

Research Article

# Mitigating the Effects of Large Class Sizes for Improved Teaching and Learning in Ghanaian Senior High Schools

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## Abstract

Large class sizes pose significant challenges to the quality of teaching and learning, although previous studies have examined the effects of large class sizes on teaching and learning outcomes, relatively few studies have been given to the pedagogical strategies that can mitigate these challenges and enhance educational quality. This study therefore investigated the effects of large class sizes on the quality of teaching and learning and explored pedagogical strategies that can be employed to improve instructional effectiveness in such contexts. Two research questions were formulated to guide the study: (1) What are the challenges faced by teachers in handling large class sizes and their effects? (2) What pedagogies could be employed to improve the quality of teaching and learning in large classes? A qualitative research method was employed, and a purposive sampling approach was used to arrive at 38 respondents. Primary data were gathered through focus group discussions and personal interviews. The findings highlighted significant issues faced by teachers, such as difficulties in providing individualised attention, proper assessments, several assignments, timely feedback, and good classroom control and management. These challenges hinder academic progress and contribute to poor student performance. To address these issues and enhance the quality of teaching and learning, the findings further revealed several strategies, including peer teaching and marking, group studies, collaborative teaching, field trips, and the use of projectors. The study also emphasises the importance of professional development training programs for in-service teachers to improve their teaching methodologies and confidence in managing large classes. The study concludes that these methods reduce teacher workload and improve the overall learning experience. The study recommends that the Ghana Education Service should encourage teachers to employ these teaching strategies in large classes to improve the quality of teaching and learning.

## Keywords

Large Class Size, Effective Teaching and Learning, Challenges Faced by Teachers, Quality Teaching and Learning Academic Performance

## 1. Introduction

In both academia and the field of practice, there is a consensus that education and training serve as the cornerstones of

national development [1, 2]. This pivotal process involves the transmission of various forms of knowledge, encompassing

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experiences, ideas, skills, norms, and values, either between individuals or across generations [3, 4]. Studies [5, 6] posited that education constitutes a socially structured and regulated mechanism for passing down culturally significant experiences from one generation to another. This suggests that education is universally acknowledged as the primary agency of socialization, civilization, and human development. Research indicated that a nation's capacity to foster behavioural transformations in its citizens, facilitating rapid development, hinges on providing the appropriate education [7, 8]. Formal education should be geared towards nurturing the youth into responsible and capable individuals, equipping them to contribute positively to both their personal growth and development and the development of their communities at large [9].

Scholars [10-13] revealed that for an educational system to effectively achieve its goals, certain factors such as the availability of teachers, teaching and learning materials, and the size of the class play crucial roles. A study [14] suggests that inadequate teachers are one of the factors affecting teaching and learning in schools. The most valuable resource for teaching and learning is the teacher [15]; teaching and learning become ineffective when there are inadequate teachers to match the student ratio [16]. Similarly, a study [17] indicated that in schools where there are inadequate teachers, smooth teaching and learning are not observed. The inadequate provision of teachers will affect effective teaching and learning.

As educational institutions continue to evolve, one factor that consistently emerges as a crucial determinant of student engagement, academic performance, and overall learning outcomes is the size of the class [15, 18]; its effects on teaching and learning have garnered significant attention from educators, researchers, and policymakers [3, 16]. While class size is just one element within an educational system, it exerts a profound influence on the quality of instruction [19], the level of individualized attention students receive, and the overall classroom atmosphere [20]. Many countries grapple with challenges in their education systems, particularly regarding the issue of large class sizes [16, 17, 21].

A study [18] conducted in Hong Kong uncovered that large class sizes have a negative impact on teaching and learning in schools. Teachers often find it challenging to attend to individual students' needs. The situation is not different in Saudi Arabia, as a study [20] opined that teachers who teach in large class sizes cannot employ certain teaching pedagogies that they often employ in small classes. The study further found that teachers who teach large classes face challenges in regulating students' behaviours and that the negatives outweigh the positives. Another study [12] carried out in Nigeria found that there is no effective correlation between teaching and learning in large classes. Similarly, a study [16] revealed that teachers encountered difficulties in effectively implementing continuous assessments, leading to diminishing academic performance [20]. In Kenya, it was found that both teachers and learners are faced with a hurdle in this—class management

becomes problematic and effective assessments are challenged [17]. However, these studies only highlighted the effect of large classes on teaching and learning but failed to identify strategies to employ to make teaching and learning more effective in these classes.

A study [11] discussed the positives that are accompanied by large class sizes. The study found that large class size is an efficient way of managing costs—governments of various countries will not spend more money on building classes to reduce large class sizes or hiring and paying more teachers, though it has implications for students' academic performance. The study further suggested that schools with large classes efficiently and effectively make good use of educational resources. Relatedly, a study [15] revealed that large classes frequently consist of students from diverse backgrounds. This dynamic fosters a vibrant milieu ripe for the exchange of ideas, cultures, and perspectives. However, these studies and many more have not been able to indicate ways through which teaching and learning in large classes can be made effective to improve quality within schools.

