

EFFECT OF JUNIOR HIGH SCHOOL SCIENCE TEACHERS' SELF-EFFICACY ON PUPILS PERFORMANCE

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ABSTRACT

The study was conducted to assess the influence of JHS Science Teachers' self-efficacy on pupils' performance. The study was guided with two research questions to find answers to the research problem. Theoretical and empirical literature was reviewed to give grounding in philosophy to the study. A correlational approach was adopted in giving direction to the entire study. The study was to determine the relationship between the variables in the research questions since there was no manipulation of any variable. The participants in the study were Junior High School pupils in form two and the integrated science teachers. The participants were sampled through multi-stage sampling with a sampling size of 378 pupils and 34 integrated science teachers. The instrument for the data collection with respect to the teachers was integrated science teachers scale (STS) while pupils answered a teacher-made test. Data collection was done by administering the instruments to the respondents through the head teachers and the participating teachers in adherence to Covid-19 protocols announced by the government of Ghana. The research questions were analysed using IBM-SPSS version 25. The result obtained revealed that there is no statistically significant correlation between the novice and the experienced science teachers' sense of Efficacy. Also, the result indicated that there was a relationship between teacher self-efficacy and students' performance. The study recommends the enhancement of teachers' self-efficacy to promote students' academic performance.

Keywords: Self-efficacy, science teachers, pupils' performance, academic performance

INTRODUCTION

Educators have implemented educational reforms over the years to accomplish the ultimate success of students, emphasizing great leadership in the classrooms (Fullan, 2005; Guskey, 2005). The Industrial revolution emphasized the need for more specialized instruction and influenced much of the educational practices of this modern era (Harris, 2005). Thus, successes at all level of professions, work and social life is dependent on students' educational achievement (AlKhateeb, 2018). Nelson (2007) explained that 'what teachers bring into the

classroom dictates the quality of the educational experiences of their students. To understand how to create optimal learning environments that promote interest in academics, we must study teacher variables linked to student interest (p. 10). Teacher characteristics, such as qualification and experience are factors related to learner performance (Omolar, 2008). Consequently, there is a demand for qualified teachers who can make a difference in student achievement. Miles and Stapleton (1998) agree with Omolar (2008) when they say that skilled and capable teachers are the most important determinant in academic performance. Teachers have a significant role, and for nearly 40 years, the literature has focused on teacher qualifications (Kurt, Güngör, & Ekici, 2014). Over the last 3 decades, there have been many studies conducted within the educational research community to determine the process of how new teachers come to understand themselves as teachers (Costigan, 2005). This knowledge is very important as teachers are seen as playing a pivotal role, if not the pivotal role, in student learning and achievement (Vesely, Saklofske & Leschied, 2013). Retaining teachers beyond their novice years to become more experienced is believed to be a key component of successful student learning and creating schools of excellence (Ingersoll, 2012). In the light of this, many researchers in Ghana have explored varied teaching approaches to enhance students' academic performance in Ghana (Adusei & Sarfo, 2020, Agormedah et al., 2020, Edem et al., 2020, Yeboah, & Siaw, 2020). However, they overlook teachers' psychological drive (self-efficacy) that urges teachers to embark on more challenging tasks. Self-efficacy is an individual's motivational beliefs that stimulate him/her to embark on difficult and more challenging task (Fitriyana et al., 2021). The teacher, however, remains the pivot in improving teaching and learning. Educational reforms in Ghana were geared towards teachers' involvement to achieve educational excellence in the country. Whether one examines the teacher's effectiveness from the perspective of the legislator, parent, principal, or student level; the main goal is to prepare teachers who have a strong knowledge of effective teaching strategies, ability to teach, and the desire to make a difference in the life of their students. The underlying construct that influences each of these factors as above is teachers' self-efficacy. The phrase "self-efficacy" has been defined numerous times in educational professional literature. Self-efficacy is the conviction that one is capable of acting in a specific way to achieve the desired outcome (Bandura, 1986). Bandura (1994; 1997) defines self-efficacy as a person's confidence in his or her skill to accomplish a specific task; individuals' judgments about organising and realisation of predetermined work, task, and activities. It also means self-related beliefs of an individual's capacities to disclose his or her attitudes and skills against life-related situations. Self-efficacy is the personal belief of possessing the ability to perform professional tasks with mastery (Pendergraft & Wilson, 2014). Self-efficacy, therefore, serves as a measure of the individual's ability in doing what is expected of him/her. Teachers' self-efficacy is the teachers' confidence in their abilities to promote students' learning and it determines levels of effectiveness, innovativeness, and persistence among teachers (Protheroe, 2008; Klassen & Chiu, 2010).

