The Need for a Context-Based Training Model: Reconceptualizing Pre-Service Primary Teacher Education in Kenya

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Abstract

Many studies have positively linked learner achievements to teacher quality. However, there has been an outcry in many African countries on low achievement of primary school pupils despite heavy investments in the sector. This has been largely attributed to poor quality of teachers as a result of the traditional concurrent content-based model of training that is structurally fragmented and conceptually impoverished and thus does not provide pre-service teachers with an opportunity to effectively engage in their learning. Consequently, pre-service teachers are not able to connect theory to practice. This study aimed at formulating a suitable pre-service primary teacher training model for Kenya and was guided by four null hypotheses. A quasi-experimental research design in form of pre-test/post-test longitudinal panel control group was used. This consisted of a stratified random sample of 80 first year pre-service teachers from Meru and Egoji colleges (40 for experimental and 40 for control groups). Primary teacher training colleges in Kenya select students from a national pool based on the same minimum entry criteria. The selection of the two colleges is meant to control experimental treatment diffusion. The experimental group was sub-divided into focus discussion groups of ten of equal gender proportions. The experimental group was treated through the use of focus discussion groups and use of reflective practice diaries which were components of the proposed pre-service primary teacher context-based learning model while the control group learnt under the traditional concurrent content-based training model. Pre-tests and post-tests in form of actual classroom observations were made for each member of the experimental and control groups. The findings obtained through the use of a t-test of independent means showed that the experimental group performed better than the control group. This led to the formulation of a context-based pre-service primary teachers training model that will help primary pre-service teachers link theory to practice and thus improve the quality of their teaching in primary schools.

Key Words: Context-based Learning, Cooperative Learning, Focus Discussion Groups, Pre-Service Teachers, Reflective Practice, School-based Learning, Traditional Concurrent Content-based learning Model.

Introduction

Teacher quality is positively correlated with learner achievements (McArdle, 2010; Darling-Hammond, Wei and Johnson, 2005). The Government of Kenya (1964; 1976; 1988) through education commission reports, has pointed out that teachers and classroom processes are central to learner performance. Similarly, the Dakar Education Summit in Senegal in April 2000 argues that teachers are essential in promoting quality education (KESSP; 2005). Dembele and Miaro-II, (2003) note that studies done in African countries show that the influence of the teacher on pupil learning is more important than the effects of other factors such as availability of resources. In this study, extraneous factors such as availability of resources were controlled through randomization, use of a control group and not revealing the purpose of the study to the respondents. This means that there is a strong relationship between teacher's pedagogical skills and the quality of learning that occurs in their classrooms. Schwille, Dembele and Schubert (2007) note that researchers have suggested that teaching is arguably the strongest school-level determinant of learner achievement. A report by UNESCO (2005) and Dembele and Miaro-II (2003) indicate that poor quality teachers lead to poor quality teaching since the teacher is the most influential factor in a learner's performance.

Research has proved that despite the proven gains in primary school enrollment in many African countries, learners' performance and achievement has remained low (Government of Kenya, 2012; GoK 2005; the Kenya Education Sector Support Programme document of 2005-2010, 2005; ,Kisirkoi and Kadenyi, 2012 and Akyeampong, 2002). This has generally been attributed to low teacher quality. (Awuor, 2013; Kisirkoi and Kadenyi, 2012). Awuor (2013) and Salhberg (2011) indicate that the most important component in student learning is an excellent teacher.

