

## RELATIONSHIP BETWEEN INCREASED STUDENT ENROLMENT AND DELIVERY OF CATERING SERVICES IN PUBLIC BOARDING SECONDARY SCHOOLS IN KISUMU WEST SUB-COUNTY, KENYA

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### Abstract

This study sought to investigate the relationship between increased student enrolment and the delivery of catering services in public boarding secondary schools in Kisumu West Sub-County, Kenya. A descriptive survey approach was used to gather relevant data. The outcomes of this research will offer valuable insights to school administrators when making decisions concerning the allocation of school resources, with a particular focus on areas that have a significant impact on student catering services. The study involved a sample of 357 students and eight cateresses from eight public boarding secondary schools. The sample size of 357 students was determined using the Krejcie & Morgan table. A combination of census and proportionate sampling techniques was employed to select participants. Both open-ended and closed-ended questionnaires were utilised as data collection instruments. The qualitative data was presented in a narrative form, while the quantitative data was coded and entered into SPSS for analysis. Ethical research requirements were strictly adhered to throughout the study. The research findings indicates that the relationship between student enrolment and delivery of catering services was negative and statistically significant at .05 confidence level,  $r(294) = -0.205$ ,  $p = .000$ . These findings concluded that increased enrolment has an adverse impact on the standard of catering services offered to students.

**Key terms:** Catering Services, Kisumu West, Public Boarding Secondary Schools, Relationship, Student Enrolment.

## 1.0 INTRODUCTION

Education is widely recognised as a key driver for economic growth, equity, and development by governments worldwide (Abdul-Rahaman et al., 2020). To ensure students receive a holistic educational experience, it is crucial to examine the role of catering services in supporting their well-being and academic success. According to Deb et al. (2020), schools are responsible for fostering curiosity in young minds and equipping students with the necessary tools for personal growth. One vital aspect is providing good welfare services within educational institutions. These services keep students and staff motivated and contribute to the overall happiness and productivity of the entire school community (Mubita, 2016). By ensuring that students receive balanced and wholesome meals, catering services contribute to their overall well-being and provide a foundation for successful learning experiences.

Over the past two decades, Indonesia has successfully improved accessibility to education for its citizens (Beatty et al., 2018). Notably, there has been a substantial increase in enrolment rates for Grades 7 to 9 and Grades 10 to 12 between 2000 and 2014. By 2014, more than (93%) of students had completed their schooling, reflecting the country's commitment to education. However, despite remarkable enrolment and educational attainment achievements, Indonesia has faced challenges in enhancing student learning outcomes. The focus on increasing enrolment has yet to be accompanied by significant improvements in the quality of education provided (Beatty et al., 2018).

In the case of Ghana, the government has implemented various policies to promote education, including partial funding and the introduction of progressively free upper secondary school education in 2015. Furthermore, in 2017, Ghana introduced a policy of total financing for education, providing free education for all (Ministry of Education & Republic of Ghana, 2017). These policies were designed to increase enrolment rates and ensure greater access to education for Ghanaian students. In the context of increased enrolment, catering services in schools have faced challenges. As student enrolment grows, there is a higher demand for meals and food services within educational institutions. Providing catering services for a larger student population requires careful planning, efficient infrastructure, and adequate resources. However, the increased enrolment may strain the capacity of catering services, resulting in potential difficulties in delivering satisfactory meals and maintaining quality standards. Ghana's government policies have aimed to enhance education access through various funding mechanisms. However, the surge in students poses challenges for catering services within schools.

Rwanda, like many other African nations, has historically struggled with low enrolment rates among secondary school students (Rukabu, 2015). To address this issue and improve education access, Rwanda implemented a policy of free education, particularly targeting disadvantaged children (Rukabu, 2015). While this policy led to a significant increase in enrolment rates, there have been concerns about the quality of education provided as a result (Rukabu, 2015). Rukabu (2015) highlights that the implementation of free education in Rwanda has been a crucial state policy to boost school admission, especially among marginalised and economically disadvantaged children. By removing financial barriers, more students were able to enrol in secondary schools. However,

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there have been concerns that the rapid increase in enrolment may have negatively impacted the quality of education provided. Nyirandikubwimana et al. (2019) conducted a study that specifically examined the impact of free public education on education in the Huye district of Rwanda. The study focused on high schools and their experience with increased student enrolment as a result of the free education policy. The findings of the study shed light on the consequences of the policy implementation. It is important to note that the rapid increase in student enrolment, driven by the availability of free education, has placed additional pressure on schools. High schools in the Huye district have witnessed a surge in the number of enrolled students due to the accessibility offered by the free education policy (Nyirandikubwimana et al., 2019). This increase in enrolment poses challenges for schools, as they need to accommodate and provide quality education to a larger student population.