One major factor that influences elementary science teachers' instruction is their self-efficacy beliefs (Aydin & Boz, 2010). The instructor's efficacy beliefs are indicators of his or her ability to teach. In his social cognitivist theory, Bandura (1977) defined self-efficacy as "beliefs in one's capacity to organize and execute the course of action required to address approaching circumstances." Self-efficacy is made up of personal science teaching efficacy and scientific teaching result anticipation in the setting of science education. Personal scientific teaching efficacy refers to the teacher's belief in his or her capacity to provide effective science instruction, whereas science teaching outcome expectancy refers to the teacher's expectations for

students' ability to study science. According to Schunk (2003), even though self-efficacy is crucial to teacher achievement, it is not the only important factor in that regard. Schunk (2003) argued that another very inextricable influence on teacher achievement is knowledge. Pajares (1992) also asserted that knowledge and beliefs cannot be considered separately. It is the person's beliefs in a situation of phenomena that would motivate him/her to study and gain knowledge about a subject matter.

Thus, this study is aimed to assess the self-efficacy beliefs of junior high school science teachers on pupils' performance in the Asante Mampong municipality. The teaching and learning of science at the basic schools in Ghana's formal educational system is very critical. This has therefore made governments of Ghana, after independence in 1957 revolutionized the teaching and learning of science through several educational reforms. Science plays a crucial role in global economy, especially in the manufacturing sector.

Science is an essential learning area in curriculum and instruction from early grades to high school worldwide. International student achievement tests such as The Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) give rise to discussions about the quality of national education programs, as education stakeholders look for ways of improving their educational systems (Senler, 2016). Quality science teachers, therefore, are needed by developed and developing countries of which Ghana is not an exception.

Science teaching mostly goes beyond normal classroom instruction. The teacher has to demonstrate to his/her learners what the theory is all about by taking the learners through science practical sessions. The teacher's self-efficacy and belief in the subject matter would therefore come into play not only in the theory section but also during the demonstration and involving the learners in practical works. The learners, therefore, have the chance to create their knowledge through observations and deductions. In recent years, the current concern over teaching and learning at all levels of education is a commitment to improving quality teaching and students' learning (Azuelo, Sariana & Manual, 2018). The focus on educational excellence is merely to improve teaching and learning in the classroom through school reform and educational administration practices (Chong-Lee, 2009).

LITERATURE REVIEW

Self-efficacy (self-confidence) has been shown in numerous studies to aid students in achieving academic achievement in a variety of ways (Bresslere, Bressler, & Bressler, 2010; Kluemper, Little, & DeGroot, 2009; Mahyuddin, Elias, Loh, Muhamad, Nordin, & Abdullah, 2006; Siddique, LaSalle-Ricci, Arnkoff, & Diaz, 2006). Teenagers that have a high level of self-efficacy are always on their best behaviour and do not have any unpleasant personalities. Women who suffer from miscarriage will be better if they have high efficacy. Similarly, counselors with high efficacy will be able to help their clients more effectively. Self-adequacy can likewise assist individuals with overseeing pain and working on their wellbeing over a long time, for example, stopping smoking, overlooking malignant growths, stopping drinking, and bringing down their HIV hazard (Yaacob and Shah, 2009). In other situations, employees who are always optimistic will have powerful expectations of their ability to succeed despite the challenging new work environment. They will constantly feel confident of success. These types of workers have a high sense of responsibility in carrying out any task by demonstrating an earnest effort. They are always positive to achieve high-performance goals. Efficacy is also a critical element that represents a personal assessment of the ability to meet the standards of an organization.

Sugahara, Suzuki, and Boland (2010) discovered that accounting programs or courses can boost self-efficacy in terms of academic accomplishment. Work experience and the ability to communicate in English as a native language are two more factors that contribute to students' high self-efficacy in developing their overall abilities. The self-efficacy model that fosters expected self-goals also states that self-efficacy does contribute to one's achievement when examined in detail (Betz, 2004). Efficacy could also influence a result's outcome. When it comes to completing tasks, self-efficacy is a good predictor of motivation and performance. This idea has been widely implemented in domains like education, human resource management, organizational behavior, sport, health, and many others due to the importance of success efficacy. In the context of the learning environment for secondary and elementary school children, students with high self-efficacy see failure as a result of not putting in enough effort, whereas students with low efficacy see failure as a result of their inability to complete certain tasks successfully (Bandura, 1993; Collins, 1982). Students who learned from teachers who had high self-efficacy performed higher on examinations than students who learned from teachers who had poor efficacy, according to Hines and Kritsonis (2010). The higher a student's CGPA, the more conservative and careful they are throughout exams. Students who are less optimistic about their academic success will devote less time to studying (Tho, 2006).

