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Mathematics Curriculum for Primary School Teacher Training Colleges and its Impact on the Teaching of Mathematics in English Speaking Primary Schools in South West Region of Cameroon

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ABSTRACT

The paper examined the extent to which the mathematics curriculum for PSTTC impacts the teaching of mathematics in English Speaking Primary Schools in South West Region. The research question was to examine the extent to which mathematics pedagogic knowledge learnt in PSTTC have an impact on the teaching of mathematics in primary schools. The survey research design was used on a target population of 31 mathematics teacher trainers and 6482 primary school teachers. 31 mathematics teacher trainers and 45 primary school teachers formed the accessible population. The instruments used to collect the data were a questionnaire The researcher used the direct delivery technique to collect data from 31 mathematics teacher trainers on the questionnaire, 5 mathematics teacher trainers on one interview, and 45 primary school teachers on another interview. All the mathematics teacher trainers were from primary school teacher training colleges located in South West Region, while all the primary school teachers were from primary schools located in the South West Region. Data were analysed descriptively using frequencies and percentages, and also inferentially using Spearman Rank correlation. The results showed that the mathematics pedagogic knowledge learnt in PSTTC has no significant impact on the teaching of mathematics in English Speaking Primary Schools in South West Region is not effective, not efficient, and not appealing. Generally, the mathematics curriculum for PSTTC has no significant impact on the teaching of mathematics in English Speaking Primary Schools in South West Region. Based on the findings, it is recommended that: More time should be allocated for the teaching/learning of mathematics in PSTTC, the mathematics syllabus for PSTTC should align with that of English Speaking Primary Schools, the weighting of mathematics in PSTTC should be increased so as to motivate student teachers to learn mathematics and the teaching of mathematics. Further research could be carried out on: The effectiveness and efficiency of mathematics teacher trainers of PSTTC on the teaching of mathematics in PSTTC; The strategies that could be employed in PSTTCs and during in-service training of primary school teachers, that would enable student teachers and primary school teachers develop positive attitudes and enthusiasm towards mathematics and the teaching of mathematics; and the causes of pupils' poor performance in mathematics in English Speaking Primary Schools in South West Region of Cameroon.

KEYWORDS: *Mathematics Curriculum, Primary School Teacher Training Colleges, Impact, Teaching of Mathematics, English Speaking Primary Schools, South West Region of Cameroon*

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INRODUCTION

Mathematics is a compulsory subject in primary and secondary schools, as well as in primary school teacher training colleges (PSTTCs) in Cameroon. It is 'the study of numbers, shapes, and space using reason and usually a special system of symbols and rules for organizing them' (McIntosh, 2013 p. 883). Ali (2013) opines that mathematics is an international language, a way of thinking and organizing a logical proof and it is the subject that is recognized as the mother of all learning with other subjects deriving their concepts from it, in both arts and sciences.

According to Ali (2013), mathematics is regarded as the queen of all sciences such as chemistry, physics, biology and economics, reason why any individual who is competent in mathematical sciences, can equally have the ability to do any

other course. Close (2006) says that mathematics facilitates the study of academic subjects especially in the physical and social sciences, problem solving in our personal, educational, and occupational lives, and for studying and making sense of the world around us. Ali (2013) posits that mathematics can be used to determine whether an idea is true or not, or at least, whether it is probably true as a way of thinking, since it gives insight into the power of human mind and becomes a challenge to intellectual curiosity. Ali (2013) adds that mathematics is used in handling money, measurement in fashion and carpentry, as well as in technical economics. MINEDUB (2018) states that mathematics is a creative and highly inter-connected subject that is essential to everyday life, critical to science, technology, agriculture and engineering, and also necessary for financial literacy and most forms of employment. According to MINEDUB (2018), mathematics develops logical and inferential thinking, as well as the ability to deduce and visualize in time and space. Mathematics according to Maliki, Ngban, and Ibu (2009) is described as a subject that affects all aspects of human life at different degrees (p. 131). According to The National Mathematics Advisory Panel (2008), mathematics is used throughout our daily lives.In Cameroon, mathematics is a prerequisite for admission into some professional programmes such as medicine, engineering, accountancy, agriculture and banking. It also forms part of the study of single subjects like physics, chemistry, economics, biology and geography. Generally, people in all works of life make use of some knowledge of numeracy either consciously or unconsciously. Therefore, the importance of mathematics cannot be over emphasized.

According to Close (2006, p. 53), "mathematics is a key subject in school curricula." Therefore, acquiring quality mathematics education requires quality primary education. There have been calls for primary education to be of desired quality in Cameroon and perhaps other parts of the world. Reason why one of the major concerns of the Growth and Employment Strategy Paper in Cameroon (GESP) (2010, p. 50) is to "Encourage quality primary education for all and nationwide." In addition, one of the reforms envisaged with regard to Vision 2035 is "quality basic education" (GESP, 2010, p.74).

Apart from quality primary education, section 9 of Law N° 98/004 of 14 April 1998 which laid down guidelines for education in Cameroon stipulates that primary education shall be compulsory for children of school going age to acquire basic literacy, numeracy and survival skills. Other educational programs such as the Millennium Development Goals (MDG) (2000) and the World Declaration on Education for All (1990) also emphasize the need for all children of school-going age to acquire primary education. The Draft Document of the Sector Wide Approach on Education which reflects a common and coherent vision of education in Cameroon (2005, p. 27) looks at primary school as "the major system of training, to which the state has the objective of providing a solid base for continuous training for the Cameroonian child."

Background to the Study

According to MINEDUC (2000, p. 19), the general objectives for teaching mathematics in primary schools are to help the pupils:

- Become aware of the consistent structure and concise language of mathematics.
- Develop logical reasoning.
- Relate mathematics to their environment through appropriate experiences, activities and materials.
- Develop critical thinking.
- Acquire appropriate mathematical content and skills.

It is seemingly the hope of education stakeholders in Cameroon that if the above objectives which are also like goals are implemented, pupils will acquire quality mathematics education. The terminal learning outcomes according to MINEDUB (2018, p. 30) states that after learning-teaching experiences involving mathematics, learners will:

- Solve problems involving sets and logic
- Solve problems involving number operations
- Solve problems involving measurement units
- Construct different geometric shapes
- Categorize statistics on graphs
- Use mathematical skills in daily life
- Show interest in mathematics

Seemingly, it is also the expectation of education stakeholders that pupils would acquire quality mathematics education if the above objectives are implemented.

In English Speaking Primary Schools in Cameroon mathematics is one of the subjects with the highest occurrence on the weekly time table, given that it is taught for six hours thirty minutes for schools practicing the one shift system, and five hours thirty minutes for schools practicing the two-shift system. Other subjects such as citizenship, history, and geography have two hours or less for schools practicing the one shift system, and one hour for schools practicing the two shift system (MINEDUC, 2000). Consequently, in most of the classes and for most of the days, mathematics is taught more than once. This puts the primary school teacher in contact with mathematics on regular bases. This in turn requires that primary school teachers should learn adequate mathematics content and pedagogic knowledge in order to cope with the challenge.