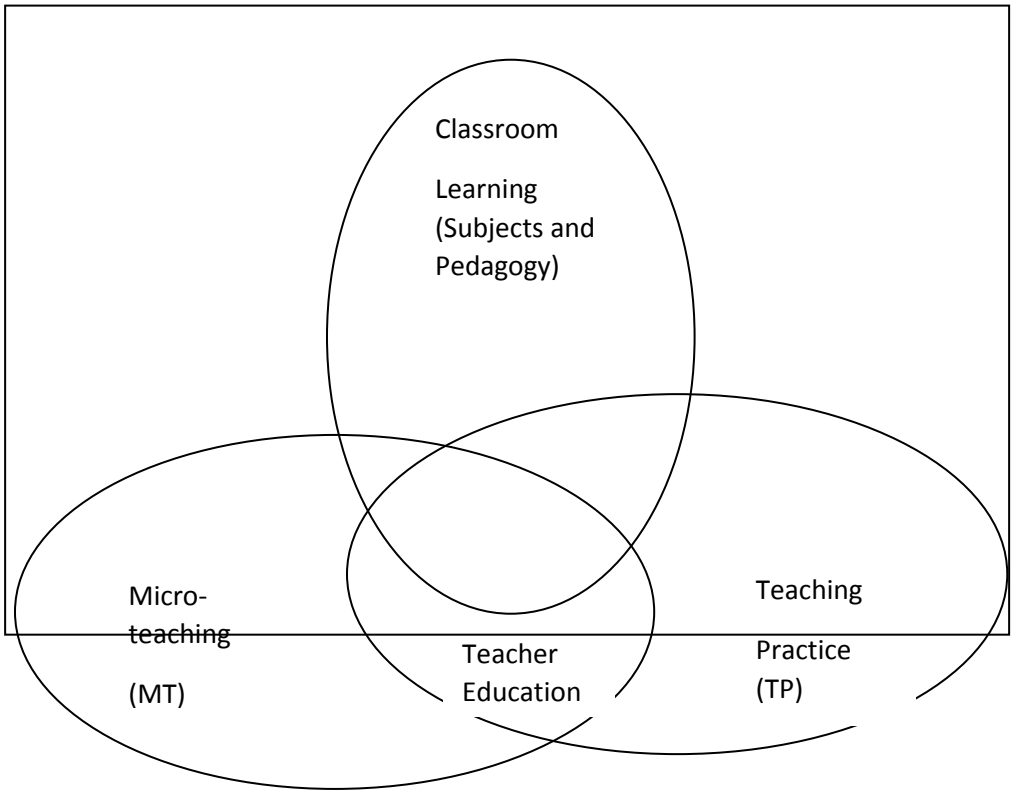
The quality of primary school teachers is low in many African countries due to the structurally fragmented and conceptually impoverished traditional training models used in their training as noted by Feiman-Nemser (2001), Wanzare (2002) and Dembele and Miaro-II (2003). This observation is supported by a UNESCO (2005) report which indicates that large proportions of primary school teachers in developing countries lack adequate training and content knowledge. The said UNESCO (2005) report attributes this to an ineffective pre-service teacher education. Pre-service teacher education particularly in developing countries utilizes traditional concurrent content-based pedagogical models and approaches to teacher education that are structurally fragmented and conceptually impoverished leading to lack of adequate learner involvement, lack effective relationship between theory and practice and of mechanisms to help teachers creatively seek solutions to teaching professional problems in their specific day-to-day teaching environments.

In Kenya, the government Sessional Paper No. 1 of 2005 on Policy Framework for Education, Training and Research, MoEST report (2003), Wanzare (2002), Republic of Kenya (1999), Bogonko (1992), Shiundu and Omulando (1992) and Republic of Kenya (1988) support this argument and indicate that the traditional concurrent content-based primary teacher education model in Kenya has fragmented courses and lacks adequate learner involvement. The MoEST report (2003) notes that the traditional teacher education model does not connect teacher training with the actual experiences in the classroom. It is primarily concerned with the transference of content. The Sessional Paper No. 1 of 2005 and the MoEST report (2003) point out the need for continuous improvement on teacher training in Kenya through development of innovative training models and techniques.

Carter (2000) argues that teachers can only be as strong as the training they receive. This means that if there are higher chances of quality teaching in schools, then there is quality pre-service teacher training.Educationists and researchers agree that there is need to improve teacher education or reform it altogether in Eastern and Southern Africa (UNESCO, 2005; Wanzare, 2002; Moorosi, 1996; Shongwe, 1996). This may be addressed through innovative primary teacher education training models and techniques such as the context-based learning model. Kiggins (2007) opines that we need to note the fact that what we expect a beginning teacher to know and be able to do is continually evolving in line with the constantly changing world and thus there is need for continuous innovation in the pre-service teacher training models. The focus of this study was on context-based learning model of training pre-service primary teachers. The model has four components namely; Classroom Learning and Micro-teaching, School-based learning, Cooperative learning and Reflective practice learning. The Context-based pre-service primary teacher training model incorporates Cooperative learning and Reflective practice learning components with a view of helping pre-service teachers link theory to practice based on their respective teaching environment and thereby help them contextualize their learning during school-based learning. All these components are aimed at producing quality teachers. This study was limited to a pre-service primary teacher's classroom teaching. The variables of focus in the study were: teacher-learner classroom interactions, teacher's motivation of learners**,** teacher instructional system planning, teacher's use of instructional resourcesin the classroom and teachers' classroom management and control skills. Though there has been improvement on pre-service primary teacher training in Kenya through reduction of subjects, allowing trainees to specialize, raising the minimum entry requirements and increasing the entry grade of teachers joining teacher training colleges, the training model used has largely remained the same.

The MoEST report (2003) indicated that not much has been done to review the traditional concurrent content model of training pre-service teachers in Kenya. The model is concurrent because all the components namely; teaching content, pedagogical knowledge and skills, and teaching skills are integrated. It is content-based and pedagogical since it emphasizes on knowledge and skills acquisition with little room for learner participation (Thomas, 1997). According to the MoEST report (2003), the pre-service primary teacher education model in Kenya comprises three components namely; college classroom learning (Pedagogy and teaching subjects), micro-teaching and teaching practice. The components are supposed to interact as indicated in Fig 1.1 to produce a qualified primary school teacher.

