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# **Moderating Role of Teachers' Demographic Variables on Attitudes and Technology Usage in Predicting Successful Inclusive Education in Ghana**

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## **Abstract**

The purpose of this study was to explore the moderating role of teachers' demographic characteristics on the attitude and technology usage in predicting successful inclusive education. Using a cross-sectional survey, 124 participants were randomly selected from 15 inclusive schools in the southern part of Ghana. The research instrument was an adapted questionnaire used in previous researches. A conceptual model was constructed and the Partial Least Square (PLS) Structural Equation Modelling (SEM) statistical approach in data analysis was utilized to test the model for the path coefficient results. The results indicated that teachers' gender, age, experience and qualification did not significantly moderate the teachers' attitude and technology usage in the prediction of successful inclusive education. It was recommended that teachers require a change of attitude through re-orientation, awareness creation, and active information dissemination through workshops, forums, seminars, television and radio programmes. The Government acting through the MOE, the GES and NGOs should make the provision of equipment to the schools a top priority. Equipment such as computers and their accessories should be supplied to the schools.

**Key words:** Attitudes, technology, inclusive education, demographic variables

## **Introduction**

Education of students with special needs has been and continues to be a focus of educational reforms in many countries. At the heart of this issue is the movement of students with special needs from a segregated setting, through integration paradigm to a more inclusive setting where the discourse is central to contemporary times. Nations

across the globe have reacted differently to calls for improved special needs education and services for children with special education needs, specifically, children with disabilities. Many countries have followed the United Nations statements such as the “World Program of Action Concerning Disabled Persons”, and created national policies that required education options for people with disabilities (Garbo, 1999; Hegarty, 1998). Again, many other countries and organizations also were compelled to invest significantly to making inclusive education as part of regular education system. Realizing the need for a new focus in education in the global arena, the Ghana government and other non-governmental organisations, continue to invest in making the achievement of the aims and objectives of UNESCO’s Salamanca Declaration; on inclusive education, a reality. Of such significant investments are teacher preparation and the supply of educational technological equipment to aid teaching and learning.

Despite these huge investments and its undisputable importance, it is not clear how teachers’ attitudes influence the use of educational technology in teaching in the inclusive education classrooms. Inclusive education philosophy proposes that it is an underlying belief of academic access and social success for all students in the general education (Dieker, 2006). Inclusive education places emphasis on the needs of all children rather than their disabilities and shortcomings. This viewpoint suggests that diversity is valued. It is therefore, believed that holding a positive attitude to technology usage can substantially impact positively in the participation of children with special needs in academic activities in inclusive classrooms.

Successful inclusive education may have different interpretations; however, in this context it is when children with special needs in the regular classrooms or school achieve positive outcomes in their academic, social and psychological development through full time participation in academic and social activities of the school. Successful inclusive practices allow all children learning opportunities through the use of technology, accommodations and alternate teaching strategies. The implication is that a meaningful change to teaching and learning describes as student centred must replace the old teacher centred pedagogy. This new forms of pedagogic reforms suggests that teachers must employ contemporary educational technological resources in their classrooms in order to bring about the desired change and outcomes.

They also need to develop positive attitudes to the use of technology in the inclusive education setting. Realizing the impact of the teacher factor and their perceptual behaviours in achieving successful inclusive education, the assumption carried by this study is that teachers' attitudes and technology usage in inclusive education classrooms can significantly influence successful inclusive education. Understanding the impact of teachers' demographic factors and how they moderate attitude and technology usage is crucial for policy makers and special education administrators who are seeking to improve the outcomes of inclusive education.

### **Theoretical Framework**

In this study the theory of planned behaviour (TPB) is useful in exploring the moderating role of teachers', gender, age, teaching experiences and qualification on teachers attitude and technology usage in the prediction of successful inclusive education. Ajzen (1991) theorized that the TPB constructs of attitude behaviour (AB), subjective norm (SN), and perceived behavioural control (PBC) are directly linked to behaviour and that relationship is causal and unidirectional. The theory further postulated that these direct factors (AB, SN, and PBC), in turn, are functions of the sum of their respective salient beliefs or indirect factors. Salient beliefs refer to the primary or immediate determinants of an individual's attitude and perceptions. TPB asserts that behaviour; in this case attitude, is a direct function of intention to use technology.

