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# **African Journal** of Historical Sciences in Education

**A Journal of Historians of Education Development Society of Nigeria  
An Affiliate of the International Standing Conference  
for the History of Education (ISCHE)**

***Secretariat:***

***Department of Early Childhood and Educational Foundations  
University of Ibadan, Ibadan, Nigeria***

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## NOTE ON CONTRIBUTORS

1. Michael Omolewa, currently Emeritus Professor of the History of Education at the University of Ibadan and Emeritus Professor of History and International Studies at Babcock University, Nigeria, served as member of the Executive Council of the International Standing Conference of the History of Education, and he is Life Patron of the Historians of Education Development Society of Nigeria.
2. Prof. Taiwo Edun is of the Department of Educational Foundations and Counselling Faculty of Education, Olabisi Onabanjo University, Ago-Iwoye.
3. Ojebiyi, O. A (Ph.D.), Department of Educational Foundations and Counselling, Faculty of Education, Obafemi Awolowo University, Ile-Ife, Nigeria
4. Adenigbagbe Henry Adeloye (Ph.D) Department of General Studies, School of Education, Osun State College of Education, Ilesa.
5. Adeniyi, W. O. (Ph.D) Department of Educational Foundations and Counselling Faculty of Education, Obafemi Awolowo University, Ile-Ife, Osun State
6. Adediwura, B. S. Department of Educational Foundations and Counselling, Faculty of Education, Obafemi Awolowo University, Ile-Ife, Osun State
7. Kayode, Sadiq Toyin, Department of Adult and Primary Education, University of Ilorin, Nigeria
8. Adebisi, Tajudeen Adeumi Ph. D., Department of Adult Education and Lifelong Learning, Obafemi Awolowo University, Ile-Ife, Nigeria
9. Anderson Paingha Sele Ph.D, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria
10. Dorgu Theresa Ebire Ph.D, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria
11. Opara Felicia Nnenna, Department of Educational Foundations Faculty of Education, University of Nigeria Nsukka
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14. Peter U. Jwunna, Ph.D, Department of Educational Foundations University of Nigeria, Nsukka
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17. Dr. Mayowa Olurotimi Ogunjimi, Department of Adult and Primary Education, Faculty of Education, University of Ilorin, Nigeria
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23. Dr. Garba, Abdullahi, Department of History and Diplomatic Studies Ignatius Ajuru University of Education
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26. Igboasanu Olumuyiwa A., Department of Educational Foundations and Counselling, Olabisi Onabanjo University, Ago-Iwoye, Nigeria.
27. Abdur-Rafiu, Jamiu Ph.D., Department of Arts Education, University of Ilorin, Ilorin, Nigeria

## PRE-SERVICE TEACHERS EMOTIONAL ATTITUDE AND SENSITIVITY TO MATHEMATICS TEACHING IN ILORIN, KWARA STATE

Dr. Mayowa Olurotimi Ogunjimi

### Abstract

*This study examined the pre-service teachers' emotional attitude and sensitivity to mathematics teaching in Ilorin, Kwara State. It examines if pre-service teachers' emotional attitude and sensitivity to mathematics teaching depend on gender and age. A survey type of descriptive research design was adopted for this study. The target population consist of all 300 and 400 level pre-service teachers of primary education in some tertiary institutions in Kwara State. The sample of the study consists of two hundred pre-service teachers selected from three tertiary institutions in Ilorin Metropolis. A self-constructed questionnaire was used as the instrument for data collection. The content validity of the instrument was conducted by two experts in educational psychology and mathematics education while the reliability value of the instrument was 0.82 using test retest method. Descriptive statistics was used to answer the research questions while the hypothesis was tested with the use of Multivariate Analysis of Variance. The findings showed that majority of the pre-service teachers of primary education had positive emotional attitudes and sensitivity towards teaching mathematics. It was also found out that there was no significant difference between emotional attitude and sensitivity of pre-service teachers towards mathematics teaching in Kwara State on the basis of age and gender. It was recommended among others that students on teaching practice should be encouraged to work on improving their attitude and sensitivity towards teaching mathematics. Also, workshop on mathematics pedagogy should be organized frequently for pre-service teachers at every level of their education.*

**Keywords:** Emotional Attitude, Sensitivity, Pre-service Teachers

### Introduction

Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. It frequently takes place under the guidance of educators and also learners may also educate themselves. In the wider sense, it is a life-long process. It begins at the birth of a child and ends at his death. It is not limited to the classroom only; it is also not limited to a particular period of life. An individual learns through his experiences

which are acquired throughout his life. Education is not merely collection of some information; it is the acquisition of experiences throughout life in the social and natural environment. It includes all the knowledge and experiences, acquired during infancy, childhood, boyhood, adolescence, youth, manhood and old age through any agency of education: the press, the travels, the club and the nature (formally or informally). Thus, education becomes the totality of all experiences that the child receives either in the school or outside.