Fig. 1.1 Current Kenya pre-service primary teacher education model



Source: MoEST (2003)

During college classroom learning, pre-service teachers are taught educational professional courses and teaching subjects. The educational professional courses such as Instructional methods, Sociology of Education and Philosophy of Education are offered as one subject known as Professional Studies.

The teaching subjects are categorized as follows: Language Education (English & Kiswahili), Mathematics, Science Education, Social Studies (Geography & History) and CRE/IRE. Micro-teaching entails short practical teaching sessions (normally between 8-10 minutes long) through the use of fellow pre-service teachers as learners under the supervision of a tutor. The pre-service teacher is then evaluated by both colleagues and the tutor after each micro-teaching lesson. Teaching practice involves actual attachment of pre-service teachers in primary schools for practical application of knowledge and skills acquired during the college classroom learning and micro-teaching. This is done three times for a period of about three weeks, each spread across the two years pre-service primary teacher training programme. The 1st teaching practice is done during the first term and first year of pre-service teachers' training and the other two are done during the 2nd year of training.

Pre-service teacher training that incorporates the three components is expected to produce a qualified primary school teacher. However, as noted by Armour and Booth (1999) and Hoban (1999), teacher education graduates in many countries often feel inadequate in their preparation for classroom teaching. This situation as pointed out by Shiundu and Omulando (1992); Kiggins (1999); Hoban (1999), Carter (2000), Feiman-Nemser (2001) and Mitchell, Hunter, Stevenes and Mayer (2005) could be due to a fragmented view of learning as a result of the way teacher education courses are presented.Often, their delivery is not context-based, leading to little or no connection between theory and practice to a teacher trainee.

It also gives little room and sometimes none at all for the learner to effectively participate in his or her learning. Feiman-Nemser (2001) argues that teacher education in many countries is structurally fragmented and conceptually impoverished. This raises the problem of lack of connecting tissue holding things together within or across the different phases of learning to teach. Kiggins (2007) emphasizes that, it is imperative that pre-service teachers be equipped with alternative teaching strategies that can meet the challenges of the ever changing world. Therefore, there is need for development of innovative teacher education techniques such as the context-based learning model that may address the limitations cited.

Context-based learning models are increasingly becoming an integral part of education reform in many parts of the world (Cheany&Ingebritsen, 2005). However, as asserted by Tiwari, Wong and Lai (2005), there is no universally accepted definition of what the term context-based entails. Jonassen, Peck and Wilson (1999) argue that most scholars define context-based learning as a process where the real world context, culture and tools in the learning environment drive the learning. Choi and Johnson (2005) point out that context-based learning is based on constructivist arguments that knowledge cannot be simply transmitted from the teacher to the pupil since learners do not have the same experiences as the teacher. Therefore, learners' interpretation of the experiences would be different from that of the teacher. Hence the need for learners to be given an opportunity to take responsibility for their own learning through active participation and collaborative learning. Tiwari, Wong and Lai (2005) note that the aim of context-based learning is to engage learners in active, constructive, intentional, authentic and cooperative learning thereby, making the learning process learner-centred through problem-solving, learner independent learning, group discussion and sharing.

Thomas (1997) stresses on the need to paying attention to the context so that the optimal mix of professional development processes can be identified and implemented. This will ensure effective professional development based on school-experiences and connected to the daily activities of teachers and learners.

Cheaney & Ingebritsen (2005) note that context-based learning models have been widely used in medical education since the 1960s especially in USA and are currently a major learning strategy for a variety of programmes in science and social science professional courses. However, as indicated by Kang'ethe, Nafukho & Mutema (2002) context-based learning is a relatively new teaching model in Kenya.

Studies done by Tiwari, Wong and Lai (2005), Choi and Johnson (2005), Cheanyand Ingebritsen (2005), Kang'ethe, Nafukho and Mutema (2002) argue that context-based learning models have important advantages to learners. For example, they improve learners' critical thinking, performance and increases their motivation to learn. However, the findings cited were not conclusive and the said researchers recommend further studies in the area. Cambourne and Kiggins (2004) argue that there has been little progress in developing valid and context - based learning programmes in teacher education in many countries in the world. This, as exemplified by Cambourne and Kiggins (2004), leaves many teacher education graduates unsure of what confronts them when they arrive in schools and end up having feelings of being under-prepared for life in classrooms. Armour and Booth (1999) observe that teacher education graduates are unable to see the relationship between what they studied at college and its application in actual classroom practice. This may lead to adoption of poor teaching methods in their classrooms and feelings of inadequacy in the execution of their duties. These weaknesses call for development of suitable primary teacher training models.

