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Improving Home Economics Students' Interest in Biology: The Influence of Certain Effective Teachers' Classroom Management Practices

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Abstract
Students are introduced to concepts in Biology through such subjects like Natural Science, EnvironmentalStudies and Integrated Science at the early stages of their education. Biological concepts therefore form partof the Integrated Science as a compulsory subject taught at the basic level of the Ghanaian Educational System.Despite the fact that students are introduced to a number of strands in Biology, studies have reported adwindling level of students' interest and academic achievements in Biology among Home Economicsstudents, most especially, when it has to do with biological drawings and scienctific namings. However,studies have shown that teachers' classroom management practices play a significant role in ensuring effectiveeducation and maintenance of students' interest. Thus, the purpose of this study was to investigate theinfluence of students' perceptions of some teachers' Classroom Management Practices on their Interest inBiology. We believe the result of this study will provide basis for teachers, researchers and administrators ofHigh Schools, especially Heads of Science and Home Economics Departments to become aware of, employor ensure the application of effective classroom social learning environment management practices especiallyregarding Home Economics students. Students' Interest in Biology (SIB) and Teacher Classroom managementPractices (TCMP) questionnaires were used to collect data from 331 Biology students selected from sevenschools from the New Juabeng Municipality of the Eastern Region of Ghana. Students' interest in Biologywas found to be generally moderate. Task orientation, equity and teacher support were often perceived. Apositive moderate significant correlation between SIB and TCMP was also recorded. Task orientation anddifferentiation were found to be very good predictors of SIB. It was recommended that SHS Biology teachersshould take steps to orient students well on tasks and use differentiated approaches in teaching.

Key Words : Classroom Management Practices, Home Economics Students, Improving, Interest in Biology, Student differentiation, Task orientation, Teacher support, Equity, Involvement

Introduction

Background to the Study

Students are introduced to concepts in Biology through such subjects like Natural Science, Environmental Studies and Integrated Science at the early stages of their education. Biological concepts therefore form part of the Integrated Science as a compulsory subject taught at the basic level of the Ghanaian Educational System. Despite the fact that students are introduced to a number of strands in Biology, studies have reported a dwindling level of students' interest and academic achievements in Biology among Home Econmics students, most especially, when it has to do with biological drawings and scienctific namings (Dzidzinyo, Bonney & Sam, 2022). This may be due to a number of factors such as non-use of diagrams; generic difficulties with

diagrams and idiosyncratic difficulties that related to specific diagrams (Diezmann, 2000); variety, complexity and intricacy of biological drawings (Dhar & Ip, 2017). A key factor involved in students' performance and choice of a subject course or programme of study is their interest in the subject (Morgan, 2021) which is in turn influenced by the teachers' classroom management practices (Morgan & Aboagye 2022). Studies have shown that teachers' classroom management practices play a significant role in ensuring effective education and maintenance of students' interest (Morgan et al, 2023; Egeberg, H. & McConney, 2019; Evertson & Weinstein, 2006).

Interest is a feeling that prompts one to spontaneous activity. To Aggrawal (2014), it is a powerful dictator and motivator in the learning process. This implies that with positive provocation of students' interest, they will readily learn , pay attention, remember, imagine and read more. Okoli (2005) believes that interest will make a learner prefer one type of activity to another. Kundu and Tutoo (2007) are also of the view that interest has much to do with attitudes, values, and other forms of human preferences, for example, interest motivates and compels attention. Stimulating interest is vital to education, as the level of a person's interest influences their attention, goals, ability to self-regulate their study strategies, and levels of learning and achievements (Renninger & Hidi, 2016). Students, generally, will choose Biology and do well in it if they find the subject interesting (Lanoven et al., 2007). However, Kiruki and Orodho (2015) have noted that the number of students who pursue science subjects such as Biology has decreased significantly.

The apparent low interest in the subject may be due to a number of factors. Some researchers seem to place the problem at the doorstep of students and others blame the situation on teachers exhibiting certain negative attitudes and students have certain unfavourable perceptions. Lastly is the inability of teachers to demonstrate the right attitude toward the subject (Harris & Farell, 2007: Kiruki & Orodho, 2015). Buabeng and Ntow (2010) and Hongsa-Ngiam (2006) for example, attribute low interest of students in a subject to poor teaching or inadequate teaching strategies exhibited by teachers in the learning processes. Others, have identified teachers' personality and attitude to teaching the subject as factors contributing to poor performance (Adesoji, Odubunmi & Balogun, as cited in Kiruki & Orodho, 2015). Hongsa-Ngiam (2006) posits that instructors' beliefs influence teaching strategies whereas students' perceptions, goals and motivation influence learning strategies. Key among the factors linked to students' interest in a particular subject is teacher-student interaction or more specifically, classroom management practices of teachers (Egeberg & McConney, 2018). The teachers' behaviour is seen to influence the students' behaviour and the students' behaviour in turn influence teacher output (Koul & Fisher, 2005).