According to Heidari, Izadi, and Ahmadian (2012), students with a high level of self-efficacy have a positive and significant relationship with the vocabulary learning strategy and the memorizing strategy compared to students with low self-efficacy. These findings demonstrated the importance of nurturing self-confidence in students to ensure the effectiveness of learning and their achievements. Self-efficacy is another essential factor in determining whether someone is a high achiever, an intermediate achiever, or a low achiever (Usher & Pajares, 2006; Yip, 2012). Bembenuddy (2011) found a link between teacher-assigned homework and students' self-confidence and sense of responsibility in a study. He claims that assignments and self-learning skills, also known as self-regulated learning, can increase students' academic performance by assisting them in efficiently managing their time and learning environment, as well as maintaining their concentration on learning. As a result, students may be able to strengthen their efforts in realizing the learning system, resulting in higher quality and academic accomplishment. Furthermore, it is also concerned that students who have high self-efficacy (in reading and writing) often adopt strategic and in-depth learning strategies, while students with low self-efficacy levels only practice basic approaches. They consistently make changes in their learning approach from time to time and feel comfortable practicing more overtime learning. Students with poor self-efficacy, on the other hand, did not adjust their learning styles (PratSala& Redford, 2010). Students act, students' perceptions of the assessment task, including whether it is compatible with the planned learning system and based on validity, reliability, and diversity, have a significant impact on their confidence in their academic ability. All of this has a significant positive effect on students' self-efficacy and confidence (Alkharusi, Aldhafri, Alnabhani, & Alkalbani, 2014).

Self-efficacy is a determinant factor that influences work performance the most, according to the conclusions of a study, and can be implemented in the local environment and public services (Halim, 2012). The self-efficacy factor is identified as a full mediator to the influence of achievement motivation on work performance. It is an extremely important component to perform a given task until the desired level of performance is achieved. Self-efficacy helps predict motivation and performance in any domain, according to research, and studies testing causal models underline the importance of self-efficacy. Students with a high level of self-

efficacy also possess a higher level of academic Motivation. In this case, difficult goals enhanced motivation. Students who received difficult Goals displayed the highest self-efficacy and performance (Schunk, 1995). In other words, self-Efficacy and motivation are important entities in enhancing students’ academic excellence.

Conceptual Framework of the Study

The framework has been adapted from Bandura (1997) which looked at the self-efficacy of teachers/persons and how they behave in their environment under given conditions. Self-efficacy is defined by Bandura as the belief in one’s capabilities to achieve a goal or an outcome (Bandura, 1997). The main variable in the model is person, behaviour and outcome which has been connected with a forward arrow. The forward arrow movement from a person through to outcome demonstrates some sought of continuum in the model as proposed by Bandura (1997). For the individual to perform, in this case, Integrated Science teacher in Mampong Municipality that self-efficacy, as determined by Bandura, must come into play or action. This has explained why ‘Performance Maker’ was placed a little ahead of ‘Efficacy expectations’ as in the model of Figure 1. In knowing the outcome expectation of the Integrated Science teachers in the Mampong Municipality at the JHS, a lot of factors could have influenced positively or negatively their behaviours. The factors that could influence the behaviour of the teacher are put into two. The factors are the school environment and the academic background of the said teacher. In brief, the teachers’ school environment entails the students they are teaching, the peers and parents of the student, the general tone/climate of the school. The educational training of the teacher matters as to how he/she can teach a science subject for the students to achieve something. This conceptual framework thus explains why it has been adapted to help in exploring self-efficacy beliefs of JHS in-service science teachers on pupils’ achievement in Asante Mampong Municipality.