In 2007, the government of Uganda introduced a program aimed at providing free secondary education to all students, with the goal of doubling the number of pupils attending secondary schools (Mamba, 2020). This initiative sought to increase enrolment rates and enhance access to education, particularly among disadvantaged students. As a result, Uganda experienced a significant rise in enrolment rates, reducing the financial burden on households and expanding the opportunity for secondary education. According to information provided by the Ministry of Education and Sports in 2017, secondary school enrolment in Uganda increased by 13.5 per cent between the academic years of 2015-2016 and 2016-2017, with the number of students rising from 1.3 to 1.5 million (Ministry of Education & Sports, 2017). The implementation of free secondary education played a crucial role in facilitating this growth, as more students gained access to education due to the elimination of financial barriers. However, the introduction of free education in Uganda also presented challenges. The surge in student enrolment exerted significant pressure on school resources and infrastructure. Inadequate facilities such as classrooms, dormitories, laboratories, and sanitary facilities, as well as a shortage of instructional materials, became apparent issues (Mwangota, 2019). The rapid increase in student numbers strained the capacity of schools to accommodate the growing population, negatively impacting the education provided.

The government of Kenya has implemented various initiatives and policies that have led to a rapid expansion of the education sector and a significant increase in secondary school enrolment (MOEST, 2016). The introduction of free primary education in 2003 and the subsequent subsidisation of secondary education in 2008 have played a crucial role in improving access to education. These policies have resulted in notable transition rates, with 70 per cent recorded in 2008 and 80 per cent in 2012 (Wanja, 2014). Furthermore, the implementation of Free Secondary Education led to an increase in the transition rate from 76.8% in 2013 to 84 per cent in 2017 (Mwikya et al., 2019). Currently, Kenya has a policy known as the hundred per cent transition policy, which mandates that all students who complete primary education should proceed to the secondary level. This policy has contributed to a significant rise in secondary school enrolment across the country.

According to a report by the Education Management Information System (EMIS, 2019), there has been a substantial increase in secondary school enrolment in public schools throughout Kenya. In 2019, the number of secondary school pupils reached 2.8 million, compared to 2.6 million in 2016.

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This surge in enrolment signifies the success of the government's efforts in expanding access to secondary education. Njenga (2019) conducted a study in Nyandarua County, Kenya, focusing on the determinants of implementing the 100 per cent transition policy. The study specifically examined the availability of sanitation facilities, learning spaces, and sports facilities in secondary schools. The findings revealed that many schools faced challenges in terms of insufficient learning and teaching spaces, inadequate sports facilities, and inadequate sanitation facilities. Overcrowding was observed in classrooms, laboratories, and libraries as a result of the government's policy of ensuring a hundred per cent transition.

As student enrolment increases, it is important to investigate how this impacts the ability of schools to effectively provide catering services to meet the nutritional needs of students. There is limited availability of information regarding the provision of catering services to students in public boarding schools, particularly in the context of Kisumu West Sub-County, Kenya. No previous studies have been conducted in this specific area. Recognising this research gap, the current study was undertaken to explore the relationship between increased student enrolment and the delivery of catering services to students in public boarding secondary schools in Kisumu West Sub-County, Kenya.

Table 1 shows the percentage increase in enrolment between 2019 and 2022.

**Table 1: Total number of Students (2019-2022)**

NO.	SCHOOL	2019	2020	2021	2022	%increase
	SCHOOL O	1550	1832	2003	2505	62%
	SCHOOL P	480	595	761	852	78%
	SCHOOL Q	512	608	710	806	57%
	SCHOOL R	501	581	653	717	43%
	SCHOOL S	238	382	526	621	161%
	SCHOOL T	250	355	461	568	127%
	SCHOOL U	2093	364	432	524	79%
	SCHOOL V	195	291	387	488	150%
	<b>TOTAL</b>	<b>4019</b>	<b>5009</b>	<b>5933</b>	<b>7081</b>	<b>76%</b>

Source: Kisumu West Sub-County Education office

## 2.0 LITERATURE REVIEW

Schools worldwide typically provide daily meals to students, including boarding schools (Mensah & Appietu, 2020). In the United States, the Fresh Fruit and Vegetable Program (FFVP) was introduced in 2019 by the United States Department of Agriculture Food and Nutrition Service. This program aims to provide free fruits and vegetables to students from low-income households, promoting access to nutritious foods and healthy eating habits and addressing childhood obesity (Rida et al., 2019).