In a study, using the theory of planned behaviour to examine teachers' attitudes, knowledge and principals' expectations as predicting effective teaching in inclusive education, Kuyini and Desai (2007) concluded that attitudes and knowledge were predictive of effective teaching. Lumpe and Chambers (2001) demonstrated the use of this model in the area of educational technology and reported that teacher context beliefs (which they maintained to be similar to Ajzen's (1991) perceived behavioural control construct and self-efficacy beliefs) were significant predictors of teachers' reported use of technology in teaching. This conclusion suggests that context beliefs or perceived behavioural control are important factors for explaining teachers' technology usage. The above studies of technology usage provide the evidence for the appropriateness of implementing a unique

model for explaining the moderation role of these specific teacher characteristics of use of technology in inclusive education.

## **Model constructs/Literature review**

### **Attitudes**

Van Reusen, Shoho, and Barker (2000) investigated whether background characteristic variables affected the attitudes of teachers toward inclusive education. The assessed variables include years of experience, professional responsibility, gender, type of teacher preparation (general versus special), and content area taught. The participants were selected teachers from a large suburban school in San Antonio, Texas. The results revealed some interesting correlations relating to the amount of special education training. No significant relationship was noted between the teachers' attitudes and other characteristic variables in this study. A significant difference was however, noted between those teachers who reported high levels of special education training and those that reported no or little special education training. The teachers with more special education training, displayed overall positive attitudes toward the teaching of children with disabilities. A significant difference was noted between two of the four domains, and the teachers' level of special education training. The teachers with high levels of special education training had a more positive attitudinal response toward academic content/ teacher effectiveness and teacher preparation. The teachers with higher levels of special education training had significantly better attitudes toward inclusion than those with no or minimal special education training. This study emphasizes the importance of providing teachers with adequate special education experience and qualification if they are to make inclusive education successful.

### **Technology**

Research shows that the influence of attitudes on person's desire to use technology varies. Venkatesh, Morris, Davis and Davis (2003) found out that attitudes associated with intrinsic motivation influence ones intention to use technology. Considerable research has been done to determine moderating factors that are critical in successful learning (Eom, Wen & Ashill, 2006; Wang, 2003). A meta-analysis (Bernard, Abrami, Lou, Borokhovski, Wade & Wozney 2004) showed that

technology provides a medium of delivering learning materials and the use of technology by itself cannot guarantee greater learning effectiveness as compared to conventional, classroom based learning. The implication is that there are other factors that mediate or moderate technology assisted learning on students' outcome Hu and Hui (n.d.) as cited in (Bernard et al., 2004). A review of literature shows that there is lack of agreement regarding the effects of these moderators on technology assisted learning. The inconsistencies in the results might have come from methodological limitations.

### **Gender**

Neuhauser (2002) researched into gender as a moderating factor while Taylor and Nikolova (2004) used age as a moderator. Gender, age and experience have been found to influence technology usage (Morris & Venkatesh, 2000), and these variables moderate and influence behavioural intention in order to predict the actual behaviour. It is evident from literature that some studies used demographic characteristics as predictors or factors and also used these variables as moderators (Durrington, Repmam & Valente, 2000); however, this depends on the type of activities investigated. There are inconsistencies that were noted in this approach. Kripamont (2007) was of the view that all these characteristics such as gender, age, experience and qualification, were usually examined as moderators and they were found to influence behaviour. Therefore, gender was investigated as a moderator as it was expected that it would moderate attitude and technology usage in the classroom in order to predict successful inclusive education.

In literature, gender has been found to have an influence on attitude, subjective norm, and behavioural control (Venkatesh, Morris & Ackerman, 2000). Research suggested that feminine individuals tend to be more tentative, socially oriented and concerned about others' feelings, whereas masculine individuals are more categorical independent in nature and concerned about their own feeling rather than others (Gefen & Straub, 1997). Additionally, differences in biological traits suggest that women compared with men are found to be more expressive in nature and easily motivated by social pressure and affiliation needs (Venkatesh & Morris, 2000), whereas men are more oriented toward interpersonal goals, achievement needs and have high

independent characteristics; moreover, men compared with women rarely rely on others' opinions (Venkatesh & Morris, 2000). Minton and Schneider (1980) found out that gender has an effect on performance of jobs that are predominantly task oriented. In the present study it is presumed that teaching in an inclusive classroom is predominantly task oriented where technological equipment are expected to be used to aid understanding of the content. Therefore, men could be more motivated with task and to have stronger performance expectancy (Kirchmeyer, 2002).

### **Age**

Age was found to affect the influence of attitude, subjective norm and perceived behavioural control. Despite the fact that age has proven to be an important demographic predictor in organisational settings, it has very little attention in technology usage (Morris & Venkatesh, 2000). As a result, few studies recently started to examine its effect on individual's acceptance of technology and usage behaviour (Morris & Venkatesh, 2000). Prior research on age difference reported that increasing age correlated with higher computer anxiety and lower attitude toward usage. The implication of this is that younger teachers tend to have positive attitudes and are more motivated to use technology than the older teachers. For younger teachers, it is easier to learn new technology than the older ones (Morris & Venkatesh, 2000).