Classroom management remains a teacher's most substantial practice in a remarkable class environment. According to Marzano (2003), no consequential teaching and learning can occur in a mismanaged classroom. This stance is supported by Teyfur and Çelikten (2008) who claim that mismanagement in the classroom leads to an unproductive learning environment. Classroom management, as a process, is geared towards satisfying the goals of the educational system, the curriculum, the school, the lesson, the teacher and of the students; to provide student motivation and to achieve an educational goal. One of such goals in the Senior High School Biology education is the development of interest as an attempt to better inculcate in the learners the willingness or desire to engage now and reengage with the subject in the future (Nacca, 2019). The quality of teacher-student relationship is an essential determining factor in classroom management. In order to obtain a good relation and communication between the student and the teacher, it is required that the relationship between the teacher and the student be open, transparent, direct and be based on trust and mutual appreciation (Kayekei, 2009). Also, Kayeke (2009) asserts that the teacher and the student should carry the feeling of dependency and in addition, the needs of the teachers and students be satisfied reciprocally. Finally, the particular assets, interests and skills of the students and their differences should be taken into account (Kayike, 2009). Despite the importance and the high demand placed on the modern teachers' skill in classroom management and the numerous works done on classroom environment, very little is known about teachers' management practices in Biology classrooms in Ghanaian Senior High Schools and in New Juabeng North Municipality in particular.

Statement of the Problem

Interest may be considered as the medium and also the goal of educational processes (Djudin, 2018). According to Djudin (2018), students will learn better, and subsequently, choose a subject intentionally, if they are interested in it. However, the number of students choosing science-related programmes and courses such as Biology keeps diminishing (Djudin, 2018; Oon & Subramaniam, 2013). In addition, performance of Home Economics students in Biology, in Ghana, over the years has been generally and consistently marginal (WAEC, 2020; 2019; 2018; 2017; 2016; 2015). Research data collected on SHS students' achievement in

Biology have revealed an abysmal performance in Biology among Home Economic students. Moreso, performance statistics by West Africa Examination Council from 2014 to 2020 show that a good number of the Biology candidates did not obtain a quality grade of A1 – B3 and the general performance has been marginal (WAEC, 2020; 2019; 2018; 2017; 2016; 2015; 2014). The Biology teachers cursory attribute this marginal performance to the Home Economics students taking Biology as one of their electives.

Students' achievement in a subject has been linked to interest which in turn is linked to the quality of the classroom environment. However, not much work has been reported on students' interest in Biology and how it is linked to the management practices of biology teachers of Home Economic classes. What is therefore lacking currently is a research work that seeks to elucidate the current state of students' interest in Biology especially in the Eastern Region of Ghana and how this relates to their teachers' classroom management practices. This study therefore intends to provide some empirical perspective to this discussion. The result of this study will provide basis for researchers who might be interested in studying about students' interest in Biology and Biology teachers' management practices in the classroom, especially regarding Home Economics students, in replicating the study at other geographical jurisdictions. In addition, this work will help Biology teachers to know about and employ classroom management practices which could help to develop students' interest in Biology. Finally, this work would add to the scanty literature available on Home Economics students' interest in Biology.

Purpose of the Study

The purpose of the current study was to examine the perceptions of students on prevailing classroom practices of biology teachers who are teaching home economics classes and their relationship to students' interest in Biology.

Research Questions

The following questions guided the study:

1. What is the level of Home Economics students' interest in Biology?
2. What are students' perceived teacher classroom management practices prevalent in the Home Economics Biology classroom?
3. What measures could be put in place to improve Home Economics students' interest in Biology?

Research Hypothesis

H_0: There is no statistically significant relationship between teachers' classroom management practices and students' interest in biology?

H_A: There is a statistically significant relationship between teachers' management practices and students' interest in biology?

II. Literature Review

Theoretical Framework

This study is influenced by the Hasni and Potvin's theory of Interest (Hasni & Potvin, 2015).). Interest is viewed as content specific and relational in this study. This implies that a person cannot simply have an interest unless interested in something specific called the object of interest. The object of interest in this study is Biology. From the theory, the Biology students' interest is a product of their personal characteristics and the characteristics of the environment. This means that with proper management skills exhibited in the classroom by the teachers, the student may develop favourable attitudes (interest). It is explained that such development of interest is a likely product of a deliberate and systematic attempt on the part of the teacher to trigger learners' interest through practices such as providing them with opportunities for scientific investigations and guided involvement of the students in class activities which are geared towards eliciting initial interest of the subject in them. With these teacher-planned and mediated activities the students' interest progresses through the less developed stages (triggered, maintained and emerging situational interest) to the level of a well-developed individual interest.

To add to this, Renninger and Hidi (2016) offers a four-phase model of interest development which brings together situational interest and personal interest and describe their development (mentioned earlier). According to them certain specific situations trigger interest, which can then develop across situations and with time become more enduring. Firstly, features of the environment such as ambiguity, novelty, and surprise

can catch a student's attention. Such situational interest can last longer, beyond a single situation if the tasks appear meaningful and involving or if the learner perceives the task as valuable or enjoyable. From the viewpoint of physics learning, the critical part of situational interest seems to be how to hold it long enough to lead to a motivation to study and the activities of studying. Ainley, Hidi and Berndorff (2002) have suggested that learners' affective response to teaching or learning material forms the link between interest and learning. According to this thinking, interest is related to affective response, affect is related to persistence in studying, and studying is related to learning.