Pre-service teacher education is the education and training provided to student teachers before they have undertaken any teaching. Pre-service teaching brings to teacher education many years of experiences in different subjects e.g. Mathematics. It is known that these experiences shape the pre-service teacher's beliefs and attitudes towards mathematics, and have the potential to shape future teaching (Ma & Kishor, 2007). For some people mathematics holds negative connotations and memories. According to Al-Harthi, Jamaluddin and Abedalaziz (2013), you do not need to look too far to find someone who will admit to hating mathematics. Hence, such mathematical dislike, associated anxiety, and concerns about content knowledge, have been specifically linked to primary school teachers and prospective primary school teachers (Grootenboer, 2001).

Mathematics is an important tool for children to develop higher level thinking skills, to be successful in other areas, and to solve problems they may face in their daily life. In primary education, pupils need to experience high-quality mathematics teaching for their future learning. This could be realized by providing them with effective learning programs and teaching methods. Furthermore, mathematics experiences for children at young ages can help them to create meaningful relationships through exploration and play in natural environments. Thus, the mathematics teaching programs should be implemented in these natural learning environments such as play areas and learning centers in preschools. Teaching mathematics in primary education gains importance because children will not have any misconceptions about their later mathematics learning. Anders and Rossbach (2015) explained that the most important foundation of children's achievement and the process of adults' professional careers are the attainment of mathematical skills. Unquestionably, it is the teacher who regulates the child's environment in preschool education and implements the appropriate program. Studies have demonstrated that the teachers' attitudes and beliefs have a direct impact on the learners' learning process and their development of mathematical knowledge (Maasepp & Bobis, 2014; Beswick, Callingham, & Watson, 2011). Hence, teachers intending to provide meaningful learning experiences

in mathematics for children are first required to have positive attitudes and beliefs about mathematics.

Dogan (2012) posits that emotion impacts on pre-service teachers' learning of mathematics are regarded as key to supporting changes in beliefs and attitudes. For example, positive experiences with their attendant emotions will eventually produce positive beliefs and attitudes towards mathematics. He explains that learners may need to experience sustained and repeated successes in their learning of mathematics in order to achieve a change in beliefs and attitudes. His findings suggest that a mathematical learning environment that includes collaboration, inquiry-based projects and support with mathematics content helps to reshape pre-service teachers' emotions such as anxiety. Similarly, Rule and Harrell (2010) reported that after a mathematics methods course that emphasized co-operative group work, an inquiry or problem-solving approach and an emphasis on mathematical discourse amongst other features, pre-service teachers' positive emotions about mathematics were significantly increased. Emotions are not only a critical aspect of mathematics learning but also a critical aspect of achieving change in professional practice. It is only when teachers are at ease with an innovation that they can adapt and adjust new practice to particular students and contexts.

The concept of attitude is often interchangeably used with terms like anxiety, confidence, motivation, enjoyment, feelings and beliefs. It should be noted that each of these terms does not wholly define attitude. Zan and Martino (2007) suggested that the definition of attitudes is a function of the problems that the researcher is dealing with, and is linked to the choice of the measuring instrument. In general, attitude is seen as learned responses to a situation or object and they are either positive or negative. Thiel (2010) defined attitude as affective responses that involve positive or negative feelings of moderate intensity and reasonable stability. Attitudes are symbolic in identifying behavioural patterns of individuals and in asserting definitive responses. According to Oluwatelure (2008), attitude can be defined as a psychological tendency expressed by evaluating a particular entity with some degree of favour or disfavour. Clarke, Thomas, and Vidakovic, (2009) observed attitudes as manners of acting, feeling, or thinking that show one's disposition or opinion. It is the tendencies to evaluate an entity with some degree of favour or disfavour, ordinarily expressed in cognitive, affective and behavioural responses. Attitudes are proclivities and dispositions that chaperon a person's behaviour and induce him or her to an act that can be appraised as either positive or negative (Ibironke, Awofala, & Awofala, 2015). Based on the foregoing attitudes are seen as predispositions to think,

feel and behave towards an event or object which affect behaviour within contextual parameters.

