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Effectiveness of Types of In-Service Programs Offered to Enhance the Quality of Teaching and Learning in Public Secondary Schools of Nakuru North Sub-County, Kenya

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Abstract

This study was on effectiveness of in-service programs in enhancing the quality of teaching and learning in public secondary schools in Nakuru North Sub-County. The purpose of the study was to examine the effectiveness of Inservice training in enhancing quality of teaching and learning in public secondary schools in Nakuru North Sub-County. The research question guiding the study was: What are the various types of in-service programs that are offered to enhance the quality of teaching and learning secondary schools? The study adapted a mixed method approach whereby a convergent parallel mixed method design was used to conduct the study. The target population comprised of 34 school principals and 452 teachers drawn from 34 public secondary schools and the TSC Quality Assurance and Standard officer, Curriculum Support Officer. The sample was obtained using both probability and non-probability procedures. Quantitative data was collected using questionnaires, while qualitative data was collected using interview guides and a document analysis guide. Quantitative data was analyzed using descriptive statistics and inferential statistics, respectively. The findings show that different programs were offered by different agencies to teachers, the contentment offered by these programs influenced the quality of teaching and learning in schools.

Key Words: Kenya, Effectiveness, In-service, Enhancing, Quality, Teaching and Learning, Nakuru North Sub-County

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Introduction

Teachers' performance remains a global challenge today. The achievement of Sustainable Development Goal No.4 requires that teachers' work effectively and efficiently (OECD, 2019). Parents, practitioners, and policymakers in the United States of America (USA) agree that the key to improving public education in America is placing highly skilled and effective teachers in all classrooms (Darling-Hammond, 2010). Ensuring that teachers deliver as per the laid down framework and curriculum will almost guarantee their job performance. Worldwide reports show that teachers' performance is below expectation and this affects the achievement of set organizational goals. For instance, Borg, (2010)'s study in the USA, United Kingdom (UK), New Zealand and Australia showed that teachers were performing below the set standards by their respective departments of education. This shows that the problem of low performance of teachers is experienced in these countries.

According to the European Union (2014), professional development of teachers is central to raising quality of education in schools. The quality of education should in principle be guaranteed by a high standard of initial education, apprenticeship and continuous professional development of teaching and non-teaching staff. The effectiveness of in-service training is important so that teachers can apply the knowledge acquired in teaching and learning. The World Bank has approved 110 projects in 67 countries since fiscal year (FY) 13 (of 207 projects approved by the Education Global Practice between FY13 and FY18) that support the professional development of teachers. This means that in-service training of teachers should be taken seriously in secondary schools. Moreover, teaching practices in low-income countries in Africa need substantial improvement, based on Service Delivery Indicators. In Mozambique, for instance, only 15 percent of teachers answered the pedagogical questions correctly. Thus, it is important for the World Bank to focus on these countries.

In-service Teacher Training Programme is teaching opportunities provided to eligible and interested teachers who cannot pursue full-time courses in the universities/college or learning institutions because they are in the teaching profession hence, they attend training during the school holidays, evenings and weekends. In-service Teacher Training Programme is designed to promote and support the professional learning of teachers who are already employed and working in the classroom (Muzaffar & Rahim, 2011). Having an effective teacher also makes a considerable difference in students' learning trajectory (Chetty, Friedman & Rockoff, 2014). This means that schools need to make an effort ensuring that teachers undergo in-service training programs.

Moran, Carlson and Tableman (2012) in Boston noted that quality teaching and learning should be one that provides support for learning. This should be climate that supports learning

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classroom climate in which educator supports learning through. This is where a teacher manages the classroom in a way that is consistent with focused and productive work in the discipline. The teacher should be able to using physical space conducive to learning in the discipline. In addition, the teacher should be able to use clear rituals and routines matched to the discipline (such as warm- ups, focusing exercises, strategies for taking care of tools). This dimension also encompasses the art of creating a climate of mutual respect between the instructor and the students

Song (2015) noted that quality teaching and learning could be measured through school teachers' performance with regard to classroom dialogue and sharing. This is a situation where, the educator and students work together to: Ensure that students' contributions and discussions form an integral part of the class; Clarify and develop powerful ideas and big questions in the discipline; Learn key vocabulary and concepts in order to better understand how to communicate about and through the discipline; Construct explanations based on evidence and examples; and Share, critique, and discuss ideas, works and performances with the goal of improving and extending work.

Teachers' job performance is a complex phenomenon especially in relation to the concept of in-service training. Job performance is the actual accomplishment of assigned task. It is the actual work done against the expected standard of achievement. There are numerous activities which teachers carry out which determine how effective and productive their jobs might be. Such activities include the drawing of scheme of work, lesson plan, delivery of lesson, evaluation of students, reporting of students' progress. Other activities carried out by teachers include maintenance of discipline among students, keeping of attendance registers of students, participation in staff meetings, conduction of morning devotion, house mastership, counseling, participation in sports, games and club activities (Imaowaji, 2018). These job areas which relate to the individual teacher's performance need adequate skills.

In 2018, the World Bank launched the Global Platform for Successful Teachers, aiming to have all children taught by effective teachers whose education systems support them. This renewed emphasis is important because there is limited guidance on what constitutes good practices for preservice training is limited. Although some reviews have identified key characteristics of in-service training, much less is known about how to scale up quality in-service training. As the World Development Report 2018 argued, all actors in the education system need to be aligned. Better designed, implemented, and scaled-up training programs could potentially offer better value for money.

