled interviews. Cross-sectional surveys are cost-effective and efficient for large populations, making them preferable to censuses. Ultimately, this design was the most suitable choice for ensuring reliable information in the study.

The target population is crucial for generalizing the findings of this study (Mokua, 2013). It encompasses Quality Assurance and Standards Officers (QUASO), secondary school principals, and agriculture teachers from selected public secondary schools in Mbita Sub County that were established prior to 2008, the year the Free Day Secondary Schools Programme was launched. This timeframe is significant for comparing data before and after the Programme's initiation. Given that Quality Assurance and Standards Officers (QUASO) were 4 in Mbita Sub County, all of them were selected for the study. .

The sample size is crucial for accurately estimating a specific population. As noted by Kumar et al. (2013), the sample size reflects the “total number of subjects in the sample.” It represents the respondents or observations that will provide valuable insights for the study. Given that there are 103 public and private secondary schools in the area, we can determine the required sample size using the proportionate number of households sampling methodology (Kothari, 2004). This systematic approach ensures that our findings will be robust and reliable. The formula used for calculating the sample size is detailed below.

$$n_0 = \frac{z^2(p)(1-p)}{e^2}$$

Where; n_0 represented the sample size; z is confidence level set at 1.96 for 95%, p is the proportion of all public secondary schools in the area which is 0.8 (80%) and $1-p$ is the proportion of private schools in the area set at 0.2 (20%). Lastly, e is the allowable margin of error or degree of precision which was set at 0.1(10%).

This study employed a carefully structured multistage sampling procedure to confidently establish a sample size of 51 public secondary schools, encompassing 51 principals and 51 agriculture teachers. As highlighted by Kothari (2004), a sample size of just 30 respondents is sufficient for reliable hypothesis testing, reinforcing the rigor of this study. The first step involved a strategic selection of Mbita Sub County as the focal area for our research. In the second stage, we purposefully selected public secondary schools that have implemented the Free Day Secondary School Programme, ensuring our sample reflects the relevant educational context. During the third stage, we applied stratified sampling, categorizing schools into three distinct types: boys' schools, girls' schools, and mixed secondary schools. To facilitate a fair selection process, each school was assigned a unique number. These numbers were inscribed on pieces of paper, folded, and placed in a container. After shaking the container, we randomly drew pieces of paper to ensure unbiased selection. This method was repeated until we successfully acquired our target sample of 51 schools. Moreover, given the limited number of Quality Assurance and Standards Officers—only four in total—we invited all of them to participate in interviews. This decision contributed to a robust total of 106 respondents for the study, enhancing the credibility and depth of our findings.

Questionnaires served as the primary tool for data collection, enabling the researcher to gather invaluable first-hand information. Montenegro, C.E. & H.A. Patrinos (2023) highlighted that expert judgment can significantly enhance the content validity of an instrument. In this research, agricultural education experts meticulously validated the questionnaires, ensuring that each item effectively measured the concepts associated with both content and face validity (Mugenda, 2008). The insightful

recommendations and suggestions from these experts were crucial in shaping the final draft of the instruments. Reliability is essential, as it indicates the consistency with which a research instrument can produce results over repeated trials (Kothari, 2010). To establish the internal consistency of the questionnaire, Cronbach's coefficient alpha was employed. For the instrument to be deemed reliable, it needed a minimum alpha coefficient of 0.70 at a 95% confidence level (Mugenda & Mugenda, 2015). The instruments underwent thorough testing in a pilot study involving 30 principals and 30 agricultural teachers from public secondary schools in Rachuonyo North Sub County, all of which were established prior to 2008. The large pilot sample size is crucial for accurately estimating a specific population. This location was strategically selected due to its similarities in conditions and characteristics with Mbita Sub County. Ultimately, a Cronbach's coefficient alpha of 0.08 was calculated, confirming that the instruments were reliable, as this value surpassed the recommended standard of 0.07. The collected data were quantitatively analyzed using descriptive statistics. Objective were analyzed using descriptive statistics and t-test. These were tested at $\alpha = 0.05$ level of significance. Kothari (2014) reported that t-test shows how significant the differences between groups of continuous variables are. In other words, it lets one know if those differences (measured in means) could have happened by chance. Since the number of students enrolled in agriculture subject, number of textbooks for teaching agriculture subject, and number of students participating in agricultural activities (Young farmers club, agricultural show, and exhibition) in secondary schools were continuous variables, use of t-test was justified. The data was

coded, tallied and converted into percentages and frequencies. These were then displayed in frequency tables, graphs, and pie-charts, and interpreted in line with the objectives of the study.