Concept of Interest

Interest has been abstracted as a particular association concerning an individual and an activity, object and or topic, which is depicted by positive passionate experiences and feelings of personal importance (Kunter, Baumert & Koller, 2007). This abstraction is based on the person-object approach to interest. Ivowi (2001) sees interest simply as a "state of concern or curiosity". To him interest is what causes a learner to become involved with anything and argues that a person shows interest in something when she/he actively gets involved with that thing, shows concern for or is curious about it. The implication is that learners demonstrate interest in Biology if they show sufficient concern and curiosity and actively involve themselves in all activities related to the subject.

Ivowi (2001) enumerates five ways in which interest in the sciences (Biology, Chemistry and Physics) and mathematics could be manifested by a learner. Firstly, the learner reads a lot of texts about the subject. That is, the learner tends to read more about the subject as compared to other subjects. Secondly, the learner exhibits curiosity, evaluation and logicality. These are attributes of a scientist. In addition, the learner is seen to like to manipulate devices as well as data, displays data in different forms and finally, applies related concepts, principles and ideas in many ways (Ivowi, 2001).

Krapp (2003) has approached interest from two significant viewpoints. Firstly, interest is viewed as a characteristic of a person and secondly as a psychological state usually triggered by specific characteristics of the learning environment. Basically, the former approach has been referred to as personal interest or sometimes as topic interest but the latter is termed situational interest (Hidi & Renninger, 2002). Personal interest is usually specific to an individual, however, situational interest is considered to be short-lived, spontaneous, and could be shared among individuals. Personal interest is topic specific and lasts longer. It can be divided further into hidden (latent) and actualized interest (Schiefele, 1991; 1999). According to Hidi (1990), situational interest is an emotional state that is evoked suddenly by something in the immediate environment but personal interest develops slowly and may have long-term effects on a person's knowledge and values. Situational interest may have only a short-term effect on the learners' knowledge and values. It is dependent on the interestingness of the content and context and can usually be regulated by teachers as observed by Schraw, Flowerday and Lehman (2001) and Renninger and Hidi (2002). By combining these ideas, Hidi & Renninger (2006) defines interest as both a psychological state characterized by increased attention, effort, and affect, experienced in a particular moment, as well as an enduring predisposition to reengage with a particular object or topic over time.

Interestingly, Lavonen et al. (2007) differentiates interest from other motivational variables in three areas. They noted that interest is content specific; it is a product of interaction between a people and the immediate environment; and finally, it has both affective as well as cognitive aspects.

The literature has outlined different types of interest. These include, basically, situational (triggered and maintained) and Individual (emerging and well-developed) interests (Hidi & Renninger, 2002; Krapp, 2006). However, Ainley and Ainley (2011) have added intention to reengage as another type of interest. According to Krapp (2006) and Hidi and Renninger (2002), interest is not a unitary concept, but two main types are usually identified in varying forms. These are individual interest and situational interest This means the concept of interest may be measured at two levels- situational and individual levels of interest. Situational interest is a short-lasting type of interest, is usually stimulated by conditions of and stimuli from the environment such as surprises, puzzles, authentic problems, or unexpected phenomena, and is thus more easily manipulated and under the control of teachers.

Individual interest, however, describes a well stable type of interest, such as a deep-seated interest in a subject like Biology, Physics, Integrated Science, Physical Education , or Geography. This interest develops gradually with time and it can predict how willing and readiness to engage and reengage with a given subject matter. The situational interest is linked to the prevailing external factors such as a situation, task or context to which

the learner is exposed to or may be involved. This situation may either promote a positive feeling or negative one. For example, the positive feeling may emerge like the joy of participating in a physics investigation or light experiment in which a rainbow is formed whereas the negative feeling may be linked to a feel of disgust in heating a metal in a heat experiment (some students may fear getting close to source of heat or may find heating an inanimate object like a metal irrelevant). This psychological state requires focused attention, persistence, affective involvement as well as cognitive functioning (Hidi, 2006; Krapp, 2007).

It is also observed that situational interest when maintained or presented repeatedly may lead to personal (individual) interest. Individual interest on the other hand, is characterized by an intrinsic desire to understand and leads to a relatively enduring preference for a specific topic, subject areas or activities and persist over time (Hidi & Renninger, 2006). It is relatively stable and stems from pre-existing knowledge, personal experiences and emotions as well as high value concerning tasks, objects, or ideas. This predisposition to attend to certain objects and events and to engage in certain activities leads to a third level termed intention to act or predisposition to act (Ainley & Ainley, 2011).

Individual interest is seen as unique form of the student's psychosocial influences acting as motivation. Finally, research shows that interest predicts intrinsic motivation as well as positive affect (Kahu, Nelson & Piston, 2017). In their longitudinal study of first year university students offering different courses, Kahu, Nelson and Piston (2017) found that students' individual interests were the principal influence on their career ambitions and subsequently the main determinant of their course choices. The students were usually passionate to learning something they loved. This individual interest revealed itself as a 'broad interest in particular domain such as science or technology'; specific past experiences'; and 'their perceived kills'. Kahu, Nelson and Piston later identified another level of students' interest which they captioned as wider interest in learning. This new category which is not properly identified is evident in students' desire to acquire new knowledge and skills, furthering education and learn more of the subject (later captioned in this work as intention to reengage). This wider interest was observed to keep a student involved in all their lessons.