Dembele and Miaro-II (2003) note that there is very little use of innovative training techniques in teacher education programmes in Africa. In Kenya, as pointed out by the MoEST report (2003) and Shiundu and Omulando (1992), pre-service primary teacher education is mainly based on the traditional teacher training model where learning is compartmentalized with little or no relationship between courses and is not context- based. Shiundu and Omulando (1992, p. 230) further opine that:

> *The traditional approach to teacher education in Kenya has been criticized for lack of commitment and efficiency as well as purpose. It is moreovermore subject-centred than learner or objective-centred. As a result, adequate learner involvement is said to lack in the learning situation.*

Wanzare (2002, p.218) quoting from Republic of Kenya (1999) supports this view by arguing that:

Whereas the intent of Kenya's school reform initiative is to ensure theprovision of quality education to Kenyans and whereas the Kenyan teacher education curriculum aims at providing manpower that would improve thequality and relevant education, evidence to date indicates that the present caliber of teachers serving in schools is unlikely to contribute to these ends. In general teacher quality is low.

As advised in the MoEST report (2003), there is need for concerted efforts to make teacher training more purposeful and learner-oriented. New and improved models of teacher education such as context-based learning model are required to achieve this purpose.

This study was based on an adapted Knowledge Building Community model (KBC) by Kiggins (1999). The KBC model is made up of three components or sources of learning for pre-service teachers namely; School-Based Learning (SBL), Problem-Based Learning (PBL) and

Community Learning (CL). These components should interact together as a basis for continuous and context-based learning.

It is aimed at supporting continuous social reconstruction of knowledge and skills by pre-service teachers in order to help them improve their classroom teaching with regard to;teacher-learner classroom interactions, teacher's motivation of learners**,** teacher instructional system planning, and teacher's use of instructional resourcesin the classroom and teachers' classroom management and control skills. The adapted model for this study incorporated reflective practice, cooperative learning components and classroom learning and micro-teaching as additional components of helping pre-service teachers contextualize their learning.

The specific objective of this study was to formulate a suitable pre-service primary teacher training model for Kenya. The study was guided by the following null hypotheses:

Ho_1; There is no significant difference in teacher-learner classroom interactions between pre-service teachers trained through the context-based learning model and those trained through the traditional learning model;

Ho_2;=There is no significant difference in teacher's motivation of learners between pre-service teachers trained through the context-based learning model and those trained through the traditional learning model;

Ho_3; There is no significant difference in teacher instructional system planning between pre-service teachers trained through the context-based learning model and those trained through the traditional learning model;

Ho_4; There is no significant difference in teacher's use of instructional resources in the classroom between pre-service teachers trained through the context-based learning model and those trained through the traditional learning model;

Ho_5: There is no significant difference in teachers' classroom management and control skills between pre-service teachers trained through the context-based learning model and those trained through the traditional learning model.

The study generates a suitable pre-service primary teacher training model for Kenya. The findings of the study are also of great use to primary teacher educators and curriculum developers by sensitizing them on the need to develop context-based pre-service teacher education through learner-centred and problem–based approaches to training. This will help in improving the quality of teachers as emphasized by the Kenya Education Sector Support Programme (KESSP) and the Sessional Paper No. 1 of 2005 on education, training and research. The findings of the study will also sensitize primary teacher education policy-makers on the limitations of the current approach in teacher education and the need for a more participatory and enhanced teacher training approach such as the context-based learning approach in order to achieve quality education as recommended by the EFA, KESSP and the Sessional Paper No. 1 of 2005. This will help them to develop appropriate in–service programmes designed to address the limitations.

Research Design

A quasi-experimental design was used in this study. It involved a pre-test / post-test longitudinal panel control group. The study was carried out between September 2010 and May 2012. The quasi-experimental design was selected because it is not possible to randomize all characteristics of the experimental and control groups in natural experiments as noted by Fraenkel and Wallen (2009), Colin (2002) and Borg *et al* (2003. The experimental and the control groups were selected through stratified random sampling of first year primary pre-service teachers from Meru and Egoji teachers colleges respectively. The strata in each group were based on gender-based.

First years were selected for homogeneity purposes in relation to knowledge and skills in teaching and classroom practice and thus the entry behaviour of the control and experimental groups was assumed to be the same since selection of pre-service primary teachers is done from a national pool based on similar criteria such as the minimum entry requirements and regional balancing.

Random selection of the first year experimental and control groups from two colleges was aimed at controlling extraneous variables. In addition, the purpose of the research was not revealed to both groups. Borg, Gall and Gall (2003) argue that a researcher can enhance the validity of the study by withholdingsome information on the purpose of the study in order to control extraneous variables.

A diagrammatic representation of the quasi experimental design selected was as follows;

Experimental R O1 X O3

Control R O2 X O4

Where R = Randomization for both experimental and control groups ; X = Treatment for the experimental group; X = No treatment; O1 = Pre-test (observation) for the experimental group; O2 = Pre-test (observation) for the control group; O3 = Post-test (observation) for the experimental group and O4 = Post-test (observation) for the control group.

The sample comprised a total of 80 first year Meru and Egoji teachers college pre-service teachers (40 from each college) for the experimental and control groups respectively.