Results and Discussion

The effect of the Free Day Secondary School Programme on participation in agricultural activities in secondary schools in Mbita sub-county

Participation in agricultural activities in public secondary schools largely depends on available funding, which is managed by principals and agricultural teachers. Students studying agriculture are encouraged to join Young Farmers Clubs, where they can gain hands-on experience through crop planting, livestock rearing, and participating in agricultural shows and exhibitions. Providing adequate resources is essential, as it enhances both student engagement in these activities and their academic performance (Ministry of Education, 2007). In Mbita Sub County, principals and agricultural teachers indicated that the Free Day Secondary Schools Programme has significantly increased student enrollment in Young Farmers Clubs. All sampled principals (100%) and agricultural teachers (100%) agreed on this positive impact, highlighting the need for ongoing support for such programs to foster student involvement in agriculture.

Results, in Table 1 revealed that the majority of principals (58.0%) and teachers of agriculture (51.5%) strongly agreed that Free Day Secondary School Programme has positively increased enrollment rates in young farmers club in their schools.

Table 1

Perception of the positive effect of Free Day Secondary School Programme on students' membership in the Young Farmers Club

Variables	Description	Respondents			
		Principals n = 51		Teachers of Agriculture n = 51	
		Frequency	Percent	Frequency	Percent
Free Day Secondary School Programme has positively increased students' membership in the Young Farmers Club	Strongly disagree	0	0.0	0	0.0
	Disagree	0	0.0	0	0.0
	Neutral	0	0.0	0	0.0
	Agree	0	0.0	0	0.0
	Strongly agree	51	100.0	51	100.0

Table 2 clearly demonstrates the average number of students participating in Young Farmers Clubs per school during the four years before the implementation of the Free Day Secondary School Programme. The data reveals that, in Mbita Sub County, the average student participation in these clubs was unacceptably low, with figures of 16, 25, 36,

and 24 for the years 2004, 2005, 2006, and 2007, respectively. This unequivocally shows that most public secondary schools in Mbita Sub County failed to engage students in Young Farmers Clubs prior to the introduction of the Free Day Secondary School Programme. It is imperative that initiatives like this are established to significantly enhance student involvement and promote agricultural education.

Table 2

Average number of students in Young Farmers Clubs per school from 2004 to 2007

Year	2004, n=51	2005, n=51	2006, n=51	2007, n=51
Average number of students in Young Farmers Clubs per school	16	25	36	24

Table 3 highlights the significant increase in enrollment in Young Farmers Clubs four years after the initiation of the Free Day Secondary School Programme. In Mbita Sub County, average participation rose dramatically, reaching 68 students

in 2009, 83 in 2010, 98 in 2011, and peaking at 126 in 2012. This upward trend demonstrates the program's positive influence on youth engagement in agriculture. The findings indicate a notable increase in student participation in Young Farmers Clubs from 2008 to 2012.

Table 3

Average number of students in Young Farmers Clubs per school from 2009 to 2012

Year	2009, n=51	2010, n=51	2011, n=51	2012, n=51
Average number of students in Young Farmers Clubs per school	68	83	98	126

Testing of null hypothesis:

H₀₁: *There is no statistically significant difference in participation in agricultural activities in secondary schools in Mbita Sub County before and after the introduction of the Free Day Secondary School Programme.*

To test this hypothesis, we examined student enrollment data in Young Farmers Clubs from 2004 to 2012 using a paired t-test.

The results presented in Table 4 indicate a notable average increase of 108 students during this period. This significant change prompted the rejection of the null hypothesis, emphasizing a meaningful difference in participation levels four years prior to the implementation of the FDSSP.

Table 4

Results of paired t-tests on the number of students in Young Farmers Clubs from 2004 to 2012

Variable	N	Mean	Std. Err.	Std. Dev.	95% confidence interval	
Number of students in Y. F. C in 2012	51	126.3	9.2	65.8	107.9	144.8
Number of students in Y. F. C in 2004	51	17.8	0.6	25.0	10.8	24.9
Difference	51	108.6	8.3	58.9	91.9	125.2
mean(diff) = mean(noyfc2012 t-value - noyfc2004)		13.1437				
Degrees of freedom	50					
Level of significance	$\alpha=0.05$					
Ho: mean(diff) = 0	$\Pr(T > t) = 0.0000$					

Strong evidence shows that the implementation of the Free Day Secondary School Programme significantly increased the number of students participating in Young Farmers Clubs in Mbita Sub County. This clear connection demonstrates that the programme not only fosters academic engagement but also enhances student involvement in vital agricultural activities within public secondary schools, benefiting the community as a whole.