Countries such as the UK and USA have taken steps to enhance the effectiveness of teaching and learning in large classes [22]. They have achieved this by reducing the student-teacher ratio in each classroom through the construction of additional classes. This implies that large classes have a detrimental effect on the quality of teaching and learning, ultimately impacting students' academic performance. A study [21] also found that India has invested a significant amount of money in reducing class sizes to enhance the quality of teaching and learning. The study further revealed that between 2017 and 2018, approximately US\$3.6 billion was spent on salaries for 0.4 million new teachers hired between 2010 and 2017 to fill the vacancies created by the decrease in class sizes. This implies that governments may face a financial burden trying to improve the quality of teaching and learning by reducing class sizes through the construction of more classrooms and the recruitment of additional teachers. Is there a way to alleviate this burden while still enhancing teaching and learning in large class settings?

Students who enrolled in smaller and intermediate-sized classes consistently outperformed their peers in large classes in terms of academic performance [23]. The good performance of students in small classes highlighted may not be solely due to the number of students; however, some teaching pedagogies may also play a significant role. As the population grows, many people may enrol in schools, which may lead to the small classes becoming overpopulated. What strategies could be employed to improve the quality of teaching and learning without governments needing to build more classrooms to reduce class sizes?

In Ghana, the educational system has undergone numerous modifications over the years with the adoption of various policies and programs meant to bring high-quality, affordable education to the doorsteps of individuals [24]. The recently im-

plemented free senior high school system has led to a significant increase in students' enrolment in senior high schools across the country [25]. This increase in enrolment brought about overpopulated classes across various senior high schools in the country. This has affected the quality of teaching and learning in these schools. The government, in addressing this issue, introduced the double track system by dividing the classes into two; when one batch is in school, the other will be on a break [26]. However, the strategy could not address the issues, as students still perform poorly [27] and some programs like General Art and Home Economics classes still experience overpopulation.

Several research works have looked at the effects of large class sizes on teaching and learning [17, 28-30]. However, these studies have paid little attention to ways of mitigating the effects of large class sizes on teaching and learning. This has created a research gap on strategies teachers could employ to promote effective teaching and learning in large class sizes across senior high schools in Ghana. The primary aim of the study is to address the gap by exploring ways through which teachers can enhance teaching and learning in large class sizes in senior high schools in Ghana, with specific reference to the Wa township in the Upper West Region. The following research questions have been raised to achieve the objective stated:

What are the challenges faced by teachers in handling large class sizes and their effects?

What pedagogies could be employed to improve the quality of teaching and learning in large classes?

The study examines the research questions and provides valuable insights into the challenges faced by teachers and students in large class settings. It reveals the effects that large class sizes have on teaching and learning and offers practical strategies to effectively manage these challenges. The findings from this study in the Wa municipality make a meaningful contribution to the existing literature on mitigating the effects of overpopulated classes and promoting quality teaching and learning. The study equips educators and policymakers with important information to address this prevalent issue in schools.

## 2. Literature Review

### 2.1. Empirical Literature

Studies have shown that large class sizes have negative effects on teaching and learning and therefore students' academic performance [12, 17, 31]. It was revealed in studies [12, 20] that teachers do not get ample time to interact with their students, which affects students' academic performance. Studies [29, 32] further indicated that engaging students in practical work is challenging and leads to a decrease in students' focus. The instructional approach is always predominantly teacher-centred, resulting in limited student participation. This may affect students who require additional time to learn and

the overall performance of the student body.

A study [16] pointed out that teachers who teach large classes always have issues with class control. Effective class control is affected by disruptive behaviours among students in large classes. A study [10] also reported that controlling students from distracting their classmates is always difficult. When a student misbehaves and disrupts the class, it is the teacher's responsibility to address the issue and manage the noise. Such disruptions, whether caused by one student or several, can hinder the entire class's learning process and impede other students' ability to concentrate and learn effectively. Teachers often dedicate valuable instructional time to managing these disruptive behaviours [33]. These distractions diminish the quality of teaching and learning and make it difficult for teachers to maintain a steady pace, ultimately hindering their ability to complete the syllabus.

Inadequate assessment is one of the challenges faced by teachers who teach large class sizes [20, 32]. Given the large number of students in the classroom, teachers are not able to give frequent assignments to students to determine their understanding of the topics being taught [29, 31]. Teachers found it difficult to conduct effective assessments in large classes, and examination malpractices are always rampant in these classes [12, 16]. A study [12] noted that teachers managing large classes encounter inadequate planning and assessment processes, making it difficult for teachers to identify students' strengths and areas of improvement. Examination malpractice becomes rampant in these classes.