Emotions and attitudes play a crucial role in all human behaviours. Over the past few decades, emotional aspects and attitudes of people have recently attracted a great deal of attention in academic research. Research studies have indicated that emotional intelligence and attitudes are closely linked to foreign language learning (Fahim & Pishghadam, 2007; Tezci, & Terzi, 2010; Young-Loveridge, Bicknell & Mills, 2012; Öz, 2015; Öz, Demirezen, & Pourfaraz, 2015). The concepts of emotional attitude is a key components of teaching process as they affect teacher competencies, influences their behaviours and the way they think and solve problems. Similarly, attitude of teachers towards the teaching of a particular subject plays an important role for effective teaching and learning of the subject (Terzi & Tezci, 2007). In this respect, it is fair to say that teaching is not only composed of cognitive competencies but also shaped by affective competencies. Teachers play a paramount role in teaching and learning process of an educational system. It is good to note that teachers' emotional intelligence can influence their beliefs and attitudes towards teaching which in turn affect their occupational behaviours which later turn to affect the quality of education. Hence, it is vital to determine pre-service teachers' emotional attitude towards their future profession as they will complete a teacher-training program and become qualified professionals in their field.

Emotional attitudes toward mathematics form the affective component of the math-related belief system. They often develop in school, and mathematics is one of the subjects that produce the most ambivalent emotional attitudes. Although many people regard mathematics as useful and important, many also may perceive mathematics as difficult. Consequently, many even suffer from math anxiety. It has been observed that former school experiences (e.g., inappropriate teaching methods, underachievement) cause math anxiety in many cases (Malinsky, Ross, Pannells, & McJunkin, 2006; Wu, Barth, Ann-Malcarne, & Menon, 2012). Teachers' emotional attitudes about math are of particular interest because it is assumed that they may influence the teacher's teaching behavior. Furthermore, teachers' emotional attitudes may be transferred to children, whether positive (e.g., math is regarded as beautiful and joyful) or negative (e.g., math anxiety or aversion). Research on primary school teachers suggests that math anxiety and math teaching anxiety are common phenomena (Bursal & Paznokas, 2006; Gresham, 2008; Peker, 2010). It showed that for pre-service primary school teacher candidates, negative attitudes toward mathematics correlate to avoidance of offering math-related learning opportunities. As a consequence, these teacher candidates should

that with the ideal mathematics instruction, children would not realize they are actually engaged in mathematics. It is hypothesized that pre-school teachers are also often uncomfortable with mathematics and technology and suffer more often from math anxiety than other professionals.

Sensitivity is an ability to understand what other people need, and be helpful and kind to them. Teacher Sensitivity is not about how "nice" or "caring" teachers are; rather, it is about how teachers consistently demonstrate awareness and responsiveness to children's current academic and emotional abilities and needs. Analysis of the qualitative data revealed that teachers who are likely to present with Sensory Processing Sensitivity (SPS) display characteristics of SPS, including depth of processing represented by reflection and deliberateness, strong empathy and emotional reactivity manifested as support for students, sensitivity to subtle stimuli by reading (Stefan-Lindsay, 2017). Teachers are sensitive when they consistently respond to students and are effective in addressing students' questions, concerns, and needs. Teaching sensitively includes an awareness of individual student's academic, social and emotional needs in a way that allows teachers to anticipate areas of difficulty and provide appropriate and effective learning opportunities and levels of support for all students in the classroom. Students make the most progress when learning opportunities are academically and developmentally appropriate and provide a reasonable level of challenge (Hughes, 2012). In a classroom with a sensitive teacher, students learn to see that teacher as a source of support, guidance, and reassurance. Teaching sensitively helps students feel comfortable with sharing their ideas, taking risks, and challenging themselves academically and socially. It also allows students to work comfortably on their own and in groups because they know they can approach the teacher and he or she will be helpful.

