Gender Differences in Senior High School Science Students' Perceptions of Their Teachers' Classroom Management Strategies in New-Juaben Municipality of Ghana

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Abstract This study explored gender differences associated with science students' perception of their educators' classroom management strategies used in the learning and teaching of science. A cross-sectional survey design was used for the investigation, which took place in three senior high schools offering the General Science programme in the New-Juaben Municipal (Koforidua), in the Eastern Region of Ghana. A sample of 300 third year (SHS 3) senior high school students in the 2018/2019 academic year were selected using a random sampling procedure to respond to a Self-Report Survey Questionnaire with closed-ended and open-ended questions. The questionnaire was adapted from the Technology-Rich outcomes-focused Learning Environment Inventory -TROFLEI) to suit the study design and was pre-tested to ensure that the statements were reliable and valid. The results from the study revealed that there are clear differences between genders regarding educators' classroom management strategies. One other key finding from the study was students' indecision as to the extent to which their teachers use the 10 classroom management strategies prescribed to be used by teachers. It was therefore recommended among others for educators to create an empowering technology-rich classroom atmosphere for learners to actively partake in classroom activities.

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1. Introduction

Teaching is an occupation that necessitates one's capability to be receptive to novel demands and changing requirements in the profession. It can be an intimidating enterprise for both specialists and beginner educators. Of late, school reform advancing high-stakes testing to improve scholarly accomplishment has subjugated the list of challenges requiring deliberation. Nevertheless, other difficulties such as classroom management also need urgent attention as a result of increased enrolment in Ghanaian senior high schools, due to the implementation of the free SHS policy. This has led to an increase in student numbers per class and has put the teacher in an awkward position concerning classroom management. Traditionally, educational activities occur in the classroom where students with shared characteristics about their educational levels are organised as an instructive domain

for attaining educational goals [14,36]. A learner's inherent qualities of mind and character to work in a classroom are reinforced by a communal sense of purpose. Accordingly, the social and cultural interaction that occurs in the classroom among learners, their psychological state, and the physical arrangements where instruction takes place culminates in the classroom environment, which impacts perceptions and evaluation of learners [14,32] Consequently, classroom instruction is a form of communal learning, planned for learners to study in a safe environment, feel appreciated and respected, and a place where they can improve their innovative capabilities and proficiency [8].

Accordingly, [40] opined that the foremost and principal phase of educational administration and management is classroom management. This suggests that an educator's compassion for anthropological relationships and an instructor's profound comprehension of issues related to classroom management will ensure and translate into a successful classroom management capability. Primarily,

the physical and psychological atmosphere in the classroom is the ultimate prerogative of teachers who must ensure that these are provided in the classroom to aid effective learning and teaching. Essentially, educators have the responsibility to stimulate superior interest in learners to enable them to manage the physical and psychological environment effectively. Issues being manifested in connection with classroom management have resulted from the multifaceted and multidimensional level of anthropological relations [40].

Classroom management for educators and learners is not stationary but a continuing process that ensures collaborative discourse between students and instructors as well as a realisation of effective learning and teaching objectives. This standpoint demonstrates that the act of classroom management goes beyond the description of a discipline [19]. In more specific terms, and from a myopic viewpoint, classroom management is the process of inhibiting, and directing and controlling of learners' unwanted conduct. In any case, it is expedient to know that a viable learning and teaching process entails to a greater extent than just the regulation of learner conduct but to enhance learners' learning in the classroom by applying the necessary teaching methodologies and strategies.

In a more complete description, classroom management is a helpful learning atmosphere for producing and handling educators' behaviours as opposed to a change of disciplinary practices and behavioural interventions for students [16]. Incidentally, classroom management is a procedure that can only be managed by the most successful teachers as they can create a conducive and effective learning environment [6]. Similarly, [15] "defines classroom management as a process including varieties of procedures and actions that create an effective learning atmosphere and maintain effective learner behaviours in parallel to the objectives of the teaching and learning process" ([1], p.181). Reference [5] accept that instructional methodologies are part of the classroom management skills of an instructor that enables the educator to prepare guidelines and techniques of the classroom, to organise learning groups, to observe and check the progress of learning of students and situations confronting their learning. Other classroom management techniques that a successful teacher applies include the ability of the educator to arrange the conceivable studying speed and to control misconduct that may take place [5]. In conclusion, [24] shows that instructional techniques such as organisational structure and intelligible subject matter are essential components of success in classroom management as that bolsters greater success. Educators' classroom management techniques have a constructive and momentous consequence for lowering learners' misconduct. A weaker classroom management technique will result in ineffective instruction and learning and can be very frustrating for the teacher.