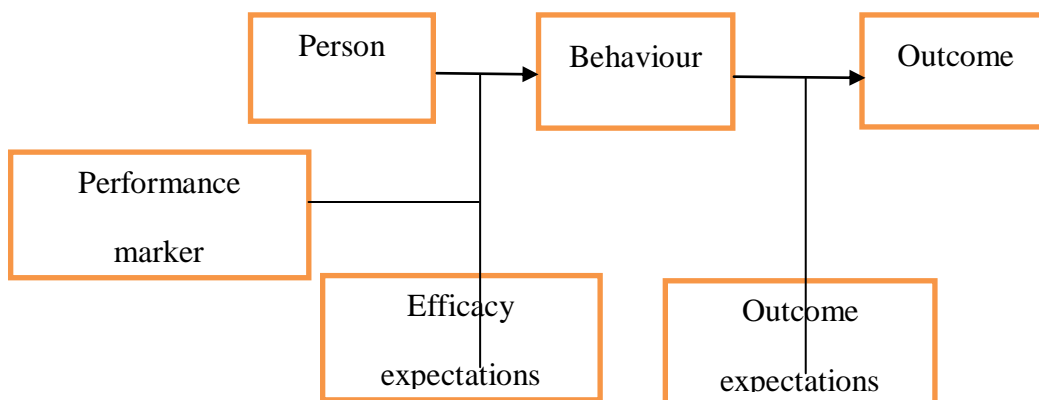


Figure 1: Conceptual framework adapted from Bandura (1997)

Theoretical Review

Self-efficacy

"Beliefs in one's capacity to arrange and execute the courses of action required to produce specific attainments" is what self-efficacy is defined as (Bandura, 1997, p. 3). The self-efficacy theory of Bandura is based on the fact that different persons have varied levels of self-efficacy in different situations. According to Yilmaz (2004), the main concerns of the theory are the differences between people with high self-efficacy and low self-efficacy in terms of their

attitudes towards tasks and the amount of work to be done, the structure of self-efficacy, and sources of self-efficacy. Bandura (1997) states that people improve their skills as much as they can in particular fields of interest to them. As a result, their levels of self-efficacy in various domains vary. High performance necessitates the development of abilities required to excel in specific tasks, as well as a high level of self-efficacy to deal with difficult and demanding situations. People's self-efficacy has an impact on their performance. Low self-efficacy leads to self-doubts about one's talents and a lack of desire, both of which make it difficult for people to focus on the task at hand. When people fail at something, they doubt their talents and become depressed (Yilmaz, 2004). People with high self-efficacy, on the other hand, believe they can overcome obstacles. The complexity of the task may further excite them, and they will strive for achievement. The fact that someone has a high level of self-efficacy and has given it their all does not guarantee that they will succeed. Yilmaz (2004) noted they may fail, but people with high self-efficacy do not feel the need to hide behind external factors like the physical conditions in a setting or the fact that they have defects, just like people with low self-efficacy. Instead, they believe that getting control of "potential stressors or threats" will help them achieve better success (Bandura, 1997, p. 39). These attributes set persons with high self-efficacy apart from others with low self-efficacy, allowing them to succeed.

METHODOLOGY

Research Design

A research design is a methodical approach to investigating a scientific subject. Also, it is the framework that has been created to seek answers to research questions. This study has adopted a quantitative correlational research design. According to Creswell (2009), quantitative research methods focus on measurements that are objective, with statistical analysis or numerical data collecting. Different approaches, such as polls and questionnaires, are used to collect data. Correlational research involves collecting data or searching out records of a specified population and ascertaining the relationships among the variables of interest (Creswell, 2009). The correlational approach studies the relationship between un-manipulated variables and does not use random assignment. The correlation research design was seen to be the most appropriate design to be used for the study has looked at all the available research designs. This design will help to vividly explore the research problem that is being studied since no variable will be manipulated. In this study, the result of teachers was compared with students' achievement data. The correlation research design allowed for the use of statistical techniques that identifies a relationship, if any, between the survey results and teacher's data in the content areas of science.

Study Area

The study was done in Mampong Municipality of the Ashanti Region of Ghana. Mampong Municipal is one of Ghana's 260 Metropolitan, Municipal, and District Assemblies (MMDAs), and is part of the Ashanti Region's 43 MMDAs, with Mampong as its administrative center. It lies between the longitudes of 00 05W and 10 30W, and the latitudes of 60° 55N and 70° 30N, with a total area of around 23.9Km². Mampong Municipality was established after the former Sekyere West District was split and upgraded into Mampong Municipal and Sekyere Central District by Legislative Instrument (L.I.) 1908. Mampong Ashanti is bounded to the south by Sekyere South District, to the east by Sekyere Central District, and to the north by EjuraSekyedumase Municipal (Mampong Municipal Assembly, 2020). The population of the

Municipality according to the 2010 Population and Housing Census stands at 88,051 with 42,653 males 45,398 females (PHC, 2010).