The total population of first-year pre-service teachers for Meru and Egoji teachers colleges were 485 and 564 respectively. Stratified random sampling based on gender was used to select forty (40) pre-service teachers from Meru teachers college to form the experimental group and forty (40) pre-service teachers from Egoji to form the control group. The same sampling technique was used to select 10 pre-service teachers per focus discussion group (5 for each gender per group) for the experimental group. The researcher facilitated focus discussion groups once per week for each group during three teaching practice (school-based learning) sessions. The FDGs meetings' agenda was based on the FDG schedule and the pre-service teachers' reflective practice diary recordings. Each group met once per week for one hour per session in each of the first two teaching practice sessions. There was a total of seven focus discussion group meetings for each group spread over two teaching practice sessions. The meetings of focus discussion groups (FDGs) started immediately after the pre-tests under the facilitation of the researcher.

Focus discussion group schedule and reflective diary recordings were purely used as treatment research instruments for the experimental group.The focus discussion group schedule based on the main elements of classroom observation schedule was used for guiding the facilitator working with the focus groups in facilitating purposeful discussion. The main elements of the classroom observation which were also the main variables of the study were; teacher-learner classroom interactions, teacher's motivation of learners**,** teacher instructional system planning, teacher's use of instructional resourcesin the classroom and teachers' classroom management and control skills. A reflective teaching diary for pre-service teachers aimed at helping them reflect on their teaching and classroom behaviour practices. The aim of the reflective diary was to help the experimental group retrospectively evaluate their performance in relation to the requirements of the profession and seek solutions to the problems they encounter.

Pre-service teachers were required to fill in the reflective practice diaries every day after their lessons. Information contained in the diaries was used during the focus discussion group meetings.

A developed pre-test (pre-observation) and post-test (post-observation) in form of a detailed classroom observation schedule on teacher actual classroom teaching was utilized as the data collection instrument. It was usedto make classroom observations for the experimental group and control groups. Classroom observations were made for any of the subjects taught by the pre-service teacher at the point of pre-tests that was done during the 1st teaching practice in primary schools. The teaching of the same subjects was evaluated during post-tests that were done duringthe 3rd teaching practice.

Research and treatment instruments used were piloted at Kigari Primary Teachers college. Their reliability and validity were evaluated. Validity of the focus discussion groups schedule and the reflective teaching diary were evaluated through expert opinion comprised of experienced college tutors and lecturers in primary teacher education.

Reliability (r_{tt}) of the observation schedule was tested through the split – half method. The Spearman-Brown prophecy formula was applied to the correlation to determine the reliability.

Reliability of scores on total test $= \frac{2 \times \text{reliability for 0.5 of the test}}{1 + \text{reliability for 0.5 of the test}}$

Table 1.1 Split Half Reliability (r_{tt}) Analysis

Reliability Coefficients	
No of cases = 20.0	N of Items = 2
Correlation between forms = .7741	Equal length Spearman-Brown (r_{tt}) = .8727
Guttman split-half = .8606	Unequal-length Spearman-Brown(r_{tt}) = .8727
1 Items in part 1	1 Items in Part 2
Alpha for part 1 = 1.000	Alpha for part 2 = 1.000

As indicated in table 1.1, reliability (r_{tt})of .8727 was obtained from the scores in through the use of Statistical Package for Social Sciences (SPSS). This level of reliability was considered adequate for the study. Babbie, Halley and Zaino (2003) and Gibbon and Morris (1987) point out that a reliability (r_{tt}) level of .60 and above is a strong one and thus, adequate for a test. Fraenkel and Wallen (2009) recommend a reliability coefficient of at least .70 or above as adequate.

After getting relevant permission, pre-test and post-tests were done by one trained observer and the researcher during the normal teaching practice sessions. A total of two pre-test observations for each pre-service teacher were made during the first seven days of the first session of teaching practice. The mean of the two observations for each learner constituted the pre-test results. Post-test observations were made for the teaching of the same subject as the one observed during the pre-test for each pre-service teacher. The mean of the two observations was used as the post-test results.

Results

The Statistical Package for Social Sciences was used for data analysis. Descriptive statistics in form of frequencies means, gain scores and standard deviations were used to analyze data obtained from the classroom observation schedule. The study hypothesis were tested through the use of a t-test for independent means at a set significance level of ($p < .05$) as shown in Table 1.2. Borg *et al* (2003) argue that the preferred statistical method for testing the difference between means is the t-test. Fraenkel and Wallen (2009) point out that a t-test for independent means is a statistical technique for comparing the mean scores of two independent groups. In this study, there were two randomly selected groups; the experimental and control groups.

Pre-Test Classroom Observation t-test Results

Pre-test data analysis was done to find out whether the experimental and control groups were significantly different from each other on the dependent variables under study before treatment. The results of an independent sample t-test are as indicated in Table 1.2.