Despite the challenges highlighted by scholars regarding large class sizes, there are still proponents who argue that such class sizes possess certain positive aspects [11, 34, 35]. A study [11] indicated that large class sizes are an efficient way of managing costs, though they have negative effects on students' academic performance. Similarly, [22] shared the view that the reduction of large class sizes does not promote cost-effectiveness. To control the rising capital cost of education, the average class size could be increased [12]. They argued that the higher the class size, the lower the cost of investment. Moreover, a study [15] indicated that students who constitute the large classes are from diverse backgrounds. This diversity creates a rich environment for the exchange of ideas and culture.

Moreover, a study [36] added that in a class with a multitude of students, diverse learning styles emerge. This creates an environment where students can benefit from each other's unique approaches to learning. These students may have different teaching and learning needs, which will encourage teachers to integrate different and effective teaching pedagogies in their classes [11]. Students exhibit a range of behaviours and attitudes. As they interact with one another, they learn and develop skills in adapting and accommodating different situations.

The literature highlighted some of the challenges that teachers face whilst teaching large classes and the consequences on

students' academic performance. The studies cited also highlighted the benefits of large class sizes to students. However, these studies have not highlighted pedagogies that teachers should employ to enhance effective teaching and learning in such classes. This study will add to the literature by providing pedagogical strategies that teachers may employ to enhance effective teaching and learning in large classes.

## 2.2. Theoretical Lens

The study is guided by the Social Development Theory, also known as the sociocultural theory, by Lev Vygotsky in 1978 [37]. The theory highlights the importance of social interaction and cognitive development [33]. The theory states that learning is a social process that occurs through interaction with more knowledgeable others, such as teachers or peers.

Meaning, if students from different backgrounds constitute a class and they interact, their interaction may lead to the acquisition of knowledge and experiences, leading to their cognitive development [38].

Large classes create opportunities for meaningful social interaction, which can foster collaborative learning environments where students engage in debates, group discussions, peer collaboration projects, and cooperative learning activities. The theory also emphasizes the importance of cultural values on cognitive development [39]. Large classes may create opportunities for students to learn various cultural beliefs from one another, which will increase their tolerance. Teachers may introduce pedagogies that will let students learn different cultural values and tolerate different behaviours and attitudes from one another.

The Zone of Proximal Development (ZPD) is another concept covered in the theory. This concept compares what a student can learn independently and what they need to be guided to learn [37]. In large classes, teachers may find it difficult to determine each student's ZPD to offer specific support to scaffold their learning, especially for those who need special assistance. However, the introduction of certain pedagogies by teachers may help improve the quality of teaching and learning in such classes. Vygotsky highlighted the importance of supportive teacher-student relationships in facilitating learning. Despite the challenges of large classes, teachers can strive to build rapport with students by showing genuine interest in their progress and establishing a positive classroom climate where students will feel valued and respected, to enhance motivation and engagement in learning.

## 3. Methodology

### 3.1. Study Area

The study was conducted in the Wa Municipality. The municipality is in the Upper West Region of Ghana. The municipality shares boundaries with Nadawli District to the north, Wa East District to the east and Wa-West District to the west.

It lies within latitudes 1°40'N to 2°45'N and longitudes 9°32'W to 10°20'W [40]. The municipality has an estimated land area of 579.86 square kilometres, which constitutes about 6.4% of the Region. The municipality has 4 tertiary institutions, 7 Public Senior High Schools (SHS), 2 Private SHS, 62 Public Junior High Schools (JHS), 16 Private JHS, 88 Public Primary Schools, 30 Private Primary Schools, 72 Public Kindergartens (KGs), 31 Private KGs [41].

### 3.2. Research Design

The study employed the qualitative descriptive survey design to explore ways by which large classes can be handled to improve the quality of teaching and learning. The qualitative method is the most appropriate approach for this study because it enables the collection of comprehensive and in-depth data that may have been overlooked by quantitative methods. Qualitative research adheres to the interpretive philosophical paradigm, which holds that reality is socially created based on human feelings and perceptions [42]. Therefore, by employing this research method, the researchers were able to collect detailed data from teachers regarding challenges they face in large classes and ways of mitigating these challenges to improve the quality of teaching and learning. This approach brings research participants into closer proximity with the phenomena being investigated, diverging from the quantitative researchers' stance, which relies on numbers to quantify social phenomena under the presumption of objectivity [43, 44].

