Social Education Research
http://ojs.wiserpub.com/index.php/SER/

UNIVERSAL WISER PUBLISHER

Research Article

Effects of Increasing Student Enrollment on Teaching and Learning in Senior High Schools in Ghana: The Free Senior High School Policy in Retrospection

Richard Kwame Duah, Kojo Oppong Yeboah Gyabaah, Bismark Mensah*, Adjoa Afriyie Poku, Felix Kofi Damte

Department of Geography Education, University of Education, Winneba, Ghana
Email: bismarkmensah@uew.edu.gh

Received: 15 April 2023; **Revised:** 17 June 2023; **Accepted:** 17 June 2023

Abstract: Senior high school education in Ghana has experienced tremendous growth following the introduction of the Free Senior High School (FSHS) policy. Several studies have proven that increased student enrollment presents challenges to effective teaching and learning and academic performance. In view of this, the study explored how teaching and learning are reacting to the recent increase in student enrollment in Ghanaian Senior High Schools (SHSs). In this study, 181 teachers were selected from six SHS within the Ejisu Municipality using the cluster sampling technique in order to examine how changes in student enrollment following the implementation of the FSHS policy have affected teaching and learning. The study adopted trend analysis, with data analyzed using SPSS. The findings showed an impressive, steady increase in student enrollment. It was also found that students' academic performance generally dipped in the introductory years of the FSHS policy, while some improvements were observed from 2019 forward. However, the study revealed that schools experienced classroom and dining hall congestion, inadequate teaching and learning materials, inadequate hostel infrastructure, and a high student-teacher ratio. The study recommends a multi-stakeholder collaboration to salvage the infrastructure deficits and their associated challenges that characterize SHSs in Ghana.

Keywords: Free Senior High School (FSHS), student enrollment, class size effect, academic performance, Ghana

1. Introduction

Education is both a necessary and permissive factor for social change and economic development in all countries. The expenditure of various governments in Sub-Saharan Africa on improving education in recent years makes up a notable percentage of national budgets. This is because of the growing number of students in schools and a push for more people to be enrolled in various schools. The push for this is because of education's relevance in attaining quality of life (UNESCO, 2017; World Bank, 2017). As part of the Government of Ghana's steps toward realizing Sustainable Development Goal 4 by ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all (United Nations, 2018), the government introduced the Free Senior High School (FSHS) policy in September 2017. The FSHS policy is expected to give opportunity to many basic school leavers to gain entrance

DOI: https://doi.org/10.37256/ser.4220232849

into second-cycle education (Ministry of Education, 2018). This is part of the Government of Ghana's effort to ensure that students from low-income communities get access to at least SHS education. In the first term of the 2017-2018 academic year, enrollment in the first year of SHS was 424,092 students, representing an increase of approximately 72% compared to the 2016-2017 academic year's 260,210 student enrollment (Ministry of Education, 2018). Also, it is expedient to indicate that the introduction of the FSHS policy is consistent with the provisions of the 1992 Constitution of Ghana, particularly Chapter 5 of that Constitution, Clause 1(b), which states that "secondary education in its different forms, including technical and vocational education, shall be made available and accessible to all by every appropriate means, and in particular, by the progressive introduction of free education" (Government of Ghana, 1992).

Secondary education in Ghana has experienced tremendous growth since its independence in 1957. This growth has even been more significant in recent times due to the introduction of the FSHS policy (Tamanja & Pajibo, 2019). Ghana's SHS education, equivalent to high schools in most developed countries, has witnessed a significant increase in enrollment since the inception of the FSHS policy in 2017 (Deho & Agangiba, 2019). The Ministry observed that in the 2018-2019 academic year, SHSs recorded a substantial increase in admissions from 362,118 students to 472,000 students, representing an increase of approximately 23% (Ministry of Education, 2018). One feature of the FSHS policy is that it allows teachers to have more contact hours with students. The longer contact hours provide students with more time for learning and interaction with their instructors. Another key feature of the FSHS policy was the introduction of the double-track system. Under the double track system, which is a system introduced by the government in order to enable various SHS to take in more students so that the school run more or less a semester type of school by rotating students in tracks due to infrastructural challenges, teaching hours have increased from six hours to eight hours per day. Teaching hours are expected to increase from 1,080 hours per year under the single-track system to 1,134 hours per year under the proposed double-track system. The double-track system was to be run in schools with large class sizes (Ministry of Education, 2018). The double-track system, an intervention that enables schools to accommodate more pupils in the same school facility, is frequently driven by its ability to reduce overcrowding and save money in the short term compared to building new schools (Abdulai & Ahmed, 2021). Two student streams-the green and gold tracks-are operated by the double-track system. The green and gold represent two streams of students. The intervention establishes a two-semester instructional cycle. Each of the 81 days of this intervention's semester includes 41 days of sandwich class vacation (Adarkwah, 2022). Before the double-track system, all SHSs in Ghana operated on the single-track, where all students were engaged in one stream of three "terms" within the academic year.

The Ejisu Municipality is one of the municipalities in the Ashanti region of Ghana that has seen an increase in student population because of the FSHS policy. This increase could lead to ineffective learning outcomes. It is reported that when students' populations are lower, teachers can select and utilize a variety of instructional methodologies, including discussion and role play, among others, which provide individual attention and increase student involvement in their learning (Zainuddin & Halili, 2016). Before the introduction of the FSHS policy, the Ejisu municipality had four public SHSs (Ejisuman SHS, Ejisu Secondary Technical SHS, Achinakrom SHS and Bonwire Secondary Technical SHS). Subsequently, the Government of Ghana absorbed two private schools (Onwiman SHS and Church of Christ SHS). Also, before the policy, the number of students was approximately 12,054, with about 120 teachers. Data show that the number of students increased to 24, or 212, representing a little over 100 per cent compared with the previous academic year (Ministry of Education, 2018). However, despite the increase in enrollments, resource availability still needs to improve, including the provision of textbooks, requisite teaching staff, and other teaching and learning resources.