Mathematics is among the subjects with the highest coefficient (coefficient five) in primary school, and therefore marked on one hundred. Other subjects such as history, geography, information and communication technology, are coefficient one subjects, marked on twenty. Student teachers are also expected to acquire adequate strategies on the assessment and evaluation of mathematics in the course of their training. Mathematics and English language are the two subjects assessed at the Government Common Entrance Examination, during which both subjects are weighted equally (each is weighted on one hundred). Government Common Entrance Examination is a selection examination which usually qualifies a pupil to gain admission into a secondary school. Mathematics is also one of the major subjects tested in the First School Leaving Certificate (FSLC) Examination. FSLC examination is an end of primary school examination taken by class 6 pupils. Success in this examination qualifies a pupil to an end-of-course certificate. During the FSLC Examination, mathematics and English Language have the highest coefficients (coefficient five) and therefore marked on one hundred. Other subjects such as general knowledge, arts and craft, and physical education are coefficient one subjects marked on twenty. Seemingly, the teaching of mathematics in primary schools is of paramount importance.

In English speaking Primary Schools in the South West Region, mathematics is taught in all the classes and every teacher is expected to teach mathematics in his/her class. Therefore, every teacher is expected to have learnt adequate mathematics content and pedagogic knowledge to be able to teach mathematics to his/her pupils. However, experience has shown that for a few schools, specific teachers are assigned to teach mathematics in classes five and six, while the main class teachers teach the rest of the subjects. This could either be due to the better mathematics ability of the 'specific mathematics teacher' and/or the weak mathematics abilities of the main class teachers. The same mathematics topics are taught in all the classes with increasing complexity as pupils move to higher classes. It could be suggested that pupils' performance in the different mathematics topics would be a function of how they performed in those topics in the junior classes. Consequently, the performance of pupils in mathematics in one class could to an extent depend on how they performed in the preceding classes.

According to The General Report of the Inspector Coordinator of Basic Education for the South West Region (2012), reports from the field show that there is a high rate of failure registered at the end of course examinations, classroom repetition, indiscipline and an exponential rate of school dropout. Given the place of mathematics as a key subject in school curricula (Close, 2006), it would seem likely that it plays a key role in the general performance of pupils. The percentage pass in mathematics has hardly gone up to 50% irrespective of the class and the school as shown in Appendix F (with the use of pseudo names). For example, the results of the first continuous assessment test in Government School (G.S) Bwiyuku-Meveo for 2015/2016 academic year shows that for mathematics, Class Five scored 35.29% while Class Six scored 40%. In the same academic year, the first term examination for Class Six in Catholic School Sasse shows that the class scored 37% in mathematics.

In Cameroon, the Draft Document of the Sector Wide Approach on Education (2005, p. 43) describes the knowledge acquired by pupils as mediocre. Probably, the knowledge acquired by pupils in mathematics would also be mediocre given its position as a key subject in school curricula, and that its percentage passes have hardly gone up to 50%.According to MINEDUB (2018), teachers claim ownership and are totally accountable for the implementation of the mathematics curriculum in primary school. Perhaps, teachers who are the main implementers of the mathematics curriculum and guarantors of quality mathematics education, contribute in the mediocrity. Seemingly, any efforts aimed at improving the quality of primary education in mathematics may also likely consider the improvement of teacher education in mathematics. It is against this backdrop probably that the improvements of pedagogic training (p. 77), and the management of both the personnel and the training programmes of teacher training colleges (p. 87), are among the objectives of the Draft Document of the Sector Wide Approach on Education (2005).This researcher being a former teacher trainer is motivated to find out the impact of mathematics curriculum for PSTTCs on the teaching of mathematics in English Speaking Primary Schools in South West Region.

The National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards for School Mathematics (1989), Professional Standards for Teaching Mathematics (1991) and Assessment Standards for School Mathematics (1995) as cited in (Spungin, 1996) are all of the opinion that problem solving, reasoning, and communicating mathematics are the central concerns of mathematics education at all levels. The NCTM's Professional Standards for Teaching Mathematics (1991) as cited in (Spungin, 1996) says that 'How mathematics is taught is just as important as what is taught. Students' ability to reason, solve problems, and use mathematics to communicate will develop only if they are actively and frequently engaged in these processes.' Student-teachers' knowledge on the methodology of teaching mathematics probably forms part of their mathematics pedagogic knowledge.

In Cameroon, methodology forms part of the mathematics syllabus for PSTTCs. However, the mathematics syllabus does not specify the particular methods to be used in teaching the different themes or topics. Seemingly, it is at the discretion of the mathematics teacher trainer which methods to use. Spungin (1996) holds the view that most mathematics teachers still talk too much, lecturing most of the time. He adds that for primary school student-teachers, these well-organized and enthusiastic lectures usually fall on deaf ears. Domino (2009, p. 41) opines that students tended not to like mathematics lessons in which their teachers only lectured. They tuned out these teachers and thus did not learn anything. It is likely that teaching methods influence the choice and use of instructional materials. The teaching methods, types and use of instructional materials learnt by the student-teachers will most likely affect their mathematics subject matter and pedagogic knowledge, and consequently the teaching of mathematics in primary school.

Statement of the Problem

The mathematics curriculum for Primary School Teacher Training Colleges (PSTTCs) prescribes mathematics content and pedagogic knowledge. It therefore requires of student-teachers adequate competency in the teaching and learning of mathematics. Upon graduation, student-teachers are expected to use the mathematics content and pedagogic knowledge as well as the skills and attitudes acquired during their training, to teach mathematics in primary schools.

However, literature, experience and statistics show that percentage pass in mathematics in English Speaking Primary Schools in South West Region has remained low irrespective of the class, level and the type of school (public, confessional or lay-private). Poor performance in mathematics may result in pupils developing a negative attitude towards mathematics which they may carry along to higher classes and post-primary institutions. Pupils' poor performance in mathematics could hinder them from studying subjects that have links with mathematics like economics, chemistry, and physics, as well as hinder them from studying professions that make use of mathematics like medicine, engineering and accounting. Generally, their use of numeracy would likely be hindered by their poor performance in mathematics. Pupils' inability to study professions and subjects that have links with mathematics implies that by 2035 that Cameroon would be expected to emerge, there would be relatively fewer English Speaking Cameroonians as engineers, medical doctors, accountants and architects. This would likely slow down the rate at which Cameroon would emerge by 2035.

Primary school teachers are the main implementers of the mathematics curriculum for primary schools. Primary school teachers are also the guarantors of the quality of mathematics education in primary schools. Pupils' poor performance in mathematics would suggest amongst other reasons that the teaching of mathematics in English speaking Primary Schools in South West Region still lags behind despite reforms in the mathematics syllabuses for PSTTCs in Cameroon.