Professional development is essential to effective teaching. Observations in many countries have shown that teachers are often inadequately prepared to teach well (Reimers& Chung 2018). The study by Nyamwange, Kyalo and Opakas (2017) revealed that teachers admitted that they experienced problems in handling some of the topics, while Bold, Deon, Gayle, Ezequiel *et al.* (2017) revealed that in most of the developing countries of Africa teachers were inadequately prepared to teach mathematics. The need for in-service training in schools is getting more attention. Hence, emphasis is for teachers to equip with new knowledge and skills for them to face new challenges and reformation in education. In-service training can enhance the professionalism of teachers who can contribute to the organization to achieve its goals.

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A study by Bold, *et al.* (2017) for the World Bank in Sub-Saharan Africa countries; namely Mozambique, Uganda, Zambia, Ghana, Kenya and Nigeria, reveals that many teachers lack the necessary pedagogical skills; classroom observations. Only a few public-school teachers are able to assess students' abilities and evaluate their progress. Only a few engage in the practices such as learner assessment and preparation of professional documents, which are typically associated with good teaching. Consequently, teachers often do not have sufficient mastery of concepts they are expected to teach. Moreover, the average teacher does not perform much better on reading tests than the highest-performing grade 6 students. The report reveals that, 40 percent of school teachers are not as knowledgeable as their students should be. In Bihar, India, only 10.5 percent of tested public-school teachers are able to solve a three-digit by one-digit division problem and show the steps correctly.

Quality of secondary school education in Sub Saharan Africa is notably low as compared to other parts of the world. According to a World Bank (2018) report few teachers in Sub Saharan Africa have the requisite knowledge and skills to teach effectively: For instance, teachers' knowledge in language was as follows in some of the countries: Mozambique (77%), Uganda (90%), and Togo (54%). With respect to teachers' knowledge in mathematical curriculum, Mozambique was at 26%, Togo (24%), Uganda (55%) and Uganda (55%) (Bold *et al.*, 2017).

In a study by Omar (2014) in Malaysia, it was found that the effectiveness of in-service on the quality of teaching and learning varied from one school to another. In-service training was found to be fundamental aspect to improve teacher professionalism. The factors that contribute towards the effectiveness of in-service training are role of administrator, attitudes of teachers, training needs and strategies in conducting in-service training.

In Ghana, Hervie and Winful (2018) observed that poor performance of teachers was due to lack of frequent in-service training, lack of teaching and learning materials, lack of incentives and motivation, and improper supervision. It is therefore, recommended that Ghana Education Service should improve upon its in-service training and development policy to be consistent with the needs of teachers. In Nigeria, Amadi (2013) noted that If teachers are to become real leaders in their respective schools, teachers must be provided with a programme of in-service training which is concerned with doing and not merely with listening.

The effectiveness of in-service training is important so that teachers can apply the knowledge acquired in teaching and learning. In-service training can enhance the professionalism of teachers who can contribute to the organization to achieve its goals. In-service training is a professional and personal educational activity for teachers to improve their efficiency, ability, knowledge and motivation in their professional work (Omar, 2014). A plethora of problems have been identified to militate against in-service education programmes as follows: In-service education programme is capital intensive and most of the participants are self-sponsored. As a result, many of them cannot cope with exorbitant school fees and other incidental expenses for textbooks and personal upkeeps. There is the problem of poor planning and organization whereby available activities for participants are impersonal and unrelated to their job settings in the classroom. There are the problems of inadequate facilities in terms of classrooms, laboratories and boarding facilities to accommodate the size of enrolment.

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In Kenya, studies have revealed the existence of challenges such as inadequate preparation of lessons, inability to complete assigned tasks, absenteeism and poor teaching methods. Such studies include Mburu (2013) in Gilgil District and Sogoni (2017) in Bungoma County. The challenge of unimpressive teachers' performance has persisted over many years. According to a 2017 World Bank report, in Kenya, 34% of teachers in secondary schools do not meet the set minimum thresholds of performance on knowledge assessments for language curriculum and mathematics curriculum. That is to say they are not as knowledgeable as they should be (Bold et al., 2017).

Musyoka (2011) in a study in Machakos district, Kenya found out that there are other factors rather than in-servicing affect students' performance in Mathematics. From training received in SMASSE it is clear that many teachers do not improvise because they lack know how and the work load is high. Despite having been in-serviced the majority of the teachers had not developed teaching and learning materials. Teachers in most parts of Kenya still need in-service training to update their knowledge, skills and competence. However, a study by Manduku, Boiyon and Cheruiyot established a statistically significant positive relationship between In-service Teacher Training Programme and effective teacher planning for instruction, and positive relationship with teachers' lesson content delivery at a coefficient in in Sotik Sub-County.

Kenyan teachers experience some forms of in -service education and training (INSET). These range from Strengthening of Primary Education (SPREAD) 1 and 2, School based Teacher Development (SbTD), Strengthening of Mathematics and Science in Secondary Education (SMASSE), and reading to learn (RTL). Though a majority of these were carried out nationwide, learning outcomes are still low in the country (Uwezo K, 2011).

Low achievements in learning show that INSET is probably not contributing to better learning outcomes, even though it is not the only factor affecting learning outcomes. Generally, there is inefficiency and lack of effectiveness in secondary school education in Kenya (Jones, Schipper, Ruto and Rajani 2014). For this reason, there is need to look for interventions that have high impact and low cost (Piper and Mugenda, 2014). INSET is indeed one such options, if only planning shifts away from focusing on inputs towards a focus of improving teaching and learning process and outcomes.