Research has revealed that small class sizes lead to active student participation in the learning process. In contrast, large class sizes lead to less involvement of students in the teaching and learning process (Bedard et al., 2011). The aim of increasing the population in SHS education in Ghana is to make education more accessible to all as part of efforts aimed at attaining Goal 4 of the Sustainable Development Goals (SDGs), which is quality education. However, the rapid expansion of secondary education amid inadequate provision of teaching and learning facilities poses severe challenges to effective teaching and learning in schools, which could have far-reaching effects on the quality of education offered (Edla, 2012). The challenges posed or emerging from the introduction of the FSHS policy have yet to be adequately examined or researched by scholars, partly due to the limited time since its introduction and the fluid nature of new policies and programs being implemented (Tamanja & Pajibo, 2019).

A study focused on understanding the FSHS Policy and concluded that the aftermath challenges were inadequate

funds, limited textbooks, inadequate infrastructure, and doubts about educational quality (Adarkwah, 2022; Mohammed & Kuyini, 2021). A similar study evaluated the program, process, and political dimensions of the Ghana FSHS Policy (Rivkin & Schiman, 2015). These dimensions could have offered more direct insights into how the quality of teaching and learning is affected following the FSHS Policy's implementation. More so, the Chanimbe and Dankwa (2021) study affirmed the findings of previous studies by pointing to issues of high enrollment rates culminating in teacher shortages, increased workload for existing teachers, classroom deficits, overcrowding in class, high rate of indiscipline and inadequate teaching/learning materials. However, it is unclear from these studies how the increasing student enrollment impinges on the quality of teaching and learning within SHSs in Ghana. With the already existing infrastructural deficits and inadequate deployment of teachers to SHSs due to a lack of funding (Tamanja & Pajibo, 2019), soaring student enrollment will likely exacerbate these problems and further pose a threat to the quality of teaching and learning.

Further, efforts to promote inclusion in classrooms (Deku & Ackah, 2012) will be undermined since students with special needs may need more attention due to large class sizes. There is a need for the conduct of systematic empirical research to unpack the consequences produced within the SHS educational landscape following the FSHS policy implementation in Ghana with respect to achieving learning outcomes. This will help inform policy decisions regarding school administration, the supply of teachers and teaching and learning resources to SHSs, and the current bid of the Government of Ghana to improve the infrastructure deficits in schools in Ghana. This current study sought to answer the following research questions; (1) What are the dynamics of student enrollment in senior high schools in Ghana following the implementation of the Free SHS policy? (2) How have changes in student enrollment in Ghanaian senior high schools affected the quality of teaching and learning? (3) What are the emerging challenges faced by teachers and students in the teaching and learning process after the introduction of the Free SHS policy?

2. The class size effect literature

Quality education is a priority for both developed and developing countries (Ojewunmi, 2020; Agbedahin, 2019). A review of the literature reveals several factors affecting the quality of teaching and learning, particularly students' learning outcomes (Bosworth, 2014; Bernard et al., 2022). Students learning outcomes or academic performance is determined by, but not limited to, age, prior learning experiences, preference in delivery format, average study time (Lim & Morris, 2009), motivation (Renandya, 2013), and class size (Ehrenberg et al., 2001; Bernard et al., 2022; Bosworth, 2014). The relationship between class size and students' learning outcomes has been of interest to educational researchers for decades (Adarkwah, 2022; Uhrain, 2011). Since the implementation of the Free Senior High School policy, which has significantly boosted student enrollment over the past five years, class size's causal relationship to students' academic achievement has become a crucial topic in Ghana's continuing educational debate, as it is in many other countries (Osei-Owusu, 2021; Deho & Agangiba, 2019; Ministry of Education, 2018). However, studies on the class size effect have produced conflicting results. According to Dobbelsteen et al. (2002), variables other than differences in class size can contribute to performance gaps between students in small and large classrooms. Thus, they could be affected by the aforementioned factors. This sharply contrasts the traditionally upheld view that large class size leads to poor student learning outcomes. For instance, Uhrain (2011) contends that fewer students in a classroom change the climate of the entire classroom, fostering a more pleasant learning environment where students can develop stronger relationships with their classmates and instructors. Educational context, a key moderating variable, is mostly missing in the ongoing class size debate. It is therefore important to extend the literature on the class size effect by exploring different educational contexts, especially where intentional interventions and policies are targeted at ensuring improvements in students' learning outcomes amidst increasing class size, as is the case with Ghana's FSHS policy.

Several quasi-experimental studies have been conducted to explore the class size effect. However, the literature on educational studies does not agree on whether lower student achievement will be affected by larger classes on average. Some experts say class size changes may affect students' standardized achievement levels. When class sizes were decreased in Grades K-3, results from the Tennessee Student-Teacher Achievement Ratio (STAR) research, which Uhrain (2011) quoted, revealed a significant improvement in student performance. Atta et al. (2011) state that secondary class sizes under 20 students significantly affect academic performance. Brühwiler and Blatchford (2011) also came to the same conclusion, finding that a one-student decrease in class size increased students' grade point averages at both the primary and secondary levels by 0.5 points. Other research indicated that class size reduction had little to no effect

on students' academic performance. Canadian 15-year-olds' results on the Program for International Student Assessment were examined by Corak and Lauzon (2009). They discovered that class size did not affect students' academic performance. At the secondary level, Owoeye and Yara (2011) and Wyss et al. (2007) revealed no statistically significant differences in student achievement between large and small classes. As a result, there is inconsistent and inconclusive evidence about the effect of class size on student progress. However, to provide policy direction for Ghana's case, it is important to examine how increasing student enrollment affects teaching and learning at the senior high school post-implementation of the FSHS policy. This would also provide insights into whether the accompanying interventions are effective.