Teachers' behaviour in mathematics classrooms probably affects pupils' performance in mathematics. The improvement in the quality of mathematics teaching is likely to succeed only if there is an adequate supply of suitably qualified mathematics teachers. It is against this backdrop that the researcher observes that there is a problem and wants to find out the impact that mathematics curriculum for Primary School Teacher Training Colleges has in the teaching of mathematics in primary schools, with the hope that findings from this study would help in improving the performance in mathematics in English speaking Primary Schools in the South West Region.

Objective

1. To investigate whether Mathematics pedagogic knowledge learnt in PSTTC has an impact on the teaching of mathematics in primary schools.

Research Question

1. To what extent does the mathematics pedagogic knowledge learnt in PSTTC have an impact on the teaching of mathematics in primary schools?

METHODOLOGY

The research design adopted for this study was the survey design because of the suitability of its purpose and method. A mixed research method was used in this study, whereby both qualitative and quantitative research methods were used

The study was carried out in the South West Region of the Republic of Cameroon, which is made up of six divisions namely: Fako, Meme, Ndian, Manyu, Kupe-Manenguba, and Lebialem divisions. Each of these divisions is in turn broken down into sub divisions. Each sub division has over a hundred public, confessional, and lay- private primary schools, which are accessible by road except some in the coastal regions that are accessible by boat or canoe. Thousands of pupils attend these primary schools in which teachers teach mathematics alongside other subjects.

Each of the divisions of the South West Region has at least a Public Primary School Teacher Training College commonly called Government Teacher Training College (GTTC). However, there are eight GTTCs and seven confessional and/or lay private PSTTCs in the South West Region. The South West Region also has a good number of other post primary institutions.

Two sets of population were used for this study. The first set consists of all mathematics teacher trainers in Primary School Teacher Training Colleges (PSTTC) in the South West Region of the Republic of Cameroon as shown on the table below.

Table1: Distribution of mathematics teacher trainers in PSTTCs

Division	Primary School Teacher Training College.	Number of mathematics teacher trainers
Fako	GTTC Buea	4
	GTTC Limbe	2
	St John Bosco TTC Buea	2
	Remedial TTC Buea	1
	St Andrew TTC Limbe	1
Meme	GTTC Kumba	3
	Mary Mussongo TTC Kumba	1
	NAVOC Kumba	1
Manyu	GTTC Mamfe	4
	Blessed TTC Mamfe	1
Ndian	GTTC Mundemba	3
	GTTC Akwa	1
	BuaNaseri TTC EkondoTiti	1
KupeManenguba	GTTC Bangem	3
Lebialem	GTTC Fontem	3
Total		31

From Table 1 above, Fako and Ndian Divisions each have two public Primary School Teacher Training Colleges (PSTTCs), commonly called Government Teacher Training Colleges (GTTCs), while the other divisions of the South West Region have one each. In addition, four out of the six divisions in the South West Region have a confessional teacher training college, a lay-private teacher training college, or both.

For this study, the accessible population comprises all the 31 mathematics teacher trainers in PSTTCs in the South West Region of the Republic of Cameroon. According to Amin (2005), the accessible population or the sampled population is a portion of the target population that the researcher can have access to. For this study, the target population of mathematics teacher trainers was the same as the accessible population.

The second set of population for this study consist of all primary school teachers in the south West Region of Cameroon as shown on the table below.

Table2: Distribution of Primary School Teachers in South West Region

Type of School	Number of Teachers
Public	3584
Confessional	906
Lay-Private	1992
Total	6482

Source: South West Regional Delegation for Basic Education. Summary of number of teachers for 2017/2018 school year.

Table 2 above shows that public primary schools have the highest number of teachers (3584), followed by lay-private primary schools with 1992 teachers. Confessional primary schools have the least number of teachers (906).

For this study, the accessible population of primary school teachers was made up of the primary school teachers in Fako Division.

The sample size for mathematics teacher trainers was made up of 31 mathematics teacher trainers and this was the same as the target and the accessible populations, given the small size of the target population of mathematics teacher trainers.According to Amin (2005, p. 454) the sample size depends on the population. For example the sample size (S) required for a population (N) of 25 is 24, while for a population of 30, the sample size is 28 (Amin, 2005 p. 454). The sample size for primary school teachers was made up of 45 primary school teachers who volunteered to be interviewed.

Purposive sampling technique was used given the small size of the population of mathematics teacher trainers. 31 mathematics teacher trainers of public, confessional and lay-private PSTTCs in the South West Region were used for this study. Awotunde, Ugodulunwa and Ozoji (2002) hold the view that sampling technique is a process in which a portion (sample) of a population is carefully selected and taken as representative of the population. Random sampling technique was used to obtain the 45 primary school teachers who volunteered to be interviewed.

Instrumentation

According to Kumar (2005), there are primary and secondary sources of data collection as shown on the figure below.

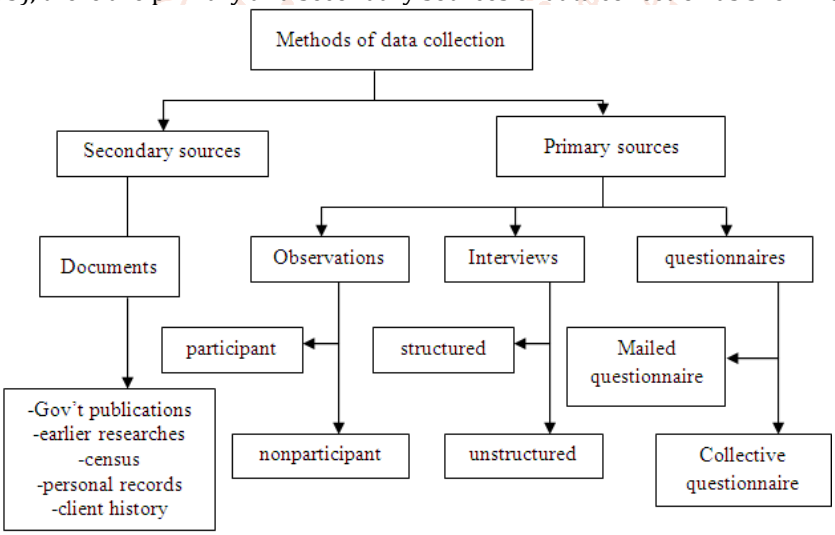

Figure1: Methods of data collection (Adapted from Kumar, 2005).

The primary sources for this study are a questionnaire and twoopen ended interview guides that were formulated by the researcher in consultation with the supervisors, and used in collecting data for the specific research questions. The secondary sources for this study are government publications.

Likert – type items were analyzed using the statistical package for the social sciences (SPSS) to obtain descriptive statistics (more specifically frequencies, percentages, distribution tables, and bar charts for graphical or pictured representation) as well as inferential statistics (using the Spearman Rank correlation) to infer whether there is a significant relationship between the independent and the dependent variables.

