



Yes! We Can Teach and We Feel More Confident in Teaching: The Influence of Senior High School Teachers' Demographic Variables on Their Self-Efficacy in Teaching

Opoku Adusei¹

Department of Education, Mampong Technical College of Education
opokudusei@yahoo.com

Mercy Adwoa Eduam²

Department of Business and Social Sciences Education, University of Cape Coast
mercyeduam@gmail.com

Benjamin Praise Afeku³

Department of Languages, St. Francis College of Education, Hohoe
benisbill@gmail.com

Samuel Kwabla Segbefia⁴

Department of Business and Social Sciences Education, University of Cape Coast
samsegbefia329@gmail.com

Abstract

It is generally accepted that a teacher's perception of efficacy correlates with the quality of instruction they offer. The purpose of this study was to determine the characteristics that senior high school (SHS) mathematics teachers in Ghana's Ashanti Region regard as the most influential in influencing their confidence in their abilities to teach their subject. It was requested that 154 senior high school teachers from 20 different senior high schools reply to a questionnaire containing 12 items. According to the results of an independent sample t-test, male teachers have significantly stronger self-efficacy views than their female colleagues. Again, the results of a one-way analysis of variance (ANOVA) test reveal that there was no statistically significant difference between the means of the five groups of teacher teaching experience in terms of teacher efficacy. Teachers should take part in ongoing professional development activities to make sure they are still good at their jobs.

Keywords Efficacy, Teaching, Senior High School, Variables, Demographic

INTRODUCTION

In the United Nations Millennium Development Goals Report (2010), specifically Goal 2, education is recognized as a primary focus due to its status as both a right and a requirement (United Nations, 2010). Accordingly, the product of high educational standards is a population of individuals who are not only well educated but also highly skilled and highly motivated. To accomplish this objective, most national governments allocate a sizeable portion of their total budgets to the educational sector. This is due to the believe that education is the primary means of developing the kind of knowledgeable and talented workforce needed to thrive in today's ever-changing economic landscape. By increasing employment and productivity, as well as the composition of the general public, education contributes directly to growth and development (Akyeampong, 2002). In a similar vein, Barro and Lee (2013)) contend that a high level of labour productivity goes hand in hand



with a large population of highly educated workers. Child mortality, fertility rates, and children's schooling are all influenced by educational achievement, according to the authors.

Furthermore, education equips people with the academic abilities to adapt to changes and embrace new ideas while maintaining a dynamic relationship with cultural traditions. The instructor is the driving factor behind the transformations. Teachers are expected to manage and organise classrooms, plan and organise instruction, conduct instruction, and assess the progress and potential of their pupils (Stronge, 2007). Teachers should also hold students to high expectations, be creative and fair, respect students and be forgiving (Walker, 2008), and promote the learning process (Cardelle-Elawar & Lizarraga, 2010). According to Darling- Hammond (2017) Consequently, teacher effectiveness has quickly risen to the top of the education policy agenda, as many nations now see teaching as one of the most influential school-related elements on student educational attainment. Teachers must therefore create conditions and chances for meaningful learning experiences that expose and grow students' capabilities (Caena & Redecker, 2019).

The authors say that teachers should be activators of meaningful learning rather than just facilitators and that they should be creative in mixing and matching tactics to context and learner. The forgone statements underscore the need for teachers to be more effective. Livers et al. (2020) argue that teacher self-efficacy and teaching methods relate to effective instruction and learning. Self-reported teacher self-efficacy would correlate positively with self-reported effective teaching methods. Thus, teacher efficacy (efficacy, self-efficacy) continues to attract the interest of education researchers (Kleinsasser, 2014). Consistently, research has demonstrated that teacher efficacy is associated with various positive student outcomes, making teacher efficacy an essential component of high-quality mathematics instruction (Giles et al., 2016). Accordingly, research on teacher self-efficacy has yielded clear conclusions regarding the significance of being an effective teacher (Fackler & Malmberg, 2016; Moè et al., 2010). Since selecting meaningful tasks is frequently based on teacher efficacy, this facilitates the teacher's ability to select meaningful task (Thurlings et al., 2015). The authors continue by claiming that teaching efficacy is associated with adaptable tactics, tenacity in the face of hurdles, and student-centred education. An increased efficacy has been shown to be associated to better educational practises. High levels of efficacy can be difficult to maintain or cultivate for teachers who work with pupils who are underperforming (Hoy & Spero, 2005). Educators need to understand how teachers can maintain a feeling of self-efficacy in this dangerous situation to prepare and equip teachers. Despite demands from researchers, few inquiries into the origins of efficacy data have been conducted (Goddard et al., 2004; Tschannen-Moran & Hoy, 2002). Less is known about the sources of efficacy information instructors use to evaluate their capacity to teach low-achieving students (Yeo et al., 2008). This research fills this void. Thus, the goal of this study was to evaluate the effect of demographic variables on the self-efficacy of Senior High School teachers in the Ashanti Region of Ghana.