Effect of Free Day Secondary School Programme on access to agriculture instructional materials and their participation in agriculture subject in secondary schools.

In order to increase student involvement in public secondary schools, access to agricultural teaching and learning tools is crucial. Farm plots and textbooks are

among the many resources that depend on school funding. We polled agricultural instructors and principals to determine the effects of the Free Day Secondary School Program. Notable results show that 84% of agriculture instructors and more than 92% of principals think the initiative has greatly increased access to essential agricultural supplies. This emphasizes how crucial it is to keep funding instructional materials in order to raise the standard of students' agriculture education.

Table 5 revealed that over 92% of principals and 84% of teachers of agriculture agreed that the implementation of the Free Day Secondary School Programme greatly increased access to agriculture teaching and learning resources in their schools and hence increased participation in agriculture subject in secondary school.

Table 5

Effect of Free Day Secondary School Programme on access to agriculture teaching and learning resources in their schools

Variables	Description	Respondent			
		Principals, n = 51		Teachers of Agriculture n = 51	
		Frequency	Percent	Frequency	Percent
Implementation of FDSSP influence access to agriculture teaching and learning resources	Agree	47	92.2	43	84.3
	Disagree	4	7.8	8	15.7

Respondents assessed their educational institutions' agricultural teaching and learning resources both before and during the launch of the Free Day Secondary School Program. Before the initiative, a sizable majority of agricultural teachers (60%) and principals (58.9%) said that these materials were not easily accessible. However, upon acceptance, 73% of agricultural instructors and over 70% of principals reported a significant increase in resources.

This improvement shows that agriculture teaching resources are becoming more widely available in Mbita Sub County's public secondary schools. Despite the fact that 50 of the 51 schools possessed libraries, 40 (78%) of the administrators and 41 (80.4%) of the agriculture instructors felt that the amount, size, and

materials available in these libraries were insufficient. This highlights the urgent need for further investment to enhance agricultural education in these schools.

The findings in Table 6 show that before the Free Day Secondary School Program started, the majority of agriculture-related instructional materials were insufficient. Before the program's launch, over 90% of the agricultural instructors and school principals in the sample felt that the available resources for teaching agriculture were insufficient. It's interesting to note that after the program's execution, over 80% of the school administrators and agricultural instructors in the sample said that the materials used in agriculture classes were adequate

Table 6

Availability of physical facilities for teaching and learning agriculture in sampled secondary schools in Mbita Sub County

Variables	Description	Respondent			
		Principals, n = 51		Teachers of Agriculture n = 51	
		Frequency	Percent	Frequency	Percent
Classrooms	Adequate	21	41.2	23	45.1
	Inadequate	30	58.8	28	54.9
	Not available	0	0	0	0.0
Library	Adequate	10	19.6	9	17.6
	Inadequate	40	78.4	41	80.4
	Not available	1	2.0	1	2.0
School bus	Adequate	10	19.6	10	19.6
	Inadequate	20	39.2	20	39.2
	Not available	21	41.2	21	41.2

Demonstration plots	Adequate	40	78.4	38	74.5
	Inadequate	11	21.6	13	25.5
	Not available	0	0.0	0	0.0
Plots for KCSE project	Adequate	30	58.8	30	58.8
	Inadequate	21	41.2	21	41.2
	Not available	0	0.0	0	0
Laboratory and apparatus	Adequate	2	4.0	2	4.0
	Inadequate	46	90.1	46	90.1
	Not available	3	5.9	3	5.9

According to the findings, every public secondary school in Mbita Sub County that was sampled had both demonstration plots and plots for the KCSE project. About 78% and 74% of the chosen teachers and principals, respectively, concurred that the number of demonstration plots was appropriate. Qualitative evidence from a sample of Quality Assurance and Standards Officers corroborated each of these conclusions. They reiterated that even while certain facilities were accessible, the library, laboratory, and classrooms, for example, were still not enough to handle the increasing number of pupils. Other facilities, like the school lab, were incomplete and lacked fume chambers, gas fills, and preparation tables. Energy and water sources are still insufficient, need to be upgraded to solve water scarcity, and have limited power availability. This might help develop agricultural operations for livestock and crops.