Table 1.2 Pre-test Independent Sample t-test Values

Dependent Variable			**Laverne's Test for Equality of Variances**		**t-test for Equality of Means**		
			F	**Sig.**	**t**	**df**	**Sig.(2-tailed)**
Instructional System Planning.	Equal assumed	Variances	.106	.746	.060	78	.1193
Teacher-learner Interactions	Equal assumed	Variances	1.011	.318	.049	78	.1258
Learners' motivation & interest.	Equal assumed	Variances	.828	.366	-.107	78	-.2348
Use of Instructional Resources	Equal assumed	Variances	2.032	.158	1.611	78	4.8758

Classroom Management & Control.	Equal assumed	Variances	.458	.501	-.389	78	-.6793

Table 1.2 shows that the two groups did not differ significantly in all the dependent variables under study namely; Instructional system planning t (78) = .060, $p < .05$), teacher-learner interactions (t (78) = .049, $p < .05$), learners' motivation and interest (t (78) = -.107, $p < .05$) and classroom management (t (78) = -.389, p = < .05.

Post-test Classroom Observation t-test Results

A post-test independent t-test was calculated to determine whether the experimental and control groups were significantly different on all the dependent variables at the post-test after treatment. The results are as shown in Table 1.3.

Table 1.3 Post-test Independent Sample t-test Values

Dependent Variable	**Laverne's Test for Equality of Variances**		***t*-Test for Equality of Means**			
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed**	

Instructional System Planning.	Equal Variances assumed	.040	.842	5.327	78	.000
Teacher-learner Interactions	Equal Variances assumed	.705	.404	2.458	78	.016
Learners' Motivation & Interest	Equal Variances assumed	3.807	.055	2.348	78	.021
Use of Instructional Resources	Equal Variances assumed	1.102	.297	2.807	78	.006
Classroom Management and Control	Equal Variances assumed	10.927	.001	1.143	78	2.425

Table 1.3 indicated that Instructional system planning had an independent t-test value of t (78) = 5.327, p < .05) while teacher-learner classroom interactions recorded an independent *t*-test value of *t* (78) = 2.458, p < .05) as recorded in table 1.4. Learners' motivation and interest had an independent *t*-testvalue of (*t* (78) = 2.348, p < .05). Use of teaching resources showed t-test value of *t* (78) = 2.807, p < .05) while classroom management and planning had a t-testvalue of *t* (78) = 1.143, p < .05). These results show that all the independent t-test values obtained except for classroom management and control were significant. Therefore, the experimental group

performed better than the control group on all the variables under study except on classroom management and planning which showed a non-significant t-test value.

Based on these results which showed that the experimental group performed better than the control group in all variables of the study except one, a context-based primary teacher education model that focuses on four sources of learning was designed as indicated in Fig. 1.2. The model takes into consideration the treatment used in the experiment.