The dearth of skills of teachers in classroom management techniques is as a result of the fact that they have not been able to acquire, develop, apply, and display that competency as a skill. This suggests that ability ought to be connected for showing a competency. Even though there is rich literature concerning theoretical know-how on classroom management, literature does not present rich information with regards to the functional abilities of educators for backing their very own long-lasting, professional advancement. Numerous educators most often, spontaneously and inconsistently attempt classroom management strategies, which sometimes fail and lead to discouragement on the part of the teacher.

Efficacious learner behaviour management has consistently been a fundamental problem among the majority of instructors. Thus, effective classroom management plays a significant role in constructive educational environments for both learners and educators. Discipline alludes to the structures and guidelines for learner behaviour and endeavours to ensure that learners comply with those principles. "Classroom management is a more extensive, umbrella term portraying educator endeavours to look out for a huge number of activities in the classroom as well as learning, social collaboration, and learner conduct" [[26], p.1]. These researchers defined "Classroom management as an extensive conception that comprises three scopes (instructional management, people management, and behaviour management) that do not depend on each other. The instructional management dimension depends on the day by day schedules of the classrooms and distribution of materials. Teachers' perception of learners and how they view their relationship with the learners determine the people management dimension of classroom management. The final dimension, which is the behaviour management, is conceptually similar to classroom discipline except that it focuses on an educator's pre-arranged techniques for averting bad conduct, instead of just on their response to it once it happens." [[26], p.2]. Accordingly, numerous researchers have proposed that classroom management is one of the main elements impacting learning since it is critical in encouraging the learning process. Successful classroom management techniques are urgent to making productive learning conditions for the students.

Literature obtained from research comparing classroom management capabilities and proficiencies of educators by gender has produced different outcomes. Some researches indicate that educators' observations and thoughts concerning their classroom management capabilities and proficiencies have been impacted by their gender [14,35,41]. However, the results of some other studies reveal that there are no statistically significant differences or conclusive roles between male and female instructors' capabilities and proficiencies in classroom management [14]. Examining the literature, most of the studies encountered regarding classroom management skills on gender-related to teachers but not from students' perspectives. In this unique situation, the motivation behind this investigation is to discover the differences in perceptions among male and female science students on their teachers' classroom management skills and competencies.

1.1. Purpose of the Study

The inspiration behind this investigation is to discover gender differences in students' perceptions about classroom management strategies utilised by their educators in instructing and learning of science in particular senior high schools in the Eastern region of Ghana. Specifically, the study seeks to

1. Investigate the perceptions of science students regarding their educators' science classroom management strategies.
2. Examine gender differences on students' perceptions concerning their educators' science classroom management strategies.
3. Explore gender differences on students' perceptions of the various dimensions of their educators' classroom management strategies.

1.2. Research Questions

The following questions were explored:
1. What are the perceptions of science students regarding their educators' science classroom management strategies?
2. What are the gender differences of students' perceptions concerning their educators' science classroom management strategies?
3. How do students' perceptions of the various dimensions on TROFLEI of their educators' classroom management strategies differ by gender?

2. Literature Review

The motivation about this review of related literature is to examine investigations that have addressed classroom management strategies used in teaching and learning. The literature was explored following the purposes of the study.

2.1. Theoretical Framework

The theoretical framework seeks to discuss the effect of the Classroom Environment Theory on teachers' classroom management theory.