3. Methodology

The study was conducted in the Ejisu Municipality in the central part of the Ashanti Region of Ghana. Traditionally, the people of Ejisu rely on farming and small and medium-scale business activities for a living. Subsequently, public-led and private industries have been established to cater to the area's increasingly youthful population due to the increased population. The upsurge in the increasing youthful population coupled with the introduction of the Free SHS policy has also resulted in an increment in the student population in the SHS situated within the Ejisu municipality, hence the basis for the choice of this study area.

The study adopted an exploratory case study design to understand the relationships between the increase in student enrollment resulting from the FSHS policy and teaching and learning outcomes. This study analyzed data from 6 schools (subunits), which were considered at a single time. All six schools were located within the Ejisu municipality. In a more objective lens, the present study combines primary and secondary data to empirically (Creswell, 2003) examine the dynamics in the increment of the senior high school population from the 2016 to 2020 academic years. The accessible population for the study included all teachers of the six senior high schools within the municipality. Table 1 summarises the teacher population distribution from the six senior high schools. In all, there were 380 teachers.

Table 1. Teacher population distribution from the six selected schools

School	Teacher population			
	2016	2017	2018	2019
Ejisuman SHS	54	73	94	143
Ejisu Sec Tech	38	42	51	82
Achinakrom SHS	32	41	53	64
Bonwire Sec Tech High SHS	27	38	50	62
Onwiman SHS	05	08	12	13
Church of Christ SHS	7	11	13	16
Total	163	213	273	380

The sample size was determined using (Krejcie & Morgan, 1970) sample size determination from a given population. The population distribution table was created using the "Small Sample Techniques" formula put forth by the research division of the National Education Association. The formula is given as follows:

$$s = X^2NP\,(1 - P) \div d^2\,(N - 1) + X^2\,P\,(1 - P);$$

where, s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be 0.50 since this provides the maximum sample size).

d = the degree of accuracy expressed as a proportion (0.05).

Based on the formula above, the corresponding sample size of the given population of 380 SHS teachers in the Ejisu municipality was 181. Hence, the total sample size for the study was 181 teachers. This sample size was proportionally distributed across the six schools that were involved in the study. Table 2 provides a summary of the sample proportion estimation. The participating teachers from each school were conveniently sampled.

Table 2. Sample proportion estimation

SHS Category	Total Teacher's population	Sample Proportion		Sample Size Per school
Ejisuman SHS	143	37.63158	68.11316	68
Ejisu Sec Tech	82	21.57895	39.05789	39
Achinakrom SHS	64	16.84211	30.48421	30
Bonwire Sec Tech. High School	62	16.31579	29.53158	30
Onweman SHS	13	3.421053	6.192105	6
Church of Christ SHS	16	4.210526	7.621053	8
Total	380	100	181	181

A questionnaire was used to collect the quantitative data. Questionnaires serve as efficient data collection tools, especially when the researcher knows exactly what he or she wants and what variables to use (Mugenda & Mugenda, 2003; Sekaran, 2003). With this in mind, the researchers carefully prepared questionnaires that answered the research objectives. The structured questionnaire consisted of three sections. The first section collected data related to respondents' socio-demographic characteristics. The second section sought to investigate how teaching and learning are affected by the increased student population following the introduction of the FSHS policy. The third and last section explored emerging challenges to teaching and learning post-FSHS policy implementation. The items were developed after an extensive literature review. This section consisted of nine scale items for which respondents were asked to indicate their level of agreement or disagreement on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. The final section of the questionnaire asked participants to indicate their level of agreement and disagreement on emerging challenges following the introduction of the free SHS policy and increased student population. This section consists of seven scale items on which respondents were asked to respond on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. These scale items were selected after an extensive literature review. The reliability of the questionnaire items was assessed using Cronbach's alpha reliability. Alpha values for the reliability test using the Statistical Package for the Social Sciences (SPSS) ranged from 0.79 to 0.91. In SPSS, a reliability coefficient (alpha) of 0.70 or higher is regarded as satisfactory (Bolarinwa, 2015).

Data from the questionnaire were coded into the SPSS software (version 23) for statistical analysis. The data was processed and cleaned to avoid errors during the data analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated. Microsoft Excel sheet was used to analyze the trend analysis of the

secondary data obtained. The Relative Importance Index (RII) was used to rank the emerging challenges as well as how teaching and learning are affected by the FSHS policy implementation. The researchers adhered to the four principles of respect, competence, responsibility, and integrity that serve as the foundation for APA codes of conduct regarding ethical issues (Clarke & Braun, 2017). Respondents' privacy, anonymity, and confidentiality of the data provided were ensured. No particular identifiers were requested from respondents. Informed consent was sought before data collection proceeded. The voluntariness of participating in the study was stressed to respondents.

4 Results

This section presents the findings in relation to the research questions. The section first presents the demographic characteristics of respondents, followed by findings relating to the three research questions.