The Government of Kenya recognizes the importance of teacher education as one of the important levers of accelerating the attainment of Education for All (EFA) and Sustainable Development Goals (MDGs) (Manduku, Edward and Cheruiyot, 2017). In Kenya the main types of trainings/events include good practice examples, pedagogical workshops, field work, study visits, consultation-mentoring, school visits, school-based in-service training, modular in-service training, e-learning, round table, training for trainers, Supervision, and plenary sessions.

There is acknowledgement within Kenya that high education standards are dependent upon the quality of its teachers, which is in turn dependent upon the quality of their pre-service training, and subsequent in-service training. However, amidst accusations that educational standards are declining, in-service training programmes in particular have been singled out as being overly bureaucratic, under resourced, poorly delivered and ineffective in helping to raise teaching standards (Lowe & Prout, 2018). Moreover, current in-service training programmes are

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failing to address more fundamental issues surrounding Kenyan teaching professionalism as a whole.

The quality of teaching and learning has remained unimpressive in public secondary schools in Nakuru County and precisely Nakuru North Sub County (Munge, Kimani and Ngugi, 2016). This is demonstrated in poor academic performance in KCSE, in the Sub County year after year. However, these scholars pointed out that despite government efforts to strengthen schools' financial management the situation appears to have remained static. The unaddressed concerns with respect to the quality of teachers, their limited competencies continue to linger. However, studies in Nakuru North Sub County have always ignored the likelihood of the status of teacher's in-service training as a factor influencing the quality of teaching and learning in the secondary schools. Moreover, earlier studies in the area such as Nyaoga (2015) revealed that inadequacies in teacher competencies in specific subject areas as well as limited ICT literacy.

Nakuru North Sub County secondary school teachers just like the rest of the teachers in the country are provided with In-service training programs which are supposed to support and build capacity in order for them to provide quality teaching and learning in their schools. These capacity building endeavors become important and are reflected in the performance of learners in the secondary schools. However, it is notable that the education standards and performance of students in this Sub County are still wanting and despite the fact that there can be other factors that can cause this low performance and standards, in-service training and professional development of teachers can be one of them. It is against this background that this study seeks to examine the effectiveness of types of in-service programs in enhancing the quality of teaching and learning in public secondary schools in Nakuru North Sub-County.

Statement of the Problem

Despite the efforts by the Government of Kenya to enhance the quality of teaching and learning in Kenya, there are reports and studies showing low quality, low teachers' performance in secondary schools in Kenya (Nyamwange, *et al*, 2017; Altinok, 2013) and Kisumu County in particular (Omondi, 2011; Atwalla, 2011). Low academic achievement and indiscipline have been cited as some of the causes of the high drop-out rates in secondary schools across the country.

The government consistently runs into teacher strikes which are related to limited teacher competencies and indiscipline, and each time a less-than-satisfactory solution is found. Proposals to improve teacher training, provide more supplies and structures to aid capacity and curriculum reform largely have not been taken seriously by key education stakeholders. The situation of unimpressive quality of teaching and learning has continued to persist year after year as reflected in KCSE academic scores. This means that teaching in Kenya is not very effective. The argument is that there is a possibility that low quality in-service training and its inadequacy could be responsible for the reported low quality of teaching and learning in the public secondary schools. For instance, Akkari (2015) found that in Kenya, both their pre-service and in-service training are superficial and inadequate and thus have little bearing on classroom practice. Questions also emerge on the effectiveness of the types of in-service programs used.

There is limited research to ascertain this possibility in Secondary schools in Nakuru North Sub-County. This situation casts aspersions as to whether in-service training influences

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teachers' performance as intended. Secondary schools in Nakuru North Sub-County are not an exception. The link between teachers' in-service training and quality of teaching and learning in the secondary schools remains however unexplored. Therefore, this study seeks to examine the effectiveness of types of in-service programs in enhancing the quality of teaching and learning in public secondary schools in Nakuru North Sub-County.

Research Questions

This study was guided by the following research question

- i. What are the various types of in-service programs that are offered to enhance the quality of teaching and learning in public secondary schools of Nakuru North Sub-County?

Significance of the Study

The study findings are significant to the Teachers Service Commission can use the findings in informing the review or development of strategies related to enhancing the effectiveness of in-service training for quality of teaching and learning in public secondary schools. Head teachers will be able to use the findings to find out how to improve the in-service training programs for quality teacher job performance and learner performance.

The Ministry of Education will benefit from these findings on informing the development of appropriate in-service training programs for the enhancement of quality teaching and learning. Ineffective in-service training programs can be eliminated or improved so as to meet the training needs of teachers. Education theorists and researchers will be able to postulate theories and as well as test research hypothesis that associate in-service training programs and quality of teaching and learning in secondary schools and other educational institutions. The study findings will thus be a contribution to the existing body of knowledge and literature.

Theoretical Framework

This study was guided by the Human Capital Theory (HCT). The Human Capital Theory may trace its roots to the theory of macroeconomic growth. The main productive factors in the 1950s included land, labor, physical capital and management (Mincer 1962, Becker 1993). Nevertheless, by the 1960s economists had great difficulty describing the development of the US economy based on the aforementioned production factors (Schultz 1961). Nevertheless, by the 1960s economists had great difficulty describing the development of the US economy based on the aforementioned production factors (Schultz 1961). The underlying principle behind the theory of human capital is that intellectual abilities of people are of comparable value to other tools involved in the production of goods and services (Lucas 1990).