Population

According to Hanlon and Larget (2011), a population is all the individuals or units of interest; typically, there is no available data for almost all individuals in a population. Deductively, the population is determined by theory as the set of observations for which the theory claims validity. Depending on the precision of the theory, the population may become more or less clearly defined (Plümper&Neumayer, 2014). Inductively, the population is the set of observations to which the results from a selected or given 'sample' can be generalized. In this approach, the population is determined by the set of observations to which the empirical finding can be generalized and can only be defined for a specific conclusion based on a specific sample. Since this generalisation can only be valid for cases that have sufficiently close properties to the analysed sample, the set of observations to which researchers can generalise findings can be infinitely small (Plümper&Neumayer, 2014). There are 54 public JHS in the Municipality with a total of 6,985 teachers and students. There are 6784 JHS students and 201 JHS teachers who teach science and other science-related subjects in the Municipality. Also, the geographical distribution of the public JHS is 17 and 37 in the rural and urban areas respectively. For this study, 34 public JHS was used by purposively choosing 17 from the rural area and randomly selecting 17 from the urban area so that the number of schools will be even. The target population of teachers is comprised of two groups, novice and experienced science teachers within the municipality.

Sample Size and Sampling Procedure

A sample is a subset of the individuals in a population; there is typically data available for individuals in samples (Hanlon &Larget, 2011). For this, a total of 412 participants (378 students and 34 teachers) were used in the study from 34 public JHS in the rural and urban areas in the municipality. The sampling technique that was used in the study included purposive and random sampling techniques. All 34 public, JHS were involved in the study and a census sampling approach was adopted to select 34 teachers from the 34 public JHS for the study. The sampling frame for the schools included the list of teachers in the selected schools in the Municipality. All the 17 JHS from the rural area were purposively sampled. In the case of the JHS in the urban area, all their names were written on pieces of paper and put in a bowl to be picked at random and replaced. Using probability random sampling, gives equal chance to all the schools to be selected within the urban area. The selected schools were verified to know the gender of the science teachers there since the selected schools had her science teachers selected by default. This was to ensure that an almost equal number of male and female teachers participated in the study as much as possible. The number of teachers that participated in the study was 34 novice and experienced science teachers.

In selecting the students to participate in the study, the Ghana Education Service standard for a class size of 45 students in a class was the basis of calculating the participants in the study. In using Yemen's (1967) formula of sample size determination, the target population of 6784 students was used. The formula is presented as $n = N/(1+N(e)^2)$ Where; n =sample size, N is the target population size and 'e' is the level of precision (.05). With a target population of 6784, the sample size arrived at using the above formula is 378 students. The student sample size of 378 was divided by the 34 JHS so that the number of participants coming from each school is known ($378/34 = 11.11$). An approximated number of 12 students were randomly selected from

the JHS 2 with the help of the sampling frame (school attendance register). In selecting the students, gender was not given any priority since it has nothing much related to the study. The students were numbered on pieces of paper and put in a bowl. Twelve (12) students were then picked at random from the bowl in School A. The already picked number from the bowl was put back and another piece of paper was picked. This was repeated until the 11 other students were selected. The written number on the pieces of paper was then used to locate the exact named students from the sampling frame. The process of selecting students to participate in the study was repeated in the remaining 33 schools that were participating in the study.

Instrumentation

The instruments for data collection for this study were two. The instrument for data collection from the participating teachers was adapted from Riggs and Enoch's (1990). This instrument is referred to as 'Science Teaching Efficacy Belief Instrument (STEBI). STEBI questionnaire was adapted because it has been used and most of the items have been validated to be good.

Reliability of Instrument

Creswell (2013) believes that a researcher should consider the various threats to a study's validity and reliability. Identifying and considering the various threats to validity and reliability will ensure that the instrument is valid and reliable, and will sustain the idea that the explanations of the information are accurate (Johnson & Christensen, 2007). A pre-test of the instrument was carried out among 5 science tutors in St. Monica's College of Education. In all, there were 1 female tutor and 4 male tutors that were involved in the pilot-testing. The reason for using these tutors was the fact that they are experienced in the teaching of science and hence their impact would be great. Reliability was established using the Cronbach's Alpha. All the data were entered into the SPSS version 25 and was asked to calculate the reliability of the instrument. The reliability obtained for the self-efficacy was 0.80 suggesting that the items have a high internal consistency.