2.1.1. Classroom Environment Theory

Research has shown that [27], on his work regarding classroom environment, grouped learning environments into three categories, namely, relationship, personal growth, and system maintenance and system change, which formed the conceptual foundation of classroom environment theory. Moos described Relationship as an assessment of the inherent features and strength of personal relationships established between the learner, their peers, and their instructor. On Personal growth and development, Moos emphasised that learners be active participants in all classroom activities to occasion their personal growth and self-enhancement. Finally, for System maintenance and system change, the educator has to set measurable objectives and expectations and endeavour to uphold control in the classroom to create an orderly and innovative learning environment. Thus, classrooms, where there are supportive relationships among instructors and the learners and where there is an emphasis on involvement, will result in a positive effect of these psychosocial dimensions on student learning [28].

2.1.2. Gender Differences and Perceptions of Technology For Learning

Different outcomes over the last three decades regarding research on gender differences in perception of the classroom environment have been reported. Whereas some studies reported that there were no gender differences in the perception of classroom support [12], the results of other researches indicated that females perceived more inspiration and assistance in the classroom [20,30]. Accordingly, a cross-cultural study involving Chinese and British students, examined the differences in the use of the Internet and computers [25]. The results indicated that the British group had greater gender differences than the Chinese groups with males in both countries showing higher self-confidence in their computer skills compared to women. They suggested that this could be attributed to the early exposure of males to computers and the internet as opposed to females. Consequently, [10] conducted a study among 15-16-year-olds and found that males enjoyed using computers more than their female counterparts and were more self-confident than the females as well. [21] researched into the attitude of ninth-grade natural science and mathematics students in Yugoslavia toward computers, and found that the attitude of males toward computers was more positive than females, suggesting that a positive attitude to computers can enhance one's self-confidence. Other studies have also confirmed the lack of self-confidence by females regarding the use of computers. For instance, a study conducted by [22] among 9th- 12th-grade students in Istanbul, Turkey, indicated that compared to their male counterparts, even though female learners have a positive attitude toward using computers for learning, they still lacked self-confidence in using technology.

2.1.3. Gender Differences and Classroom Management Strategies

"Gender refers to the roles and responsibilities of men and women that are created in our families, our societies, and our cultures. The concept of gender also includes the expectations held about the characteristics, aptitudes, and likely behaviours of both women and men (femininity and masculinity). Gender roles and expectations are learned but they can change over time and they vary within and between cultures. Systems of social differentiation such as political status, class, ethnicity, physical and mental disability, age, and more, modify gender roles. The concept of gender is vital because applied to social analysis, it reveals how women's subordination (or men's domination) is socially constructed. As such, the subordination can be changed or ended. It is not biologically predetermined nor is it fixed forever" [[37], p1].

From the foregoing, it is clear that the gender roles of learners may also influence their behaviour in the classroom including their societal roles. The influence of gender in developing countries concerning societal roles is very crucial. For instance, [3] elucidated that Pakistani women are marginalised, and as such gender concerns are very important and tremendously noteworthy. "Culture is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the 'meaning' of other people's behaviour" [[34], p.3]. Unfortunately, these social norms, mores, beliefs, values, behaviours, mindsets, and policies seem to enhance gross discrimination against

women. However, of late, some efforts are being made by non-governmental organisations to alleviate this inequality, especially in the educational system. Reference [38] stated that "Teachers and educators influence the gender roles of their students thus impacting their educational outcomes". It is therefore imperative for the teacher to play a positive role regarding issues related to discrimination between males and females in the society, for students to emulate.

Despite the fact that numerous investigations have been conducted in research issues related to classroom management strategies among educators, there are just a couple of studies on the impact of instructors' gender on classroom management approaches, particularly in Ghana. Also, and as expressed previously, existing researches regarding the matter of the connection between educators' gender and classroom management are varied. While some of the researches indicate no relationship between the gender of educators and their classroom management techniques, others were positive that a relationship exists. For instance, [7] was of the view that despite the fact that there are a few differences between male and female instructors on classroom management strategies, the similarities between them were far more than the variances. In conclusion, the investigation likewise uncovered that gender does not influence classroom management strategies as teaching is independent of gender but instead about teachers' inspiration. Additionally, [33] in an investigation, examined classroom management procedures utilised by Iranian instructors and found that there is no factually noteworthy distinction among male and female educators. Similarly, findings from a study conducted in science classrooms in Turkey show that "differences clearly exist between genders in their actual and preferred perceptions of classroom environment and their use of technology in the science classroom" [[39], p. 1]. These researchers found that their findings were inconsistent with the research of [26] who opined that male educators' behaviours were more controlled, demanding, inflexible, impersonal, confident, and forceful than female instructors.