### **Experience**

In today's world of business, commerce, and political governance, employers place high premium on experience as an added advantage to qualification. This is even more critical when it comes to teaching. According to Ajzen and Fishbein (1980), past experience has been found to be an important determinant of behaviour. Empirical evidence has demonstrated that experience moderates the relationship between subjective norm and behavioural intention, so subjective norm becomes less important with increasing experience (Venkatesh et al., 2003). Experience can be explained as the individual's involvement or action in something over a period of time. Clough and Lindsay (1991) observed that younger teachers and those with fewer years of experience have been found to be more supportive to inclusive education. They further found out that there was no significant

difference in attitude to inclusion among teachers whose teaching experience was between one and four years although younger teachers and those with fewer years of experience were more supportive of inclusion. Other researchers have concluded that teaching experience was not significantly related to teachers' attitudes (Avramidis et al., 2000). The results of these studies are mixed and therefore inconclusive.

### **Qualification**

The issue of qualification and professionalism in teaching has been discussed extensively by educational authorities for decades. Scholars argued the necessity of skilled teachers for effective teaching and learning. Fajonyomi (2007) emphasized that the success or failure of any educational programme rests on the adequate availability of qualified teachers. This is because the trained teachers have been taught the technical know-how for effective learning to take place in the learners. The effects of teacher qualification usually expressed in terms of formal qualifications such as Bachelor in Education, Diploma in Education, and Certificate in Education are qualifications that mandate teachers to teach in a specific field and level in Ghana. Goldhaber and Brewer (2000) noted that certified teachers were better than those of the teachers who were not formally qualified or were alternatively qualified. Darling-Hammond (2000) used a finer scale of teacher qualification distinguishing between (i) teachers with full certification and major in their field, (ii) teachers with full certification, (iii) teachers less than fully certified and (iv) uncertified teachers. She found substantial positive effects for certified teachers and substantial negative effects for uncertified teachers.

In sum, the relationships among the constructs attitude and technology usage may be moderated to varying degrees by gender, age, teaching experience, and qualification. A moderator is a characteristic of the individual that affects the relationship between the independent variable and the dependent variable (Wu & Zumbo, 2009). In other words, moderating effects are evoked by variables whose variation influences the strength of the direction of the relationship between an exogenous and endogenous variable (Baron & Kenny, 1986). The relationships among the variables have been encapsulated in the



research model and from these relationships the hypotheses were formulated.

In Ghana, many researches have been carried out in special and inclusive education on factors that are likely to improve successful inclusive education (Gyimah 2011; Ocloo & Subbey 2008; Agbenyegah 2007; Kuyini & Desai 2007; Ackah 2006). However, none of these studies have explained the moderating values of the demographic characteristics of teachers and their influences on inclusive education. Again, the research methodologies used for these studies differ from the present study. This study adopts the Partial Least Square (PLS) - Structural Equation Modelling (SEM) approach hence it is expected that this study fills this knowledge gap.

### **Purpose of the study**

The purpose of this study was to investigate the moderating role of teachers' demographic variables on attitudes, and technology usage in predicting successful inclusive education.

### **Hypotheses**

1. Teachers' gender, age, qualification experience, will significantly moderate attitudes in predicting successful inclusive education.
2. Teachers' gender, age, qualification and experience will significantly moderate technology usage in predicting successful inclusive education.

### **Methods**

This study is part of a larger research that employed a cross-sectional survey to explore the moderating effects of teachers' demographic variables on attitudes and technology usage in predicting successful inclusive education. The population from which the sample was drawn was 550. Using a multistage sampling technique the sample size for the study was 124 classroom teachers. These teachers were selected from 15 inclusive schools located in southern Ghana. In selecting the sample size, the researcher was guided by Partial Least Square (PLS) Structural Equation Modelling (SEM) for sample size and power requirements. PLS is a second generation statistical technique for conducting SEM based analysis. According to PLS (SEM), a large

sample size is not as demanding and that this method is amenable to smaller numbers (Chin & Newsted, 1999). Reinhartz, Haenlein and Henseler (2009) showed that PLS (SEM) achieves high levels of statistical power in comparison to covariance-based counterparts, even if the sample size is small (i.e., less than 100 observations). The PLS can be adapted to complex models and is useful for exploratory research where the focus is on prediction (Neufeld, Dong & Higgins, 2007). The primary goal of PLS is to produce determine values for latent variables and therefore, PLS is suitable for this study.