Research Question

The following are the hypotheses were used to guide this study

1. What is the self-efficacy of male teachers and female counterparts in the teaching of the respective subjects?
2. What is the level of teacher self-efficacy for experienced teachers and that of less experienced teachers in the teaching?

Research Hypothesis

H₀: There is no significant difference in self-efficacy of male teachers and female teachers in teaching their respective subjects.

H₁: There is a significant difference in self-efficacy of male teachers and female teachers in teaching their respective subjects.

H₀: There is no significant difference in the level teacher self-efficacy for experience teachers and that of less experience teachers in teaching.

H₁: There is no significant difference in the level teacher self-efficacy for experience teachers and that of less experience teachers in teaching.

LITERATURE REVIEW

Teacher Self efficacy and Teacher Self Efficacy

Based on social cognitive theory, self-efficacy can be defined. The social cognitive theory describes how specific behavioural structures are learned and maintained (Bandura, 1977). Self-efficacy relates to how people view themselves as capable of completing a specific task (Cansoy & Parlar, 2018). Organizational ability is a concept that refers to people's capacity to plan out what they want to accomplish, how they will accomplish it, and how they will go about overcoming hurdles. Rather than focusing on an individual's current level of competence, this approach focuses on their future-oriented view of their abilities (Hoy & Spero, 2005). Self-efficacy relates to teachers' belief that they can effectively teach a subject and achieve the desired results of student engagement and learning (Holzberger et al., 2013). It is considered a critical factor in determining how a teacher approaches educational processes in general (Woolfolk & Hoy, 1990). As a result, good teachers are more likely to be open to adopting new teaching methods or ideas (Thurlings et al., 2015). High self-efficacy teachers are confident in their abilities to deal with problems, change instruction, plan, and produce lessons that are relevant to their students' needs (Allinder, 1994). According to the study, a number of teacher-related factors have been found to be linked to a teacher's efficacy. So, things like teaching experience and gender have been shown to affect a teacher's sense of how effective they are (Klassen & Chiu, 2010).

Teacher self-efficacy and Gender

A teacher's gender is an important demographic factor to consider. In the words of Karimvand (2011), teachers' lives are affected by social interactions and the dominance of one gender (typically male). As a result, Bartlett (2005) suggests that in educational environments where professional relationships are typically marked by the marginalisation



of women, female professionals are typically subject to male authorities. There are a plethora of discrepancies across the studies looking at the link between teachers' perceptions of their own efficacy and their gender. Bellibas and Liu (2017) revealed that instructors' self-efficacy perceptions were significantly influenced by gender. Using a modified version of the Teacher Efficacy Scale (TES), Imants and De Brabander (1996) found that instructors' self-efficacy is influenced by gender. According to their findings, male primary school teachers had higher levels of efficacy views than female colleagues. When comparing male and female classroom managers in Ghasemboland and Hashim (2013) research, the direction of the correlations showed that the former had more self-efficacy and more confidence in their classroom management abilities than the latter. Researchers Hammack and Ivey (2017) discovered significant differences in self-efficacy levels between men and women, concluding that women engineers are less confident than men. Cheung (2006) and Karimvand (2011), on the other hand, discovered that female teachers are much more effective than their male counterparts. As a result, Perera et al. (2019) found that women were substantially more highly effective than men in their study.

There is some evidence that teachers' self-efficacy is not affected by their gender, such as research by Ghaith and Shaaban (1999) and Odanga et al. (2015), as well as Isler and Cakiroglu (2009).

Teacher self-efficacy and Experience

Employees' years of experience are recognised as a critical component in human resource strategies such as compensation systems, benefits packages, and promotion decisions in a variety of occupations (Rice, 2010). The idea is that as workers acquire experience, their knowledge, abilities, and productivity improve. According to Bandura (1977, 1986), mastery or performance experience is the most important source of self-efficacy, with success strengthening it and failure weakening it. This assumption has sparked a lot of research on how teachers who have been teaching for a long time think about their own teaching efficacy (Fives & Buehl, 2009; Fives & Looney, 2009; Penrose et al., 2007; Wu et al., 2019)