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The American School, Food Service Association published a report on school nutrition and food service practices, highlighting the implementation of the Smart Snack Standards for competitive foods and beverages. In the United Kingdom, the Department of Education revised school food requirements, emphasising government meal funding and discouraging the consumption of sugar-sweetened beverages (Micha et al., 2018). However, the impact of increased student enrolment on nutrition and food services in schools in the United States remains to be seen. Despite the significance of catering services in student well-being and academic performance, there needs to be more research regarding the influence of higher student enrolment on providing such services in public boarding secondary schools in Kenya. Therefore, the present study aims to address this gap by investigating the relationship between student enrolment and the delivery of catering services in these institutions.

In Asia, Tam (2017) examined the effects of increased student enrolment on university catering services in Thailand. The study found that as enrolment increased, it became increasingly difficult to provide adequate catering services, resulting in increased wait times, less food availability, and diminished student satisfaction. The researchers advise universities to invest in expanding their dining facilities in order to keep up with the rise. The study, unfortunately, failed to examine how the expansion of enrolment impacts the nutritional requirements and overall quality of food provided to students, creating a significant gap in the research.

On the other hand, in Norway, a similar initiative was introduced to provide all secondary school students with a piece of free fruit or vegetable every day (Hovdenak et al., 2021). Unfortunately, the implementation was revoked after a change of government. It is now up to the various counties to set aside funds to do so. According to studies, just about 10 per cent of counties provide fruit to school students (Prestbakmo, 2020). On the contrary, it did not consider the total number of students enrolled at the institutions. It is unclear why only 10 per cent of the schools provided fruits, and the rest did not. However, the relationship between increased enrolment and student catering services was not established. This current work seeks to fill this gap.

Guidelines for school nutrition have been established by the China National Health Commission (2017). These guidelines propose that students between the ages of 12 and 14 should have daily portions of various kinds of greens and at least one dairy product in order to achieve their daily requirements for energy and vitamins. These recommendations are intended to make certain that students consume a diet that is nutritionally sound and conducive to the growth of both their bodies and their minds. Many schools, on the other hand, did not adhere to these rules. Students in boarding houses are suffering from bad health because of poor nutrition. Due to the restricted space, the student canteen fed boarding students dinner. At the same time, the cooks delivered food to the classes during lunch hours. In comparison to their non-boarding peers, these boarding students in rural China exhibited lower academic achievement. Students are at a greater risk of suffering from anxiety and malnutrition as a direct result of packed class schedules, insufficient facilities, and unsatisfactory service (Wan, 2021). The study investigated students' academic performance. However, this study in China was not clear on whether these challenges faced by the

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school were due to increased student enrolment in those schools. The study did not establish any relationship between student enrolment and catering services, which is the focus of the present work.

Malaysian Ministry of Education and Health has resulted in a policy on healthy school eating, where food and drinks provided in boarding schools must meet standards based on macronutrient and energy content (Nor et al., 2021). The study goal was to find out what it is like to implement a healthy eating policy in a boarding school food service setting and whether or not students adhere to it. School healthy eating policy includes a list of menus served in the dining hall (Nor et al., 2021). Most principals agreed that the menus were healthy for their students. The findings show that school-based healthy eating practices are still low because students prefer the canteen to the dining hall. The policy encourages students to eat healthily, but it is challenging to implement. However, the study did not relate the policy of healthy eating in boarding schools to student enrolment. Therefore, this study aims to establish this relationship.

Even though students pay fees, the government supports public boarding schools in Ghana. The 2015/16 academic year saw a GH71.9 million (US\$14,998,852) grant for senior high school (SHS) pupils (Government of Ghana, 2017). In addition, unlike university cafeterias where students pay for food, Ghana provides subsidised food services in public boarding schools. All meals were served in boarding school dining halls and were mandatory for all boarders. In addition, other available food sources are food stored in chop boxes and food vendors from outside (Ababio et al., 2016), cited by (Mensah & Appietu, 2020). According to Mensah and Appietu (2020), certain schools' food safety was jeopardised due to the lack of fly-proof doors and windows, which allowed flies and dust into food processing rooms. The majority of respondents were unaware of this approach (sanitisation), indicating that it was not widely used. In addition, food storage and thawing were unfamiliar to the majority of the respondents. According to the Food and Agriculture Organization (2020), food preservation should be done in a particular area dedicated to it. The preparation areas should be kept clean at all times and away from any source of contamination (such as garbage, wastewater, dust, flies, and domestic animals). The study conducted in Ghana did not establish a connection between increased student enrolment and catering services. Consequently, there is a need for further research to investigate the correlation between increased student enrolment and catering services, specifically in the context of Kenya. The Ghana study also did not provide evidence regarding whether the deterioration of food hygiene practices in those schools was influenced by the rise in enrolment.