### 3.3. Population, Sample Size and Sampling Procedure

The study focused on secondary school teachers, headmasters, and heads of departments in the Wa municipality. The population consisted of all the headmasters, heads of departments and teachers in the studied schools. To ensure comprehensive coverage of diverse perspectives, a purposive sample of 38 participants was selected using the principle of data saturation. The participants had to meet certain criteria to be included in the study. These criteria include readiness to give informed consent, currently working as a teacher, teaching in a class where the students are more than 40 and having the ability to share valuable insights on the impact of large class sizes on teaching and learning, as well as effective strategies to enhance the quality of teaching and learning in such settings. Both male and female participants were considered for the study. The inclusion of both male and female teachers in the study aimed to ensure gender diversity. This is crucial because male and female teachers may have had distinct experiences, attitudes, and challenges when dealing with large classes.

### 3.4. Instruments, Validity, and Reliability Test

The instruments used for gathering data for the study were

a semi-structured interview guide and a focus group discussion guide. The interview guide was used to collect data from headmasters and heads of departments, while the focus group guide was used to solicit data from the teachers. These instruments create the opportunity for the respondents to express their views and experiences without any limitation on the effects of large classes and ways to improve the quality of teaching and learning in these classes. The instruments used for the data collection were validated by some senior lecturers in the School of Education and Life-Long Learning, SDD-University of Business and Integrated Development Studies. Some suggestions and corrections were incorporated before the instruments were used to collect the data.

The validity and reliability of this study were ensured through rigorous methodology. Triangulation was employed by collecting data from various sources, including interviews and focus groups, to support the findings. Member checking was conducted, allowing participants to review and validate the interpretations of their responses, thereby ensuring accuracy and authenticity. A comprehensive audit trail was maintained to ensure transparency and facilitate the replication of the study. Furthermore, peer debriefing sessions were held to discuss and refine the findings, which further enhanced the study's credibility.

### 3.5. Data Collection and Analysis

The Data were sourced through semi-structured face-to-face interviews and focus group discussions. Interviews were carried out with the Headteachers and Heads of Departments of the schools. Focus group discussions were held with teachers who teach large classes in the schools. The qualitative data were tape-recorded and later transcribed into written documents. The researchers emphasized identifying emerging themes and categorizing them according to differences and similarities. Subsequently, content analysis was employed to identify the most frequently occurring phrases, considering their relevance to the study objective.

### 3.6. Ethical Considerations

Ethical considerations are a very important factor to consider when exploring ways of mitigating the impact of large classes on teaching and learning. Permission was obtained from the headmasters of the selected schools after the purpose of the study was explained to both the headmasters and the teachers. This allowed the researchers to interact with the teachers who participated in the study. They were told it was not compulsory for them to participate, and anyone who was not interested could step out. Safeguarding participant confidentiality is essential, requiring the avoidance of identifiable information in reports and the anonymization of shared data. Privacy considerations entail respecting the privacy of teachers during interviews and focus group discussions, minimizing disruptions to their daily activities, and refraining from

collecting unnecessary personal information.

## 4. Results and Discussions

### 4.1. Introduction

This section of the study presents the results and discussion on the challenges faced by teachers in large classes and the strategies used in addressing some of these challenges to enable effective teaching and learning. The section first presents the demographic characteristics of the participants, including the size of the classes that they teach. It further looks at the challenges faced by the respondents in handling these sorts of classes. It also represents the participants' viewpoint on ways that large classes could be handled to improve the quality of teaching and learning.

### 4.2. Demographics

The study included 38 participants, with an equal distribution of 19 males and 19 females. This ensured a balanced representation of gender. The majority (31/38) of the respondents were married. All the respondents (38) stated they are professional teachers. This suggests that they have likely received different pedagogical approaches in managing large classes. The participants have different years of teaching experience, ranging from 1-25 years. Specifically, 3 participants had 1-5 years of experience, 14 had 6-10 years, 9 had 11-15 years, 7 had 16-20 years, and 5 had 21-25 years of experience. This variation in experience may enable them to understand and reveal how large class sizes can be managed effectively to improve the quality of teaching. New teachers in the profession will have the opportunity to learn from the more experienced teachers.

The respondents further indicated that they teach classes of 50 to 70 students. A study [45] revealed that a large class is generally perceived to consist of between 40 and 60 students. This suggests that any class with 40 or more students can be considered a large class and may affect the quality of teaching and learning if appropriate pedagogies are not used. The respondents further revealed that General Arts and Home Economics classes have more students than the Business, Pure Science, and Agricultural Science classes; handling these classes is challenging for them. These findings are also in line with a study [6], which revealed that the number of students taking business in senior high schools is experiencing a downward trend.

### 4.3. Understanding Challenges Faced by Teachers in Large Classes

What are the main difficulties you encounter when teaching large classes?