Data Collection

In collecting data for this study, a permission letter was obtained from Mampong Municipal Education office to conduct a study in the 34 selected schools. Prior visit was made to all the participating schools a week ahead of time. This visit helped to familiarize the researchers with the selected schools. The science teachers were also met to discuss time schedules for test administration. The JHS 2 form teachers were contacted for the attendance register of each which constituted the sampling frame of the study. The form teachers assisted in planning and test administration. The students' instrument was administered to them and they were given 40 minutes to complete the teacher-made test. Two schools were visited each day for the test administration which was carried out before noon. In all, 17 days were used to collect the data from all the 34 participating schools.

Ethical Consideration

It is very important to abide by research ethics (McMillan & Schumacher, 2010; Wallen&Fraenkel, 2011; Opie, 2004). Credible research is research that is done with permission from relevant authorities for where the research is to be conducted (McMillan & Schumacher, 2010; Wallen&Fraenkel, 2011). Credible research also protects the participants, adheres to the privacy and confidentiality of the participants, and also takes care of the wellbeing of the participants (McMillan & Schumacher, 2010; Wallen&Fraenkel, 2011). All participants were

informed about the study. The respondents were not allowed to write their names or make any indication that may help link them up with their questionnaires during data collection. The respondents were given a consent form to be filled and this was to assure them of their confidentiality in a written form. Consent forms were given to the respondents to seek their formal permission by signing. In addition, the several sources of intellectual materials quoted directly or paraphrased in this research were acknowledged by in-text citations with full bibliographic details in the reference list according to the American Psychological Association (APA) referencing style.

Data Analysis

The collected data were screened and coded for entering into statistical software called IBM-SPSS version 25 for Windows. Research questions 1 and 2 were analysed by using Pearson Correlation while research question three was analysed with the Chi-Square test. An independent sample t-test was used to analyse research question four.

RESULTS AND DISCUSSIONS

Biographical information of Teachers

Gender of respondents

Figure 2 presents the gender information of respondents who were involved in the study. Out of the 30 respondents who took part in the exercise, 7 were female while 27 Male participants. It was realised after the exercise that the majority of the respondents were male. This result can be interpreted that more male science teachers teaching in the municipality than female science teachers.

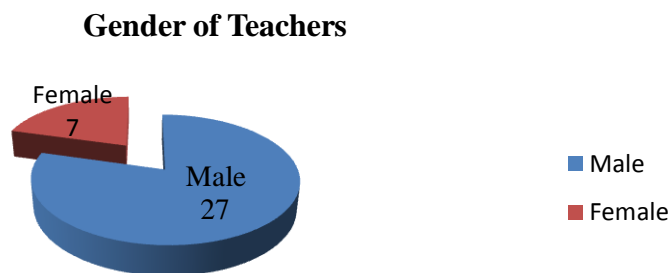


Figure 2: Gender of teachers

Age of Respondents

Table 1 presents the result on the age of teachers who took part in the study. The result on the age range of the teachers that took part in the study was 20 to 50 years. The least age range of the teachers was 20 to 30 years being the least age and the most age range was from 41 to 50 years with four persons. The age range with the most participants was from 31 to 40 years with 19 persons. The result thus shows that most of the participating teachers were in the age bracket of 31 to 40 years. It can also be noted that their mean age was thirty-five and half years. In the

Mampong Ashanti Municipal, the science teachers have a mean age of about 35 years which is good for the Municipality. This group of science teachers would therefore stay in the teaching profession on the assumption that all factors remain equal. In the case of the older teachers of mean age of forty-five and half years, could be said to have enough teaching experiences. In any case, the older/experienced science teachers though few in the Municipality, could have a lot of influence on the in-experienced science teachers in the Municipality when the appropriate measures are put in place.

Table 1: Age of Teachers who took part in the Study

Age	Frequency	Percentage
20-30	11	32.4
31-40	19	55.9
41-50	4	11.8
Total	34	100.0

Educational background

Table 2 presents the result of the educational background of the science teachers that took part in the study. Educational background has a lot of influence is positive or negative on ones’ work. A cursory look at the result as presented in Table 4 has shown that the educational levels of the participants were high. The least educational background of the participants was Diploma in education and the Masters being the highest. The Bachelor's degree holders in the Municipality that have taken part in the study were 23 and the least number of participants were MA/MEd/MPhil degree holders. Although the diploma holders in the Municipality were the least degree holders, it cannot be said to be not good. The current proposal for the least qualification to teach at the basic level is a degree from any recognized university within or outside the country (Ghana). It can, therefore, be concluded that the Mampong Ashanti Municipality is having more than qualified science teachers to handle the students in the Municipality.