Fig. 1.2 Context-Based Primary Teacher Education Model for Kenya

Proposed Primary School Teacher Training Model

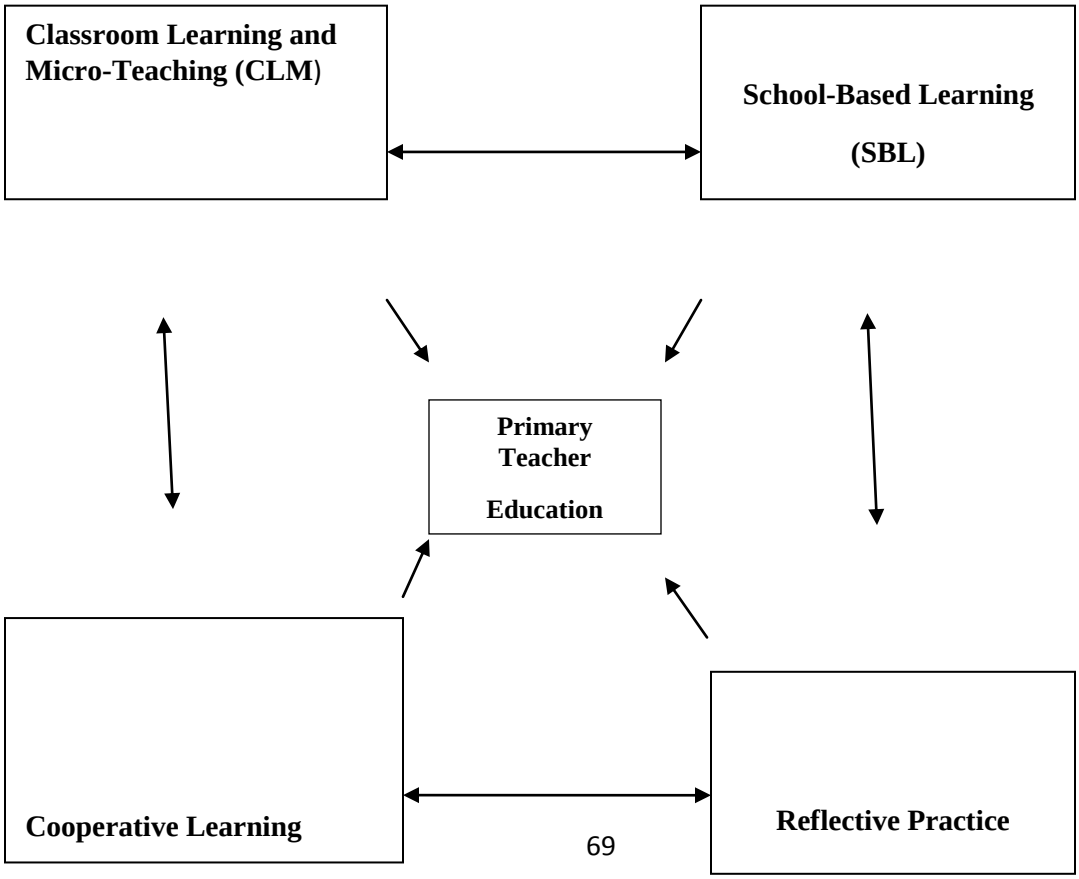


Fig. 1.2 shows the proposed primary teacher education model for Kenya based on the findings of this study. It focuses on the effective model of training a primary school teacher in Kenya for the 21st Century classroom. The fundamental aim of this model is to help a pre-service teacher understand and appreciate the complexities of the teaching profession with a view of enabling him/her acquire requisite knowledge and skills. This will challenge him/her to create and maintain a classroom setting that supports effective learning. This model has four fundamental sources of learning for pre-service teachers. The four sources of learning contribute to effective training of a primary school teacher capable of engaging in concrete tasks of teaching, assessment, observation and reflection. They include:

1. **Classroom learning and micro-teaching (CLM)**

This entails the teaching of educational professional courses such as Education Psychology commonly referred to as Professional studies and teaching subjects to pre-service teachers. The teaching subjects are Language Education, Mathematics, Science Education, Social Studies and CRE/IRE. Micro-teaching involves short simulated practical teaching sessions (normally between 8-10 minutes long) through the use of fellow pre-service teachers under the supervision of the tutor. The pre-service teacher is then evaluated by colleagues and the tutor after each micro-teaching lesson.

This source is the first part in pre-service teacher education and should provide a foundation on teaching and classroom practice to the pre-service teacher on which later learning is built. However, the source should provide more room for pre-service teachers to actively participate in their learning as opposed to the current situation where it is more tutor-centred.

The source is interlinked with school-based learning and cooperative learning. Pre-service teachers are recommended to start with classroom learning after which they are attached to primary schools for school-based learning and later pre-service teachers go back to college for classroom learning. This process should be repeated three times (based on the current teaching practice schedule) over the two years training period. Currently, pre-service primary teachers are attached to primary schools three times during their training period. This source of learning is also linked to cooperative learning since pre-service teachers are expected to be provided opportunities for cooperative learning through discussion groups in both classroom learning and during micro-teaching.

2. Cooperative learning (CL)

This source focuses on creation of a community of learners made up of pre-service teachers and the tutors as facilitators. In this study, the community of learners was in the form of focus discussion groups made up of ten pre-service teachers in equal gender proportions and the researcher as the facilitator. The aim of the community of learners is to establish team spirit and provide a forum for collaborative problem-solving activities. As pointed out by Anne (2001), professional development of teachers is considered a collaborative process where there are meaningful interactions between teachers, administrators and parents. Lieberman and Mace (2009) argue that all teachers can benefit from making their teaching practices public and sharing with each other.

Through a community of learners, pre-service teachers are able to discuss the strengths and weaknesses of their lessons and thereby make improvements on their professional practices. Kiggins (2007) comments that, the issue of teachers working collaboratively has been in educational conversation since Dewey but has been taken seriously in last decade. The adoption of a community of learners provides teachers with a research team aimed at advancing collective intellectual growth through sustained collaborative investigation. Wenger (1998) indicates that most people learn better in a community of learners through three processes namely; learning through experience and practice, meaning (which implies learning is intentional) and identity (learning and changing who we are). The participation in a community of learners shapes not only what we do but also who we are and how we interpret what we do. As argued by Kiggins (2007), the community of learners help the members to work together and develop competent emerging professionals.

The source is also interlinked to classroom learning and reflective practice sources of learning. Pre-service teachers are expected to reflect on their teaching after each school-based session and thereafter share their experiences with their colleagues. Similarly, cooperative learning is equally important during classroom learning and micro-teaching where pre-service teachers discuss concepts, issues and their relationship to the teaching and learning process and education in general. This helps them to connect theory to practice though at a hypothetical and theoretical level. This skill is later put into practice during school-based learning.

This source of learning is critical to this model since it places the learner as the main determinant of his/her learning as opposed to the others such as the mentorship model where the mentor plays a more significant role in pre-service teachers' learning. In Fig. 1.2, the rectangle representing the cooperative model is slightly larger than the rest for two reasons.