Ascribed in the sense of organizations HC theory suggests that employees investing in education and training would improve their level of skills and be more competitive than those less qualified and can therefore justify higher earnings as a result of investing in HC. As Becker (1993) suggests, 'schooling raises earnings and productivity mainly by providing knowledge, skills and a way of analyzing problems. Moreover, Becker's ideas play an important role in contemporary employee development and learning literature, as HC theory fuels the idea that employees' knowledge and skills can be developed through investment in education or training.

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Butters, Asarta and Fischer (2011) pointed out that teacher's knowledge and training has a positive impact on quality teaching and learning. This theory is relevant because in-service training for teachers is modeled along this premise. Moreover, according to USAID (2011), improved classroom instruction requires better in-service teacher training and reinforcement by appropriate teacher terms of service, teacher support supervision, and instructional materials. Improving instruction is a complex task that entails a wide range of interventions, including along with technical assistance to strengthen local teacher training institutions and teacher in-service training options.

A major strength of Human Capital Theory is that it helps policymakers and researchers evaluate the relationships between education and training as inputs and economic and social benefits as outputs. Strength of HCT is that it provides a useful lens for understanding how policy can be developed to incentivize individuals' investment in their own education. Moreover, the theory holds that investment in human capital enhances employees' productivity, and in the case of this study quality of teaching and learning.

Human capital theory stresses the significance of education and training as the key to participation in the new global economy. In one of its recent reports, the Organization of Economic Cooperation and Development (OECD), for example, claims that the radical changes to the public and private sectors of the economy introduced over recent years in response to globalization will be severe and disturbing to many established values and procedures. In another report it explains internationalism in higher education as a component of globalization.

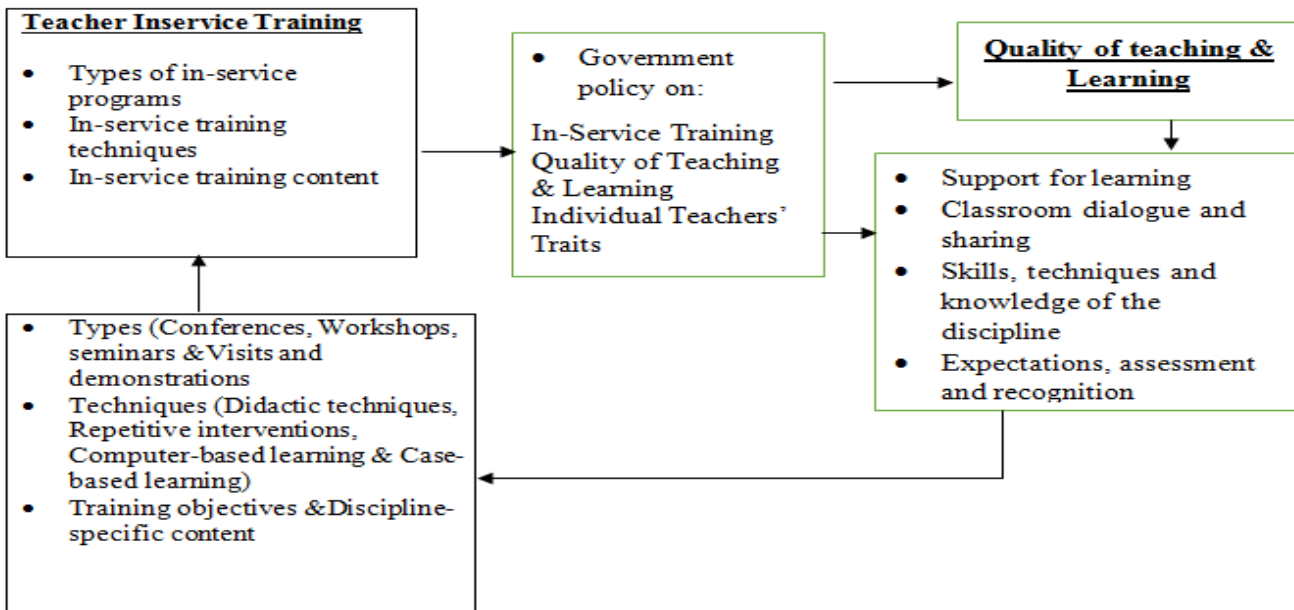
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1.7 Conceptual Framework

This study used a conceptual framework which demonstrated the link and the relationship between the independent, intervening and the dependent variables of the study as shown in Figure 1.

Independent Variable Intervening Variables Dependent Variable

Figure 1: Conceptual Framework for in-service training of teachers



Source: Field Data 2020

Figure 1 is a presentation of the independent variable which is the variable the experimenter changes or controls and is assumed to have a direct effect on the dependent variable. In the figure, it is clear that there are various types of in-service training of teachers which include conferences, workshops, seminars and visits and demonstrations. Another independent variable is in-service training techniques which include Didactic techniques, Repetitive interventions, Computer-based learning & Case-based learning. Training objectives and discipline-specific content is the third independent variable

Figure 1 further shows that between the independent and dependent variable, there are the intervening variables which is a hypothetical variable used to explain causal links between other variables. In this study, the intervening variables are government policy on which includes in-service training and quality of teaching and learning. The other variable is individual's teacher's traits.

In this study the intervening variable cut across in a linear manner whereby they influence both the independent and the dependent variables almost simultaneously. For example, there is a linear link between the government policy and the type of in-service training programs

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and at the same time this will directly affect the teaching and learning process in a linear manner and this is well understood in this study.