### **Instrument**

The survey instrument in a questionnaire format was based on constructs validated in previous researches (Mahat 2008; Davis 1989; Moses, Wong, Abu-Bakar, & Mahmud 2011; Walton, Nel, Hugo & Muller, 2009) and adapted in this study. The questionnaire was structured into two main parts. The first part solicited information on the demographic variables of the teachers and the second part dealt with the attitudes, technology usage, and successful inclusive education.

#### ***Attitude questionnaire***

This study adapted the Multidimensional Attitudes toward Inclusive Education Scale (MATIES) developed by Mahat (2008). It is an 18 item questionnaire developed in a Likert Scale format with 6 items in each subscale. The participants were asked to rate each item on a 5 point range such as: strongly agree, agree, uncertain, disagree, and strongly disagree, with scores ranging from 5-1 respectively. The Cronbach reliability for each subscale for measuring cognitive dimension of attitude was 0.77, affective dimension of attitude was 0.78, and behavioural dimension of attitude was 0.91. The inter-subscale correlations were significant at 0.05 cognitive/affective 0.48 cognitive/ behavioural 0.61 and affective/ behavioural 0.62. These correlations showed a medium to a high positive correlation between the variables.

#### ***Technology usage questionnaire***

This scale was adapted from Davis (1989); Moses, Wong, Abu-Bakar, and Mahmud (2011). Respondents were asked to strongly agree,

agree, disagree or strongly disagree with the statements. For example, “I like using educational technology in inclusive classroom”.

### ***Successful inclusion questionnaire***

The scale required the teachers to strongly agree, agree, disagree or strongly disagree with the statements. There were five items in this scale which were adapted and modified from Walton, Nel, Hugo and Muller (2009). For example, “the needs of all students are met”.

### **Validity and Reliability**

In determining the validity and the reliability of the scales, the convergent and the discriminant validity were assessed. In assessing the convergent validity the value of the constructs under consideration were found to be greater than 0.05 and the composite reliability measures were greater than 0.7 (Chin, 1999). The loadings of the constructs in the model matrix also met the recommended value of 0.5. The Chronbach Alpha for each dimension of attitude, technology usage and successful inclusive education were all above 0.7 benchmark. The discriminant validity also demonstrated that each square root of the Average Variance Extracted (AVE) was larger than its correlation with each construct in the matrix (Chin & Newsted, 1999). This indicated that the latent variables in the proposed model were both conceptually and empirically distinct from each other indicating a good fit.

### **Data collection procedure**

The researcher having satisfied the ethical requirements made the instrument available to the participants in their various schools. Participants were assured of anonymity and were given two weeks to complete the questionnaire. An agreement was reached with the various head teachers in the schools to collect the completed survey questionnaire for onward submission to the researcher.

### **Data Analysis**

#### ***Testing moderating effect***

According to Baron and Kenny (1986), a moderator can be a qualitative or quantitative variable that affects the direction and or the strength of a relation between an independent and a dependent or criterion variable. In this study, the moderator variables were teachers’

demographic characteristics; gender, age, qualification and experience, attitudes and technology usage were the independent variables while successful inclusive education served as the dependent variable. These variables were modelled in a reflective form. Reflective constructs are latent variables which are observed first before their effects are seen (Bollen & Lennox, 1991). In a reflective model, the indicators reflect the underlying construct hence all the indicators are expected to be correlated. Jarvis, MacKenzie, and Podsakoff (2003), posited that the indicators are interchangeable hence eliminating an indicator should not change the conceptual meaning of a latent variable.

The current study used the PLS-SEM analytic approach to examine the moderating effects of the demographic variables on the attitudes and technology usage in predicting successful inclusive education. The researcher observed the interactions between these variables to find out whether the moderating hypotheses were confirmed, that is, if the path coefficient of the moderating variables and the predictor variables was significant. Again, the effect size was also evaluated in order to determine the magnitude of the moderation effect similar to the strength of the path coefficients. The effect size was calculated as follows (Chin, Marcolin & Newsted, 2003):

$$F^2 = \frac{R^2 \text{ model with moderator} - R^2 \text{ model without moderator}}{1 - R^2 \text{ model without moderator}}$$

According to Henseler and Chin (2010), the effect size of 0.02, 0.15, and 0.35 are regarded as small, medium and large respectively. The significance of these moderating effects was tested at 0.05 with bootstrapping using 500 samples in each case. The bootstrapping is a re-sampling technique used to give information on the validity of the parameter estimates and their significance (Temme, Kreis, & Hilderbrandt, 2006). These are values of *t*-statistics that show the strength of the indicators of the outer model. A feature of SmartPLS is the ability to test the obtained relationships for the possible moderator effect (Ringle, 2006).