Multiple studies have discovered a correlation between years of teaching experience and teachers' self-assurance in their abilities. For instance, Veisi et al. (2015) and Akbari & Moradkhani (2010), for instance, discovered a positive relationship between years of experience and teacher efficacy beliefs, with experienced instructors claiming a higher degree of self-efficacy than their less experienced peers (Lin & Tsai, 1999; Wolters & Daugherty, 2007). In Siaw-(2011) Marfo's study, a two-tailed independent sample t-test was utilised to determine the significance of the difference between less experienced and more experienced social studies teachers' evaluations of their self-efficacy in teaching social studies. There are, however, studies that contradict the conclusions. For instance, Woolfolk and Hoy (1990) and Weinstein (1988) discovered that inexperienced educators evaluated high levels of efficacy. In a separate study, Desouza et al. (2004) discovered in a separate study that the number of years of science teaching experience was unrelated to being a successful teacher. In addition, some studies have found no correlation between a teacher's



years of experience and their confidence in their own competence. Chacon (2005) found that there was no link between how well people thought they were engaged, teaching methods, management, and how long someone had been teaching English.

METHODOLOGY

Research Design

The research adopted a descriptive design. According to Siedlecki (2020), the objective of descriptive design is to describe individuals, events, or conditions by observing them in their natural state. Siedlecki (2020), added that, a researcher employing this study strategy does not change any variables but rather describes the sample or variables.

Participants and procedure

The current study used data from 154 (141 males, and 13 females) teachers from 20 Senior High Schools in six districts of the Ashanti Region of Ghana. The multistage sampling technique was used to select the participants. Respondents completed a questionnaire comprising of items on demographic information. It comprised questions related to participants gender, and number of years teaching Mathematics. Again, Mathematics Teaching Efficacy Beliefs Instrument (Enochs et al., 2000) comprising 12 Likert-type items were adapted and used (see appendix 1).

Result and Discussion

Hypothesis 1 sought to find out the male and female teachers' efficacy level in teaching. To be able to find out this, the mathematics teachers were given a questionnaire to respond to. The teachers agreed to most of the efficacy-related statements in the teaching of mathematics at the Senior High School level used in the study.

To be able to establish the male and female teachers' efficacy, the boxplot in Figure 1.1 is used.

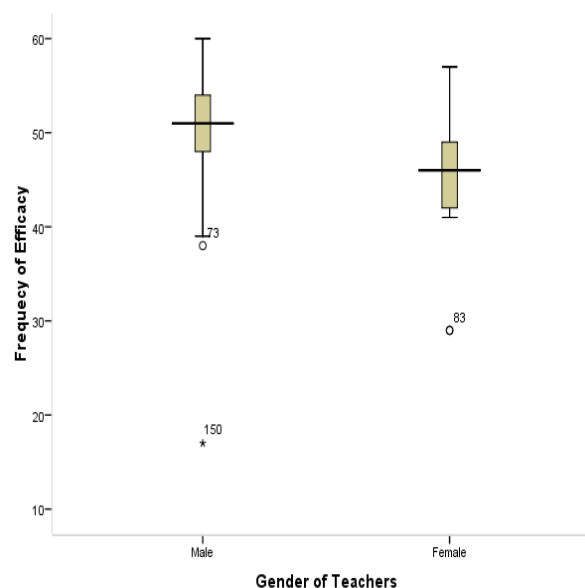


Figure 1.1: A boxplot of male and female teacher efficacy.



The results from Figure 1.1 show that there is considerable overlap in the efficacy scores of male and female teachers. This is because the interquartile range of the male teachers was six and the interquartile range of the female mathematics teachers' efficacy was eight. The findings show that the middle 50.0% of the female teachers' efficacy score is higher than that of the male teachers' efficacy. This could be due to the difference in the percentage of the male and female mathematics teachers involved in the study. However, the mean score of the female teachers' efficacy ($M = 40.77$, $SD = 8.3$) is lower to that of the mean score of the male mathematics teachers' efficacy. ($M = 50.77$, $SD = 5.6$).

To be able to establish the difference in teachers' efficacy among the male and female teachers, the independent samples t-test was calculated. The results from the independent-samples t-test was used to test whether there was any statistical significance difference between the mean scores of the male teachers' efficacy and their female counterparts. The results on the independent-samples t-test are presented in Table 1.2.