Classroom Management Practices (CMP)

It is common practice to interchange the terms "behaviour management" and "classroom management." The two terms though related or better still, might be considered to be intertwined, are different. Classroom management means creating systems that support the kind of positive behaviour across a classroom. Behaviour management is made up of strategies and systems that will manage and eliminate difficult behaviours that prevent students from succeeding in an academic environment. Also, Classroom management encompasses all procedures and strategies used by a teacher to maintain discipline in the classroom to ensure a conducive environment that can facilitate student learning. Classroom management is crucial in classrooms because it supports the proper execution of curriculum development, developing best teaching practices, and putting them into action.

Classroom management has been looked at from different perspectives. To one, classroom management is used to describe the process of ensuring that classroom lessons run smoothly without disruptive behavior from students compromising the delivery of instruction. For example, Victor (2005) sees classroom management as simply the means through which teachers control disruptive behaviour so as to be able to allocate classroom time and effort to the teaching and learning activities as much as possible. To another, it refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive, on task, and academically productive during a class. Strictly however, all the activities undertaken by a teacher to organize the available space, students, time, and materials for instruction in content and student learning to take place forms part of classroom management (Wong & Rosemary, 2001). It also encompasses procedures and practices used by a teacher to maintain an environment conducive for instruction and learning to take place).

A well-managed classroom improves student learning. The classroom is a congregation of different students with different personalities; thus, teacher needs to know how to effectively manage the class. This has a positive impact on students' achievement, given learning requirements and goals (Webster, 2020). Oon and Subramaniam (2013) also found that teachers can foster or influence students' interest in the subject. This will depend on the kind of management practices employed by the teachers in the classroom-Classroom Management Practices. Woolnough (1994) has revealed in his subject choice study that the most significant factor impacting on students' preference for the sciences is the teacher. He noted that how well a teacher is able to inspire their students, through being empathetic towards his students in encouraging them and his

enthusiasm about the subject encourage students to develop interest in science. Hence, in an effort to ensure all students receive the best education, it would seem beneficial for educator programs to spend more time and effort in ensuring educators and instructors are well versed in classroom management.

Relationship between classroom management practices and students' interest

In their longitudinal study of first year university students Kahu, Nelson and Piston (2017) found that students' initial interest in a course dropped later as the semester progressed. The students reported that the university became less enjoyable. According to Kahu, Nelson and Piston this implies interest is not enough to sustain students' persistence in a subject area. The missing link then are the practices adopted by the teacher for the sustenance of the learners' initial interest to develop to a higher level (such as the intention to reengage or sustained engagement). This could be inferred from a student's assertion "It's just not really my style of learning, like I'm doing the things I like but like I'm not doing it the way I want to do it" (p.5).

The teacher has a role for instance in adapting class management to factor learner-diversity. Kahu, Nelson and Piston (2017; 2016) also identified teacher attitude and emotions, teaching activities and student's individual interest as influencers of students' situational interest. The first two dimensions falls under the broader construct of teacher classroom practices. For example, student differentiation, cooperation, involvement, investigation, cohesiveness, equity, computer usage falls within teaching activities whereas teacher support comes under teacher attitude and emotions. All these can be linked to interest development and sustenance. This study points to the fact that teachers' approach and relationship with the learners is quite crucial. It is a common notion among students that teachers' passion towards what they teach is a driving force in their own willingness to engage with the material under consideration. Learners tend to like the subject because of the teacher's relationship with them, they have to be interesting and yet be focused. Interest affects academic achievement, adjustment and happiness.

Interest is a mental resource that contributes to learning and academic achievement (Harackiewicz & Hulleman, 2015). It enhances learning and eventually results in better performance and higher achievements. Interest is usually considered as a process that contributes to learning and consequent subject achievement (Hidi & Renninger, 2011). That is, interest appears to play a very significant role in learning and academic achievement. Schiefele, Krapp, and Winteler cited in Harackiewicz and Hulleman (2010) reports that interest correlates so well with academic achievement ($r = .30$). This means being interested in a subject serve as a mental resource that promotes learning and eventually results in enhanced performance and achievement as stated earlier. Rotgans (2015) citing a meta-analysis of Schiefele and Krapp which used 121 studies reports that the average correlation between interest and academic achievement was .31. They also noted that interest is a powerful predictor of study success and has the ability to predict future study choices as well.

To Hidi and Renninger (2016), the relationship between interest and achievement depends upon the type of interest the learner holds. A learner can even experience success if there is environmental support for her/him and also if s(he) decides to commit some effort to developing a connection to the content even though the learner has a less developed interest. When the interest is well developed one would not pay attention to the time spent on a task, more time will be spent, possesses sustained ability to engage in a task, be challenged by these tasks and greater achievement results. However, the importance of interest must not only be looked at in terms of achievement and performance but also its role in adjustment and happiness in life. Ainley, Hidi, & Berndorff (2002) have indeed shown that situational as well as individual interest promote attention, effort, recall, and task persistence.