In a study conducted in Nigeria by Matthew (2020), inadequate food delivery has hindered the efficient management of public boarding institutions. Boarding school students require adequate nutritious food; food gives energy for various bodily functions, including schooling. Students may riot if there is insufficient food. The scholar avers that the high expense of food has an impact on managing boarding schools. When both the price of the food items and the student population rises, it becomes difficult for management to acquire the appropriate quantity. As a result, they may resort to purchasing low-food items, endangering the students' health and nutrition (Mathew, 2020). Inadequate staff, such as cooks, is also a problem in schools. However, the survey only looked



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at the perceptions of teachers and principals, not the students, since it was on the management of schools. Hence, this research aims to explore the correlation between an upsurge in student enrolment and the provision of catering services, encompassing both teachers and students as participants.

As per Nicholaus et al. (2020), the diet of secondary school students in Tanzania mainly consists of legumes and cereals, lacking adequate animal protein, vegetables, and fruits. Furthermore, essential nutrients such as zinc, vitamin C, iron, and calcium are insufficient in the food provided in most boarding schools. To address student malnutrition, the study recommended including a diverse range of foods in school diets, including nutrient-rich sources like animal products, fruits, and vegetables. However, the study conducted in Tanzania did not explore the potential impact of student enrolment on dietary practices. It focused on examining the students' dietary practices, nutrient intake, and nutritional status without considering student enrolment data. Therefore, this study aims to fill this gap by investigating the relationship between student enrolment and the provision of catering services in boarding schools.

The research undertaken by Bouterakos et al. (2021) underscores the critical role of school food programs in enhancing the nutritional well-being of schoolchildren, a matter of utmost importance during the COVID-19 pandemic. The study highlights the significance of school nutrition initiatives in ensuring that children, especially those from food-insecure households, have adequate access to nourishing meals. It has been acknowledged that school feeding programs are an effective means of enhancing children's health, nutrition, and educational outcomes. In addition, the study indicates that school nutrition programs can have positive effects on the local economy by bolstering local farmers and food producers. The study recommends governments and authorities to prioritise school food initiatives during the COVID-19 pandemic. The authors recommend that local culinary culture and tastes should be considered when designing school feeding programs. School feeding programs should be combined with other health and nutrition interventions like deworming and micronutrient supplementation to improve children's health and education, according to the study.

In Kenya, every child is entitled to sufficient adequate nutrition, health care, and primary education (Ramukumba et al., 2019). Amidst the peak of the COVID-19 epidemic, the Ministry of Education (2020) formulated safety protocols for the resumption of educational institutions, outlining specific guidelines and procedures. Tables and chairs in the dining hall must be at least 1 meter apart. To avoid overcrowding in the dining hall, students per class are required to eat at different times. Lunches are to be served in the classes where possible. Sharing utensils or food is not allowed. The school should provide liquid soap and water for cleaning and disinfecting; shared canteens should remain open; students should sit far apart, and differentiating times to be observed when serving food (Johansen et al., 2020).

Serrem et al. (2020) aver that adolescents require adequate nutrition for optimal growth, development, and overall well-being. It was determined that Kenyan high schools failed to feed students properly; many schools did not offer adequate healthy foods and did not meet all students' energy needs. Serrem et al. (2020) revealed that neither of the high schools properly satisfied the

nutritional needs of the meals given to students. The menus were monotonous and simple, with limited food options. Fruits, proteins, and vegetables were the least popular foods in schools. On the other hand, githeri, a blend of maize and beans, was the preferred option, followed by starchy foods such as ugali and porridge. Serrem et al. (2020) mentioned that national schools consume more fibre and starch than other schools, and fruits and veggies are eaten more frequently in rural classrooms. From the findings, learners in private schools consume more proteins during breakfast than in public schools. Most schools did not meet the correct nutrient requirements. At the same time, some exceeded them, such as dietary fibre, which is three times the recommended amount. The findings point to the necessity of cooperation between the government of Kenya and other relevant parties in order to establish and put into practice a school food plan that complies with the nutrition requirements of the nation. The previous study examined the nutritional requirements of students in 50 boarding schools across eight counties in Kenya, namely Uasin Gishu, Elgeyo Marakwet, Nandi, Nairobi, Kisumu, Kakamega, Nakuru, and Laikipia, but failed to explore any relationship between nutrition services and student enrolment, highlighting a significant gap in knowledge that the current study seeks to address.

According to a report by Owino (2023), there were unfortunate fatalities at a school in Kakamega County, where three students and a teacher lost their lives. The authorities attributed these deaths to food poisoning. Some members of parliament expressed concerns that the safety of the food consumed by students in high schools is not verified by health officers, thus exposing learners to potentially deadly diseases. Various scholars argue that school staff should undergo training to ensure they are disease-free before handling food. The report also implicated principals accused of overcrowding their schools for higher funding, leading to compromises in sanitation standards. Disturbingly, it was observed that even after students displayed symptoms of a severe infection, the management kept them in the sick bay for days before eventually transferring them to a hospital.