The findings in Table 7 show that before the Free Day Secondary School Program started, the majority of agriculture-related instructional materials were insufficient. Before the program's launch, over 90% of the agricultural instructors and school principals in the sample felt that the available resources for teaching agriculture were insufficient. It's interesting to note that after the program's execution, over 80%

of the school administrators and agricultural instructors in the sample said that the materials used in agriculture classes were adequate. This implies that sufficient agricultural teaching resources have been produced as a result of the Free Day Secondary Schools Program.

Because of the efficient use of money given by the Free Day Secondary School Program for the purchase of these textbooks, Mbita Sub County had a greater ratio of agriculture textbooks to pupils. Sampled agriculture teachers and principals were asked to provide their thoughts on how the Free Day Secondary Schools Program affected students' access to agricultural education resources in Mbita Sub County's secondary schools. According to the results in Table 7, the majority of agricultural instructors (68.6%) and principals (58.8%) agreed that the Free Day Secondary School Program has made it easier for students to access resources for agricultural education in the secondary schools located in Mbita Sub County. This indicates that the majority of agricultural instructors and administrators firmly believe that the Free Day Secondary Program has had a significant influence on students' access to resources for agriculture education in Mbita Sub County's secondary schools.

Table 7

Perception of the positive effect of Free Day Secondary School Programme on students' access to agriculture instructional materials

Variables	Description	Respondent			
		Principal, n=51		Teachers of Agriculture, n=51	
		Frequency	Percent	Frequency	Percent
Free Day Secondary School Programme has positively increased students' access to agriculture instructional materials in secondary schools in Mbita Sub County	Strongly disagree	0	0.0	0	0.0
	Disagree	0	0.0	0	0.0
	Neutral	0	0.0	0	0.0
	Agree	30	58.8	35	68.6
	Strongly agree	21	41.2	16	31.4

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Table 8

Average number of agriculture instructional materials (textbooks) per school from 2004 to 2007

Year	2004, n=51	2005, n=51	2006, n=51	2007, n=51
Average number of agriculture instructional materials (textbooks) per school	9	11	11	15

The results revealed that the average number of agriculture instructional materials (textbooks) per school in Mbita Sub County, four years before the implementation of the Free Day Secondary School Programme, were 9, 11, 11 and 15 for the year 2004, 2005, 2006 and 2007, respectively.

Results in Table 9 indicates the average number of agriculture instructional materials per school four years after the implementation of the Programme. The results confirm that there is a general positive change in the average number of agriculture teaching resources per school between the years 2008 – 2012. The trend is attributed to the enhanced funding in public secondary schools.

Table 9

Average number of agriculture instructional materials (textbooks) per school from 2009 to 2012

Year	2009, n=51	2010, n=51	2011, n=51	2012, n=51
Average number of agriculture instructional materials (textbooks) per school	30	32	38	68

The Free Day Secondary School Programme has significantly enhanced access, equity, and the quality of secondary education in Kenya by ensuring adequate instructional materials are available (Ndolo, 2011). However, data from Quality Assurance and Standards Officers reveal a troubling reality: government funds are often insufficient and frequently delayed. This situation directly impacts our ability to meet the essential agriculture textbook-to-student ratio of 1:1, highlighting the need for timely and increased funding to truly fulfill our educational goals.

Table 10

Results of paired t-tests on agriculture instructional materials from 2004 to 2012

Variable	N	Mean	Std. Err.	Std. Dev.	95% confidence interval	
Number of textbooks for teaching agriculture subject in 2012	51	68.1	8.5	61.3	50.9	48.4
Number of textbooks for teaching agriculture subject in 2004	51	8.5	0.6	4.6	7.2	9.8
Difference mean(diff) = mean(agriculture 2012 – agriculture 2004)	51	59.58	8.6	61.7	42.2	72.9
t-value	6.9022					
Degree of freedom	50					
Level of significance	$\alpha=0.05$					
Ho: mean(diff) = 0	$\Pr(T > t) = 0.0000$					