Contrary to the outcomes of researches discussed, [29] found out that female educators have superior teaching approaches than their male counterparts regarding student engagement. They opined that there was no measurably huge contrast regarding classroom management techniques among males and females. Nevertheless, they observed that male and female students varied regarding learner engagement and instructional strategies. For instance, male educators have superior student engagement' strategies, whereas female educators have better at instructional strategies. Similarly, [31], investigated gender differences in classroom management strategies among Cypriot teachers. The results indicated that gender does not affect classroom management strategies for instructors. Consequently, the outcome favours what the greater part of the literature has guaranteed about the comparability among male and female educators' classroom management strategies.

3. Materials and Methods

3.1. Research Design

The study employed descriptive survey design,

as it justified the process of collecting data on specific social phenomena at a single point in time to verify the relationships among stated variables [11]. It was desirable to institute this design because the researchers wanted to capture the narratives of students to teaching methods used by their teachers. The descriptive survey design was suitable for this study because it helped in finding out students' perceptions about classroom management strategies used in learning and teaching science [4] concerning the actual and preferred use of technology.

3.2. Sampling Procedure

The study employed stratified random sampling procedure to collect data from a total of 300 students sampled from three out of the ten senior high schools offering the General Science programme in the New-Juaben Municipal, in the Eastern Region of Ghana. Out of the ten senior high schools, there was one girl only, two boys only, and seven mixed schools. One school from each category was sampled to participate in the study except the one girl only school which was automatically selected. The computer-generated random numbers were then used to sample 100 science students from each school for the study.

3.3. Instrumentation

This study utilised the ten-scale "Technology-Rich outcomes-focused Learning Environment Inventory (TROFLEI), developed by [2]" [[39], p. 1], to collect data. The instrument calculates the impact of technologies on educational outcomes for different learners through self-reporting of authentic classroom encounters and ideal classroom experiences [9]. "The TROFLEI consists of seven scales of the "What Is Happening in This Class instrument (WIHIC)", developed by [18]. The seven-scale WIHIC comprises student cohesiveness, teacher support, involvement, investigation, task orientation, cooperation, and equity). The three new scales that pay particular attention to technology and outcomes of secondary school classrooms and were added to the WIHIC seven are differentiation, computer usage, and young adult ethos" [[13], p. 82]. Each scale contains eight items and each item has two procedures (actual and preferred), using a 5-point Likert scale (almost never, seldom, sometimes, often, and almost always). Table 1 provides a concise clarification of the scales of the "TROFLEI and their relationship to Moos' conceptual framework.

3.4. Data Collection Procedure

At the time of data collection, the school authorities and the educators present gave permission to the researchers to conduct the investigation in the research schools. The drive for the study and the technique required to respond to the questionnaire items were explained to the sampled learners in each class. Students were encouraged to think critically about each item before making a choice. Learners spent about 50 minutes to respond to the questionnaire items.

Table 1. TROFLEI Scale descriptions

Scale Name	Scale Description	Moos' Framework
Student Cohesiveness	The extent to which students know, help, and are supportive of one another.	R
Teacher Support	The extent to which the teacher helps befriends trusts and is interested in students.	R
Involvement	The extent to which students have an attentive interest, participate in discussions, do additional work, and enjoy the class.	R
Investigation	The extent to which skills and processes of inquiry and their use in problem-solving and investigation are emphasized.	P
Task Orientation	The extent to which it is important to complete activities planned and to stay on the subject matter.	P
Cooperation	The extent to which students cooperate rather than compete with one another on learning tasks.	P
Equity	The extent to which students are treated equally by the teacher.	S
Differentiation	The extent to which teachers cater to students differently based on ability, rates of learning, and interests.	S
Computer Usage	The extent to which students use their computers as a tool to communicate with others and to access information.	S
Young Adult Ethos	The extent to which teachers give students responsibility and treat them as young adults.	P

R: Relationship; P: Personal development; S: System maintenance and system change" (Adapted from [[13], p. 82].