4.1 *Characteristics of the sample*

Table 3. Demographic characteristics of the respondents

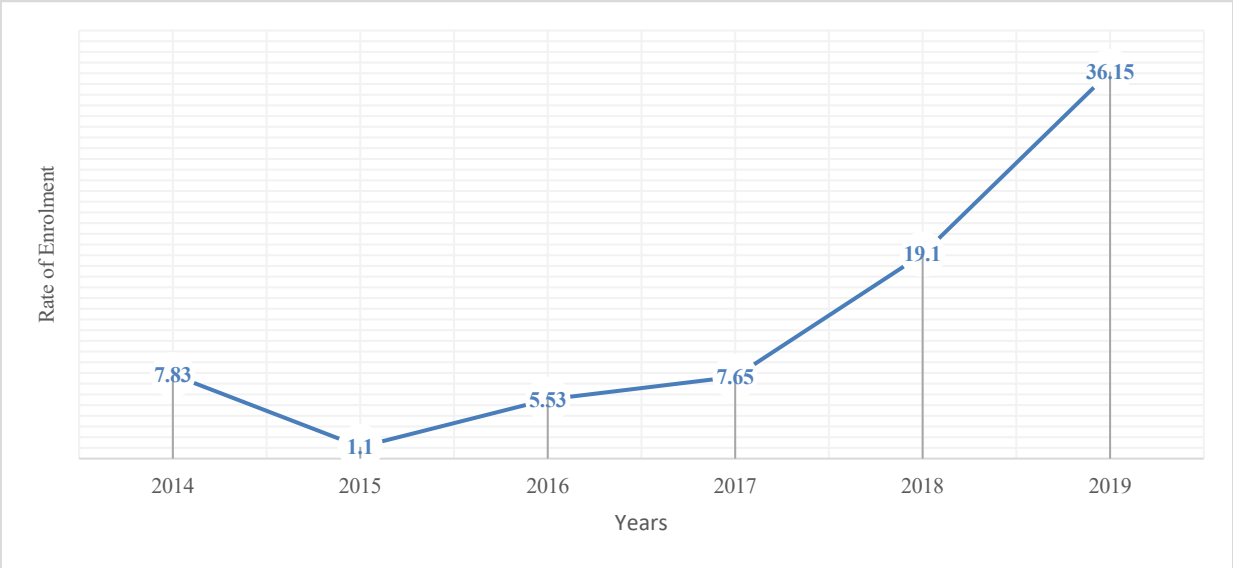
Variable	Options	No. of teachers	Percentage (%)
	Female	113	62
	Male	68	38
Age (in years)			
	20 to 29	100	55
	30 to 39	44	24
	40 to 49	27	15
	50 +	10	6
Level of Education			
	First degree	109	60
	Master of Philosophy (MPhil)	51	28
	Master of Education (MEd)	21	12
Working Experience			
	Less than 1 year	30	17
	1-3 years	54	30
	54-6 years	40	22
	7-9 years	57	31
Total		181	100

Source: Field data (2022)

Table 3 summarizes the characteristics of the sample. The results indicate that the majority of the respondents were female (n = 113, 62%). This finding is consistent with (Deku & Ackah, 2012) who established that the majority of teachers in Ghana are women. The results also highlight the age range of the teachers in the sample. The results indicate that the majority of the teachers (n = 100, 55%) were within the age range of 20 to 29. This finding suggests that most of the teaching populations are younger adults. Similarly, the results indicated that the majority of the teachers (n = 109, or 60%) were first-degree (Bachelor of Arts or Education) holders. This result is indicative of the reality in Ghana, as the Bachelor of Arts in Education (first degree) is the minimum requirement for teaching in senior high schools in Ghana. The results indicated that a significant number of the respondents have taught for a substantial number of years. For example, ninety-seven (97) of the teachers, representing 54% of the sample, reported that they have been working as teachers for more than 3 years. This implies that at least a significant number of the respondents have over three years of teaching experience. Thus, they were better informed to appreciate the challenges experienced by the schools before and after the introduction of the FSHS policy.

4.2 *Dynamics of students' enrollment due to free SHS in the Ejisu municipality*

The dynamics of student enrollment from 2014 to 2019 is shown in Figure 1.



Source: Field data (2022)

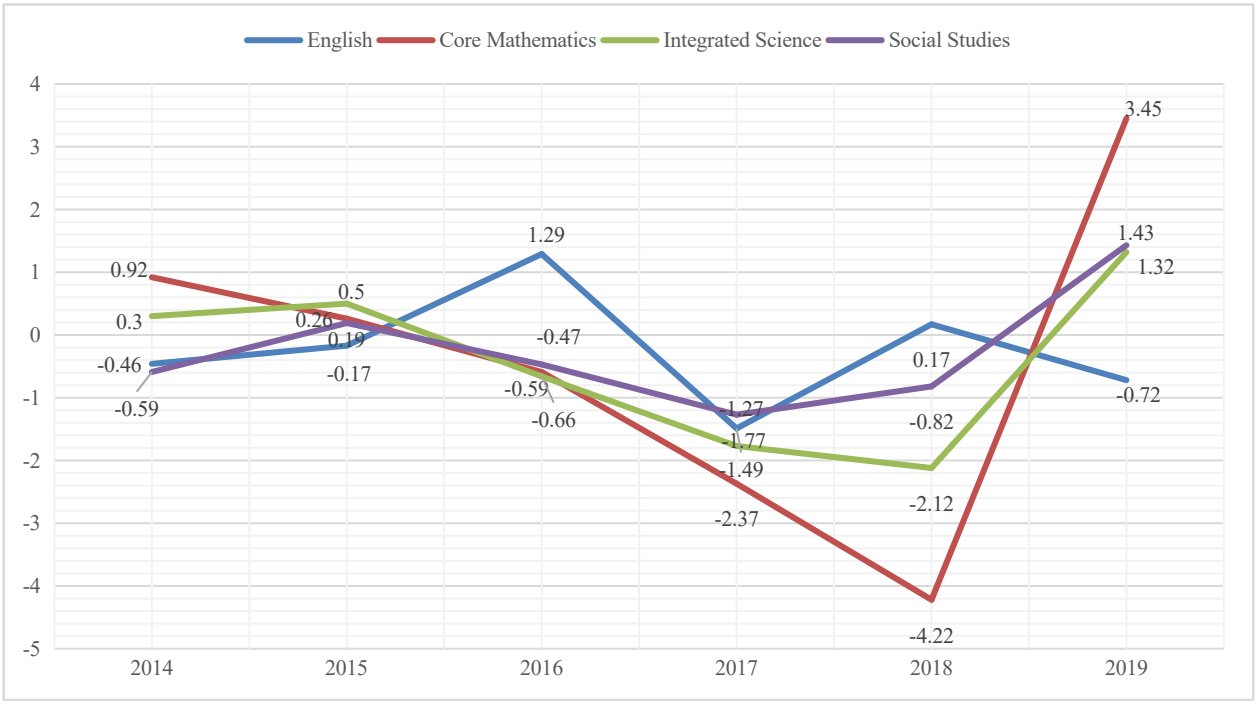
Figure 1. Student enrollment before and after the introduction of the Free SHS policy