According to Table 10's paired t-test results, there were an average of 60 more agriculture-related textbooks published between 2004 and 2012. Given that the p-value is smaller than $\alpha=0.05$, the null hypothesis was rejected and conclude that, on average, there was a substantial difference in the quantity of agriculture-related textbooks available between 2004 and 2012. Thus, there is strong evidence that the introduction of the Free Day Secondary School Program led to an increase in the quantity of textbooks used to teach agriculture in Mbita Sub County. The availability of resources for teaching and learning about agriculture has a significant impact on secondary school students' engagement in the topic in Mbita Sub County. When

Testing of null hypothesis:

H0₂: *There is no statistically significant relationship existing between access to agriculture teaching and learning resources and their participation in agriculture subject in secondary schools in Mbita Sub County before and after the introduction of the Free Day Secondary School Programme.*

Data on the number of agriculture instructional materials (textbooks) in 2004 and 2012 were analyzed using paired t-test and results shown in Table 10 from 2004-2012.

educational institutions has sufficient resources for a specific subject,

The availability of resources for teaching and learning about agriculture has a significant impact on secondary school students' engagement in the topic in Mbita Sub County. Students are more likely to pass exams when schools have sufficient resources for a certain topic. Students' performance and school resources were found to be strongly positively correlated by Hanushek (1997).

The results of Pearson's product-moment correlation coefficient are displayed in Table 11 for the association between the number of agricultural textbooks used in 2004 and the number of students enrolled in the subject. The number of students enrolled in

agricultural subject and the quantity of texts available for teaching agriculture subject in 2004 were compared using Pearson's product-moment correlation. According to Table 11's results, there was

a significant positive connection ($r(49) = 0.6087$, $p < .0000$) between the number of students enrolled in agricultural courses in 2004 and the quantity of textbooks accessible for instruction in that subject.

Table 11

Pearson product-moment correlation coefficient (r) results for 2004

Variable	Number of students enrolled in agriculture subject in 2004	Number of textbooks for teaching agriculture subject in 2004
Number of students enrolled in agriculture in 2004	1.0000	
Number of textbooks for teaching agriculture in 2004	0.6087	1.0000
Coefficient of determination,	r^2 0.37 or 37%	
Level of significance	95% or $\alpha = 0.05$	
Observations	51	
P-value	0.0000	
Degree of freedom	49	

Since there was a substantial, significant, and positive correlation between the number of students enrolled in agricultural subjects and the quantity of textbooks accessible for teaching agriculture subjects in 2004, the null hypothesis was rejected since the p-value was less than $\alpha = 0.05$. As the number of textbooks used to teach agriculture subjects expanded, so did the number of students enrolling in agriculture classes. The number of agricultural textbooks used to teach the

topic in 2004 strongly described 37% of the variation in the number of students enrolled in agriculture, according to the results of the coefficient of determination, $r^2 = 37\%$. The findings of Pearson's product-moment correlation coefficient are displayed in Table 12 for the association between the number of students enrolled in agricultural courses and the quantity of agriculture-related textbooks accessible in 2012.

Table 12

Pearson product-moment correlation coefficient (r) results for 2012

Variable	Number of students enrolled in agriculture subject in 2012	Number of textbooks for teaching agriculture in 2012
Number of students enrolled in agriculture subject in 2012	1.0000	
Number of textbooks for teaching agriculture subject in 2012	0.4975	1.0000
Coefficient of determination, r^2	0.25 or 25%	
Level of significance	95% or $\alpha = 0.05$	
Observations	51	
P-value	0.0002	
Degree of freedom	49	

According to the results in Table 12, there was a somewhat significant correlation ($r(49) = 0.4975$, $p < .0002$) between the number of students enrolled in agriculture subject and the quantity of textbooks used to teach such subjects in 2012. The number of students enrolled in agricultural subject in 2012 and the quantity of textbooks used to teach agriculture subject in that year were shown to be moderately, positively, and significantly correlated, as the p-value was less than $\alpha = 0.05$. This suggests that as the quantity of textbooks rose in 2012, so did the number of students enrolling in the agriculture subject.

According to results on the coefficient of determination, $r^2 = 25\%$, there were much more textbooks available in 2012 to teach agriculture, which helped to explain the 25% change in the number of students enrolled in the subject. Thus, the study came to the conclusion that there was a positive and

substantial correlation between the number of students studying agriculture and the quantity of textbooks available to teach the topic.

This may be explained by the fact that many textbooks used to teach agriculture improve students' academic performance, which in turn leads to more students in Mbita Sub County enrolling in agriculture subject. The head teacher's attitude, the availability of teaching staff, the professional training and experience of teachers, and the availability of teaching and learning materials all have a positive impact on the enrollment rate in a subject in Kenyan secondary schools, according to a similar finding from a study by Maoga and Sureiman (2011). Regression analysis was performed after enrollment and financing data for the free day secondary school program were calculated and correlated. The outcomes were as follows.