### **Statement of Problem**

There is the quest of determining the emotional attitude and sensitivity of pre-service teachers of primary education towards the teaching of mathematics in primary schools. The challenge is compounded for pre-service teachers who have not initially been successful in their mathematics methodology courses. It follows that pre-service teachers' education programme needs to provide opportunities for pre-service teachers to consider their mathematical knowledge, identify and examine their beliefs, emotional attitudes and sensitivity towards mathematics teaching. Teacher education programme in primary education studies should also include opportunities for pre-service teachers to examine their conceptions of mathematics teaching, including what and how to teach. Also, their mathematics learning and assessment tasks need to be carefully chosen, and the design of these is regarded to be a crucial

aspect of supporting the development of a sound understanding about mathematics learning and teaching (Fenwick, Humphrey, Quinn & Endicott, 2013). Responding to all of these demands means the task of the pre-service teachers of primary education is a multi-faceted and complex one especially as it concerns teaching of mathematics which is an indispensable adjunct to the physical sciences and technology, and has assumed a similar role in the quantitative aspects of the life sciences. Supporting pre-service teachers to develop appropriate content knowledge, positive emotional attitudes, feelings and sensitivity about mathematics teaching, is certainly seen to pose significant challenges. Hence, this study aimed at investigating the pre-service teachers of primary education emotional attitude and sensitivity to mathematics teaching in Ilorin, Kwara State.

### **Purpose of the Study**

The general purpose of this study was to investigate pre-service teachers of primary education's emotional attitude and sensitivity to teaching of mathematics in Ilorin, Kwara State. Specifically, the study attempted to determine:

- i. the emotional attitude of pre-service teachers of primary education studies.
- ii. the sensitivity of pre-service teachers to teaching of mathematics.
- iii. whether pre-service teachers' emotional attitude and sensitivity to mathematics teaching depends on gender and age.

### **Research Questions**

- i. What is the emotional attitude of pre-service teachers of primary education studies?
- ii. What is the sensitivity of pre-service teachers towards teaching of mathematics?

### **Research Hypothesis**

- i. There is no significant difference between pre-service teachers' emotional attitude and sensitivity towards mathematics teaching on the basis of gender and age.

### **Methodology**

The research design adopted for this study is descriptive survey research design. Descriptive research design is used to describe characteristics of population or phenomenon being studied. It was adopted for this study to investigate the pre-service teachers of primary education emotional attitude and sensitivity towards mathematics teaching in Ilorin, Kwara State. The population of the study consists of all pre-service teachers of primary

education studies in Ilorin, Kwara State while the target population consists of all 300 and 400 level pre-service teachers of primary education studies in tertiary institutions in Ilorin, Kwara State. Simple random sampling technique by hat and draw was used to select one hundred respondents from the two tertiary institutions that offer primary education studies. Consequently, a total number of 200 respondents were selected from the two institutions (University of Ilorin & Kwara State College of Education, Ilorin). The instrument used for data collection was self-constructed questionnaire titled: Teachers' Emotional Attitude and Sensitivity to Mathematics Teaching Questionnaire (TEASMAQ). The questionnaire contained three sections. The first section which is section A contains the demographic information of the respondents. Section B, the second section, contains ten items on pre-service teachers' emotional attitude to mathematics teaching. Also, Section C contains ten items on pre-service teachers' sensitivity to mathematics teaching. The instrument was designed in four points Likert type scale ranging from Very True (VT); True (T); Not True (NT); Not Very True (NVT). To ascertain the content validity of the instrument, it was given to two experts in the area of educational psychology and mathematics education for proper scrutiny and modification. The reliability of the instrument was determined using test re-test method. This was done by administering twenty copies of the instrument to respondents that were not part of the sample selected twice with an interval of two weeks between the first and second administrations. The two sets of responses were subjected to correlation coefficient and a value of 0.82 was established as the reliability index. The data collection was done personally and the copies of the questionnaire were retrieved from the respondents immediately after the completion. Data collected were analysed using descriptive statistics for the two research questions while multivariate analysis of variance was used for the research hypothesis.

## Results

Two research questions were generated, and they were answered with the use of descriptive statistics. The results are presented in the table below.

**Research Question 1:** *What is the emotional attitude of pre-service teachers of primary education studies?*

In order to decide on the emotional attitude of pre-service teachers, the total response of each of the pre-service teachers was summed up having a minimum of 10, maximum of 40 and the range of 30. The range was divided by two levels of emotional attitudes (Positive and Negative) and the cut-off was 15. Scores between 10 – 24 and 25 – 40 are categorized as negative and positive emotional attitudes. The result is presented in the table below.