### 3.0 METHODOLOGY

A descriptive survey design was employed by the researcher to gather data for the study. The data collection process involved administering questionnaires to a selected sample of participants within the Kisumu West sub-County. The target population comprised eight public boarding secondary schools, which consisted of 5945 students in form two, three, and four, as well as eight cateresses/caterers (County Director of Education Office, 2021). The selection of schools was based on a purposive sampling technique, while all eight boarding secondary schools were included in the study using a census method. The sample size for students was determined using the Krejcie and Morgan table (1970), and proportionate sampling was employed to establish the sample size for each school. Simple random sampling was then utilised to select the actual students who would participate in the study. The final sample consisted of eight cateresses/caterers and a total of 357 students. Both close-ended and open-ended questionnaires were utilised as data collection instruments. The questionnaires underwent an evaluation to ensure content validity. The open-ended questionnaires were administered to the cateresses/caterers, while the closed-ended questionnaires were given to the students. For data analysis, both qualitative and quantitative data were employed. Qualitative data was summarised in narrative form, whereas descriptive statistics like mean, frequencies, and percentages were employed to analyse quantitative data. The researcher



obtained permission from the respective school principals to collect data from the students, as they were minors. Informed consent was sought, and voluntary participation was emphasised. Anonymity was maintained for all respondents, and the information provided was treated as confidential and private.

## 4.0 RESULTS AND DISCUSSIONS

### Students Descriptive Statistics on Catering Services

Quantitative data on the delivery of catering services were provided by the students. It was gathered using a set of 9 closed-ended items. The items were based on the extent to which the respondents agreed with them (SD=4. D=3, A= 2, SA=1). The descriptive statistics were computed to analyse the relationship between increased student enrolment and delivery of catering services. Table 2 presents the findings in percentages.

**Table 2: Students' Responses to Items on Delivery of Catering Services**

Item	N	SA (%)	A (%)	D (%)	SD (%)
As a result of increased enrolment, sometimes we eat half-cooked meals.	29 4	33. 2	30. 7	15. 3	20. 7
As a result of increased enrolment, the school sometimes provides poor-quality food.	29 4	31. 8	37. 0	14. 7	16. 5
Due to increased enrolment, we are sometimes served little food.	29 4	45. 5	27. 1	16. 3	11. 1
Due to increased enrolment, we spend a lot of time queuing to be served food.	29 4	37. 8	22. 0	13. 4	26. 8
As a result of increased enrolment, we often don't eat a balanced diet.	29 4	43. 3	18. 4	19. 1	19. 2
Due to increased enrolment, there is overcrowding in the dining halls.	29 4	57. 2	21. 4	9.3	12. 1
Due to increased enrolment, there are fewer cooks in the school.	29 4	24. 4	20. 6	32. 0	23. 0
As a result of increased enrolment, there is competition for food among students.	29 4	43. 8	28. 1	13. 0	15. 1
Due to increased enrolment, sometimes students eat stale food.	29 4	19. 8	15. 7	29. 7	34. 8

According to Table 2, the data shows that (63.9%) of the students acknowledged consuming undercooked meals is linked to the rise in student enrolment. This concurs with Roqib (2021), who reported shortage of cooking staff caused by increased enrolment led to rushed meal preparation and undercooked meals. Moreover, half-cooked meals can pose a health risk to students, as they may lead to foodborne illnesses such as salmonella and E.coli. In addition, undercooked meals may lack essential nutrients, potentially leading to malnutrition and its associated health consequences.

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The data suggests that a significant proportion of respondents (68.8%) feel that the school sometimes provides poor-quality food. Poor quality food can have several negative consequences for students. Firstly, it may lack essential nutrients, leading to malnutrition and health problems. Secondly, it may harm students' academic performance and overall well-being, as poor-quality food can reduce concentration and energy levels. This resonates with Mathew (2020), who avers that when the cost of food items and the student population keeps rising, it resorts to purchasing low-food items. Mathew concurs with Mensah and Appietu (2020), who revealed that the respondents needed more knowledge regarding proper storage and food thawing. The absence of fly-proof doors and windows also encouraged the entry of flies and dust into food preparation areas. This reduces the amount of meal that is offered to schoolchildren. The findings of the study led to the suggestion that food be preserved in a place far from contamination (Rubbish, wastewater, dust, flies, and domestic animals) and kept clean always.

Additionally, (72.6%) of those surveyed agreed they are sometimes served inadequate food. This concurs with Matthew (2020) on inadequate food delivery in schools. The scholar avers that the high expense of food has an impact on the governance of boarding schools. When both the price of the food items and the student population rises, it becomes difficult for management to acquire the appropriate quantity.