This is because it takes place both during classroom learning and micro-teaching and after reflective practice learning. Its importance is supported by other research findings by Lieberman and Mace (2009), Kiggins (2007) and Wenger (1998) who point out that cooperative learning helps learners to collaboratively research in their area of interest and thereby collectively advance their intellectual growth through sustained collaborative investigation.

Further support has been put forth by Zwart*et al* (2009) who argue that, with time, professional learning has been acknowledged as a social enterprise in which professionals rely upon the enterprise and support of one another to adopt innovative new teaching methods. Whitecomb, Borko and Liston (2009) additionally support this argument by stating that a lot of current literature indicates that professional development experiences are effective when situated in a collegial learning environment where teachers work collaboratively to inquire and reflect on their teaching. Teachers who are involved in cooperative learning are intrinsically motivated to participate and feel more pressure to experiment with new strategies in constructive coaching environments.

3. School-Based Learning (SBL)

This source of learning represents the actual attachment of pre-service teachers to schools. In this study, it was carried out during teaching practice. The aim of school-based learning is to help the pre-service teacher develop an understanding of the primary school-based culture and how schools operate. This is already a requirement for any pre-service teacher in the current traditional primary teacher education model in Kenya. However, in the formulated model for this study, school-based learning should be more enhanced in terms of generating problems for

discussion in a community of learners. The objective is to increase pre-service teacher's awareness on the teacher's role in the classroom and school.

This would reduce what Koetsier and Wubbels (1995) calls "reality Shock" that confronts beginning teachers when they start their teaching practice.

In this study, school-based learning was the source of problems for discussion during the focus discussion group meetings. This source of learning is closely linked to both classroom learning and micro-teaching and reflective practice sources of learning. It is linked to classroom learning and micro-teaching because pre-service teachers will be expected to put into practice in an actual classroom setting what they have learnt in college. It is closely connected to reflective practice learning since it is the source of the issues to be reflected on by the pre-service teachers.

4. Reflective Practice Learning (RPL)

Anne (2001) indicates that a teacher is considered a reflective practitioner; one who joins the profession with a certain knowledge base in which he/she builds on new experiences. Schon (1983) notes that reflective practice helps beginning professionals retrospectively evaluate their individual performance. Adesina, Daraniola and Talabi (1989) recommend cooperative learning or a social interaction model as a means of improving teacher education. Reflective practice helps pre-service teachers confront existing theories and their preconceived ideas of what teaching entails taking into consideration what Thyalk and Cuban as quoted by Dembele and Miaro-II (2003) call the 'grammar of schooling'. In other words 'a set of expected patterns teachers have historically constructed regarding what teaching entails'. In this study, reflective practice learning was carried out through recording of the pre-service teachers' reflections on

their teaching in a diary. These recordings formed the basis of discussion problems during the focus discussion group meetings.

From the foregoing, it is clear that the four sources of learning were effective in improving primary school pre-service teachers teaching effectiveness as evident from the results of the independent t-test for equality of means on all variables under study. The four models are fundamental in the training of a pre-service primary teacher.

As noted by Jonassen, Peck, and Wilson (1999), Cheany & Ingebritsen (2005), Tiwari, Wong and Lai (2005), Choi and Johnson (2005), Kiggins (2007), and Schwille, Dembele and Schubert (2007) a context-based model of training pre-service teachers has various advantages that include, helping pre-service teachers participate in active, collaborative, authentic learner-centred learning processes, developing problem-solving and individual-educational abilities required to meet the challenges of life and career in ever changing complex professional contexts, enabling pre-service teachers take responsibility for their learning through effective independent decision-making and individual as well as collective decision-making processes, transforming learning into a collaborative professional affair turning pre-service teachers into a team of educational researchers. Through this, pre-service teachers are more productive and positively influence each other. In addition, they are able to acquire skills such as conflict resolution, teamwork and understand how group dynamics work, helping pre-service teachers relate theory to practice through the incorporation of reflective practice, problem solving, cooperative learning and school-based learning. In seeking solutions to the problems they face, pre-service teachers are able to research and relate the problems to the theories learnt in class or proposed in reference materials, providing pre-service teachers with an opportunity to be creative and innovative in their teaching through solving problems, discussing in groups and reflecting on their teaching

using the context of their workplace as source problems, fostering higher order thinking through problem-solving and reflective practice and contextualizing learning by relating it to the work environment of the pre-service teacher and thereby connecting theory to the real work context.

The main potential challenges of the model include the enormous amount of time required to effectively implement it in a large scale, the costs required in terms of human resource and other resources and the requirement for re-training of the primary teacher educators and policy-makers as well as pre-service teachers to embrace a rather unconventional form of teacher training. As pointed out by Brooks and Brooks (1993), such individuals may experience a cultural shock and may be resistant to change. Nevertheless, based on the findings of this study and the advantages mentioned above, the context-based pre-service teacher educational model as discussed has more advantages than the current traditional content-based pedagogical model and is therefore, recommended for primary teacher education in Kenya.

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