Figure 1 further presents the dependent variable which is the expected outcome of the independent *variable*. In the study, the dependent variable is quality of teaching and learning, which is exhibited by Support for learning Classroom, dialogue and sharing Skills, techniques and knowledge of the discipline and Expectations, assessment and recognition among other variables.

Review of Related Literature

According to Sim (2011), the fundamental purpose of in-service teacher training programmes is to create an environment that enables the effective practice of teaching within a classroom. Sim (2011) suggests the following outcomes of in-service teacher training programmes: Increase teachers' knowledge, build positive attitudes and beliefs and enhance the teaching practices. Suneta (2012) observes that the purpose of in-service training is to "enhance the quality of students' learning by improving the quality of teaching through constant review and assessment of teachers' instructional approaches, identifying effective teaching approaches, and capitalizing on them for the benefit of the learners." Effective training equips teachers with knowledge in subject content, pedagogical strategies, and classroom management.

Ko, Sammons and Bakkum (2013) contends that teachers are key elements in any school and effective teaching is one of the key propellers for school improvement. Subsequently, teacher effectiveness is generally referred to in terms of focus on student outcomes and the teacher behaviors and classroom processes that promote better student outcomes. They suggested that effective teachers are clear about instructional goals; knowledge about curriculum content and strategies for teaching it. They also communicate to their students what is expected of them and why; make expert use of existing instructional materials in order to devote more time to practices that enrich and clarify the content, knowledgeable about their students adapting, misconceptions in their existing, knowledge; teach students Meta-cognitive strategies and give them opportunities to master them; address higher as well a slower-level-cognitive objectives; monitor students' understanding by offering regular appropriate feedback; integrate the instruction with that in other subject areas; and accept responsibilities for student outcomes.

In India, Khan (2017) investigated the attitude of teachers towards in-service training for the improvement in quality of teaching at school level of Aligarh district. The sample comprising of 112 teachers of Aligarh of both central and state schools were selected through purposive sampling procedure based on the availability of school teachers who have attended in-service training specially refresher course. The study revealed that in-service training specially refresher courses is responsible for the improvement in quality of teaching in senior secondary school teachers of Aligarh district.

In-service training can improve teachers' performance, knowledge, skills, and motivation. Effective training, implemented with the key features shown in the conceptual framework, is also linked with improvements in student learning (Darling Hammond, Hyler, and Gardner 2017; Popova and others 2018). The essential features are adequate duration, discipline specificity, active and applied learning based on teachers' needs and capacity, and follow-up

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support to provide opportunities for feedback and reflection. However, well designed and well-implemented training programs alone cannot improve teachers' pedagogical practices, suggesting the importance of the broader education system to create an enabling environment. Finally, sustained scale-up is another key feature of effective in-service training.

In Iran, Pirmehar and Omidian (2014) investigated the effectiveness of in-service training courses on the sixth-grade teachers of Andimeshk city. The population consisted of all 115 sixth grade teachers of Andimeshk selected by using complete census. The results showed that teachers evaluated the effectiveness of in-service training courses on their attitudes, skills and knowledge to be above the average. The results show that in Andimeshk, in-service training was effective in enhancing teacher quality.

According to a research study by Education International (2017), in parts of North America and Europe, the status of the teaching profession is threatened. One sign of that decline is that only a small number of high-performing college students are attracted into the teaching profession due to other career options that have more attractive pay and working conditions. The study also found out that with the expansion of free public education in countries such as Latin America and the Caribbean, school enrolments have skyrocketed, creating overcrowded classrooms with abysmal learning and teaching environments. In parts of the Asia-Pacific region, there are urgent calls to reform teacher education and preparation programs as nations strive to position themselves to compete in the global economy.

Types of In-Service Programs and Quality of Teaching and Learning

Deneme (2017) just like Asaya, mentions that other types of INSETS include Committee (five or several members work on a problem that could be impossible for a whole staff to tackle) such as Professional reading (with the aid of a professional library' study groups); Individual conferences (dependent of feelings of mutual understanding and support existing between teacher and supervisor); and Visits and demonstrations (opportunity to observe actual teaching techniques). However, the researcher observed that most teachers found in Nigerian classrooms today have nothing to offer to students by ways of professional training. However, the researchers did not show whether the type of INSET employed had an influence on the quality of teaching and learning. This is attributed to limited in service training in the schools. Such teachers need in-service training to update their knowledge, skills and competence.

According to the Centre for Innovation in Research and Teaching (2018), the use of in-service training conferences was motivated by the need to have teachers gain knowledge, present their research results and stay current in the field. However, there are a variety of reasons that faculty should attend conferences as a professional development tool. Attending conferences helps motivate teachers, helped them learn new ideas, helped them find new approaches to problems, and be able to practice communication skills. The report also shows that in-service training though conferences enabled teachers to feel integrated in the academic community.

Bawa (2018) identified seminars as one of the key types of teachers' in-service training. The researcher described a seminar as one of the common devices to impart information regarding specific topic to develop higher cognitive abilities-analysis, synthesis, evaluation and observation, and to develop co-operation and toleration among the participant. Bawa observed

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that seminars helped promote teachers' power of understanding and insight. The seminar helped develop self-reliance, self-confidence, sense of co-operation and responsibility among the teachers. According to Bawa, besides promotion of higher cognitive abilities, this technique helps in development of certain affective attributes like tolerance for other views, openness to ideas, co-operation with others, emotional stability and respect for others feelings among the participants.

According to Hill (2012), in order to become a truly great teacher, one must go beyond the textbook and attend workshops and ongoing education courses to truly master the practice. The researcher observed that workshops helped develop co-operation and team spirit among the participants. The workshops were found helpful for developing understanding and proficiency for the approaches and practices in education. Moreover, the participants can gather theoretical and practical knowledge with regard to problems they face. There are workshops on how to integrate technology into the classroom and how to make it cross curricular.