Happiness in life and satisfaction are essential components of a person's well-being. Inability to Pursue activities and subjects that one finds interesting makes one unease and discontent. The secondary school is supposed to help learners discover their interest, nurture and pursue them in the near future (Nacca, 2019). In his attempt to validate an instrument for measuring subject interest, Rotgan (2015) found that learners' cognitive engagement, curiosity, enjoyment, boredom, attention can be used to measure interest as these regressed so well with interest. Rotgan, in addition, stated that this finding points to the fact that the individual subject interest students have is a relatively strong predictor of their willingness to engage with the subject during a class" as well as future reengagement. This implies that measuring a learner's enjoyment, curiosity, attention, cognitive engagement, and boredom levels and willingness to engage with a subject is a measure of the learner's interest in that particular subject. Surprisingly, relatively little is known about development of interest in school subjects such as physics (Ryan & Deci, 2000).

Improving students' interest in a subject

Three factors contribute to the development of interest (Hidi & Renninger, 2002). These include knowledge, personal value, and positive emotion. As students learn more about a topic, the task engagement makes them become more skilled and knowledgeable. This increase in knowledge could eventually result in positive affect as the learners become more competent and skilled. The learners also find the activity personally meaningful and relevant. For an example a student of Biology who realizes that in depth knowledge of Biology could help to become a good medical doctor will persist in studying and spending more time on the subject. The goals a person has can also contribute to his/her development of interest. This will help to become more engaged in their learning, explore the subject matter further and develop competence (Harackiewicz & Hulleman, 2010). For example, a footballer that wants to become an expert free-kick taker will spend extra time practicing the skill until he/she becomes the best. The development of competence will also help to increase knowledge and positive affect.

In a 2002 longitudinal case study of a single subject, Renninger and Hidi (2002) noted that the process of interest development is contingent on the students' cognitive development and is a product of students' culture purposely directed at empowering the development of some interest whiles constraining others. Recognition provided support for the subject who felt a sense of efficacy in a language art class. It also came to light that choice or autonomy could also help to develop individual interest in learners. Though most schools have fixed set of courses/subjects that learners are expected to take, teachers can still give them opportunities to make choices concerning depth, how and focus of assignments, home works and design of experiments.

Several researchers, such as Hidi and Renninger (2016); Mitchell (1993); and Krapp (2002) have made a distinction between catching and holding situational interest. Catching or triggering refers to variables that initially stimulated learners to become interested in a specific topic (interestingness). Holding interest refers to variables that empower pupils with a clear goal or purpose. Mitchell (1993) has suggested that essential to the shift from catching to holding a learner's situational interest are learning conditions that make the content of learning meaningful and personally relevant to pupils. Krapp (2002) has suggested that in certain conditions situational interest can transform into personal interest. According to him, this ontogenetic transformation is a two-step mental process where internalization and identification play a central role: (1) Catching and holding the situational interest for the first time, and (2) Through an internalization process this situational interest can develop into individual or personal interest and, therefore, motivation and interest are no longer seen as simply an individual variable.

The development of interest of students in a subject, such as Biology, should be a deliberate effort considering the significance and the role interest plays in knowledge acquisition, student achievement and future engagement with the subject. The teacher has an important role in motivating students' interest in any particular subject area. Although students, to a large extent, are responsible for what they learn teachers need to guide them in their pursuit of knowledge and this could be achieved with proper interaction between the teacher and his learners (Ivowi, 2001).

III. Materials And Methods

The overarching design that was employed in this study was the cross sectiomal survey research (Creswell, 2012). This study therefore employed a descriptive survey tool. The tool is chosen because the study seeks to find out the current situation as far as the interest of Home Economics students in Biology and Biology teachers' classroom management practices in Senior High Schools are concerned. The survey involved the gathering of information from students of Senior High Schools in the New Juabeng North Municipality about their interest in Biology and their perception on various teacher classroom management practices undertaken by their Biology teachers. This study therefore used the characteristics of the descriptive survey for the sake of drawing a true picture of relationships between teachers' management practices variables and students' interest variables.

The population of this study was made of all Home Economics Biology students in the New Juabeng Municipal area. The area had seven Senior High Schools who offer Biology as an elective subject. Biology is a compulsory subject for all General Science students but optional for Home Economics students. The total number of students stood at 2,675. This study used 338 students randomly selected from seven Senior High Schools which offer Biology as elective in the Home Economics programme within the New Juabeng Municipality. A quota sampling technique was used to select the actual participants from each school based on the number of Home Economics students in each school. The sample size for the study was based on the

table for sample size determination suggested by Krejcie and Morgan (1970). According to Krejcie and Morgan population of about 2775 will take an estimated sample size of 338.

Census sampling technique was used to select all the Senior High Schools within the New Juabeng Municipal area. However, quota sampling technique was employed to decide on the number of Biology students selected form each participating school. In addition, using computer-generated random numbers, simple random sampling technique was used to select the actual participants to respond to the questionnaires from each of the seven schools under consideration. The simple random sampling was considered most appropriate because it gives each element in the population an equal probability of getting into the sample and all choices are independent of one another (Kothari, 2004). It also gives each possible sample combination an equal probability of being included. This informed the researcher's choice in selecting the sampling procedure.