Decision Rule

Predetermined alpha (α) = 0.05

The sig. (2-tailed) which is the p-value is compared with α (Amin, 2005, p. 386)

When the calculated sig. (2-tailed) or p-value is greater than the predetermined α (0.05), i.e. sig.(2-tailed) > α, it implies that there is no significant relationship and so the null hypothesis would be accepted (Amin, 2005. p. 329).

When the calculated sig. (2-tailed) or p-value value is less than the predetermined α (0.05) i.e. sig.(2-tailed) < α, it implies that there is a significant relationship and so the null hypothesis would be rejected (Amin, 2005. p. 329).

By convention, it is assumed that the relationship between the independent variable and the dependent variable is:

Perfect if r = 1;

- Positive if r > 0. In this case the researcher has four possible qualities:
- Very strong if r > 0.8.
- strong if r is between 0.5 and 0.8;
- medium intensity if r is between 0.2 and 0.5;
- low if r is between 0 and 0.2

Negative if r < 0. In this case the researcher has four possible qualities:
- Very strong if r < - 0.8.
- strong if r is between -0.8 and -0.5;
- medium intensity if r is between -0.2 and -0.5;
- low if r is between -0 and -0.2;
- Zero if r = 0.

FINDINGS

The findings related to the mathematics pedagogic knowledge learnt in PSTTC were presented as on table 4 below.

Table4: Presentation of findings based on mathematics pedagogic knowledge acquired in primary school teacher training college (PSTTC).

Items	Stretched				
	UD	SD	D	A	SA
Upon graduation, student teachers are able to teach mathematics using different teaching methods such as lecture demonstration and illustrated lecture.	0 (0.0%)	0 (0.0%)	6 (19.4%)	23 (74.2%)	2 (6.5%)
		6 (19.4%)		25 (80.7%)	
Upon graduation, student teachers are able to teach mathematics using strategies such as BODMAS in calculations involving whole numbers and fractions, rhymes involving numbers, explanation of concepts and experiments.	0 (0.0%)	0 (0.0%)	12 (38.7%)	17 (54.8%)	2 (6.5%)
		12 (38.7%)		19 (61.3%)	
Upon graduation, student teachers are able to teach mathematics using teaching materials such as protractor and compass as required in geometry.	0 (0.0%)	7 (22.6%)	19 (61.3%)	5 (16.1%)	0 (0.0%)
		26 (83.9%)		5 (16.1%)	
Upon graduation, student teachers are able to teach mathematics using teaching materials developed by themselves such as real objects and concrete symbols.	0 (0.0%)	0 (0.0%)	1 (3.2%)	26 (83.9%)	4 (12.9%)
		1 (3.2%)		30 (96.8%)	
Upon graduation, student teachers are able to assess pupils' learning constantly using strategies such as practical test, oral tests and written examination, review lessons and interviews.	0 (0.0%)	0 (0.0%)	7 (22.6%)	21 (67.7%)	3 (9.7%)
		7 (22.6%)		24 (77.4%)	
Upon graduation, student teachers are able to teach mathematics using teaching resource materials such as recommended mathematics textbooks.	0 (0.0%)	0 (0.0%)	3 (9.7%)	27 (87.1%)	1 (3.2%)
		3 (9.7%)		28 (90.3%)	
Upon graduation, student teachers are able to follow a systematic procedure in solving problems in mathematics.	1 (3.2%)	1 (3.2%)	14 (45.2%)	14 (45.2%)	1 (3.2%)
		15 (48.4%)		15 (48.4%)	
Upon graduation, student teachers are able to determine when the mathematics problem is solved, write out the solution of a problem and explain the solution of a problem.	0 (0.0%)	0 (0.0%)	13 (41.9%)	18 (58.1%)	0 (0.0%)
		13 (41.9%)		18 (58.1%)	
Upon graduation, student teachers are able to teach mathematics to the understanding of low achievers.	1 (3.2%)	6 (19.4%)	18 (58.1%)	6 (19.4%)	0 (0.0%)
		24 (77.4%)		6 (19.4%)	
Upon graduation, student teachers are able to teach mathematics at a slow pace, with enthusiasm, with self-confidence, and with lessons being neither boring nor monotonous.	1 (3.2%)	5 (16.1%)	19 (61.3%)	5 (16.1%)	1 (3.2%)
		24 (77.4%)		6 (19.4%)	
Total	**3 (1.0%)**	**19 (6.1%)**	**112 (36.1%)**	**162 (52.3%)**	**14 (4.5%)**
		132 (42.2%)		**176 (56.8%)**	

About four-fifth (80.7%) of mathematics teacher trainers who responded to the questionnaire agreed that upon graduation, student teachers are able to teach mathematics using different teaching methods such as lecture demonstration and illustrated lecture. A few of them (19.4%) contested the above view and said that upon graduation, student teachers are not able to teach mathematics using different teaching methods such as lecture demonstration and illustrated lecture.

Many mathematics teacher trainers (61.3%) attested that upon graduation, student teachers are able to teach mathematics using strategies such as bracket, of, division, multiplication, addition, subtraction(BODMAS) in calculations involving whole numbers and fractions, rhymes involving numbers, explanation of concepts and experiments. Some of the mathematics teacher trainers (38.7%) said that upon graduation, student teachers are not able to teach mathematics using strategies such as BODMAS in calculations involving whole numbers and fractions, rhymes involving numbers, explanation of concepts and experiments.

According to a large majority of mathematics teacher trainers (83.9%), upon graduation, student teachers are not able to teach mathematics using teaching materials such as protractor and compass as required in geometry. A few of them (16.1%) said that upon graduation, student teachers are able to teach mathematics using teaching materials such as protractor and compass as required in geometry.

Almost all mathematics teacher trainers (96.8%) argued that upon graduation, student teachers are able to teach mathematics using teaching materials developed by themselves such as real objects and concrete symbols. A very small percentage of mathematics teacher trainers (3.2%) opined that upon graduation, student teachers are not able to teach mathematics using teaching materials developed by themselves such as real objects and concrete symbols.

A comfortable majority of mathematics teacher trainers (77.4%) held the view that upon graduation, student teachers are able to assess pupils' learning constantly using strategies such as practical test, oral tests and written examination, review lessons and interviews. However, a few of them(22.6%)said that upon graduation, student teachers cannot comfortably assess pupils' learning constantly using strategies such as practical test, oral tests and written examination, review lessons and interviews.

An overwhelming majority of mathematics teacher trainers (90.3%) generally agreed that upon graduation, student teachers are able to teach mathematics using teaching resource materials such as recommended mathematics text books. A contrary view is however shared by some 9.7% of them who instead held the opinion that upon graduation, student teachers are not able to adequately teach mathematics using teaching resource materials such as recommended mathematics textbooks.