### 4.3.1. Lack of Individual Attention

The participants indicated that large classes often result in a lack of individualized attention, which affects students' learning. The amount of time teachers spend with each student is limited, so they find it challenging to identify the needs of these students. This reduction in interaction time hinders personalized feedback and support, essential for addressing individual learning needs and fostering academic growth. One of the participants revealed that,

*It is difficult for us to provide personalized attention to students who require more help because of the numbers we have in each class. Effective formative evaluations and timely feedback become problematic, hindering students' growth [Personal interview (PI)]*

Studies [45] and [46] indicated that large class sizes do not permit teachers to pay individual attention to students during lesson delivery. A study [22] added that large class size leads to a higher student-teacher ratio, which reduces the time and attention teachers have for students. As a result, they are not able to identify the individual student's needs and the kind of support to offer them. This affects the academic achievement and growth of the students. A study [46] affirmed that large class sizes have a negative impact on student engagement. Students are not motivated to participate in class discussions, which lowers their academic achievement.

### 4.3.2. Lack of Class Control

According to the respondents, one of the challenges they face is class control. Due to the high number of students, maintaining order in the classroom during teaching becomes difficult. When the teacher is teaching, some students will make noise and distract the lesson. This affects the quality of teaching and learning and also the level of concentration of the students. One of the participants said this during the interview session.

*It is difficult to maintain order in large classes for effective teaching and learning. Whilst you are busy trying your best for the students to understand, some are also very busy doing their things and making unnecessary noise. I sometimes spend almost half of the lesson's time trying to maintain order in the class. This makes it difficult for me to complete the scheme of work I always prepare for the semester [Focus Group Discussions (FGD)].*

Another participant expressed that.

*Managing a large class is fundamentally complex. We must address various behavioural challenges to ensure that everyone stays on track and create a positive learning atmosphere. This results in significant time lost on discipline rather than instruction (FGD).*

Class control is very essential in teaching and learning. Effective teaching and learning will not be able to take place if there is no effective class control. A study [47] revealed that some students sometimes exhibit disruptive behaviours during teaching and learning. These destructive behaviours affect the quality of teaching and learning and are largely common in

large classes. The findings of this study are consistent with the findings of a study [12] conducted in Ekiti State of Nigeria, which found that large class size leads to poor classroom management and control, which affects the quality of teaching and learning. Similarly, a study [45] in Thailand also revealed that large classes bring about a lack of discipline among students—more disruptive behaviours are displayed by students in these classes. These behaviours affect the entire teaching and learning process and the progress that could have been made by both teachers and students.

### 4.3.3. Improved Planning and Assessment

The respondents revealed that large class sizes lead to poor planning and assessment. They revealed that the standard and quality of assessment are compromised. The number of exercises given to students is always few to enable the teachers to mark. A respondent shared that:

*I do not give my students a lot of assignments. When I give them a lot of assignments, the marking becomes a challenge. We sometimes do eighteen weeks per semester; even if a teacher is to give one assignment a week, that could amount to eighteen assignments, but sometimes it is always difficult to even give up to ten assignments (PI).*

Another respondent expressed that.

*Providing students with timely feedback is challenging. Marking their assignments takes time. Students often do not receive their work in time to do revisions and corrections. We are unable to provide detailed personalised feedback on assessments, resulting in low academic performance. The standard and quality of assignments given are always compromised (PI).*

The findings of the study are in line with a study [12], which found in Nigeria that large class sizes lead to poor assessment of students. Teachers find it difficult to determine students' level of understanding because of the fewer exercises that are always given. Correspondingly, A Study [16] revealed in Potiskum that proper assessments overwhelm teachers. Teachers therefore resort to simpler and less effective forms of assessment like multiple-choice questions. These sets of questions measure specific knowledge and skills, but they do not capture higher-order thinking, creativity, and practical application of knowledge [48].

### 4.3.4. Poor Learning and Performance

The respondents again revealed that overpopulated classes lead to poor learning and academic performance. When the class size is large, students do not get the needed attention from their teachers to meet their academic needs, which affects their academic performance.

*Students are not always directed to proper learning practices, which can have an impact on their academic achievement. Teachers find it difficult to complete the required syllabus before the students write their final examination, which often leads to poor academic achievement (PI)*

A study [21] in India confirmed that students in large classes mostly perform weakly. Another study [49] revealed that

students in large classes mostly have poor learning habits. Competition in these classes is always less, which leads to insignificant performance. However, the size of a class has little role to play in the academic performance of students [18]. The study indicates that if students are serious and good regardless of the class size, they will be able to perform well.

#### 4.4. Ways to Handle Large Classes to Improve the Quality of Teaching and Learning

The respondents were asked to point out the various pedagogies that could be employed to improve the quality of teaching and learning in large classes. Some respondents indicated that the teacher-centred approach is often used to manage large classes due to its simplicity. However, they noted that this method does not promote effective teaching and learning. They suggested that the following pedagogies could improve the quality of teaching and learning and also reduce the burden on teachers.