Table 13

Results of paired t-test on enrollment in agriculture subject from 2004 to 2012

Variable	N	Mean	Std. Err.	Std. Dev.	95% confidence interval
Enrollment in agriculture subject in 2012	37	197.9	8.8	62.7	180.3 215.6
Enrollment in agriculture subject in 2004	37	80.1	4.6	32.9	70.89 89.4
Difference mean(diff) = mean (enroll 2012 –enroll 2004)	51	117.8	6.7	47.86	104.4 131.3
t-value	17.5826				
Degree of freedom	50				
Level of significance	$\alpha = 0.05$				
Ho: mean(diff) = 0	$\Pr(T > t) = 0.0000$				

Based on the amount of funding received via the Free Day Secondary School Program, the 37 schools were divided into three groups: small schools ($n = 27$), medium schools ($n = 15$), and big schools ($n = 9$). Therefore, the contribution and effect of Free Day Secondary School Program money on access to agricultural topic teaching resources were determined

by interpreting Pearson's Correlation coefficients (r). Pearson's r was used to identify the direction and intensity of the link. The association between the availability of agricultural topic teaching resources in secondary schools in Mbita Sub County and the Free Day Secondary School Program was determined using Pearson's r . The outcomes are displayed in Table 14.

Table 14*Pearson product-moment correlation coefficient (r) results*

Variable	Number of students enrolled in agriculture subject.	Number of textbooks for teaching agriculture subject.
Number of students enrolled in agriculture subject.	1.0000	
Number of textbooks for teaching agriculture subject.	0.4975	1.0000
Coefficient of determination, r^2	0.25 or 25%	
Level of significance	95% or $\alpha=0.05$	
Observations	51	
P-value	0.0002	
Degree of freedom	49	

Table 14 showed that access to agricultural teaching resources (textbooks) and the Free Day Secondary School Program were positively and significantly correlated. The computed p-value of 0.0002, which was below the predetermined p value of 0.05, demonstrated that the association was significant. Thus, the null hypothesis was rejected. This implies that more students would enroll in agriculture courses if funding for the Free Day Secondary School Program increased. The results of this study support those of the 2015 Economic Survey (Republic of Kenya, 2015), but they also thoroughly examine how the Free Day Secondary School Program affects access by figuring out how it affects access to agriculture courses in small, medium, and large secondary schools.

In medium-sized and big secondary schools, the Free Day Secondary School Program had a significant impact on access, accounting for 96.8% and 93% of the differences in access, respectively. This indicates that financing for the Free Day Secondary School Program mostly accomplished the intended outcomes at medium-sized and large secondary schools. The effect was positive in tiny secondary schools, but it was less pronounced in medium and large secondary schools.

Conclusion

The availability of instructional materials in agriculture in secondary school has been greatly improved by the Free Day Secondary School Program. Particularly at medium-sized and big secondary schools, the contribution is quite considerable. This indicates that the primary issue adversely affecting access was the expense of teaching materials in secondary school education, including agriculture, as envisioned by the taskforce on affordable secondary school education and the recommendations that were later accepted. As a result, the subsidy has greatly improved the secondary school education sub-sector's access to instructional resources on agriculture.

Recommendations

1. In order to properly accomplish the goals of the Free Day Secondary School Program, funding for the program needs be raised.
2. Smaller secondary schools ought to combine as medium-sized and bigger secondary schools are more likely than tiny ones to benefit from the Free Day Secondary School Program's financing for agriculture-related teaching resources.
3. Because the Free Day Secondary School Program has a greater impact on medium and large secondary schools' access to agricultural

instructional resources, these institutions should be enlarged to accommodate more students based on careful planning and logistics.

4. To make sure that the intended results are being achieved, the government should continuously assess the Free Day Secondary School Program.

Generative AI and AI assisted technology in the writing process

While preparing this work, we used AI technique for checking the spellings and grammar to make sentences more clear.

Authors' contributions statements

George Odero was involved in writing, the original draft, methodology, data collection and analysis. Oyier Ogwenyo was involved in writing, review and editing. Quinter was involved in editing and proof reading.

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Conflicts of interest

There is absolutely no conflict of interest in this paper.

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