The opinion of mathematics teacher trainers was equally shared with respect to student teachers' ability to follow a systematic procedure in solving problems in mathematics upon their graduation. 48.4% of mathematics teacher trainers agreed that upon graduation, student teachers are able to follow a systematic procedure in solving problems in mathematics. A similar 48.4% of mathematics teacher trainers instead argued that upon graduation, student teachers are not able to follow a systematic procedure in solving problems in mathematics. A few of them (3.2%) were however undecided on whether or not student teachers are able to follow a systematic procedure in solving problems in mathematics upon their graduation.

A small majority of mathematics teacher trainers (58.1%) opined that upon graduation, student teachers are able to determine when the mathematics problem is solved, write out the solution of a problem and explain the solution of a problem. A good number of them (41.9%) opposed the view of that small majority, and instead said that upon graduation, student teachers are not able to determine when the mathematics problem is solved, write out the solution of a problem and explain the solution of a problem.

A large majority of mathematics teacher trainers (77.5%) said that upon graduation, student teachers are not able to teach mathematics to the understanding of low achievers. A handful of them (19.4%) were rather of the opinion that upon graduation, student teachers are able to teach mathematics to the understanding of low achievers. Very few of them (3.2%) were undecided on whether or not student teachers upon their graduation are able to teach mathematics to the understanding of low achievers.

The item which says that upon graduation, student teachers are able to teach mathematics at a slow pace, with enthusiasm, with self-confidence, and with lessons being neither boring nor monotonous was highly contested by most mathematics teacher trainers (77.4%). A small percentage of them (19.4%) held the view that upon graduation, student teachers are able to teach mathematics at a slow pace, with enthusiasm, with self-confidence, and with lessons being neither boring nor monotonous. Very few of them (3.2%) were undecided on whether or not upon graduation, student teachers are able to teach mathematics at a slow pace, with enthusiasm, with self-confidence, and with lessons being neither boring nor monotonous.

Generally, a slightly above average percentage of mathematics teacher trainers (56.8%) shared the view that upon graduation, student teachers acquire mathematics pedagogic knowledge to enable them teach mathematics in primary school. A good number of them (42.2%) argued that upon graduation, student teachers do not acquire enough mathematics pedagogic knowledge to enable them teach mathematics in primary school. Very few of them (1%) were undecided so far as the issue of mathematics pedagogic knowledge is concerned.

Table5: The impact of mathematics pedagogic knowledge acquired in PSTTC on the teaching of mathematics in primary school

Math Pedagogic Knowledge * The teaching of math in primary school Crosstabulation						
			The teaching of math in primary school			Total
			Disagree	Agree	Strongly Agree	
Math Pedagogic Knowledge	Agree	Count	6	18	5	29
		% of Total	19.4%	58.1%	16.1%	93.5%
	Strongly Agree	Count	0	1	1	2
		% of Total	0.0%	3.2%	3.2%	6.5%
Total		Count	6	19	6	31
		% of Total	19.4%	61.3%	19.4%	100.0%

Table 5 shows that 93.5% of mathematics teacher trainers agreed on the mathematics pedagogic knowledge learnt in PSTTC, while 61.3% of them agreed on the teaching of mathematics in primary school. In a similar manner, 6.5% of mathematics teacher trainers strongly agreed on the mathematics pedagogic knowledge learnt in PSTTC, and 19.4% of them strongly agreed on the teaching of mathematics in primary school. Generally, all mathematics teacher trainers (100.0%) were in agreement so far as mathematics pedagogic knowledge learnt in PSTTC is concerned. About four fifth of them (80.7%) generally agreed on the teaching of mathematics in primary school. This shows that there is a very strong relationship between mathematics pedagogic knowledge and the teaching of mathematics in primary school.

Mathematics pedagogic knowledge and the teaching of mathematics in primary school is shown in picture form below.

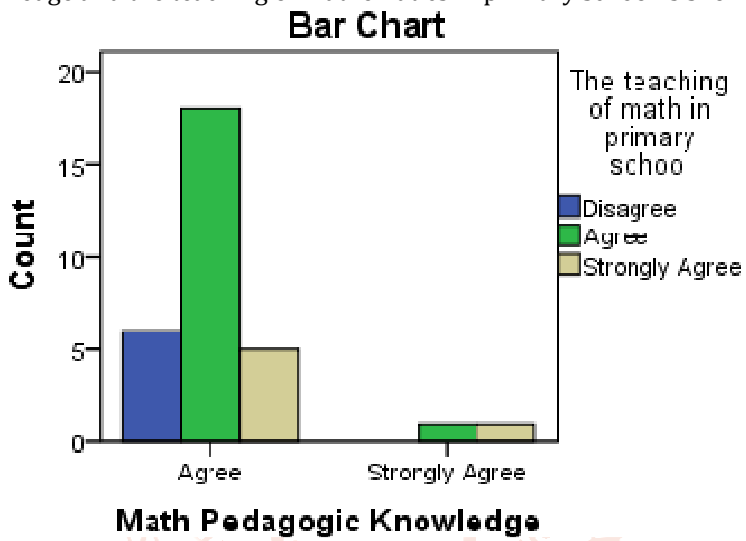

Figure2: Mathematics pedagogic knowledge and the teaching of mathematics in primary school

Figure 2 shows that most of the respondents who agreed on the acquisition of mathematics pedagogic knowledge in PSTTC also agreed on the teaching of mathematics in primary school. Some of those who only agreed on the mathematics pedagogic knowledge strongly agreed on the teaching of mathematics in primary school.

The figure also shows that some of the respondents, who agreed on the acquisition of mathematics pedagogic knowledge, disagreed on the teaching of mathematics in primary school.

Specific Research Hypothesis

Ho_1: Mathematics pedagogic knowledge acquired in PSTTC has no significant effect on the teaching of mathematics in primary school.

Ha_2: Mathematics pedagogic knowledge acquired in PSTTC has a significant effect on the teaching of mathematics in primary school.

Table Correlations of Mathematics Pedagogic Knowledge and the Teaching of Mathematics in Primary School

			Math Pedagogic Knowledge	The teaching of math in primary school
Spearman's rho	Math Pedagogic Knowledge	Correlation Coefficient	1.000	.211
		Sig. (2-tailed)	.	.254
		N	31	31
	The teaching of math in primary school	Correlation Coefficient	.211	1.000
		Sig. (2-tailed)	.254	.
		N	31	31

According to Amin (2005, p. 386), the sig (2-tailed) or p-value is compared with the predetermined α value of 0.05 and a decision taken. Amin (2005, p. 329) says that if the calculated sig. (2-tailed) or p-value is greater than the predetermined α value of 0.05, then the null hypothesis is accepted.