##### 4.4.1. Hiring of More Teachers

The respondents indicated that more teachers should be recruited to help handle students in large classes. Hiring more teachers will help reduce the student-teacher ratio. This will help teachers have time for their students' individual needs. Having more teachers will enable co-teaching and potentially enhance the quality of teaching and learning in large classes.

*My school has insufficient teachers to adequately manage all the classes. As a result, some of the classes were combined, resulting in large class sizes. If more teachers are recruited, it would allow for the split of these classes into more manageable ones. This will help in quality teaching and learning (FGD).*

Studies [50, 51] revealed that when more teachers are hired, the student-to-teacher ratio will be reduced. This will improve classroom management, student engagement, and students' overall learning outcomes. While there are challenges related to cost [21], the long-term rewards of higher educational quality make the investment worthwhile.

##### 4.4.2. Provision of Resources Such as Textbooks

The respondents revealed that there are inadequate textbooks for students, which affects the quality of teaching and learning. They, therefore, indicated that textbooks should be provided to schools, especially schools with large class sizes, to facilitate teaching and learning. When textbooks are provided to students, it will help them to do individual and group studies.

*Textbooks provide a well-organised and consistent framework for teaching and learning. Textbooks help teachers to plan their lessons. In Classes where students receive limited individual educational attention, textbooks are crucial in helping learners meet their educational needs (PI).*

The provision of textbooks to students will support them in

doing independent learning [52]. Textbooks empower students to take charge of their learning and study at their own pace. Textbooks are invaluable resources for teachers, providing a reliable reference that they can use to prepare lessons and conduct classroom activities [53]. Studies have shown that the availability of textbooks is correlated with improved student performance [54, 55]. They offer clear explanations, structured information, and practice exercises that aid students in comprehending and retaining knowledge.

##### 4.4.3. Professional Development Training

The participants revealed that organizing professional development training is crucial for enhancing the quality of teaching and learning. Professional development programs will provide teachers with current pedagogical strategies that are effective in large class settings. Some participants revealed during the focus group discussion that:

*Professional development training equips teachers with advanced classroom management skills, which are essential in large classes. Techniques such as using positive behaviour interventions and implementing efficient classroom organization can help maintain order and foster a conducive learning environment in large classes, allowing for better student engagement and learning outcomes (FGD).*

Another participant indicated that

*Training helps teachers develop skills in using data to inform instruction. By analysing assessment data, teachers can identify trends, understand student needs, and adjust their teaching strategies accordingly. This data-driven approach ensures that all students in large classes receive targeted support to address their learning gaps (FGD).*

A study [56] found that professional development training is essential for improving the quality of teaching and learning. It creates opportunities for teachers to learn new teaching strategies, improve classroom management, utilise technology, and address diverse student needs [57]. It also fosters a supportive and collaborative professional environment, promoting continuous improvement and reflective practice [58]. Well-trained and confident teachers can establish a positive and inclusive learning environment, ensuring that learners receive high-quality education.

##### 4.4.4. Group Learning

The respondent suggested that students in large classes can be divided into various groups based on gender and mixed abilities. This approach facilitates collaborative learning, allowing students to benefit from each other's strengths and perspectives. One of the respondents said this during the interview session.

*Grouping students helps them utilize their diverse strengths and learning abilities. Gender diversity introduces varied perspectives and problem-solving approaches, while capability-based grouping ensures students can support and challenge each other effectively. This method fosters an inclusive learn-*

*ing environment where all students feel valued and understood. It encourages students to ask questions and express difficulties to peers, enhancing their understanding of the material and creating a supportive learning atmosphere (PI)*

Before placing students into groups in large classes, it is essential to conduct an assessment to determine their strengths, weaknesses, and preferences. Putting students in groups is necessary in large classes as it enables students to assist one another [36]. Teachers are also able to pay attention to these groups and help them improve their academic performance. A study [59] revealed that group learning fosters engagement by involving students in discussions and problem-solving activities rather than simply delivering information passively. To maximize the benefits of group work, it is important to keep the groups dynamic and regularly rotate members. This variation in interactions and learning experiences ensures that students derive maximum value from the collaborative setting [60, 61].

#### 4.4.5. Peer Teaching

The respondents indicated that teachers who handle large classes should introduce peer teaching strategies. This strategy will help the students to further learn from one another. It may significantly enhance the quality of teaching and learning in large classes. This method leverages the strengths and abilities of students, fosters a collaborative learning environment, and addresses some of the challenges associated with large class sizes. Students can explain concepts to one another in ways that might be more relatable than traditional instruction. This peer teaching reinforces their understanding and builds confidence. One of the participants indicated during the interview session that.