From Table 1.2, the independent sample t-test revealed statistical significant difference between the mean efficacy score of male teachers and the mean efficacy score of female teachers $t(152)=3.5$, $p=0.001$. As predicted the male teachers ($M=50.77$, $SD=5.6$, $N=141$) was higher than their female counterparts ($M=40.77$, $SD=8.3$, $N=13$ in the teaching of their respective subjects. The findings show that the male teachers' efficacy in teaching at the senior high school level is comparative higher to that of their female counterparts. This means that the male teachers have the self-belief that they have the knowledge, skills, and attitudes needed in teaching at the high school level. This finding agrees to the study by Ghasemboland and Hashim (2013) where male teachers considered themselves more efficacious than female teachers in all dimensions of teaching efficacy. However, the findings of the current study are not in agreement with the findings from the study of Isler and Cakiroglu (2009) where there was no difference in teacher efficacy in teaching at the secondary school level. The current study may have shown a difference between the efficacy of male and female teachers at the high school level as the knowledge, skills, and attitudes required to teach Ghanaian high school could be demanding than that required at the basic school level.

Table 1.2: Independent-Samples t-test Results on Male and Female Teachers' Efficacy

Gender	N	Mean	SD	t	df	p
Male	141	50.77	5.6	3.5	152	0.001*
Female	13	40.77	8.3			

* Significant, $p < 0.05$

The objective of the second hypothesis was to determine the impact of teaching experience on teacher efficacy. In the study, the number of years that teachers have taught at the Senior High School level is treated as their teaching experience. To determine this,



certain components of the questionnaire (Item 3) were compared to the teacher efficacy items. Table 1 presents the results of teachers' teaching experience to start with. 2

Table 1.2 reveals that 37.0% of the 154 teachers had less than five years of experience in the classroom. This is because 63.0 percent of high school instructors have been in the field for more than five years. 31.2 percent have 6-10 years of teaching experience, 20.8% have between 11-15 years of teaching experience, 3.2 percent have between 16-20 years of teaching experience, and 7.8 percent have more than 21 years of teaching experience. This suggests that most teachers in this survey were seasoned educators. This is because the teachers had more than five years of high school teaching experience.

Table 1.3: Teaching Experience in Years (N = 154)

Years of teaching	N	%
0-5 years	57	37.0
6-10 years	48	31.2
11-15 years	32	20.8
16-20 Years	5	3.2
>21 years	12	7.8
Total	154	100

The focus of Research Question 3 was to establish the effect of teacher teaching experience on teacher efficacy. This could not be provided by the results and findings from Table 1.3. To establish the effects of the teacher teaching experience, on teaching, the boxplot in Figures 1.2 was explored.

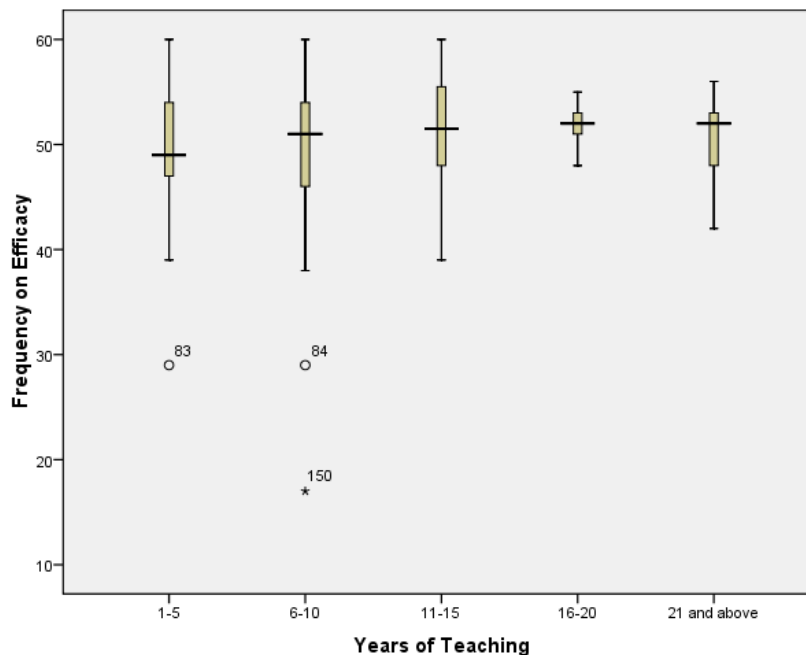


Figure 1.2: A boxplot exploring effects of teaching experience on teacher efficacy



From Figure 1.2, the results show that there are considerable overlaps in the effects of teacher teaching experience on teacher efficacy. This is partly because the interquartile ranges of teacher teaching experience from 1-5 years, 6-10 years, 11-15 years, 16-20 years and 21 years and above were respectively, 7.0, 8.0, 8.0, 4.0, and 6.0. This shows that the middle 50.0% of the teachers with 6-10 years and 11-15 years teaching experience has efficacy scores higher to that of teachers with 1-5 years, 21 years and above, and 16-20 years teaching experiences. The overlaps could be attributed to the number of teachers within each group of teacher teaching experience in their respective subject.