According to Table above the calculated sig. (2-tailed) or p-value (0.254) is greater than the predetermined α value of 0.05. That is, Sig.(2-tailed) of 0.254> α (0.05),implying that there is no significant relationship between the mathematics pedagogic knowledge learnt in PSTTC and the teaching of mathematics in primary school. Therefore H_{a2} is rejected and H_{02} is accepted. Thus in this study, the mathematics pedagogic knowledge learnt in PSTTC has no significant impact on the teaching of mathematics in English Speaking Primary Schools.

Presentation of Findings Related to Interview of Primary School Teachers

The researcher interviewed 45 primary school teachers on three questions that have direct relationship with the research questions and are therefore made up of items that are included in the questionnaire. This was to find out if the responses from primary school teachers have any corroboration with the responses of the mathematics teacher trainers got from the questionnaire and/or interview. The 45 primary school teachers (T) were coded as T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39, T40, T41, T42, T43, T44, and T45 whereby T1 corresponds to the 1st primary school teacher and T45 corresponds to the 45th primary school teacher. Therefore the "T1" responses were those of the first primary school teacher, while "T45" responses were those of the 45thprimary school teacher.

Question a: Do teachers teach mathematics using different teaching methods and different instructional materials?

Out of the 45 respondents, 12 answered positively that teachers teach mathematics in primary school using different teaching methods and different instructional materials. 33of the respondents responded negatively. According to them, teachers do not teach mathematics using different teaching methods and different instructional materials.

In an attempt to find out the reasons for their different opinions, the researcher probed.

Are there any reasons?

The responses of the 12 primary school teachers who answered positively are presented below:

T1, T2, T3, T4, and T5: Teachers present instructional materials while teaching maths, especially when teaching classes one and two.

T6, T7, T8: There is no way a teacher will teach maths in say class one without demonstrating with the use of instructional materials.

T9 and T10: Teachers sometimes use themselves or their body parts for demonstration.

T11 and T12: Teachers use different teaching methods and different instructional materials to teach maths in junior classes.

The 33 teachers who responded in the negative gave the following as their reasons:

T13, T14, T15, T16, and T17: Parents do not even provide basic instructional materials to their children so the teacher tries to do what he/she can do.

T18, T19, T20, and T21: Many teachers do not know the maths and therefore do not know how to teach it.

T22, T23, T24, T25, and T26: Instructional materials and different methods were used in PSTTC where one needed marks. Teachers do not want to incur cost as they did in PSTTC. For example, buy charts and then pay someone to draw.

T27, T28, T29, T30, T31, T32, T33, and T34: Teachers use methods that will cost them little or nothing, even if other methods would have been better.

T35 and T36: Some teachers do not know different methods.

T37, T38, and T39: Teachers do not devote time to prepare instructional materials, they mostly lecture.

T40: It is not easy carrying bulky things to school all the time so teachers manage what they can.

T41: Most schools do not assist in providing and teachers do not want to spend their money.

T42: In some schools, the materials cannot be well preserved and the teachers feel bored carrying them all the time.

T43, T44, and T45: Some teachers do not know instructional materials like protractor, compass, etc., talk less of using them.

The above responses could be put into four categories: teachers' lack of knowledge of mathematics, teaching methods and instructional materials; lack of motivation from both school authorities and parents; teachers do not want to spend time and money; and teachers mostly lecture avoiding methods that would require materials. Shulman (1986) opine that content knowledge and pedagogic knowledge are complementary to each other. Seemingly, a teacher who lacks mathematics content knowledge would likely lack mathematics pedagogic knowledge, given that the teachers would seldom have knowledge on how to teach what he/she does not know. It could be suggested that teachers who lack knowledge of mathematics equally lack knowledge on the different teaching methods and the different instructional materials that can be used in teaching mathematics.

According to expectancy theory (Vroom, 1964), motivation influences one's ability to do work. Ornstein and Hunkins (2009) posit that parents and the school administration are among the key players in the implementation of acurriculum. Spungin (1996) stresses the need to use manipulative in teaching mathematics. Perhaps parents and school authorities have not been doing enough to motivate teachers on the use of instructional materials. Perhaps it is due to lack of motivation that teachers do not want to spend time and

money to get instructional materials. In the absence of instructional materials, teachers most often use the pure lecture method, confirming the argument of Spungin (1996) who says that teachers lecture while teaching mathematics. Given the different responses with respect to teachers' use of teaching methods and instructional materials, the researcher went ahead to find out if teachers solve mathematics problems systematically explaining clearly to the understanding of slow learners.

Question b: Do teachers solve problems systematically explaining clearly to the understanding of slow learners?

Out of the 45 respondents 15 answered in the positive. They opine that teachers solve mathematics problems systematically, explaining clearly to the understanding of slow learners. 30 respondents answered in the negative. They argue that teachers do not solve mathematics problems systematically, and they do not explain clearly to the understanding of slow learners.

The researcher elicited in order to find out the reasons for their varied responses.

Why do you think so please?

The reasons for the teachers who answered in the positive are presented below.
T1, T2, T3, T4, T5, T6, T7, and T8: That is possible for classes one and two where maths is easy and mostly involves only one step.

T9 and T10: The teachers who teach only mathematics in classes five and six are trying their best

T11, T12, T13, T14, and T15: Teachers explain up to the level that they know.
From the different responses, it could be suggested that primary school teachers solve mathematics problems systematically and explain to the understanding of slow learners only in classes one and two, where the mathematics is less challenging with just one step.

The reasons for the 30 teachers who answered in the negative were as follows:
T16, T17, T18, T19, T20, T31, T22, T23, T24, and T25: Most teachers do not know maths and can't solve or explain clearly.

T26, T27, T28, T29, T30, and T31: Teachers only explain up to what they know and cannot explain what they do not know
T32, T33, T34, T35, T36, T37, T38, and T39: Many teachers try just to get the answers.

T40, T41, T42, T43, T44 and T45: Many teachers concentrate on the fast learners. When the teacher asks: 'have you understood?' The fast learners quickly answer 'yes sir/madam'.

Based on the above reasons, it could be suggested that teachers' weak mathematics ability is the main reason why teachers find it difficult to solve problems systematically, explaining to the understanding of slow learners. Of course a teacher cannot clearly explain in a step-by-step manner what he/she does not know. It boils down to the argument that mathematics content knowledge is a prerequisite to the teaching of mathematics (Shulman, 1986).

In spite of the responses of primary school teachers with respect to their mathematics content knowledge, use of teaching methods and instructional materials, and the ability to solve mathematics problems systematically and explain clearly to the understanding of slow learners, the researcher went ahead to find out whether teachers teach mathematics without their lessons being boring and monotonous.

Question c: In your opinion, do teachers teach mathematics without their lessons being boring and monotonous?

Out of the 45 respondents, 10 answered positively. According to them, teachers teach mathematics without their lessons being boring and monotonous. 35 teachers responded negatively. These opine that teachers teach mathematics with their lessons being boring and monotonous.

The researcher probed in order to find out the reasons for their responses.

Why do you say that please?