**Table 1: Summary of Pre-service Teachers' Emotional Attitude towards Mathematics Teaching.**

| Range   | f   | %     | Remarks  |
|---------|-----|-------|----------|
| 10 – 24 | 17  | 8.5%  | Negative |
| 25 – 40 | 183 | 91.5% | Positive |

The above shows that 17 (8.5%) respondents have negative emotional attitude, while 183 (91.5%) respondents have positive emotional attitude towards teaching of mathematics. This revealed that majority (91.5%) of the pre-service teachers have positive emotional attitudes towards teaching mathematics in Kwara State.

**Research Question 2:** *What is the sensitivity of pre-service teachers towards teaching of mathematics?*

In order to decide on the sensitivity of pre-service teachers, the total response of each of the pre-service teachers was summed up having a minimum of 10, maximum of 40 and the range of 30. The range was divided by two levels of sensitivity (Positive and Negative) and the cut-off was 15. Scores between 10 – 24 and 25 – 40 were categorized as negative and positive sensitivity. The result is presented in the table below;

**Table 2: Summary of Pre-service Teachers' Sensitivity towards Mathematics Teaching.**

| Range   | f   | %     | Remarks  |
|---------|-----|-------|----------|
| 10 – 24 | 21  | 10.5% | Negative |
| 25 – 40 | 179 | 89.5% | Positive |

The above shows that 21 (10.5%) respondents have negative sensitivity towards mathematics, while 179 (89.5%) respondents have positive sensitivity towards mathematics. This revealed that majority (89.5%) of the pre-service teachers have positive sensitivity towards teaching of mathematics in Kwara State.

**Research Hypothesis:** *There is no significant difference between pre-service teachers' emotional attitude and sensitivity towards mathematics teaching on the basis of gender and age.*

The only research hypothesis generated for the study was analysed with the use of Multiple Analysis of Variance and the result of the analysis is presented below.

**Table 3: Summary of MANOVA showing the emotional attitude and sensitivity on the basis of gender and age**

| Source          | Sum of Squares | F    | Dependent Variable | Type III Sum of Squares | df  | Mean Square | Sig. |
|-----------------|----------------|------|--------------------|-------------------------|-----|-------------|------|
| Corrected Model | 78.120         |      | Emotion            | 78.120                  | 7   | 11.160      | .912 |
| Intercept       | 121964.926     |      | Sensitivity        | 69.794                  | 7   | 9.996       | .790 |
|                 | 9.962E3        |      | Emotion            | 121964.926              | 1   | 121964.926  | .000 |
|                 | 9.812E3        | .000 | Sensitivity        | 124153.079              | 1   | 124153.079  | .000 |
| Gender          | .002           | .965 | Emotion            | .024                    | 1   | .024        | .612 |
|                 | .362           | .584 | Sensitivity        | 4.576                   | 1   | 4.576       | .032 |
| Age             | .826           | .481 | Emotion            | 30.349                  | 3   | 10.116      | .965 |
|                 | 1.487          | .219 | Sensitivity        | 56.456                  | 3   | 18.819      | .965 |
| Gender * Age    | .1319          | .269 | Emotion            | 48.451                  | 3   | 16.150      | .965 |
|                 | .349           | .790 | Sensitivity        | 13.256                  | 3   | 4.419       | .965 |
| Error           | 2350.755       |      | Emotion            | 2350.755                | 192 | 12.244      | .965 |
|                 | 2429.381       |      | Sensitivity        | 2429.381                | 192 | 12.653      | .965 |
| Total           | 127679.000     |      | Emotion            | 127679.000              | 200 |             | .965 |
|                 | 128853.000     |      | Sensitivity        | 128853.000              | 200 |             | .965 |
| Corrected Total | 2428.875       |      | Emotion            | 2428.875                | 199 |             | .965 |
|                 | 2499.355       |      | Sensitivity        | 2499.355                | 199 |             | .965 |

Table 3 above shows the difference between emotional attitude and sensitivity of pre-service teachers towards mathematics teaching on the basis of gender and age. It was revealed that pre-service teachers' emotional attitude towards teaching mathematics does not depend on gender ( $p$  value  $.965 > .05$ ). Also, pre-service teachers' sensitivity towards teaching mathematics does not differ on the basis of gender ( $p$  value  $.584 > 0.05$ ). The table also revealed that emotional attitude of pre-service teachers does not differ based on age ( $p$  value  $.481 > 0.05$ ) and the sensitivity of pre-service teachers does not depend on their age ( $p$  value  $.219 > 0.05$ ). Hence, the null hypothesis above which states that there is no significant difference on emotional attitude and

sensitivity of pre-service teachers towards mathematics teaching on the basis of gender and age is accepted.