Table 1: Sample Size Determination

School	Total number of Home Economics Students offering Biology	Total number of students selected
A	408	50
B	365	44
C	491	60
D	361	44
E	371	45
F	397	48
G	382	47
Total	**2775**	**338**

Source: Field Data, 2022.

The main instrument for data collection was the questionnaire. The questionnaire was broadly divided into four. The first section dealt with demographic data about students' age, sex, and class. In the second section, students were expected to respond to 12 items measuring their interest level in the subject. The third part sought their perceptions about their teachers' classroom management practices, whereas the final part presented the respondents with an opportunity to express their opinion on how their interest in Biology could be enhanced by the teachers. The questionnaire on interest was adapted from Morgan (2021). The original instrument had items structured to measure students' interest in physics. The teacher classroom management practices (TCMP) scale was made up of ten (10) sub-constructs including a section each on teacher support, cohesiveness, involvement, equity, investigation, young adult ethos, differentiation, cooperation, task orientation, and computer usage. The study adopted the TCMP from the What is Happening in this Class (WIHIC) scale. However, due to time constraints, only practices that borders directly on teacher-student interactions were studied. These include teacher support, student involvement, task orientation, equity and differentiation.

The instrument (questionnaire) was piloted on different biology students (Connelly, 2008) in a different school from the schools studied. This enabled us to ascertain the reliability of the instrument and validity of items constructs and helped to refine the questionnaire, enhance its legibility, and minimize the chances of misinterpretation. The instruments were administered within classes hours, collected same day and directly, and subjected to data cleaning. Permission was sought at different levels from the regional office, district offices and the selected schools. Data collection was done by the researchers within a period of 16 working days. The purpose of the study was explained to the respondents and they were assured of confidentiality and anonymity. After conducting the simple random sampling, the questionnaires were distributed to the selected respondents to respond to them and return them to the researcher.

The data collected were coded, screened and input into SPSS version 23 which aided in the processing and analysis of the data. Specifically, students' interest was correlated with their perception of teachers' classroom management practices using the Pearson's product-moment correlation coefficient. Quantitative data analysis methods were used to analyse the responses gathered from the study. Percentages, frequency tables, standard deviations, and mean were used to analyse the data on the demographic characteristics of the respondents. Subscales of teachers' classroom management practices and students' interest were presented using means and standard deviations (Pallant, 2005).

IV. **Results**

Home Economics Students' Interest in Biology

Research question one sought to find out the level of Biology interest of Home Economics students pursuing Biology in the New Juabeng Municipality. To seek an answer to this research question, students were made to respond to a 5-point Likert scale measuring their level of interest in Biology. Two stages were followed to completely answer this research question. First, students' overall interest in physics was measured using mean and standard deviation and then the mean was compared to a Format (Table 2) (Morgan & Aboagye, 2022) to determine the interest level.

Table 2: Format for interpreting mean interest

Level	Range	Description
1	1.01 to 1.80	Very low
2	1.81 to 2.60	Low
3	2.61 to 3.40	Moderate
4	3.41 to 4.20	High
5	4.21 to 5.00	Very high

Source: Morgan and Aboagye (2022).

Using the format in Table 2 and the descriptive statistics of students' interest in Biology (M=3.08, SD=.72), Home Economics students' interest in Biology was found to be moderate.

Students' perceived teacher classroom management practices

This section of the study sought to investigate students' perception of their Biology teachers' classroom management practices. To investigate this, means and standard deviations were calculated (Table 3) and these were compared to a standard (Table 4) to interpret the mean scores of students on the classroom management practices studied. Table 3 shows that the most perceived classroom management practices among the Home Economics Biology students studied was task orientation (M=4.03, SD=.70). This was followed respectively by equity (M=3.52, SD=.91), involvement (M=3.05, SD=.71); teacher support (M=2.86, SD=.99) and differentiation (M=2.56, SD=.75). By comparing this to the format set out in Table 4, it is observed that Task orientation, equity and involvement were often perceived in the Biology classrooms studied, teacher support was only sometimes perceived whereas differentiation was perceived seldomly.

Table 3: Biology teachers' classroom management practices

	Mean	Std. Deviation
Task Orientation	4.03	.70
Equity	3.52	.91
Involvement	3.05	.71
Teacher support	2.86	.99
Differentiation	2.56	.75
Valid N (listwise)		

Table 4: Format for interpreting CMP prevalent levels

Level	Range	Description
1	1.01 to 1.8	Almost never
2	1.81 to 2.6	Seldom
3	2.61 to 3.4	Sometimes
4	3.41 to 4.2	Often