Ali, Ramzan and Tabassum (2016) investigated the psychological effects of excessive administrative visits on teachers' performance in Bahawalpur, Pakistan. The study used the simple random sampling technique for selecting 371 teachers from the secondary schools from Bahawalpur area. The findings showed that psychological effects like fire out, lack of interest, conversion to other profession, anxiety, depression, overburden, etc exist among teacher due to excessive administrative visits, which may affect teachers' efficiency. Often such measure was appreciated but an element of fear among teachers was also noticed during teachers' conversation and this indicates an origin of psychological issues.

Essien, Akpan and Obot (2016) investigated the influence of in-service training, seminar and workshop attendance by social studies teachers on students' academic performance in Cross River State, Nigeria. Ex-post facto research design was adopted for the study. A sample of five hundred Social Studies teachers (500) and students were selected for the study. The result of the analysis revealed that there exists a positive and small relationship between the frequency of teachers' attendance at in-service training, seminars and workshops and students' academic performance in social studies.

Research Methodology

Research Design

This study used a mixed method approach. Specifically, the study used a convergent parallel mixed method design (Creswell, 2014). A convergent parallel mixed-methods design is an approach to inquiry that combines both qualitative and quantitative methods concurrently, prioritising both methods almost equally (Creswell & Clark, 2011, and Creswell, 2014). In this case, the quantitative and qualitative methods complemented each other, and provided for the triangulation of findings, hence greater validity of the emerging inferences. Whereas the former approach gave a more general understanding of the issue of the in-service programs, the latter provided a detailed and in-depth understanding of the same.

The convergent parallel mixed methods design was preferred because the researchers prioritised the methods (qualitative and quantitative) equally and keep the strands independent during data collection and analysis and then mix the results during overall interpretation. It was

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also preferred because the researcher compared and relate data collected and analysed easily before making interpretation (Teddlie and Tashakkori, 2009). In this study the researcher collected data on effectiveness of in – service training in enhancing the quality of teaching and learning in public secondary schools in Nakuru North Sub-County quantitatively and qualitatively from the different targeted population.

Target Population

According to Saunders *et al.* (2009) target population means the total number of individuals, objects, or any other subject of concern which by virtue of a common characteristic is of interest to the researcher and may lead to obtaining relevant information regarding a phenomenon under study. The target population was the TSC Quality Assurance and Standard officer, Curriculum Support Officer, Principals and teachers of all the 34 public secondary schools in Nakuru North Sub County. The study targeted a total population of 486 school staff; comprising of 34 school principals and 452 teachers (TSC County Office Records, 2019).

Sampling procedures

The study selected TSC Quality Assurance, Curriculum Support Officer and Standards Officer and principals using purposive sampling technique. This is because there is only one in each case.

Accordingly, the study purposively selected the TSC Quality assurance and Standards officer, who is only one TSC Quality Assurance, Curriculum Support Officer and Standards Officer in a Sub County. There is also only one principal per secondary school. The sample for teachers was selected using simple random sampling technique. This is because of the number of teachers. Based on this non-probabilistic sampling, the actual sample categories for the study in this category was as follows:

- i.** TSC Quality assurance and standards officer.
- ii.** Curriculum support officer
- iii.** The principals

The sample generated from this exercise consisted of staff from the selected ministries, government departments as follows:

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Table 1: Sampling Matrix

Category	Target population	Sampling procedure	Proposed Sample	Percentage (%)
Public secondary Schools	34	Purposive	26	76
DQASO/CSO	1	Purposive	1	100
Teaching Staff	452	Simple Random/stratified	160	60
Principals	26	Purposive	8	30

Source: Field Data 2020

Data Collection Instruments

The instruments that the researcher used for the study, included a questionnaire for the teachers at the Nakuru north sub county the questionnaire was structured into two sections. Section A dealt with bio data information of the participants and section B will deal with information on effectiveness of In-service training in enhancing quality standards of education.

The researcher also conducted interview discussions with the principals, DQASO and CSO to have an understanding of the organization and conduction of inset in the Nakuru North. The different instruments were utilized to obtain information for triangulation purposes (Creswell, 2009). For a research instrument to be considered valid, the content selected and included in the questionnaire must be relevant to the variable being investigated as argued by (Neuman, 2008). Once participants complete them, the questionnaires were checked for completeness and consistency of information.

a. Questionnaires

A questionnaire is an instrument employed to collect data through a written list of questions to be answered by a large number of subjects who give information for a study (Kothari and Garg, 2014). This research employed Closed-ended, structured questionnaires for data collection. Questionnaires have an advantage since so much information can be collected and analyzed within a short time and since they are presented on paper, there is no opportunity for researcher bias.

b. Interview Schedule

An interview schedule was used to obtain qualitative data required to answer questions related to certain objectives in the study. According to Mugenda and Mugenda (2013), an interview schedule helps to standardize the interview such that the interviewer can ask the same question in a different manner. The school principal’s interview schedule was used to capture information on: the effectiveness of types of in-service programs in-service programs, as well as on the quality of teaching and learning in public secondary schools.