The 10 teachers who answered in the positive gave the following as their reason:
T1, T2, T3, T4, T5, T6, and T7: It is in a playing manner in classes one and two, so pupils enjoy it.

T8, T9, and T10: It is interesting for example in class one where pupils learn while playing with their 'counters'

The reasons for those who responded negatively are presented below.
T11, T12, T13, T14, and T15: Many teachers do not like maths and do not teach it lively.

T16, T17, T18, and T19: Some pupils have the knowledge that maths is difficult and they do not pay much attention during maths lessons.

T20, T21 and T22: Many teachers do not know maths. They manage to teach it just because it is on the timetable.

T23, T24, T25, T26 and T27: Maths is boring especially when pupils are taught topics/lessons that were skipped in previous classes."

T28, T29, and T30: Some teachers even say maths is boring to them. The way such teachers teach maths would likely be boring to the pupils.

T31, T32, T33, T34, T35, T36, and T37: Some teachers concentrate on the fast learners, thereby making their lessons boring to the slow learners who are mostly the majority.

T38, T39, T40, T41, T42, and T43: Some teachers do not use teaching aids that can help make their lessons interesting.
T44 and T45: Some teachers do not use different teaching methods that can make their lessons lively.

Based on the opinions of the respondents, the responses were categorized into three: teachers' lack of mathematics content knowledge, teachers' lack of mathematics pedagogic knowledge, and teachers' lack of enthusiasm in mathematics and the teaching of mathematics. According to Goulding et al (2002), teachers without adequate mathematical subject matter knowledge are usually weak in understanding mathematical concepts and will be poor in planning and teaching mathematics. Seemingly, teachers with weak mathematics ability would likely be weak in planning and teaching mathematics, resulting in their lessons being boring and monotonous. Brophy and Good (1989) as cited in Domino (2009) state that teachers with limited background and low interest in the subject being taught may teach incorrect content or fail to recognize and correct learners' misconceptions. It could be suggested that teachers with weak mathematics ability, and who do not have enthusiasm in mathematics and the teaching of mathematics, may teach incorrect content as well as fail to recognise and correct pupils' misconceptions, thereby making their lessons boring and monotonous.

After getting the opinions to primary school teachers with respect to mathematics content knowledge and mathematics pedagogic knowledge, the researcher decided to find out the extent to which teachers were motivated to learn mathematics before and during their training in PSTTC. Since mathematics is one of the subjects examined at the entrance into PSTTC, the researcher started by finding out whether teachers were motivated to learn mathematics while preparing for the entrance examination into PSTTC.

Findings revealed that the mathematics pedagogic knowledge learnt in PSTTC has no significant impact on the teaching of mathematics in English Speaking Primary Schools in South West Region. These findings tie with those of Noémi (2013) who states that "when talking about pedagogical training the classical form of training do not have a positive impact on the students that study to become teachers". By implication, the mathematics pedagogic training given to student teachers do not have a positive impact on them and thus on the teaching of mathematics in primary school.

Mathematics teacher trainers said that the weak mathematics ability of student teachers inhibits their ability to learn the use of teaching methods, teaching strategies, teaching techniques and instructional materials in teaching mathematics. Therefore content knowledge and pedagogic knowledge affect each other. This is in line with Pedagogic Content Theory (Shulman, 1986) which says that pedagogy cannot be separated from content. Therefore the weak mathematics ability of student teachers negatively affects any efforts towards the teaching/learning of mathematics pedagogy, thereby having a negative impact on the teaching of mathematics in primary schools. It is perhaps for this reason that Shulman (1986) blends content and pedagogic knowledge to form pedagogic content knowledge, due to the intimate relationship that exists between the two. According to Cochran (1997), both teachers' pedagogical knowledge and teachers' subject matter knowledge are crucial to good mathematics teaching and learner understanding. Bekdemir (2010) and Goulding et al. (2002) are of the opinion that weakness in mathematics content knowledge negatively affects the teaching of mathematics. Given that the mathematics content knowledge that student teachers learn in PSTTC is inadequate, it goes without saying that they are also deficient in mathematics pedagogic knowledge, thereby negatively affecting the teaching of mathematics in primary schools. Similarly, primary school teachers who have limited mathematics content knowledge would also be limited in mathematics pedagogic knowledge, thereby having a negative impact on the teaching of mathematics in primary school.

Primary school teachers said that they mostly use instructional materials to teach mathematics in classes one and two, and seldom use them in higher classes. Spungin (1996) states that the use of manipulative (physical objects that can be picked up, moved about, and rearranged to model mathematical ideas) in teaching mathematics is very important as they have been used for many years to help learners understand abstract ideas such as number, numeration, basic arithmetic operations, and spatial relationships. Unfortunately, mathematics teacher trainers shared the view that upon graduation, student teachers are unable to adequately use instructional materials in the teaching of mathematics in primary schools. For example, upon graduation, student teachers cannot adequately use the compass and the protractor, in the teaching of geometry. Primary school teachers on their part, said that they do not want to spend money in buying or preparing instructional materials, they do not always find time to assemble and/or prepare instructional materials, and they feel bored carrying instructional materials to school. Some of them cannot identify instructional materials like the compass and the protractor, some of them are unable to adequately use some instructional materials, and most school authorities and parents do not motivate them in the acquisition and use of instructional materials.

According to expectancy theory (Vroom, 1964), motivation influences one's ability to do work. Ornstein and Hunkins (2009) posit that parents and the school administration are among the key players in the teaching/learning process. Perhaps it is due to lack of motivation that teachers do not want to spend time and money to acquire and use instructional materials. In the absence of instructional materials, teachers most often use the pure lecture method, confirming the argument of Spungin (1996). Parents and school authorities may need to step up their support for the acquisition and use of instructional materials in order to improve on the teaching of mathematics in primary schools.

Apart from helping learners to understand abstract ideas such as number, numeration, basic arithmetic operations, and spatial relationships, the use of manipulative in teaching mathematics also enables all pupils to be actively involved in doing mathematics, and pupils understand best when actively engaged in the construction or visualization of the mathematics (Spungin, 1996). The inability of student teachers and some primary school teachers to adequately use instructional materials puts to doubts the extent to which they master the use of manipulative in the teaching of mathematics. Similarly, the non use of instructional materials by primary school teachers either because they do not want to spend money and/or time, puts to question the extent to which the teaching of mathematics in primary school is effective. This therefore has a negative impact on the teaching of mathematics in primary schools because

given that all pupils would neither be involve in doing mathematics nor have a better understanding of mathematics.

A problem-solving course emphasizes problem-solving strategies such as simplify the problem, gather and organize data, look for patterns, and generalize, if possible (Spungin, 1996). Student teachers graduate from PSTTC without being able to systematically solve problems in mathematics. Upon graduation, student teachers are unable to determine when the mathematics problem is solved, write out the solution of a problem and explain the solution of a problem. This is a call for concern given that student teachers carry such unsystematic way of solving mathematics problems to their classrooms and this has a negative impact in the way pupils understand and perform in mathematics. Primary school teachers testified that many of them cannot solve mathematics problems systematically nor clearly explain the solution of mathematics problem to their pupils, due to their own limited mathematics content knowledge.