*Peer teaching promotes active engagement with the material, rather than passive information transmission. When students teach their peers, they also strengthen their understanding of the content. Explaining concepts to others necessitates a deeper grasp of the material, thereby solidifying their knowledge (PI).*

Another participant had it that.

*It also offers personalised attention, as students can receive assistance tailored to their individual needs from their peers. This level of individualized support may not always be feasible in a large class where the instructor's attention is divided among numerous students (PI).*

Students bring different perspectives and problem-solving approaches to the table. This allows them to learn from each other's viewpoints, leading to a more comprehensive understanding of the subject [62]. Students feel more comfortable asking their peers questions sometimes than their teachers. As a result, peer teaching provides them with more opportunities to seek clarification in areas they do not understand. The method will help minimize the challenges that teachers encounter when teaching. Peer teaching helps promote social interaction and communication skills [63]. Learners build a sense of community within a large class, making the learning

experience more enjoyable and supportive. Peer teaching may be motivating for students, therefore creating a sense of purpose and achievement, and encouraging students to put more effort into understanding the subject matter of what is being taught [61].

#### 4.4.6. Using a Projector to Teach in a Large Class

Some of the respondents also emphasized the need to introduce projectors or smart boards in senior high schools. They believe that these tools greatly enhance the quality of teaching and learning in both large and small classes. Projectors significantly improve the quality of instruction by enabling visual and interactive presentations. Projectors can capture students' attention, facilitate better comprehension, and enhance information retention. Here are some of the respondents' opinions regarding using projectors in large classes.

*Projectors play a crucial role in making visual materials accessible to all students, especially in large classes. By incorporating visual aids such as diagrams, charts, images, and videos, projectors enhance students' ability to see and grasp the content being presented. This is beneficial for complex concepts that can be clarified through visual representation. (PI).*

Another respondent also explained that.

*Projectors support different learning styles, including visual, auditory, and kinesthetics learners. Visual learners benefit from the inclusion of images and videos, auditory learners from accompanying explanations, and kinesthetics learners from interactive elements (PI).*

Projectors enhance presentations by allowing for dynamic and multimedia content, which can effectively engage students [32] in large classes. Interactive slides, animations, and video clips can make lessons more interesting and stimulating [64]. Moreover, projectors enable teachers to provide illustrative examples that may be difficult to explain verbally. For instance, showing a video demonstration of a chemical reaction can be more effective than merely describing it. By displaying content through a projector, teachers can devote more attention to interacting with students and addressing their questions rather than spending time on writing notes. Additionally, projectors offer students in large classes the opportunity to present their work to the class, fostering the development of public speaking skills and encouraging peer-to-peer learning, which influences their academic outcome [46].

#### 4.4.7. Peer Marking

Some respondents suggested that teachers who teach large classes should consider introducing peer marking, also known as peer assessment. They revealed that peer marking is an effective method that can enhance the quality of teaching and learning in large classes. This will reduce the burden of marking on teachers, therefore enabling them to give more assignments to their students. A participant indicated that:

*Learners will work hard consistently to score high grades*

*because they may not want their peers to witness their lacklustre performance. Some students enjoy mocking their classmates when they do not excel in class. Consequently, all of them will be motivated to work hard (FGD).*

Another participant expressed that.

*Students will always receive their assignments promptly to review areas in which they do not perform and make corrections without delay. This approach will also expose the learners to various methods of approaching questions by reviewing their classmates' work (PGD)*

Studies show that peer marking reinforces students' understanding of the subject matter [65]. A study [32] found that when students assess peers, they engage more deeply with issues, leading to better retention and comprehension. The studies further indicated that peer evaluation helps students develop higher-order thinking abilities by requiring them to apply criteria and offer constructive criticism. Students are also able to learn different ways of addressing the same questions or problems, which brings about more understanding of the problem. A study [40] also indicated that the exposure by the students helps them to recognize multiple solutions and perspectives, fostering a more comprehensive understanding of the subject matter. Peer assessment increases student engagement and responsibility in their learning. Knowing their work will be reviewed by classmates motivates them to produce higher-quality results. Students will also gain self-confidence as they learn to critically analyse their performance in contrast to others. It enhances metacognitive abilities [50] such as planning, monitoring, and analysing one's learning processes.

Peer marking eases the burden on teachers in large classes. Studies reported that peer assessment allows for more frequent and detailed feedback without overwhelming teachers, enabling them to focus on more complex teaching tasks [27]. Peer assessment creates an opportunity for learners to get their work back quickly; this, along with various criticism from peers, helps students quickly identify and solve their flaws. A study [28] suggested that constant feedback via peer assessment results in incremental learning and improved academic performance. Students learn to provide and receive constructive feedback, which is a valuable skill in both academic and professional settings. Building feedback literacy is a significant benefit of peer evaluation, which prepares students for lifelong learning and professional development [17].