3.5. Data Processing and Analysis

Research question one was analysed by using descriptive statistics specifically means and standard deviation. This was ideal because it sought to determine students' perception of teachers' classroom management strategies. However, research questions two and three were analysed by using the independent samples t-test to establish overall differences in perception among male and female students as well as differences in perception on each of the ten sub-scales on the TROFLEI Scale by gender.

4. Results and Discussions

4.1. Demographic Information of the Students

This section relates to the background information of the students who responded to the questionnaires. Demographic variables, presented in Table 2, for the students included their gender and age. The excerpt from the data was analysed using frequencies and percentages to indicate how the demographic data represented the students who participated in the study.

Table 2. Demographic Characteristics (sex, age, and school type) of the students

Variables	Subscale	Freq.	Percent %
Gender	Male	159	53.0
	Female	141	47.0
Age Range	13-16	173	57.7
	17-20	91	30.3
	Above 20	36	12.0

Source: Field Data, (2018) (n=300).

From Table 2, the results suggest that on the basis of gender of the students, majority of the students were males (n = 159, 53.0%) whilst the females were the least (n = 141, 47.0%). With respect to their age range, most of the students were between 13-16 years (n = 173, 57.7%). Those who were above 20 were the least (n=36, 12.0%).

4.2. Research Question One: What are the Perceptions of Science Students Regarding Their Teachers' Science Classroom Management Strategies?

Table 3 presents the descriptive statistics of students' perception of classroom management strategies used by their teachers in teaching. As shown on Table 3 students were undecided as to the extent to which their teachers use the 10 classroom management strategies prescribed to be used by teachers. This conclusion was drawn due to the fact that a five-point Likert scale was used (Mean approximately 3.0).

Table 3. Perception of students on classroom management strategies used by teachers (N = 300)

Minimum	Maximum	Mean	Std. Deviation
2.53	3.43	2.8845	.35990

This result show that most teachers do not follow the guidelines proposed by [17] for teachers to (1) encourage students' engagement in academic tasks, which can be done by using group management methods (e.g., by establishing rules and classroom procedures and (2) promote the development of students' social skills and self-regulation.

4.3. Research Question Two: What are the Differences between Male and Female Science Students' Perceptions Regarding Their Educators' Science Classroom Management Strategies? Demographic Information of the Students

One of the objectives of the study was to determine the differences in the perceptions of male and female students in relation to their educators' science classroom management strategies. To achieve this, an independent samples t-test was deemed appropriate for the analysis as the independent variables were categorical. The dependent variable here was the perception of students about classroom practice and the independent variable was gender (male and female). The results are presented in Table 4.

Table 4. Independent samples t-test on perceptions of science students concerning classroom practice by gender

		Mean	SD	t	Df	Sig.
Variables	Male	2.965	.452	3.75	298	.000
	Female	2.813	.231			

As illustrated in Table 4, there was a statistically significant difference in perception between male students [M = 2.965, SD = .452] in classroom practices of their teachers and their female counterparts [M = 2.813, SD= .231, t(298) = 3.75, p < .001, n=300, 2-tailed). This implies that cumulatively, male students have a significantly higher perception of their teachers' classroom management practices than their female counterparts. The results are in line with the study of [3] who elucidated that Pakistani women are marginalised, and as such gender concerns are very important and tremendously noteworthy. "Culture is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the 'meaning' of other people's behaviour" [[34], p3].

In another result, [7] was of the view that despite the fact that there are a few differences between male and female instructors on classroom management strategies, the similarities between them were far more than the variances. In conclusion, the investigation uncovered that gender does not influence classroom management strategies as teaching is independent of gender but instead about teachers' inspiration. Additionally, [33] in an investigation, examined classroom management procedures utilised by Iranian instructors and found that there is no factually noteworthy distinction among male and female educators.