Dooren et al. (2002) say that, the way a student teacher evaluates pupils' work in mathematics would to a certain extent reflect the way the student teacher had solved the problem himself/herself. According to Dooren et al. (2002), many primary school student teachers did not use the correct procedure in solving problems in mathematics. The unsystematic way in which student teachers solve problems in mathematics, the wrong procedure that student teachers use in solving mathematics, and their inability to determine when a mathematics problem is solve, negatively affect the way they evaluate pupils' work in mathematics. Seemingly therefore, student teachers would teach and evaluate the unsystematic or incorrect procedures upon graduation, and the consequences on the pupils' understanding and performance are obvious.

The use of strategies in solving problems in mathematics is also an important concern. By working in groups, sharing ideas, and making and testing conjectures, student teachers gain confidence in their own ability to do mathematics and develop a variety of useful problem-solving strategies (Spungin, 1996). This is in accordance with the views of Bruner (1966) who argues that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. According to Spungin (1996), one of the reasons for the failure of many learners in mathematics is the overemphasis on rote memorization of facts and procedures rather than on underlying understandings. Upon graduation, student teachers cannot use strategies to solve problems in mathematics. Primary school teachers attested that some of them barely try to get the answers to mathematics problems without necessarily being able to clearly explain the solutions to their pupils. The inability of student teachers and primary school teachers to use strategies in solving problems in mathematics would likely have a negative impact on the teaching of mathematics in primary schools.

Mathematics teacher trainers opine that upon graduation, student teachers are unable to teach mathematics at a slow pace, and that student teachers are also unable to teach mathematics with enthusiasm, self-confidence, and with their lessons being neither boring nor monotonous. Primary school teachers corroborated this opinion of mathematics teacher trainers by saying that the teaching of mathematics in primary school is usually boring since teachers seldom use a variety of teaching methods and instructional materials. Primary school teachers add that the teaching of mathematics in primary school is also boring when a teacher is teaching a topic/lesson that was skipped in the previous class since the pupils will have little or no previous knowledge. These go a long way to affect pupils' attitude towards mathematics. This is in line with the findings of Domino (2009) who states that teachers' behaviours in mathematics classroom have a large impact on learners' attitudes towards mathematics. If the teachers have boring and monotonous mathematics lessons, teach at a rapid pace, and are not enthusiastic about mathematics or the teaching mathematics, then they will influence pupils' attitude towards mathematics in a negative way (Domino, 2009). This negative influence on pupils' attitude towards mathematics has far reaching consequences on their performance and achievement in mathematics.

Teachers' behaviour in mathematics classrooms and its negative effects on pupils' attitude towards mathematics probably have a negative effect on pupils' understanding of mathematics as well. Upon graduation, student teachers are unable to teach mathematics to the understanding of low achievers. Student teachers' inability to teach mathematics at a slow pace and with enthusiasm, but rather teach at a rapid pace with the lessons being boring and monotonous, goes to explain why upon graduation, they are unable to teach mathematics to the understanding of low achievers. According to primary school teachers, they most often teach mathematics at the pace of fast learners at the detriment of slow learners who often simply join the fast learners in answering that they have understood the mathematics concept or solution, whereas they have not.

Mathematics teacher trainers responded in the questionnaire that the mathematics curriculum for PSTTC does not state the teaching methods to be used in teaching the different topics in the syllabus. Their responses in the interview corroborated that of the questionnaire, as they attested that it is the discretion of the teacher trainer on which teaching method to use. However, most mathematics teacher trainers said that upon graduation, student teachers are able to teach mathematics using different teaching methods such as lecture demonstration and illustrated lecture, though a hand full of them opposed that view. Primary school teachers concurred that some of them use different teaching methods in teaching mathematics especially in classes one and two, with the aid of instructional materials and sometimes their own body or body parts. Primary school teachers also concurred that some of them do not use different teaching methods due to their weak mathematics ability and lack of interest in mathematics and in the teaching of mathematics. Primary school teachers however argued that most of them use the pure lecture method in teaching mathematics, avoiding the use of methods that would require the use of instructional materials (in order not to spend time and money). This is in line with the views of Spungin (1996) who states that most mathematics teachers at all levels still talk too much, lecturing most of the time. Spungin(1996) says that for many student teachers, these usually well-organized and enthusiastic lectures fall on deaf ears It could be suggested that mathematics teacher trainers and primary school

teachers also talk too much, lecturing most of the time, with their lectures falling on the deaf ears of student teachers and pupils respectively, making their lessons boring and monotonous. These consequently have a negative impact on the teaching of mathematics in primary school..

According to Huillet(2009. p. 9) teachers tend to teach in the same way they have been taught. This is in line with Social learning theory (Bandura, 1977). By implication, student teachers have a high chance of observing and modelling the teaching methods used by mathematics teacher trainers and cooperating teachers. Unfortunately, primary school teachers attested that they observed and modelled much of these behaviours while in PSTTC and particularly during teaching practice because it could earn them higher marks. As in-service teachers, they lack motivation, and are instead avoiding the use of teaching methods that would cause them to spend time and/or money. The inability of some student teachers and many primary school teachers to adequately use different teaching methods in teaching mathematics has far reaching consequences on the teaching of mathematics in primary schools.

Bekdemir (2010) states that most primary school teachers teach mathematics using traditional methods such as devoting more time to seatwork and whole-class instruction and teaching rote memorization and fewer concepts. As a result, they generally neglect to consider their pupils' learning styles and therefore, might unintentionally create mathematics anxiety in their pupils. The teaching methods, teaching techniques, teaching strategies and instructional materials used in teaching mathematics in primary school could be a reflection of the way mathematics is taught in PSTTC and this might have an impact in the teaching of mathematics in primary schools.

Mathematics teacher trainers posited that the weak mathematics ability of student teachers inhibits their ability to learn the use of teaching methods, teaching strategies, teaching techniques and instructional materials in teaching mathematics. This is in line with Pedagogic Content Knowledge Theory (Shulman, 1986) which says that pedagogy cannot be separated from content. Therefore the weak mathematics ability of student teachers negatively affects any efforts towards the teaching/learning of mathematics pedagogy, thereby having a negative impact on the teaching of mathematics in primary schools.

Lewin and Stuart (2003) say that the actual ways in which teachers acquire and use professional knowledge in low-income countries are not well understood. They add that teacher training in many developing countries is more theoretical with little practice, and therefore unable to produce qualified teachers. There are reasons to doubt the quality of teachers produced in PSTTC with respect to their teaching to mathematics, given that student teachers are found wanting in mathematics pedagogic knowledge just as in mathematics content knowledge.

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