5	4.21 to 5.0	Very often

***Source*: Morgan and Aboagye (2022)**

Ways to improve Home Economics students' interest in Biology

This section of the study focused on how, in the opinion of students, interest in Biology could be improved. The respondents were therefore made respond to 11 close ended questions indicating the extent to which they agreed or otherwise with each of the statements. The results were ranked and presented in Table 5. Results from Table 5 indicate that the learners rated tolerance (M=4.76, SD=.59); making time for slow as well as fast learners (differentiation) (M=4.74, SD=.59) and punctuality (M=4.73, SD=.53) very high on the list of ways to improve Home Economics students' interest in biology. These were followed respectively by the use of relevant teaching and learning resources such as diagrams (M=4.69, SD=.60); organisation of field trips (M=4.68, SD=.68); opportunities to use ICT during lessons (M=4.67, SD=.74) and frequent visits to the laboratory (M=4.60, SD=.68). In addition, use of practical tools (M=4.54, SD=.64); creation of conducive environment (M=5.54, .73); use of student centered approaches in teaching (M=4.46, SD=.71) and teachers use of ICT tools (M=4.45, SD=.74) were also rated high on the factors that could help in raising students' interest in studying Biology. The least rated factor was the use of real objects and organisms (M=3.89, SD=.89) in Biology lessons delivery (see table 6).

Table 5: How to improve students' interest in Biology

Statements on ways to improve students' interest in Biology	**Mean (%)**	**Std. Deviation**
Teachers should be more tolerant and patient with students	4.76 (98.0)	.51
Teachers should make time for weak and slow learners	4.74(94.1)	.59
Teachers should be punctual to class and avoid lateness and absenteeism	4.73(96.0)	.53
Teachers should employ more teaching and learning resources for illustrations (e.g. diagrams and pictures)	4.69(98.1)	.60
Teachers should organise more field trips to places such as botanical gardens and zoos where biology could be learnt at first hand	4.68(93.0)	.68
Teachers should give students opportunities to use ICT tools to search for information during lessons	4.67(90.2)	.74
Teachers should organise more visits to the laboratory	4.60(94.0)	.68
Teachers should use more practical tools and equipment	4.54(97.0)	.64
Teachers should create conducive environment / atmosphere in class by been approachable, free and friendly to students	4.54(88.1)	.73
Teachers should use more student-centered approaches such as discussion in teaching	4.46(91.1)	.71
Teachers should employ ICT tools such as YouTube videos, projectors and mobile phones to teach	4.45(89.1)	.74
Teachers should use real objects or organisms in their natural or physical states during lessons	3.89(71.2)	.89
Valid N (listwise)		

Relationship between teachers' management practices and students' interest in Biology

To test the research hypothesis that there is no statistically significant relationship between teachers' management practices and students' interest in Biology, Pearson's correlations coefficient was used and the results presented in Table 6. Table 6 shows that there was a moderate significant correlation (r=.25) between overall teachers' management practices (TCMP) and students' interest in Biology. In addition, differentiation was observed to have the highest coefficient of correlation (r=.26, p=.000). This was followed respectively by task orientation (r=.21, p=.000); involvement (r=.13, p=.018) and teacher support (r=.12, p=.027). Hence, the null hypothesis that there is no statistically significant relationship between students' interest in Biology and teachers' classroom management practices was rejected.

Table 6: Relationship between teachers' management practices and students' interest in Biology.

	Biology related interest	
Classroom management practices	**R**	**P**
TCMP	.246	.000
Task Orientation	.213	.000
Teacher support	.122	.027
Equity	.114	.037
Involvement	.130	.018
Differentiation	.255	.000

Source: *Field data (2022)*

However, regression analysis (Table 7) indicated that only differentiation (B=.224, p=.000) and task orientation (B=.175, p=.000) were significant predictors of Home Economics students' interest in Biology

Table 7: Regression analysis of significant predictors of students' interest in biology

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.502	.278		5.403	.000
	differentiation	.224	.051	.234	4.344	.000
	Task Orientation	.178	.057	.173	3.146	.002
	Involvement	.093	.065	.091	1.434	.152
	Equity	.013	.055	.017	.245	.807
	Teacher support	-.015	.049	-.021	-.307	.759
a. Dependent Variable: Biology related interest						

Source: Field Data (2022)

V. Discussions

The observation that students had a moderate interest in Biology means that Home Economics students' interest in Biology was neither low nor high. This is however is in contrast with the popular opinion that Home Economics students have low interest in Biology. The attitude of students' may be partly attributable to the biology teachers' classroom management practices (Egeberg & McConney, 2018) since it was observed that these could predict students' interest in Biology. This is therefore an invitation to Biology teachers to adopt practices that could aid in raising learners' interest in the subject.

The result (Table 3) showed that certain practices were more often perceived than others. For example, student differentiation was seldomly perceived in the Biology classrooms studied. This results, as observed from Table 4, supports the fact that the practices of differentiation was not common but only seldomly practised in the Biology classroom by the teachers. The result also portrayed that the students, generally, were not well differentiated by the teachers with regards to the selection of content and assignments. Fast as well as slow learners had almost the same amount of time to complete a task whereas high achievers and low achievers are given the same content, using same methodology and approach to facilitate learning (Morgan & Aboagye, 2022). There is also less differentiation with respect to modes of learning: visual, auditory and or tactile learners are engaged using the same instructional style as deem fit by the teacher. Meanwhile research has found that learners are diverse in many ways and require different approaches to instruction: practical texts, theory or creative activities (Kahu, Nelson & Picton, 2017). Differentiated instruction could aid learners with varied educational needs and studying styles to master the same academic content (Tomlinson, 2003).