Figure 1 displays the results of the trend analysis of the pre-and post-FSHS enrollment figures of the sampled schools spanning from 2014 to 2019. It can be observed that the schools reported a 7.83% increase in enrollment in 2014. In 2015, the schools reported a decrease in enrollment figures in comparison with figures reported in 2014, as the enrollment rate dipped to 1.1%. However, in 2016, the schools experienced a 5.53 per cent increase in enrollment figures, and in 2017, the enrollment rate increased to 7.65 per cent. In 2018, the schools saw a meteoric rise in enrollment figures as they reported a 19.1% increase in enrollment, and this increase in enrollment doubled in 2019 as the schools reported a 36.15 increase in enrollment.

4.3 *How changes in enrollment of students have affected teaching and learning*

The study used a six-year performance grade (score) of students in the West African Senior High School Examinations to establish how enrollment has affected teaching and learning. For purposes of generalization,

performances in four core subjects were used, including mathematics, English language, integrated science, and social studies. Figure 2 displays the trend in performance in the four subjects over the years under study.



Source: Field data (2022)

Figure 2. Trend analysis of student performance in core subjects

Figure 2 presents students' results at the sampled schools in the Ejisu Municipality in the four core subjects from 2014 to 2019. In the English language, the schools reported a -0.46% decrease in performance in 2014, but in 2015, the performance saw a 0.19% increase. The schools improved their results in English language arts in 2016 with a 1.29% increase in their performance. In 2017, there was a steep decline in performance as the schools reported a -1.27% decrease in the collated results for English Language for that year. However, in 2018, the performance improved as the schools reported a 0.17% increase in performance, but in 2019, this performance decreased to -0.72%.

In addition, it can be observed that the performances in core mathematics have experienced a decline from 2013 to 2018. The schools reported a 0.26% decline in performance in 2015 from 0.3% in 2014, a -0.59% decrease in 2016, a -2.37% decrease in 2017, and a -4.22% decrease in performance in 2018. However, math results improved for the schools as they reported a 3.4 percent increase in performance for 2019. Interestingly, the schools' Integrated Science and Social Studies results follow a similar trend. It can be observed that the schools reported a 0.5% and 0.19% increase in performance for both subjects in 2015. The performances dipped to -0.66% for Integrated Science and -0.47 for Social Studies in 2016. Furthermore, in 2017, the school performance dipped, with results in Integrated Science decreasing at a rate of -1.77 and Social Studies decreasing to -1.27. Meanwhile, in 2018, the performance in Integrated Science slumped to a -2.12% decrease, while the schools reported a -0.82% decrease in Social Studies. Finally, the school reported improved results for both subjects in 2019, with a 1.43% increase in social studies and a 1.32% increase in integrated science.

4.4 *Emerging challenges to teaching and learning after the introduction of free SHS policy*

Table 4 presents the results of the shares of proportion (agreement = A, uncertainty = U, or disagreement = D), importance indices (RII), and ranks (®) of the eleven emerging challenges to teaching and learning after the introduction

of the free SHS policy in the Ejisu Municipality.

Table 4. Emerging challenges to teaching and learning

Emerging Challenges	Responses (%)			RII	Rank
	Disagree (≤ 3)	Neutral (4)	Agree (≥ 5)		
Congestion in the dining hall	8	15	77	1.08	1
Inadequate teaching and learning materials	26	8	66	1.04	2
Inadequate hostel infrastructure	8	35	57	1.04	3
Inadequate trained teachers	18	6	76	1.00	4
Infrastructural inadequacies because of increased student population	25	8	67	0.98	5
Increased student-teacher ratio in the school	9	39	52	0.95	6
Health challenges beyond the school's capacity	19	39	42	0.87	7
Ineffectiveness in school administration processes due to increased student population	32	30	38	0.84	8
Increased enrollment of students has led to poor learning outcomes such as students' inability to fully complete home assignments	32	42	26	0.83	9
Unreliable supply of electricity	31	31	38	0.79	10
Lack of teacher confidence and competence (self-esteem) due to increased class size	54	38	8	0.67	11

Source: Field data (2022)

The results in Table 3 indicate that the highly ranked challenges identified by teachers in the sample SHS are congestion in the dining hall (A = 77, RII = 1.08, ® = 1); inadequate teaching and learning materials (A = 66, RII = 1.04, ® = 2); inadequate hostel infrastructure (A = 57, RII = 1.04, ® = 3); and inadequately trained teachers (A = 76, RII = 1.00, ® = 4).