The mean efficacy scores of the five groups of teacher teaching experience further show that the individual teaching experience has effect on teacher efficacy. This is because the mean efficacy score of 1-5 years teaching experience ($M = 50.0$, $SD = 5.6$) is different from the mean efficacy scores of 6-10 years ($M = 49.7$, $SD = 7.7$), 11-15 years ($M = 51.3$, $SD = 4.9$), 16-20 years ($M = 51.8$, $SD = 2.6$), and 21 years and above ($M = 50.6$, $SD = 4.1$). To be able to establish how significantly the mean efficacy scores for the groups of teacher teaching experience differ from one another, a one-way ANOVA test analysis was done. After the calculation of the one-way ANOVA test, the Levene's test from the Test of Homogeneity of Variance was calculated as 0.179 ($p = 0.18$). The significance value for the Levene's test is greater than 0.05, and hence the assumption of equal variances was not violated in this case. It is therefore proper to consider the actual results from the one-way ANOVA to establish whether there is significant difference between the five groups of teacher teaching experience on teacher efficacy in mathematics. The results from the one-way ANOVA are presented in Table 1.4.

In Table 1.4, the results for teacher teaching experience indicate that there was no statistically significant difference between the efficacy averages of the five groups of teacher teaching experience. This is due to the fact that the mean efficacy score of teachers with 1–5 years of experience ($M = 50.0$, $SD = 5.6$, $F = 0.5$, $df = 149$, $p = 0.725$) is statistically indistinguishable from the mean efficacy scores of teachers with 6–10 years of teaching experience ($M = 49.7$, $SD = 7.7$), teachers with 11–15 years of teaching experience ($M = 51.4$, $SD = 4.9$), and teachers with 16–20 years Lin and Tsai (1999) and Wolters and Daugherty (2007) found that experienced teachers were more successful than inexperienced ones. This is since there was no variation in teacher efficacy between research groups. The current study contributes to the literature by establishing that teacher efficacy is not static in relation to teaching experience; there may be a difference in teacher efficacy between novice and experienced teachers, or there may be no difference. The Ghana Education Service (GES), Ghana National Association of Teachers (GNAT), National Association of Graduate Teachers (NAGRAT), and non-governmental organisations (NGOs) regularly organise conferences, workshops, and in-service training for their members, which increases senior high school teachers' teaching efficacy beliefs.



Table 1.4: One-way ANOVA Test Results on Teacher Teaching Experience and Efficacy (N = 154)

Experience/years	n	M	SD	F	df	p
1-5	57	50.0	5.6	0.5	149	0.725*
6-10	48	49.7	7.7			
11-15	32	51.4	4.9			
16-20	5	51.8	2.6			
21 and above	12	50.6	4.1			

* Significance, $p > 0.05$

CONCLUSIONS OF THE STUDY

The goal of this study was to find out how senior high school teachers' demographics affected how confident they felt about teaching their own subjects. The results of the study show that male teachers are better at their jobs than their female counterparts. Male teachers are surer of themselves than their female counterparts, which affects how well they think they do as teachers. Because of this, the effectiveness of teachers depended on what gender they were. The study showed that teachers who had been teaching for different lengths of time did not feel like they were doing a very different job.

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Appendix 1

Subject Teaching Efficacy Beliefs Instrument

1. I will continually find better ways to teach my subject in Senior High School.	1	2	3	4	5
2. I will be able to teach my subject senior high school as I will teach another related subject/s in my field.	1	2	3	4	5
3. I know how to teach in Senior High School effectively.	1	2	3	4	5
4. I will be very effective in monitoring my subject activities at the Senior High School.	1	2	3	4	5
5. I have good conception of my subject to enable me to teach my subject effectively.	1	2	3	4	5
6. I will use practical pedagogies to explain to students how my Subject works.	1	2	3	4	5
7. I will be able to answer students' questions in my subject at Senior High School.	1	2	3	4	5
8. I have the necessary skills to teach my subject at Senior High School.	1	2	3	4	5
9. I will invite the headmaster to evaluate my subject during teaching.	1	2	3	4	5
10. When a student has difficulty in understanding a concept in my subject, I will be able to help the students understand it better.	1	2	3	4	5
11. When teaching my subject in Senior High School, I will welcome student questions.	1	2	3	4	5
12. I know what to do to turn students on to Senior High School Mathematics.	1	2	3	4	5