Students, also, sometimes received support from their teachers. The Biology teachers sometimes took personal interest in their students, their problems and feelings, move about the class to interact with individual students and to offer personalized assistance to those who may need it. This helps to motivate students to become focused and develop interest in a subject (Chionh and Fraser, 2009). Chionh and Fraser also agrees that high instructor support produced students who had more favourable attitudes (interest) towards the subject.

There were, however, a number of positive results. It is observed that the most common CMP of the physics teachers in the areas covered by this study, according to the respondents, was task orientation (TO). These finding implies that learners were very well oriented concerning tasks which were set out for them in the Biology classrooms. Learners reported that they so much know the goals of their Biology classes, know what is expected of them in the class, the amount of work they have to do and therefore paid attention and worked towards the accomplishment of set goals (see Appendix B). This might have contributed to students' moderate interest in Biology (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010).

Another practice that was also common in the Biology classroom was student equity. This suggests that the teachers often treated all learners equally; giving equal attention, encouragement, positive reinforcements to individual learners irrespective of gender differences, age, learning style or type of learner (high or low achiever). Equity is highly linked with persistence and interest (OECD, 2012). Also, students were often involved (M=3.04, SD=.76) in the classroom discourse. Learners were often able to ask the teacher questions and freely share their opinion during class discussions. Students have to be highly involved in the classroom discourse as this helps to make them become more proactive (Kickul & Kickul, 2006; Kammeyer-Mueller & Wanberg, 2000), more academically succesful (Weaver and Qi, 2005) and eventually develop a lasting interest in the subject (Sidelinger, 2010).

Concerning ways to improve students' interest in Biology, the results portrayed that, for Home Economics students' interest in Biology to be improved, Biology teachers should, first of all, be more tolerant with them. This by extension, could mean that teachers usually were impatient towards the Home Economics students and this could lead to a dwindling in their interest in the subject. This is also supported by the call on Biology teachers to have time for weaker students (Morgan, 2022). This also calls for differentiation among learners. Biology teachers are expected to see the students as having different characteristics and attend to learners according to their individual diversities instead of treating them all as one.

Teacher punctuality also appeared to be a crucial factor in the development of interest in Biology among Home Economics students as students ranked this factor third on the list. The students also called for the increased use of teaching and learning resources such as chats and diagrams in the teaching of Biology for illustrations

of concepts in order to develop their interest in the subject. The organisation of field trips to relevant sites where Biology could be learnt was also rated high by the students as a factor that could aid in raising their interest.

The Biology teachers were also called upon to involve ICT tools in lesson delivery and organise frequent visits to the laboartory and use more practical tools in lesson delivery. This has also been observed by Djudin (2018) that though teaching science related subjects could be quite challenging but the inclusion of innovations such as ICT tools could help raise the learners' interest and make its learning less challenging. A good number of the students also wanted the teachers to be more approachable, friendly and use more student-centered approaches in the teaching and learning process. Finally, students expected their Biology teachers to use real objects in teaching them as this will help them visualise the concepts being taught and not be made to learn in abstraction.

As was also seen from the results on the hypothesis testing on relationship between students' interest and TCMP, students' differentiation was found to be a significant predictor of the students' interest. Hence, instead of teachers concentrating on practices such as equity and teacher support, a greater emphasis should rather be placed on differentiation in addition to task orientation for the development of students' interest in Biology. Teachers need to be aware of learner diversity especially as may be fast as well as slow learners in their various classrooms (Ruhan & Yasar, 2010 cited in Kahu, Nelson & Picton, 2017; Njagi, 2015). Classroom management practices could therefore influence the development of students' interest in Biology. This assertion is in agreement with the findings of Morgan and Aboagye (2022) and Kahu, Nelson and Piston (2017) who have separately observed that classroom management practices have positive influence on students' interest in a subject.

Conclusions

From the findings of this study, a number of conclusions can be drawn. First, contrary to the popular opinion, SHS Home Economics students' interest in Biology was found to be moderate. This finding is surprising as it is generally expected that non-General science Biology students will have low interest in Biology. Second, the most frequent classroom management practices used by Biology teachers were task orientation followed by equity and involvement. Teacher support and differentiation were sometimes used. Despite the fact that, globally, emphasis is been made on student differentiation in teaching and learning, the concept was seldom employed in the Biology classrooms studied.

Third, there was a positive correlation between teachers' classroom management practices and students' interest in Biology. Furthermore, task orientation and student differentiation could predict students' interest in Biology. The concentration of these classroom management practices could therefore help to raise students' interest in Biology significantly. Finally, from the students' perspectives, Home Economics students' interest in Biology could be improved mostly by acts of teachers such as tolerance, differentiation, punctuality and use of TLRs.

Based on the results of this study the following recommendations were made:

1. Biology teachers should adopt classroom management practices such as student differentiation and task orientation in order to improve students' interest in Biology.

2. Biology teachers should be more tolerant, punctual and be patient towards slow learners.

3. Biology teachers should include relevant teaching and learning materials and include ICT tools in the classroom daily discourse.

4. Further studies should be conducted to ascertain the effect of teachers' classroom management practices on Home economics students' academic achievements in Biology in the New Juabeng Municipality and other juridictions.

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