Equally, the next emerging challenges identified by the teachers include infrastructural inadequacies because of an increased student population (A = 67, RII = 0.98, ® = 5); an increased student-teacher ratio in the school (A = 52, RII = 0.95, ® = 6); health challenges beyond the school's capacity (A = 42, RII = 0.877, ® = 7); ineffectiveness in school administration processes due to an increased student population (A = 38, RII = 0.84, ® = 8); and increased enrollment has led to poor learning outcomes such as students' inability to fully complete home assignments; (D = 32, RII = 0.83, ® = 9). Finally, the poorly ranked challenges experienced by the sample SHS after the introduction of the Free SHS policy are the unreliable supply of electricity (A = 38, RII = 0.79, ® = 10) and lack of teacher confidence and competence (self-esteem) due to increased class size (A = 54, RII = 0.67, ® = 11).

5. Discussion

Since the introduction of the FSHS policy in Ghana, student enrollment has more than doubled. This study sought to ascertain how the increasing student enrollment affects the quality of teaching and learning in SHSs, focusing on schools in the Ejisu municipality. The study further examined the general challenges resulting from the implementation of the FSHS policy.

The findings from the analysis established the dynamics of students' enrollment following the implementation of the FSHS policy. The trend analysis established an impressive growth in student enrollment in 2017 (the first year of the Free SHS policy) for the sampled schools compared to the student enrollment reported in the years before the introduction of the policy. This impressive enrollment growth within the sample schools is a replica of the national enrollment figures, as the World Bank reports an increase of 69.09% in 2017, 71.32% in 2018, and 74.68% in 2019 for senior high school enrollment. This finding is in line with earlier studies that advanced that the introduction of the FSHS policy has translated into tripled student enrollments in Ghana (Abdul-Rahaman et al., 2018; Tamanja & Pajibo, 2019). The increased enrollment can be attributed to the lessened financial burden for parents and guardians when enrolling their wards in secondary school. This development is consistent with the stance of advocates for the Free SHS policy, who argue that the increased enrollment justifies the need to maintain the policy since it has removed the financial barriers to education. In addition, the results indicated that with the introduction of the FSHS policy, the enrollment rate in the sampled schools had increased exponentially, with a gradual increase from 2017 to 2019. The gradual increase from 2017 can be attributed to the initial skepticism about the success and viability of the program. However, the government's continuous sensitization has translated into the subsequent increase in enrollment for the sampled schools. These findings support previous research on the impact of funding on student enrollment. For example, in some areas of South Africa, free education allowed disadvantaged parents to enroll their children in school (Dynarski & Scott-Clayton, 2013; Garlick, 2013; Melguizo, 2011). In another study, Olwande et al. (2010) examined the impact of free primary education in rural Kenya using panel data from 1,500 families between 2000 and 2007 in order to examine enrollment trends. Their study concluded that more parents could enroll their children in school because of the Kenyan government's adoption of free primary education.

The study's second objective sought to establish how the positive changes in student enrollment have affected teaching and learning. This study focused on students' performance in the four core subjects in the West African Secondary School Certificate Examinations (WASSCE). The results indicated that the introduction of FSHS has been followed by mixed levels of performance for the sampled schools. In the introductory years of the policy (2017 to 2018), it was observed that results (except for the English Language) dipped, resulting in poor performances in the subjects in comparison with the earlier years (2016, 2017, and 2018). However, in 2019, the results improved as the schools reported increased performance in all subjects except English. The initial performances can be attributed to the challenges encountered with the initial, unexpectedly increased student enrollment in the first years. This could have contributed to the overstretching of teachers and other educational resources to the detriment of the final years. This trend could have continued into the second year, explaining the performance slump. However, the introduction of the double track system, with its resultant reduction in student congestion in the schools, increased teachers' contact with students, and this, perhaps, translated into improved performances in the core subjects in 2019. Despite the widely held view that there is a negative relationship between class size and academic performance (Kusi & Manful, 2019; Bernard et al., 2022; West & Woesmann, 2003), the peculiar dynamics of Ghana's FSHS policy seem to deviate from such an observed correlation. This may be attributed to the increased contact hours associated with the double track system (Osei-Owusu, 2021).

Finally, the study explored the emerging challenges to effective teaching and learning after the introduction of the FSHS policy. Schools have faced significant infrastructure and resource challenges. These challenges are not peculiar to the Ejisu Municipality but may have a national situational implications (Tamanja & Pajibo, 2019). The challenges expressed as congestion in the dining hall, inadequate teaching and learning materials, inadequate hostel infrastructure, and inadequately trained teachers, among others, are sourced from the inadequacies in existing resources as the schools are unable to accommodate the increased student population. These challenges pose devastating effects on the teaching and learning processes, as they are instrumental barriers to learning (Mensah et al., 2022; Ababio & Dumba, 2014). The reported challenge of inadequate teaching and learning materials translates into learning challenges, as teachers would be unable to teach effectively because of unavailable materials (Mensah et al., 2022).

Meanwhile, the challenge of inadequately trained teachers does not necessarily suggest the unavailability of trained teachers to match the increasing student population effectively but rather, may reflect a lack of funding to recruit more teachers for schools. The emerging challenges appear to showcase the failure of the FSHS policymakers in diagnosing the possible shortfalls of increased student enrollment on the inadequate existing resources. *Opponents* of the policy have been vocal about the infrastructural and resource deficiencies in majority of SHSs, highlighting the

schools' inability to deal with the pressures of the FSHS policy. Therefore, a collaborative effort is needed between the government, private organizations, Parent-Teacher Associations (PTAs), and old student unions to avert the infrastructural deficits that characterize most schools.