### Discussion of Findings

The findings from this study revealed that pre-service teachers' emotional attitude towards the teaching of mathematics is positive. This was seen from the responses of the pre-service teachers that majority (91%) of the teachers had positive emotional attitude towards mathematics teaching. Before mathematics can be effectively taught, emotional attitudes of the teachers is a key component of teaching process as they affect teacher competencies, influence their behaviours and the way they think and solve problems. This goes with the submission of Brady and Bowd (2005), Henderson and Rodrigues (2008) and Benz (2012) which stated that attitudes and practices of teaching mathematics are complexly affected by beliefs, emotions, social context and content knowledge. These studies confirmed that emotional responses toward mathematics that are found in teachers include likes and dislikes of mathematics, anxiety associated with mathematics and self-confidence in relation to mathematics teaching. These emotional factors of teachers have been found to have an impact on students' performance in mathematics. Teachers' exhibition of self-confidence when teaching mathematics motivate student achievement. The learners draw from the teacher's disposition to form their own attitude which may affect learning outcomes.

Moreover, it was found out that pre-service teachers have positive sensitivity towards mathematics teaching in Kwara State. This is evident by the percentage of the respondents with positive sensitivity (89.5%). This reveals that positive sensitivity towards teaching of mathematics is very germane as it leads to good performance. This corroborates the submission of Terzi and Tezci (2010) which asserted that, it is not likely to have professional productivity unless a person has positive sensitivity towards the profession. Hughes (2012) observed that in a classroom with a sensitive teacher, students learn to see that teacher as a source of support, guidance, and reassurance. Therefore, it will be important for pre-service teachers to hold positive sensitivity to the teaching of mathematics, as sensitive teachers help students feel comfortable with sharing their ideas, taking risks, and challenging themselves academically and socially. They allow students to work comfortably on their own and in groups because the students know they can approach the teacher for guidance.

Also, the finding of this study shows that no significant difference exists between the pre-service teachers' emotional attitude and sensitivity towards

mathematics teaching on the basis of gender and age. This was evident by the p-value .965, .584, .481, and .219) respectively, which are all greater than 0.05. This implies that pre-service teachers' emotional attitude and sensitivity towards the teaching of mathematics in Kwara State do not differ on the basis of gender and age. This finding corroborates the work of Scafidi & Bui (2010) and Asante (2012) who reported that attitude towards mathematics do not differ significantly between male and female. Beliefs about mathematical activities indicated that mathematics was seen as both an important part of the pre-school curriculum and mathematical activities were considered important to create social environment, but these beliefs did not reflect the meaningful differences according to the teaching experience among the teachers.

### **Conclusion**

It was concluded that pre-service teachers of primary education studies in Kwara State have positive emotional attitude towards mathematics teaching as well as positive sensitivity towards mathematics teaching. It is the teacher who regulates the child's environment in primary education and implements the appropriate program. Hence, teachers intending to provide meaningful learning experiences in mathematics for children are first required to have positive attitudes and sensitivity about mathematics teaching. Also, pre-service teachers of primary education studies do not differ significantly on their emotional attitude and sensitivity towards mathematics teaching based on gender and age. This implies that emotional attitude and sensitivity to mathematics teaching among pre-service teachers of primary education studies does not depend on gender and age.

### **Recommendations**

The following recommendations are hereby proffered for pre-service teachers on emotional attitude and sensitivity towards teaching of mathematics.

1. Teacher education programme should include strategies in educational contexts that will improve teacher emotional attitude which are of vital importance in improving pedagogy skills and performance among pre-service teachers throughout their training.
2. Awareness campaign in promoting positive sensitivity so as to encourage the students in the teaching of mathematics.
3. Workshop on mathematics pedagogy should be organised frequently for pre-service teachers to arouse their motivation and sensitivity.
4. Pre-service teachers should be encouraged to teach mathematics at every level of primary schools.

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