4.4. Research Question Three: Differences between Science Students' Perceptions of the Various Dimensions on TROFLEI of Their Teachers' Classroom Management Strategies by Gender

One of the objectives of the study was to explore the differences between male and female science students' perceptions of the various dimensions of their teachers' classroom management strategies. The results are presented in Table 5.

As shown in Table 5, the male students had a significantly higher perception of their teachers' classroom management strategies in student cohesiveness, teacher support, involvement, task orientation, cooperation, and computer usage. Contrarily, the female students had significantly higher perception in task orientation and young adult ethos. There were however no statistically significant differences in perception between male and female students in equity and differentiation classroom management strategies.

Table 5. Science students' perception of teachers' classroom management strategies by gender (df = 298)

Variables	Gender	Mean	SD	t-value	Sig.	Decision
Student Cohesiveness	Male	4.061	.063	11.835	.000	Significant
	Female	3.311	.750			
Teacher Support	Male	2.681	.313	14.294	.000	Significant
	Female	2.318	.062			
Involvement	Male	3.061	.063	12.684	.000	Significant
	Female	2.656	.375			
Task Orientation	Male	3.303	.439	4.581	.000	Significant
	Female	2.994	.687			
Investigation	Male	2.622	.125	8.631	.000	Significant
	Female	3.580	1.312			
Cooperation	Male	2.803	.439	4.799	.000	Significant
	Female	2.389	.937			
Equity	Male	2.234	.753	1.225	.222	Not significant
	Female	2.307	.062			
Differentiation	Male	2.676	.564	1.919	.056	Not Significant
	Female	2.781	.375			
Computer Usage	Male	3.298	.690	11.016	.000	Significant
	Female	2.693	.062			
Young Adult Ethos	Male	2.915	1.007	1.989	.048	Significant
	Female	3.098	.437			

This result is consistent with a study conducted by [23] who observed that the overall comparison reflected that male teachers were dominant over female teachers in classroom management strategies. Furthermore, female teachers were facing more serious problems in managing their classrooms as compared to male teachers. Similarly, the findings of the study [1] concluded that teachers' gender affects their classroom management. However, they further opined that female teachers exhibited more classroom management skills on four out of six dimensions of classroom management than the male teachers, which is inconsistent with the findings of the current research. These dimensions included "Teamwork", "Build relationships with students", "Love and logic approach" and "Organisation in the classroom". Similarly, [29] found out that female educators have superior instructional strategies than their male counterparts regarding student engagement. Similarly, findings from a study conducted in science classrooms in Turkey show that "differences clearly exist between genders in their actual and preferred perceptions of classroom environment and their use of technology in the science classroom" [[39], p. 1].

From the foregoing, it is clear that research on gender differences in classroom management strategies is inconclusive as the findings are diverse, some in favour of males, some with females and still others with no significant differences.

5. Conclusions and Recommendations

The purpose of this investigation was to discover gender differences in students' perceptions about classroom management strategies utilised by their educators in instructing and learning of science in particular senior high schools in the Eastern region of Ghana. The study revealed that students were undecided as to the extent to which their teachers use the 10 classroom management strategies prescribed to be used by teachers. Again, it was revealed that male students in high schools in the research schools have more positive perceptions about their teachers' classroom management strategies compared to their female counterparts. Finally, male students had a significantly higher perception of their teachers' classroom management strategies in student cohesiveness, teacher support, involvement, task orientation, cooperation, and computer usage. Contrarily, the female students had significantly higher perception in task orientation and young adult ethos. However, there were no significant differences in perception between male and female students in equity and differentiation classroom management strategies.

Based on the findings of this study, the following recommendations are made for future researchers and educational leaders.

a. Educators should create an empowering technology-rich classroom atmosphere for learners to actively partake in classroom activities.

b. Additionally, the monitoring division of the Ghana Education Service should put measures in place to ensure that teachers teaching in schools with a large number of students per class be given periodic professional development in classroom management strategies to ensure effective classroom management strategies.

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