The statistics that described the moderating effect included the path weights, the *t* statistics, the *p*-value and the effect size. With respect to the properties of interaction constructs, the relationships were measured by the path values, which represented the strength of the relationships. The path for the interaction of the moderators with the construct provided the information regarding the interaction effect. The

path coefficient represented the standardized regression coefficient. The path coefficients indicated the impact of the interaction between the moderator and the constructs.

## Results

**Table 1: Demographic characteristics of respondents**

		N	%
Gender	Male	51	41.1
	Female	73	58.9
	<b>Total</b>	<b>124</b>	<b>100</b>
<b>Age in years</b>		<b>N</b>	<b>%</b>
Age	18 – 25	3	2.4
	26 – 30	12	9.7
	31 – 35	31	25.0
	36 – 40	43	34.7
	41 – 45	25	20.1
	Above 45	10	8.1
	<b>Total</b>	<b>124</b>	<b>100</b>
<b>Experience in years</b>		<b>N</b>	<b>%</b>
Teaching Experience	Below 1 year	11	8.9
	2 – 5	23	18.5
	6 – 10	42	33.9
	11 – 15	38	30.6
	Above 15	10	8.1
	<b>Total</b>	<b>124</b>	<b>100</b>
<b>Qualification</b>		<b>N</b>	<b>%</b>
Qualification	Masters	7	5.6
	B.Ed/BA/BSC	62	50
	Diploma	47	38
	Certificate	8	6.4
	<b>Total</b>	<b>124</b>	<b>100</b>

The results in Table 1 showed that 51 (41.1%) were males while 73 (58.9%) were the females. It is apparent that there were more females than males. In terms of age, 3(2.4%) were aged between 18 – 25 years while 12(9.7%) were in the ages 26- 30 years. It can also be seen from the results that a total of 31(25.0%) teachers were aged 31-

35 years. Teachers who were aged 36- 40 years were 43(34.7%). Again, 25(20.1%) were aged 41 – 45 years while teachers who were aged above 45 years were 10(10%). The age distribution shows that the teachers were moderately young with the majority below 40 years of age. Eleven respondents representing 9.9% had taught for only 1 year and below. The teachers who taught between 2-5 years were 23(21.6%). The results further revealed that 42(33.9%) had taught for 6- 10 years. Again, teachers who had teaching experience between 11- 15 years were made up of 38(30.7) while a total of 24(19.4%) teachers had taught for 15 years and above. Thus, majority of the respondents had teaching experience less than 10 years. Teachers, who qualified with Master's Degree, were 7(6.6%). Half of the respondents 62(50%) qualified with BED/BA/BSC degrees. A good number of the teachers 47(37.9%) possessed Diploma in Education. Very few teachers 5(4%) had the teachers' certificate. Thus, a good number of the respondents were qualified professionals.

Table 2 presents the model and the results of the demographic variables on attitudes.

**Table 2: Model summary of results of demographic characteristics on attitude**

Model	path coefficient	t	p-value	F <sup>2</sup>	Decision
GEN-ATT-SUC	-0.425	0.556	0.289	0.005	not supported
AGE-ATT-SUC	1.187	1.728	0.043	0.037	supported
QUA-ATT-SUC	0.278	0.0342	0.366	0.001	not supported
EXP-ATT-SUC	0.215	1.4939	0.068	0.033	not supported

Key: GEN-Gender; ATT- Attitude; SUC-Successful Inclusion; QUA-Qualification; AGE- Age of Teacher; EXP- Teaching Experience;

***Gender on attitude***

Table 2 shows that gender did not have any significant moderating effects on attitude in predicting successful inclusive education (Beta = -0.425, t = 0.556 p < 0.289). The effect size of F<sup>2</sup> 0,005 according to Cohen (1987) is negligible and therefore was not a good predictor.

***Age on attitude***

The inclusion of age resulted in a significant moderation which predicted successful inclusive education. The path coefficients of (Beta = 1.187, t = 1.728 p < 0.043) was significant. The statistical significant moderating influence of the relations between attitude and successful

inclusive education showed that the teachers' age had a moderating effect on the teachers' attitude toward inclusive education. The effect size of  $F^2$  0.037 was small and therefore, weak.

### ***Qualification on attitudes***

The performance of qualification as moderator when taken into account, was not significant. The path coefficient of (Beta = 0.278,  $t = 0.0342$ ,  $p < 0.366$ ) did not support any positive main effect on successful inclusive education. The effect size of  $F^2=0.001$  showed no effective interaction. This means that the teachers' qualification was not a strong factor in influencing the predictive power of attitude on successful inclusion.