Almost three-quarters (72.6%) of respondents agreed they waited too long for lunch. According to Otieno and Ochieng (2020), the authors concur that, with the introduction of a 100 per cent transition policy, schools have increased in population, forcing the administration to adjust the timetable to ensure organised movements during meals to save time when serving meals. This helps in the long queuing when serving food.

One large proportion of those who participated in the survey (61.7%) acknowledged that they do not consume a balanced diet. This finding coincides with the results of Nicholaus et al. (2020), which looked into what kind of food Tanzanian high school pupils ate. According to the results, these pupils' meals are mostly composed of legumes and cereals, with limited consumption of animal protein, fruits, and vegetables.

The vast majority of participants (78.4%) indicated that there is overcrowding in the dining halls. This finding aligns with the observations made by Otieno and Ochieng (2020) in their study on the dining hall situation in schools. The author reported overcrowding during meal times in the dining halls, with some schools resorting to holding meals in open areas or under trees due to limited space caused by using the dining hall for other purposes, such as learning.

Fewer cooks in the school (45.0%) of the respondents agreed to this, which means that when the number of students increases, the number of cooks should also increase to prepare enough food on time for the whole population. This collaborates with Maki et al. (2015). In order for boarding students to be able to study effectively during prep time, schools should provide suitable facilities for them. In addition to having an inadequate meal for supper, the students needed a balanced diet

and adequate cooks to prepare meals on time, which caused them to feel hungry. Those students were likely to have their attention distracted. The issue of overcrowding in dining halls can have several adverse effects, including compromising the quality of meals, creating an unsanitary environment, and making them more susceptible to sickness.

The data from the table indicates that a significant percentage of students (71.9%) agreed to experience competition for food. Students often have to line up to be served food, leading to long waiting times and food shortages. In some cases, students serve themselves more than twice in one meal, indicating that more than the food provided by the school may be needed to meet their dietary needs. A study by Beam (2020) found that public schools have a higher prevalence of food insecurity and hunger among students. In addition, the study discovered that adolescents who are food insecure are more likely to report having to compete with their peers for food.

The polling indicated (35.5%) of participants agreed to eat stale food. In addition, students' food is only sometimes fresh, especially fruits and vegetables. Studies have revealed that students' consumption of stale and expired food is a widespread issue in schools. For instance, a study conducted by Finkelstein et al. (2008) found that 60 per cent of middle and high school students purchased food from vending machines, and more than 80 per cent of those students reported that the vending machines did not offer fresh fruits and vegetables. In a report by Owino (2023), it was stated that Members of Parliament in Kenya responded to the deaths of three students and a teacher at Sacred Heart Mukumu Girls High School by calling for urgent action. The incident, believed to have been caused by food poisoning, highlighted schools' absence of health inspections and medical staff. Consequently, the MPs demanded the establishment of clinics with nurses in all public schools and regular food inspections. They also emphasised the importance of training and health checks for food handlers. Furthermore, the issue of overcrowding and compromised sanitation standards in schools was raised, resulting in a request for a comprehensive report on disease outbreaks. Immediate measures to improve student welfare and safety were demanded.

## **Qualitative Data on Catering Services Provided by Cateresses/Caterers**

A majority (80.0%) agreed that increased enrolment affected the preparation of meals for students, while the rest (20.0%) disagreed. The sectors affected over the years due to increased enrolment are increased workload, cooking mode, and preparation delays. School O's respondents stated, "*Food takes longer to be prepared.*" According to Powell et al. (2021), a study explored the impact of rising enrolment on the effectiveness of food preparation in higher education institutions. The researchers examined, via interviews and observations, how the increase in student enrolment has affected the kitchen staff's workload, the kind of cooking done, and the frequency of preparation delays. The research shows a strong link between rising enrolment and workload, shifting cooking styles, and late supper preparation. These findings demonstrate the necessity for preventative actions to address the difficulties of accommodating rising student numbers. The quantitative data (63.9%) of the respondents agreed that increased student enrolment has contributed to consuming half-cooked food. This supports the findings.

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Half (50.0%) of respondents agreed that food quality has reduced due to increased student enrolment, while the rest (50.0%) disagreed. This is included reducing the taste and delicacies like eggs and meat, among others. A respondent from school P mentioned, "*The quality has been reduced since the cooks have to prepare food for so many students.*" This concurs with Roothaert (2021), who found that large-scale meal production in schools often results in lower food quality due to limited resources and time constraints. The quantitative data collaborates with the findings (68.8%) of the students agreed and acknowledged eating poor quality food due to the rise in enrolment.