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c. Document Analysis Guide

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009). Analyzing documents incorporates coding content into themes similar to how focus group or interview transcripts are analyzed (Bowen, 2009). A rubric can also be used to grade or score document. There are three primary types of documents (O’Leary, 2014). The documents that were reviewed include: INSET invitation letters, teacher’s attendance sheet (From the heads of departments), as well as KCSE Analysis for the last 5 years.

i. Validity

The study used different methods to validity the instruments. First ,the researcher used experts in research and evaluation who reviewed them and made comments, a total of six experts were used to review and make comments on the tool. They critically assessed the relevance and appropriateness of the items in each instrument and the sequencing, wording and instructions therein. Secondly, the researcher used peers who also reviewed the tools and made important comments which were integrated into the final tools. Finally, the tools were also pre-tested and the responses from the participants used to improve on the items in the instruments. The pilot study enabled the evaluator to assess the clarity of the items in the instrument so that those items found to be vague are modified to improve the quality of the instrument thus increasing its validity.

Qualitative instruments were validated using credibility which involved recording the participants experience and insights on the in-service training, the participants were asked to confirm that what was recorded reflects their responses on the items in the instrument of data collection.

Validity of qualitative tools also used transferability. Content validity of the instrument was determined through review by experts in evaluation, where the responses of the subjects was checked against the evaluation questions. According to Punch (2005) validity ensured that the instrument measures what it is intended to measure effectively. The study defined the target population as well as the sample and its demographic profile and the location of the study. The findings can therefore be transferred to some extent to another training programme with similar characteristics or management cohorts as well as objectives of the programme. It must be appreciated that the application of transferability however remains subjective, and depends on the specific case.

ii. Reliability

In this current study, it was important to ensure the level of internal consistency with which an instrument measures what it intends to measure (Järvinen, 2001). In order for the study results to be reliable, the research instrument must yield consistent results or data after repeated trials (Mugenda, 2008). The test-retest method was employed to establish the reliability of the instruments. The technique involves administering the same instrument twice to the same pilot group of participants at different times (Kerlinger and Howard, 2006). The challenge with this method is to determine the correct delay period between the two administrations of measure

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(Gall, Gall and Borg, 2002). If the re-test is administered too soon after the initial test, participants may recall their responses to many of the items. This will tend to produce artificially high reliability coefficient. On the other hand, if the re-testing is delayed too long there is a good possibility that the participant's ability to answer some items will change, and this may lead to lower reliability coefficient (Mugenda, 2008).

A period of two to four weeks is the most appropriate for most social researchers (Kerlinger and Howard, 2006). The instruments were administered to the same group in the pilot study twice within an interval of two weeks. Pearson Product Moment Correlation Coefficient was computed for the instrument to be used. The consistency level of the research instrument is vital in determining whether the data to be generated from the instrument are reliable. A reliability of not less than 0.7 is recommended value of coefficient of consistency (Fraenkel and Wallen, 2003). The researcher accepted a level of reliability of a value of 0.746. This was with reference to questionnaires to be used for collecting quantitative data. Interview Schedules to be utilized for qualitative data collection was tested through the test-retest approach.

Data Analysis Procedures

Analysis was done using both descriptive and inferential statistics. The quantitative data was obtained from questionnaires (closed-ended Items). The qualitative data was obtained from questionnaires (open-ended Items) and interviews and document analysis. The interviews with principals, TSC DQUASO and CSO comprised verbal and narrative descriptions. Quantitative data from the completed questionnaires were cleaned, coded and then entered into the computer using the Statistical Package for Social Sciences (SPSS) Version 20.00. Descriptive statistics were used and they enable the researcher to describe the aggregation of raw data in numerical terms which are then computed for presentation and analysis (Neuman, 2008). The descriptive statistics involved the use of frequency and percentages.

Ethical Considerations

The research was based on established ethical considerations that govern research. Stufflebeam and Shinkfield (2007) recommend that a researcher should strive to control bias, prejudice and conflict of interest when conducting a research. First, data will be obtained from different sources to authenticate the information; the researcher will acknowledge the source of information to avoid plagiarism. This gave credibility to the study.

The study ensured that the permit to conduct the investigation was collected from the relevant authorities prior to the data collection. To ensure ethical behavior during the research process, the researcher sought and obtained written permission to conduct this research from the National Commission for Science, Technology, and Innovation (NACOSTI). The researcher then used the obtained permission to obtain Nakuru North Sub County. Researcher also ensured that participants are treated with the highest respect and are aware that their participation is voluntary.

Creswell (2009) says that the researcher must obtain informed consent from all the participants before undertaking the study. The researcher ensured that nobody is coerced to participate in the study. All the participants had the freedom to stop participating any time they

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feel uncomfortable. The researcher also ensured that confidentiality and anonymity are upheld during the research process by assigning numbers to participants instead of names. Participants need to be in control of the disclosure of their identity and their contribution. The researcher wore a mask and observed social distance and encouraged the participants to do the same.

Findings

a. Rating of Quality of Teaching and Learning in Schools

The teachers were asked to give a rating to selected aspects of quality of teaching and learning in their respective schools. They were given a Likert scale containing 5 measures as follows: Very Good (5); Good (4); Fair (3); Poor (2); and Very Poor (1). The data was analyzed and the results are displayed in Table 2.