#### 4.4.8. Collaborative Teaching

It was also discovered that teachers can use collaborative teaching, also called co-teaching, to enhance teaching and learning. This approach involves multiple teachers working together to plan, teach, and evaluate a group of students. By employing this method, teachers may be able to enhance the quality of teaching and learning in large classes. Collaborative teaching brings together teachers with diverse areas of expertise, which can offer a more extensive learning experience.

*By utilizing multiple teachers to teach in one class, it becomes feasible for us to integrate a wider range of dynamic*

*and diverse teaching methods. These methods will help us to be able to actively engage and sustain the interest of students even in larger classes (PI).*

Another participant revealed that

*Collaborative teaching will permit us to divide substantial classes into smaller groups, thereby enabling students to benefit from more personalized guidance and assistance (PI).*

Collaborative teaching brings together teachers with different areas of expertise, which can provide a more comprehensive learning experience. For example, one teacher may be proficient in content delivery while another excels in creating interactive learning activities [15]. Collaborative learning will allow teachers to share instructional load, allowing for more dynamic and varied teaching methods, which can help maintain student interest and engagement in large classes [52]. Co-teaching creates room for students to receive more personalized attention and support. Teachers can better address diverse learning needs by implementing varied instructional strategies, thereby improving student outcomes across different ability levels [29]. Collaborative teaching fosters a professional learning community where teachers can share strategies and feedback, leading to continuous professional growth. Less experienced teachers benefit from the mentorship of the experienced ones, which can enhance their teaching skills and confidence. With more teachers in the class, managing student behaviour becomes easier, which leads to a more conducive learning environment [29, 57].

#### 4.4.9. Field Trips

The respondents stated that field trips can help improve the quality of teaching and learning in large classes. Field trips provide real-world context, aiding students in retaining and recalling information more effectively. They also expose learners to practical applications of classroom knowledge, which can greatly increase their interest in the subject matter. During the interview session, one of the respondents indicated that

*Field trips have the potential to enhance students' comprehension of complex concepts as they provide them with the opportunity to directly observe and engage with the subject matter. By exposing students to real-life applications of what they learn in the classroom, field trips can greatly increase students' interest in the subject. It helps improve students' academic performance and increases the probability of students choosing to pursue related fields in their future careers (PI).*

Field trips give students real-world context that helps them learn and recall information more efficiently. Field trips help teachers when lectures alone might not be sufficient to engage all students [13]. The exposure that students get during the field trips can boost their interest in the subject areas, which leads to good academic performance. Scholars [28] and [13] have found that field trips have the potential to enhance students' comprehension of intricate concepts by providing them with the opportunity to observe and engage with the subject matter directly. Field trips facilitate closer interaction among

students and between students and instructors. This social bonding can enhance the overall educational experience by fostering a sense of community and collaborative learning.

## 5. Conclusion

The study contributes to discussions on the impact of large class sizes on teaching and learning. It also explores effective practices that teachers can use in these classes to improve quality, rather than relying solely on lecturing. The findings reveal that teachers struggle to identify and support students who need extra help and have limitations on assignments, feedback, and quality assessment. Classroom control and monitoring student progress are also challenging. These difficulties lead to poor academic performance.

In terms of practical application, the study provides new insights and strategies to address the challenges of teaching large classes. It identifies approaches such as peer teaching and marking, group studies, collaborative teaching, field trips, and the use of projectors in senior high schools. These strategies not only help alleviate teachers' workload but also significantly enhance the overall learning experience for students in large classes. Furthermore, the study emphasizes the importance of professional development programs for in-service teachers. These programs are seen as essential for equipping teachers with advanced teaching methodologies and boosting their confidence in managing large classes. The findings suggest that the recruitment of more teachers could further alleviate the pressures on educators, allowing for more effective collaborative teaching and thereby enhancing the quality of instruction in large classroom settings.

## 6. Policy Implication

The Ghana Education Service should develop a policy on professional development programs for teachers. These programs should focus on equipping teachers with effective strategies for managing large classes. The policy should also emphasise innovative pedagogical approaches such as differentiated instruction and the integration of educational technology. It is also important for the policy to encourage multimedia, online platforms, and other digital tools to support personalised learning in large classrooms. Revision of the curriculum to include more student-centred and interactive teaching methods is crucial. Additionally, the policy should prioritize providing adequate instructional materials and ensure equitable distribution of resources, particularly for schools with high numbers of students. Financial support and access to necessary teaching materials should be key considerations. Inclusive education practices should also be promoted, with a focus on special education and differentiated instruction to meet the diverse learning needs of students in large classes.

## Abbreviations

|     |                        |
|-----|------------------------|
| PI  | Personal Interview     |
| FGD | Focus Group Discussion |

## Conflicts of Interest

The authors declare no conflicts of interest.

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