### ***Experience on attitudes***

With respect to teaching experiences, the results indicated that its moderating effect was not significant. The path coefficient between attitude and successful inclusion showed no significant relationship (Beta = 0.215,  $t = 1.4939$ ,  $p < 0.068$ ). This means that there were no significant interactions between the moderator defined as teaching experience, and the independent variable. The effect size of  $F^2=0.033$  indicated a small moderating effect though it was not significant.

In sum, with the exception of age, all the other demographic variables failed to moderate the relationship between the variables and attitudes in predicting successful inclusive education. Figure 1 shows the path results of the moderating role of gender age, qualification and experience on attitude predicting successful inclusive education.

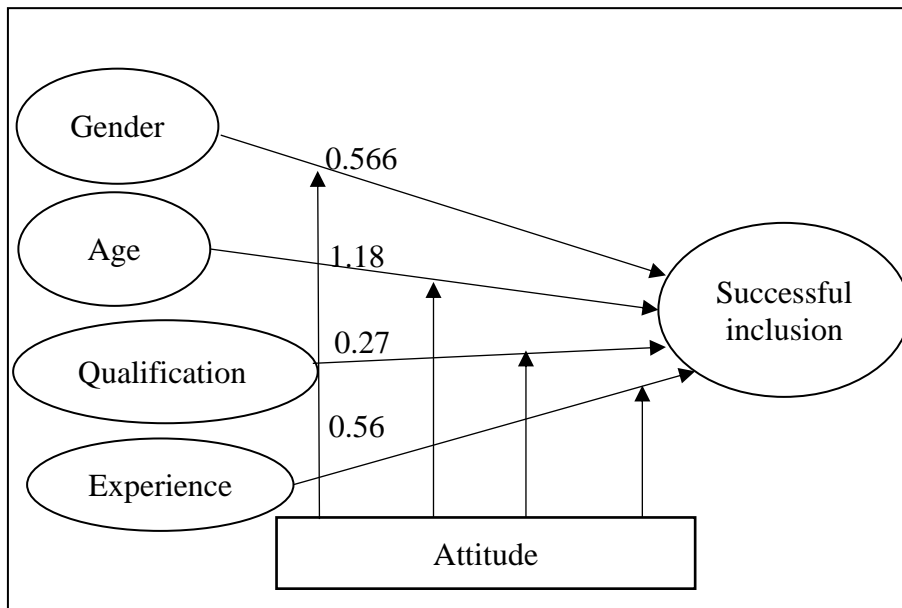


Figure 1. Path results of gender, age, experience and qualification on attitude in predicting successful inclusive education

Table 3 presents the model and the results of the demographic variables on technology usage.

**Table 3: Model summary of results of demographic characteristics on technology**

Model	path coefficient	T	p-value	F <sup>2</sup>	Decision
GEN-TEC-SUC	-0.506	0.5747	0.283	0.007	not supported
AGE-TEC-SUC	0.715	0.7687	0.221	0.014	not supported
QUA-TEC-SUC	0.157	0.710	0.239	0.000	not supported
EXP-TEC-SUC	0.569	0.319	0.3751	0.013	not supported

Key: GEN-Gender; SUC-Successful Inclusion; QUA- Qualification; AGE- Age of Teacher; EXP- Teaching Experience; TEC- Technology USAGE

**Gender on technology usage**

The results as shown in Table 3 indicated that the path coefficient (Beta = -0.506, t = 0.5747 p < 0.283) was not significant. The effect size of F<sup>2</sup> 0.007 was negligible therefore, the hypothesis was not supported. This means that gender was not significant in moderating the relationship between technology and hence weak predictor of successful inclusion.



**Age on technology usage**

The age of teachers did not show any significant moderation effect in moderating teachers' technology usage and successful inclusive education (Beta = 0.715,  $t = 0.7687 = < 0.221$ ). The effect size of  $F^2 = 0.014$  was partially small.

**Qualification on technology usage**

In the model, qualification was introduced in order to see its effect on the relationship between technology usage. In Table 3, the results indicated that qualification did not significantly moderate the relationship between technology and successful inclusive education (Beta = 0.157,  $t = 0.710$ ,  $p < 0.239$ ) hence its non-predictive value with effect size  $F^2 = 0.000$ .

**Experience on technology usage**

Finally, teaching experience was found to have no significant moderating effect in predicting teachers' technology usage and successful inclusion (Beta = 0.569,  $t = 0.319$ ,  $p < 0.3751$ ). The calculated effect size was partially small ( $F^2 = 0.013$ ).

All in all, the results indicated that there were no significant moderating effects of gender, age, qualification, and teaching experience in predicting successful inclusive education. Figure 2 shows the path results of the moderating role of gender age, qualification and experience on technology in predicting successful inclusive education.