Two-thirds (66.7%) of the respondents reported a drop in the quantity of food, while (33.3%) disagreed that there was no drop in the quantity. This was in the form of a reduced ratio of food to students. Respondents from schools O and S mentioned that; "*The ratio of meals has reduced to fit the large crowd of students.*" "*The quantity has slightly reduced.*" This view is collaborated by Mathew (2020), who maintains that the high expense of food and the high number of student enrolment has influenced the management of boarding schools in Nigeria. He notes that when both the price of food items and the student population rise, it becomes difficult for management to acquire appropriate foodstuff; they now resort to purchasing low-priced food items. The study further revealed that students riot due to the quantity of food during meals and inadequate food in schools. The students' responses in the quantitative data (72.5%) asserted that food was insufficient.

A majority (66.7%) of the respondents agreed that increased enrolment affected the time set aside for meals, while (33.3%) disagreed. Various strategies were implemented to manage this issue, such as increasing the number of cooks and serving students on time. Respondents from schools O and P stated, "*Food is not served on time.*" "*There is usually a delay in the serving of food; hence the students are now eating in a shift.*" "*Serving takes time sometimes and overlaps into other events.*" This resonates with Otieno and Ochieng (2020), who found that many educational institutions had repurposed former dining halls, staff rooms, clinics, labs, shops, libraries, and abandoned buildings into classes and living quarters in order to house their large student bodies. Quantitative data from the students reinforce that much time is spent serving food during meals (72.6%) agreed.

All (100.0%) of the respondents agreed that increased enrolment affected providing a balanced diet to students. A respondent from school P mentioned: "*Students are not provided with a balanced diet in their everyday meals.*" According to Chan (2009), the study results indicated that educators do not stress the importance of maintaining a healthy diet at school. Therefore, the primary responsibility for ensuring and encouraging the children to eat a healthy balanced diet rests with the parents. Terry-McElrath et al. (2015) found that the availability of healthy food options decreases as student enrolment increases. The study revealed that schools with higher enrolment were less likely to offer fruits and vegetables and more likely to offer unhealthy snacks and beverages. Quantitative data substantiated that (61.75) respondents agreed to not consuming a balanced diet in school.

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A majority (80.0%) agreed that increased student enrolment affected crowding in the dining halls. However, (20%) of the respondents disagreed. Over the years, expansions have yet to be done to accommodate the additional student. Some respondents from schools T and U mentioned, respectively, *"Dining halls no longer exist, so the students serve outside."* *"There is crowding in the dining hall."* This concurs with the findings of Otieno and Ochieng (2020) that a 100 per cent transition policy substantially impacted public secondary schools in Machakos County. This led to constraints on physical infrastructure such as dining halls. The study revealed that overcrowding makes students eat outside or under trees. A report by Ho & Madden-Hallett (2020) found that overcrowding in college dining halls may result in lower student satisfaction because they may have to wait longer for meals, struggle to locate a seat or feel rushed owing to time constraints.

Most schools do the table serving system. Respondents from schools O and Q stated, *"Students' take their meal in the open air; the space in the dining hall is not enough to accommodate all of them."* *"Students sit outside during meals."* A study by Otieno and Ochieng (2020) stated that several schools had rearranged their schedules to facilitate more orderly student movement during lunch by adopting a shift schedule. Some students said the dining hall was being used for educational purposes, so they ate outside, maybe beneath a tree. A prevalent number of the students in the quantitative data agreed (78.4) to overcrowding in the dining halls during meals.

Half (50.0%) of the respondents agreed that the number of cooks in their schools was insufficient due to increased student enrolment, while the other half disagreed. These are the statements from the caterers of schools O and V; *"The cooks in schools are not enough to cater for the cooking services for all the meals during the day."* *"Cooks are few hence having much workload."* This collaborates with Shi et al. (2021) that inadequate cooks cause students to wait longer for meals, leading to malnutrition and health problems. In addition, this delay means that the students miss out on recess, which can impact their overall well-being. The findings are also collaborated by (45.0%) of the students who ratified that the cooks in the schools were not enough.

Two-thirds (66.7%) of the respondents agreed that increased enrolment led to food competition among students during meals. This was evidenced by scrambling for food. The third who disagreed attributed that to proper arrangements of serving food with the assistance of teachers. Respondents from schools S and O stated, *"Competition has surged, and students are more unruly."* *"Due to long queues, learners struggle to reach earlier than others."* Galmiche et al. (2019) aver that adolescents frequently engage in disordered eating practices and have studied it. However, the prevalence of such disorders is growing. In this age group, students often fight over limited resources, including food. The quantitative data also agrees with these findings, where a majority (71.9%) of the respondents experienced competition for food amongst themselves.

Half (50.0%) of the respondents reported that increased enrolment affected the provision of fresh food to students, while the other half did not. Respondents from schools T and V stated, *"It is now difficult to provide fresh fruits and vegetables."* *"Fresh food provision has reduced due to the high cost of the quantity being purchased by the school."* This contradicts Ochieng (2023), who noted that most schools cultivated food crops on their school farms, providing fresh foods and vegetables.