6. Conclusions and recommendations

This study sought to assess the effects of the increasing student enrollment on teaching and learning in the Ejisu municipality in Ghana post implementation of Ghana's Free Senior High School Policy. The study established that the sample schools reported a steady increase in enrollment with the introduction of the policy. The reported increased student enrollments have, to a larger extent, had mixed effects on teaching and learning. The initial poor performances in the core subjects, suggested by the findings of the study, have improved in subsequent years. The improved performance may be attributed to the government's effort to address the challenges associated with the increased student population in the schools via the introduction of a double-track system. The introduction of the double-track system allowed for more teacher-student contact, which in no small way contributed to improving the student's academic performance. However, this empirical data suggests that SHS across the country's various regions may face different challenges that revolve around infrastructure, teaching and learning resources, and teaching staff.

Based on the findings, we make the following recommendations to promote the effective implementation of the policy: First, the government, through the Ministry of Education, the Ghana Education Service, PTAs, and other stakeholders in education, should speed up the expansion of infrastructural facilities in senior high schools in the municipality. The government needs to increase the teacher population to meet the needs of the increasing student population, subject to availability of funds. The Ghana Education Service should ensure teaching and learning materials are readily available to improve teaching and learning activities in schools. The current study has some limitations. The study would have benefited immensely from using formative assessment results as a measure of individual student progress and performance. Formative assessment will be vital in understanding the trajectory of individual student performance. Future studies should therefore focus on measuring students' academic performance using formative assessments conducted by teachers in schools. They should look at the differential effects of the identified challenges on the different academic programs SHSs offer. The paper analyzes the correlation between student enrollment and academic performance, but it may be challenging to establish a direct causal relationship. Other factors, such as teaching quality, resources, infrastructure, and socio-economic backgrounds of students, could also influence academic outcomes and should be considered in future studies. Failure to account for these confounding variables limits the ability to attribute changes solely to enrollment increases. Despite these limitations, the current study has contributed significantly to the limited literature examining the affordances and constraints associated with implementing the FSHS policy in Ghana.

Acknowledgement

The authors wish to thank all the respondents who contributed data for the study. We also acknowledge the efforts of the anonymous reviewers who painstakingly read and made constructive suggestions for the improvement of the initial draft.

Conflict of interest

The authors declare no competing financial interest.

References

Ababio, B. T., & Dumba, H. (2014). Assessment of the policy guidelines for the teaching and learning of geography at

the senior high school level in Ghana. *Review of International Geographical Education Online, 4*(1), 40-57.
Abdulai, K. M., & Ahmed, B. K. (2021) An evaluation of the Free Senior High School Policy in Ghana. *Cambridge Journal of Education, 51*(2), 143-172.
Abdul-Rahaman, N., Rahaman, A. B. A., Ming, W., Ahmed, A. R., & Salma, A. R. S. (2018). The Free Senior High Policy: An appropriate replacement to the progressive Free Senior High Policy. *International Journal of Education and Literacy Studies, 6*(2), 26-33.
Adarkwah, M. A. (2022). Anatomy of the "Free Senior High School" Policy in Ghana and policy prescriptions. *Interchange, 53*, 283-311. https://doi.org/10.1007/s10780-022-09459-3
Agbedahin, A. V. (2019). Sustainable development, education for sustainable development, and the 2030 agenda for sustainable development: Emergence, efficacy, eminence, and future. *Sustainable Development, 27*(4), 669-680. https://doi.org/10.1002/sd.1931
Attah, M., Jamil, A., Ayaz, M., Shah, T., & Shan, M. (2011). Effect of small class size on the academic achievement of students at secondary school level. *Interdisciplinary Journal of Contemporary Research in Business, 3*(2), 1592-1599.
Bedard, M., Kelly, C., & Kuhn, P. (2011). "Where class size really matters: Class size and student ratings of instructor effectiveness". *Economics of Education Review, 27*(3), 253-265.
Bernard, K.-A., Dabone, K. T., Saani, A.-J., Dennis, W., & Hansen, A.-B. (2022). Behavioural patterns exhibited by preschoolers in large class size: A case of early childhood centres in Ghana. *Mediterranean Journal of Social Sciences, 13*(3), 15. https://doi.org/10.36941/mjss-2022-0020
Bolarinwa, O. A. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Niger Postgraduate Medical Journal, 22*(4), 195-201. https://doi.org/10.4103/1117-1936.173959
Bosworth, R. (2014). Class size, class composition, and the distribution of student achievement. *Education Economics*, 141-165. https://doi.org/https://doi.org/10.1080/09645292.2011.568698
Brühwiler, C., & Blatchford, P. (2011). Effects of class size and adaptive teaching competency on classroom processes and academic outcome. *Learning and instruction, 21*(1), 95-108.
Chanimbe, T., & Dankwah, K. O. (2021) The 'new' Free Senior High School Policy in Ghana: Emergent issues and challenges of implementation in schools. *Interchange, 52*, 599-630. https://doi.org/10.1007/s10780-021-09440-634
Clarke, V., & Braun, V. (2017) Thematic analysis. *Journal of Positive Psychology, 12*(3), 297-298. https://doi.org/10.1080/17439760.2016.1262613
Corak, M., & Lauzon, D. (2009). Differences in the distribution of high school achievement: The role of class-size and time-in-term. *Economics of Education Review, 28*(2), 189-198.
Creswell, J. W. (2003). *Research Design-Qualitative, Quantitative and Mixed Methods Approaches* (2nd ed.). Sage.
Deho, O. B., & Agangiba, W. A. (2019). Sentiment analysis with word embedding: The case of doubletrack education system in Ghana. *Ghana Journal of Technology, 3*(2), 51-57.
Deku, P., & Ackah, F. R. (2012). Teachers' conceptualization of inclusive education in Ghana. *IFE Psychology, 20*(1), 152-164.
Dobbelsteen, S., Levin, J., & Oosterbeek, H. (2002). The causal effect of class size on scholastic achievement: Distinguishing the pure class size effect from the effect of changes in class composition. *Oxford Bulletin of Economics and Statistics, 64*(1), 17-38. https://doi.org/10.1111/1468-0084.00003
Dynarski, S., & Scott-Clayton, J. (2013). Financial aid policy: Lessons from research. In L. Barrow, T. Brock & C. Rouse (Eds.), *Postsecondary education in the United State*s (pp. 67-91). Princeton University.
Edla, B. (2012). Understanding the importance, impacts and barriers of increasing students population on teaching and learning in East African countries. *International Journal for e-Learning Security (IJeLS), 2*(3), 199-207.
Ehrenberg, R. G., Brewer, D. J., Gamoran, A., & Willms, J. D. (2001). Class size and student achievement. *Psychological Science in the Public Interest, 2*(1), 1-30. https://doi.org/10.1111/1529-1006.003
Garlick, R. (2013). *How price sensitive is primary and secondary school enrollment?* [Unpublished]. Evidence from Nationwide Tuition Fee Reforms in South Africa.
Government of Ghana. (1992). Constitution of the Republic of Ghana.
Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607-610.
Kusi, H., & Manful, H. O. (2019). Class size and academic performance of students in selected nursing and midwifery training colleges in the central region, Ghana. *Advances in Social Sciences Research Journal, 6*(9), 224-246.
Lim, D. H., & Morris, M. L. (2009). Learner and instructional factors influencing learning outcomes within a blended learning environment. *Source: Journal of Educational Technology & Society, 12*(4), 282-293. https://www.jstor.