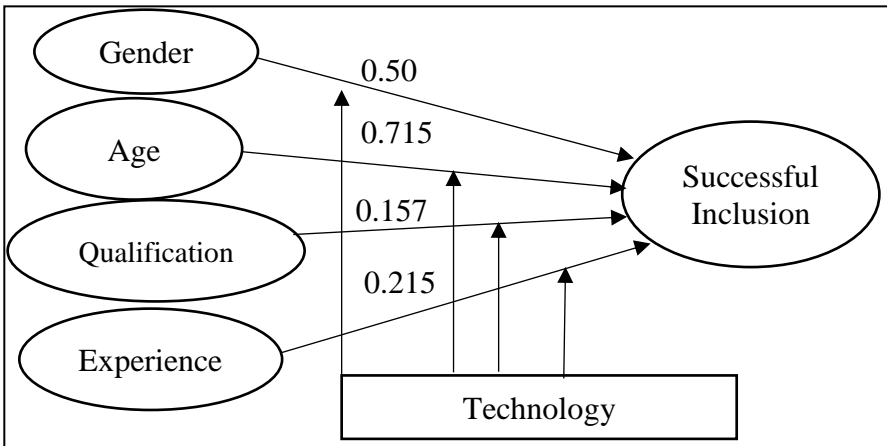


Figure 2: The path results of gender, age, experience and qualification on technology in predicting successful inclusive education

## **Discussion**

The majority of the background variables on which the information was collected and analysed in this study, were the variables that were modelled to moderate the relationship between the dependent and the independent variables. The overall purpose of this study was to develop an understanding of the moderating role gender, age teaching experience and teachers' qualification played in the teachers' attitudes and the use of technology in the classroom to foster successful inclusive education for children with special needs. This study extended the TPB by adding teachers' demographic variables as moderators which adds to the few studies that take into account the critical role these factors play in the teaching and learning enterprise.

As can be seen, the role of the moderators was not perfectly fitted as proposed in this research. The teachers' demographic characteristics did not moderate attitudes and technology usage in predicting successful inclusive education. This is because there were less likely interaction effects or, the model might lack enough statistical power (Henseler & Chin, 2010). Several of the moderators did result in a weak or, no effect on the relationship between the independent variables (teachers' demographic characteristics) and the dependent variable (successful inclusion). Chin et al. (2003) suggested that researchers often reported moderators with a small effect size; beta weights averaging 0.10, suggesting that the moderating terms play only a small part in the understanding of the issues involved in the relationship between the variables. For example, Bontis, Booker and Serenko (2007) found no interaction effects of management policies and other constructs in terms of moderator analysis. They concluded that measurement error may have occurred because the survey instrument that was used such as the Likert scales might not be suitable for every sub group of the sample.

In this study, while the relationships were not significant, however, the method used to identify the amount of variance extracted and the beta values were reliable. The absence of statistical significant effects of moderators on the relationships between the independent and the dependent variables suggests that a further research is needed.

Although, gender has received some recent attention as a key moderating influence in accordance with such findings, (Venkatesh et al., 2003) and consistent with the findings in sociology and social

psychology literature (Levy, 1988), surprisingly, gender was not found as a key moderator in this research. In similar finding Wang et al. (2009) did not find a moderating effect of gender on the relationship between the independent and the dependent variables. The non-significant interaction was due to the attitudes of both the male and the female teachers as far as inclusive education is concerned. In this current study, it was found out that attitudes were not significantly different when gender was compared. The link between gender and attitudes in studies reviewed by Avramidis and Norwich (2002) was inconclusive and subsequent findings have also been somewhat unclear. However, within the inclusive education context, males and females do not differ in terms of emphasis they place on task completion (Tarhini, Hone & Lui, 2014). Contrary to the prediction of this study, attitude and technology usage did not appear to be a more salient factor in inclusive education. This is more surprising given that gender plays an important role in predicting technology usage behaviour (He & Freeman 2010; Wang et al., 2009; Venkatesh et al., 2003).

The findings indicated that age was significant in moderating attitudes and successful inclusion. This result was expected as previous studies showed that age plays an important role in moderating the relationship among predictor variable and behavioural intention (Venkatesh et al., 2003; Wang et al., 2009). For most part, the teachers were moderately young with 79.7% falling within the ages of 31-45 years. The positive moderating effect on attitudes and successful inclusion suggests that there is a relationship between age and attitudes. This means that, when younger teachers have positive attitude, it would have an influence on the success of inclusive education. This finding did not support other findings that suggested that age of the teacher did not have any significant relationship with attitude (Williamson, 2000). Given that, the majority of teachers were moderately young, the introduction of the inclusive practices could have benefited them. This finding can be interpreted within the context of the previous literature. Venkatesh et al. (2003) and Wang et al. (2009) found that increase in age showed an association with difficulty processing complete stimuli and allocating attention to task.