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However, none of them reared animals of any sort on the farms. These findings are backed by the quantitative data where (35.5%) of the respondents identify that the school sometimes provides them with stale food.

## Correlation Analysis

The relationship between enrolment and delivery of catering services was determined using the Pearson Product-Moment Correlation Coefficient. It involved correlating the number of enrolled students with the delivery of catering services overall mean. The results of the procedure are in Table 3.

**Table 3: Correlation Analysis**

Scale		Catering services mean scores
Enrolment	Pearson Correlation	-.205
	Sig. (2-tailed)	.000
	N	294

The relationship between student enrolment and delivery of catering services was negative and statistically significant at .05 confidence level,  $r(294) = -0.205$ ,  $p = .000$ . The correlation analysis presented in Table 3 examines the relationship between student enrolment and the delivery of catering services.

The Pearson Correlation Coefficient between student enrolment and the delivery of catering services overall mean was calculated to be  $-0.205$ . This negative value indicates a negative correlation between the two variables. The significance level is reported as  $0.000$ , less than the commonly used threshold of  $0.05$ . This suggests that the correlation coefficient is statistically significant, indicating that the observed relationship between enrolment and delivery of catering services is unlikely to have occurred by chance.

Based on the correlation analysis and the observed negative correlation between student enrolment and the delivery of catering services in public boarding secondary schools in Kisumu West Sub-County, Kenya. It can be concluded that high student enrolment has a detrimental effect on the provision of catering services. This implies that as the number of students increases, the delivery of catering services tends to decrease in these schools. In light of these findings, measures should be taken to enhance the delivery of catering services in response to the rising student population. This may involve increasing the resources allocated to catering, improving the kitchen sector, hiring additional staff, and implementing more efficient meal planning and facilities, among others. By addressing these issues, the boarding schools in Kisumu West Sub-County can better accommodate the growing number of students and ensure that their catering needs are adequately met. Otieno and Ochieng (2020) noted that several schools had redesigned their curriculum by changing the school schedule to enable organised activity during meals. Due to many pupils, some schools reported eating their meals outside, under trees, because the dining hall was used for studying.



## Hypothesis Testing

Student enrolment has no statistically significant relationship with the delivery of catering services in public boarding secondary schools in Kisumu West sub-County, Kenya. In other words, the null hypothesis assumes that there is no correlation between these two variables. The obtained correlation coefficient is -0.205, indicating a negative correlation between these two variables. Since the obtained p-value is less than 0.05, we reject the null hypothesis. Therefore, this study concludes that there is a statistically significant negative relationship between student enrolment and the delivery of catering services. A study by Ohri-Vachaspati (2012) in the United States examined the relationship between school size (an indicator of enrolment) and the availability of healthy food options in school cafeterias. The study found that the availability of healthy food options decreased as school size increased. Specifically, the study found that larger schools were less likely to offer fresh fruit, whole-grain products, and vegetarian options and were more likely to offer fried foods, high-fat meats, and sugary drinks. These findings suggest a negative relationship between school size (enrolment) and the availability of healthy food options in school cafeterias, which may be related to the delivery of catering services. As enrolment increases, it may become more difficult for schools to provide healthy and nutritious meals to all students due to resource constraints, such as limited kitchen space, staff, and funding.

## 5.0 CONCLUSION AND RECOMMENDATIONS

**Conclusions:** The study concludes that increased student enrolment leads to inadequate catering services, such as limited food supply, poor quality food, and long queues during meal times. Schools should invest in better catering facilities and increase the number of catering staff to improve the quality of meals and services supplied to students.

**Recommendations:** The government should utilise the findings of this study to address the issue of over-enrolment in secondary schools and develop strategies to manage the growing student population effectively. The government should allocate sufficient financial resources to improve the quality of catering services in schools. This includes increasing the budgetary allocation specifically designated for food provision and related infrastructure. The school administrators should provide comprehensive training and capacity-building programs for school caterers and staff involved in food service. Adequate funding will enable schools to procure nutritious ingredients and modern kitchen equipment and improve dining facilities. Provide comprehensive training and capacity-building programs for school caterers and staff involved in food service. Training should focus on food preparation techniques, nutrition education, hygiene practices, and customer service. By equipping caterers with the necessary skills and knowledge, the quality of food and service can be improved. Establish a system for evaluation and regular monitoring of catering services in schools. Develop and enforce nutritional standards for school meals, making sure that they meet the dietary requirements of students. The school officials should establish channels for students, parents, and staff to provide feedback on catering services. The policy makers can also use the information to regulate students' admission to schools with limited facilities.

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