org/stable/pdf/jeductechsoci.12.4.282.pdf
Melguizo, T. S. (2011). The association between financial aid availability and the college dropout rates in Colombia. *Higher Education, 62*(2), 231-247. https://doi.org/10.1007/s10734-010-9385-8
Mensah, B., Poku, A. A., & Quashigah, A. Y. (2022). Technology integration into the teaching and learning of geography in senior high schools in Ghana: A TPACK assessment. *Social Education Research, 3*(1), 80-90.
Ministry of Education. (2018). *Budget estimates budget estimates of Ministry of Education*. Publishing House.
Mugenda, O. M., & Mugenda, A. G. (2003) *Research Methods, Quantitative and Qualitative Approaches*. ACT.
Mohammed, A. K., & Kuyini, A. B. (2021). An evaluation of the Free Senior High School Policy in Ghana. *Cambridge Journal of Education, 51*(2), 143-172.
Ojewunmi, E. A. (2020). United nations sustainable development goals and. *International Journal of Innovative Science and Research Technology, 5*(7), 1504-1510. https://doi.org/10.38124/ijisrt20jul838
Olwande, J., Muyanga, M., Mueni, E., & Wambugu, S. (2010). *Free Primary Education in Kenya: An Impact Evaluation Using Propensity Score Methods*. PMMA Working Paper 2010-08.
Osei-Owusu, B. (2021). Retrospective assessment of the successes and challenges of double track system in senior high schools in sekyere central district of Ghana. *British Journal of Education, 9*(9), 18-30. https://doi.org/https://doi.org/10.37745/bje
Owoeye, J. S., & Olatunde Yara, P. (2011). School facilities and academic achievement of secondary school agricultural science in Ekiti State, Nigeria. *Asian Social Science, 7*(7), 64-74.
Renandya, W. A. (2013). Essential factors affecting EFL learning outcomes. *English Teaching, 68*(4), 23-41. https://doi.org/10.15858/engtea.68.4.201312.23
Rivkin, S. G., & Schiman, J. C. (2015). Instruction time, classroom quality, and academic achievement. *The Economic Journal, 125*(588), 425-448.
Sekaran, U. (2003) *Research Methods for Business: A Skill-Building Approach* (4th ed.). John Wiley & Sons.
Tamanja, E., & Pajibo, E. (2019). Ghana's Free Senior High School Policy: Evidence and insight from data. In *EDULEARN19 Proceedings* (pp. 7837-7846). IATED.
Uhrain, C. (2011). *Effect of Class Size on Student Achievement in Secondary School* [Walden University]. https://scholarworks.waldenu.edu/dissertations/2301/
UNESCO. (2017). *Education for sustainable development in Africa: Trends, challenges, and opportunities*. United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000247092
United Nations. (2018). *Youth at the United Nations: Country profiles of the situation of youth*. http://www.esa.un.org/unsd/mi/mi
West, M. R., & L. Woesmann, L. (2003). *Which school systems sort students into smaller classes?* Cambridge University.
World Bank. (2017). *Africa's Pulse: An Analysis of Issues Shaping Africa's Economic Future.* World Bank. https://openknowledge.worldbank.org/handle/10986/27417
Wyss, V. L., Tai, R. H., & Sadler, P. M. (2007). High school class-size and college performance in science. *The High School Journal, 90*(3), 45-53.
Zainuddin, Z., & Halili, S. (2016). Flipped classroom research and trends from different fields of study. *International Review of Research in Open and Distributed Learning, 17*(3), 313-340. https://doi.org/10.19173/irrodl.v17i3.227