The implication is that not only would the younger teachers' benefit from a more positive attitudes toward inclusive educational

system, but they could also serve as a source of reference to other older teachers. In this study, age was found to contribute slightly to the moderating role in the prediction of successful inclusive education. On the other hand, no significant moderating effect of age on the relationship between technology usage and successful inclusive education was found. The failure to find a significant effect here may have some possible explanations. It is possible that if the variance between the ages of the sample had been greater a moderating effect might have been observed. It was also likely to be due to inadequate training in the usage of technology in the classroom.

The findings indicated that educational qualification was found to have no significant relationship between attitudes on successful inclusion. In other words, qualification had no moderating effect on the relationship between attitudes and technology usage on successful inclusion. This finding contradicted Goldhaber and Brewer (2000) who noted that certified teachers were better than those of the teachers who were not formally qualified or were alternatively qualified. It should be noted that the respondent teachers came with different levels of educational qualifications. The largest number of the teachers had first Degree in Education and Diploma in Basic Education; however, the results established that educational qualification or lack of it thereof was not a factor affecting the moderation of teachers' attitudes and technology usage for predicting successful inclusive education.

The moderating effect of teaching experience on the relationship between attitude and technology usage was not significant. This finding is contrary to other studies that teachers with less than a year of teaching experience were significantly more positive than teachers with more teaching experience (Glaubman & Lifshitz, 2001). Avramidis and Norwich (2002) found a clear difference in attitudes between teachers with and without teaching experience with inclusive education. They concluded that teachers with inclusive education experience showed significantly more positive attitudes than teachers with less or no experience in inclusive education.

Moreover, the theory about the formation of attitudes which states that attitudes are formed by direct and indirect experience (Eagly & Chaiken, 1993) was so relevant to the teachers since they had direct experience with inclusive education. In other words, the teaching experience was expected to significantly moderate the independent

variables. This is because teachers had experience with inclusive education facilitates and were more likely to develop positive attitudes. It should be pointed out that other confounding variables were likely to influence the strength of the relationship. Experience, however was found to play no important role in this study, since it had no significant effect in the model. The overall trend of the performance of the teachers' demographic characteristics as seen in the path model suggests that these variables were not effective moderators in the model.

### **Conclusion**

This current study found that gender, teaching experiences and qualification as moderating variables failed to moderate attitude and technology usage in predicting successful inclusive education. The implication is that the key constructs in the model were not moderated therefore, the relationships among the constructs were weak. Only one demographic variable (age) was found important which moderated attitude, however, the strength of the moderation was weak and its effect on the prediction was not significant in the model. The overall findings therefore, did not support the hypotheses. It can be noted that one possible causal explanation is the elusive link between the teachers' demographic characteristics and their moderating role on attitude and technology usage in the classroom for predicting successful inclusive education. In effect, the finding did not improve the understanding of the moderating role of these demographic variables, since the evidence from the study did not support the hypotheses. There are other external factors that are likely to affect the results.

### **Limitations**

The survey scales, although their validity and reliability properties were satisfactory in the study, they might not fully capture all the facets of the underlying constructs. It is therefore not known how these findings will generalize beyond this population. Second, data were collected through self-reports and a single method of data collection might have had a reflection on the accuracy of the data. However, the current study depended on the teachers' openness and sincerity when responding to the questionnaires.

### **Recommendations**

Again, teachers should develop a positive attitude toward the education of children with special needs. To achieve this, requires a change of attitude through re-orientation, awareness creation, and active information dissemination through workshops, forums, seminars, and conferences. The non-significance of these factors implies that the educational authorities should pay particular attention to those factors in order to ensure that success is achieved.

In addition, the government acting through the Ministry of Education (MOE), the Ghana Education Service (GES) and Non-governmental Organizations (NGOs) should make the provision of equipment to the schools a top priority. Equipment such as computers and their accessories should be supplied to the schools. Adequate training facilities must be provided for the teachers in order to build their capacity for the use of educational technological equipment.

Finally, the GES and MOE must organize in- service education for all teachers while pre-service programmes should be upgraded through the existing courses to include the practical components of technology usage in inclusive schools. Increasing the level of training for all teachers in inclusive education would appear to be advantageous but, perhaps, equally important, is to ensure that all teachers have basic knowledge in inclusive education and technology usage.

### **Suggestion for further research**

The absence of statistical significant effects of gender, qualification, and experience as moderating factors on the relationships between attitude and successful inclusion suggests that a further research is needed.

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