Table 2: Educational Background of respondents

Characteristics	Frequency	Percentage
Diploma in Education	8	23.5
B. Ed	23	67.6
MA/MEd/MPhil	3	8.8
Total	34	100.0

Respondents’ teaching experience

The teaching experience of the science teachers in the Mampong Ashanti Municipality is presented in Table 3. The result has shown that teachers who have been teaching for four years and below were 13 representing 38.2% and that of those teaching for five years and more were 21 which were 61.8% more than of the least experienced science teachers.

Table 3: Teaching Experience of Respondent Teachers

Characteristics	Frequency	Percentage
Below 4 years	13	38.2
5 years and above	21	61.8
Total	34	100.0

The relationship between the self-efficacy beliefs of novice and experienced science teachers

Table 4 presents the result of the Pearson Correlation on the teacher self-efficacy of novice and experienced science teachers. The assumption behind the analysis was that the novice teachers might have taught less than five years and those above the assumed classification were experienced in the teaching field. The sample size of 34 science teachers was used together with the number of experiences to calculate the Pearson' Correlation. The pre-determined alpha value for testing the assumption was set at 0.05. The Sig. (2-tailed) value as in Table 6 is 0.132 which is more than the alpha value of 0.05. Because the Sig (2-tailed) value was more than the significant value, it can be concluded that there is no statistically significant correlation between the novice and the experienced science teachers. This means that increases or decreases in one variable do not significantly relate to increases or decreases in the second variable. This result has confirmed an earlier study of Vidwans (2016) that there is no correlation between novice and experienced teachers.

Self-efficacy would not necessarily be achieved in the lecture halls while the teacher was being trained to go and educate the young ones in schools. The teacher has to read and make him/herself up to the task of teaching and be up to date. The argument could be that a teacher who has finished college or university for a long time has refused to update himself or herself so that he/she can be effective or be efficacious while on the job. This could hold for teachers who have finished college long ago or recently. The result indicating no significant relationship existing between the novice and experienced teachers in the Mampong Ashanti Municipality could be the case that has been confirmed by the result. The fact of the matter is that in recent advancements in technology and science itself, there has been a paradigm shift in how things are done. The novice teacher who is determined to achieve high lures could go the extra mile in sourcing information that could help him/her to reach that height in the teaching career.

Attaining self-efficacy depends solely on the individual who wants to get to the domain of good science teachers in the Municipality and even beyond. The fact remains that self-efficacy belief comes from within the teacher concerned. It could be that the novice or the experienced science teacher did not come to the conviction that he or she is not effective enough in the delivery of the needed task given to him/her. Self-efficacy serves as a strong motivation for the teacher and this could be a good ground to use to the advantage of the students that he/she teaches. Students at the Junior High School could easily tell if his/her teacher is up to the task in delivery. Although a student could not evaluate a teacher using professional assessment criteria to conclude on a good teacher they could see from how the teacher teaches and carry him/herself to judge that a given science teacher is 'very good' or does not know how to 'teach at all'. Students passing comments of no confidence on their teachers make it difficult for them to give respect to such teachers and it makes class control difficult. The students at times find it difficult to trust such teachers hence; they misbehave towards him/her in class. The situation where students have no belief in a teacher to meet their learning desires at the higher level of education does lead to riots and other misbehaviour characters in schools. In the case of a first-cycle institution like the JHS, the students may form cliques and start misbehaving in class to make class control very difficult. In the case of where mature students are more in the class as found in this study in particular (Table 2) where some of the students were grown and more than the recommended age, could make class control difficult. Teacher being self-efficacious makes him/her to push students high to achieving their desired goal. The study has confirmed that teachers' self-efficacy has a relationship with students' academic performance (Ross, 1992). Students want to achieve hence

if the teacher could help them in meeting their desires, would be a welcome thing to them. The ability of teachers to meet the goal of their students would be a good ground to train them. Self-efficacy has been proven to be the best in training students at varying levels of education (Redman, 2015; Ağçamii&Babanoğlu, 2016; Tschannen-Moran & Hoy, 2007). The best result of experienced teachers usually reflects on the academic performance of the students. The finding is good for the students in the Mampong Ashanti Municipality in that students would get the best of the teachers teaching Integrated Science in the schools, being a novice or experienced teachers. Any category of teachers (novice or Experienced) teaching the students would not matter. The students would get the best of instruction from the teachers. Another good thing this study revealed is that the human resource manager in the Education Office may not worry much about which category of teachers to post to a given school being experienced or novice science teachers within the municipality.

Table 4: Self-Efficacy Beliefs of Novice and Experienced Science Teachers

	Self-Efficacy
Number of teaching years Pearson Correlation (Novice & Experience)	.263
Sig. (2-tailed)	.132
N	34

The relationship between teacher self-efficacy and students’ achievement

Table 5 presents the Pearson Correlation which was tested at 0.05 alpha levels. The Pearson coefficient of $-.316$ with its p-value, Sig. (1-tailed) = $.034$, N= 34. The result as in Table 5 has shown that the self-efficacy of teachers and that of students’ test scores correlates with $p < 0.05$. It can, therefore, be concluded that there is a relationship between teacher self-efficacy and students’ test scores. However, the relation was weak since the Pearson Correlation score is far away from -1 . The finding has confirmed an earlier study by Kurt, Güngör, and Ekici (2014) that there is a relationship between teachers’ self-efficacy and the academic achievement of students. The student wants to trust in someone that could assist him/her to achieve academic lure. The teacher then has the influence factor on the students to cause things to turn around better for them. The ability of a teacher to achieve what he/she instructs is mostly measured on to what extent a student has achieved. The academic achievement of students largely depends on how teachers present their lessons and the motivating factors they have attached to them.

The belief of a teacher to deliver a lesson to students could help students to achieve better in that subject. Students’ academic performance be it poor or better is attributed to teachers in one way or the other. The self-belief of the teacher to teach students the needed skills and lead them to acquire knowledge is a welcomed one. Per the finding of Porter and Brophy (1988), teachers’ self-efficacy alone is enough to turn the school climate around for the better. Turning the school climate around entails a lot for a student who is yearning to learn. The teacher then has the moral urge to motivate students to perform better academically. An effective teacher is known and seen by students that stay close to them. Students would naturally fall in line with what the ‘motivator’ wants to imbibe in them and this would be meaningful to students (Cardenas & Cerado, 2016).

Students realising that their science teacher is not efficient and could not lead them well could contribute to the low esteem nature of students. Teachers are serving as role models to students so when the students do not see that model nature in the teacher makes them pessimistic. The students could be left thinking about what exactly is going on. Students want to follow a teacher that has high self-esteem and efficacy. Students perhaps need a little push in terms of extrinsic motivation from a high self-esteem teacher to achieve academically (Kurt, GÜNGÖR&EKICI, 2014). The finding of this research question (Research Question 2) could be an avenue for teachers themselves to explore by learning more on the job. The more a teacher learns what he/she is doing; it would have a direct effect on the students they teach in terms of their academic performance. It could be inferred that students not performing well in Integrated Science could be traced to their teachers. An increase in teachers’ knowledge might have informed the emphasis on the old phenomenon of in-service training for teachers to update their knowledge on things needed to develop students

Table 5: Correlation of Students’ test Score and Teachers’ Self-Efficacy

		Self-Efficacy of Teachers	Test Score of Students
Self-Efficacy of Teachers	Pearson Correlation	1	-.316*
	Sig. (1-tailed)		.034
	N	34	34

*. Correlation is significant at the 0.05 level (1-tailed).

CONCLUSIONS

The self-efficacy of teachers serves as an avenue to be exploited to the advantage of students. Students in science need a lot of motivation to cheer them on since the subject is very demanding as compared to other subjects. The findings from this study had made the problem being investigated more clearly and throws light on teacher self-efficacy. Self-efficacy of teachers as found in the study that there is no statistical difference between novice and experienced teachers in the municipality could be exploited to project the study of science. The novice science teachers could help as well as the experienced ones in teaching science. Teaching and learning of integrated science come with a lot of demands and a self-efficacy teacher comes in handy. Students need the motivation to study the subject. Self-efficacy teachers could easily help in teaching students to perform academically.

RECOMMENDATIONS

1. The result has indicated that there is no statistically significant correlation between the novice and experienced science teachers in the Mampong Ashanti Municipality. It is therefore recommended that the teacher category (novice and experienced) should be given fair treatment when it comes to posting teachers to schools. It should not be the case that they just came from college hence is not competent enough to each in a given school. Instead, all should be given the needed resources to teach students to acquire the requisite knowledge.

2. Teachers are to be encouraged by all stakeholders to build up the self-efficacy of teachers since this correlates with the student's academic performance. Teachers themselves should take up the challenge to develop their self-efficacy and this would boost their morale during teaching and learning. Setting challenging goals as a teacher would be the surest way in bringing students along to the line of succession. The self-efficacious teacher is not merely looking at the personal gain to derive from the earnings (salary) but the students' achievement should be his/her priority. Another material gain could come along while performing his/her duty and this could be seen by stakeholders and be awarded accordingly.

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