Table 2: Rating of Quality of Teaching and Learning in Schools N = 151

Teaching and Learning Aspect	Response	F	%	Mean	Std. Deviation
Classroom dialogue and sharing	Fair	135	89.4	3.10	0.30881
	Good	16	10.6		
Ability to apply appropriate skills and techniques	Poor	2	1.30	3.25	0.4614
	Fair	110	72.8		
	Good	39	25.8		
Able to apply requisite knowledge of the discipline	Poor	24	15.9	3.09	0.63614
	Fair	89	58.9		
	Good	38	25.2		
Able to use teaching and learning materials appropriately	Fair	110	72.8	3.27	0.44623
	Good	41	27.2		

Source: Field Data 2020

The results in Table 2 reveal that the teachers indicated the quality of teaching and learning in their school was fair. Specifically, Classroom dialogue and sharing was rated by 89.4% of the teaching staff to be fair. Classroom dialogue can both be seen as a tool or medium to support children to learn new things (such as talking to learn) and as a means to learn to talk and communicate (such as learning to talk). The aspect recorded a mean score of 3.10, a value within the fair score range as per the Likert scale, thus implying that the classroom dialogue and sharing was fair. van der Veen and Poland (2012) observed that learning to talk and to use language in socially appropriate and functional ways is essential for the development of thinking.

The results in Table 2 reveal that the teachers indicated that the quality of teaching and learning in their school was fair. Specifically, ability to apply appropriate skills and techniques was

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perceived by 72.8% of the teaching staff to be fair. Teachers who are skilled at communication, classroom management and appropriate discipline techniques create a positive learning environment. The aspect recorded a mean score of 3.25, a value within the fair score range as per the Likert scale, thus implying that the ability to apply appropriate skills and techniques was fair. The findings are in agreement with those in a study by Dorgu (2016) who established that teachers who were able to use their skills and techniques appropriately delivered high quality of education.

Table 2 results show that, the teachers indicated the quality of teaching and learning in their school was fair. Specifically, ability to apply requisite knowledge of the discipline was perceived by 58.9% of the teaching staff to be fair. Knowledge of subject matter is a prerequisite for effective classroom instruction. The aspect recorded a mean score of 3.09, a value within the fair score range as per the Likert scale, thus implying that ability to apply requisite knowledge of the discipline was fair. The results were in agreement with that by Harris et al, (2007) where it was found that a teacher's understanding of subject facts, concepts, principles, methodology, and important generalizations determine his/her pedagogical thinking and decision making

The findings provided in Table 2 show that the teachers indicated the quality of teaching and learning in their school was fair. Specifically, ability to use teaching and learning materials appropriately was rated by 72.8% of the teaching staff to be fair. The aspect recorded a mean score of 3.27, a value within the fair score range as per the Likert scale, thus implying that ability to use teaching and learning materials appropriately was fair. The results were in agreement with those in a study by Nessipbayeva (2011) who established that ability to use teaching and learning materials appropriately contributed favorably towards the quality of teaching.

The smaller the standard deviation is, the less spread out the observations are. In this case, the SD spread is between 0.30881 and 0.63614, implying that the observations are spread fairly to a significant segment of respondents.

b. Types of In-Service Training Modes

Table 3 shows the effectiveness of selected types of in-service training modes in enhancing the quality of teaching and learning.

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Table 3: Types of In-Service Training Modes in Enhancing the Quality of Teaching and Learning

Types of In-Service Training Modes	Slightly Effective		Somehow Effective		Effective	
	F	%	F	%	F	%
Conferences	12	7.9	116	76.8	23	15.2
Workshops	15	9.9	98	64.9	38	25.2
Committee	0	0	108	71.5	43	28.5
Professional Reading	18	11.9	117	77.5	16	10.6
Individual Conferences	0	0	137	90.7	14	9.3
Visits and Demonstrations	135	89.4	14	9.3	2	1.3

Source: Field Data 2020

The results in Table 3 shows that majority of the respondents (76.8%) indicated that use of conferences was somehow effective in enhancing the quality of teaching and learning. Only 15.2% indicated that conferences were effective in enhancing the quality of teaching and learning. The results suggest that the conferences were not as effective as expected by the teaching staff. The findings were contrary to those in a study by Osamwonyi (2016) who established that were effective in enhancing the quality of teaching and learning. The researcher found that conferences gave participants an opportunity to question others and discuss ideas presented.

The results show that majority of the respondents (64.9%) indicated that use of workshops was somehow effective in enhancing the quality of teaching and learning. The results also show that 25.2% indicated that conferences were effective in enhancing the quality of teaching and learning. The results suggest that the workshops mode of in-service was not as effective as expected by the teaching staff. The results were not in agreement with those in a study by Hill (2012) who established that workshops helped develop co-operation and team spirit among the participants. The workshops were found helpful for developing understanding and proficiency for the approaches and practices in education.

The results in Table 3 show that majority of the respondents (71.5%) indicated that use of committee mode was somehow effective in enhancing the quality of teaching and learning. The results also show that 28.5% indicated that conferences were effective in enhancing the quality of teaching and learning. The results suggest that the committee mode was not as effective as expected by the teaching staff. The results were not in agreement with those by Deneme (2017) who established that the committee mode was effective in enhancing the quality of teaching and learning.

The findings provided in Table 3 reveal that majority of the respondents (77.5%) indicated that use of professional reading mode of in-service training was somehow effective in enhancing the quality of teaching and learning. The results also show that 10.6% indicated that conferences were effective, while 11.9% were slightly effective in enhancing the quality of

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teaching and learning. The results suggest that the professional reading mode of in-service training was not as effective as expected by the teaching staff. The findings were not in agreement with those in a study Deneme (2017) where it was established that professional reading, which is with the aid of a professional library' study groups was effective in enhancing the quality of teaching and learning.

The results in Table 3 show that majority of the respondents (90.7%) indicated that use of individual conferences was somehow effective in enhancing the quality of teaching and learning. The results also show that 9.3% indicated that conferences were effective in enhancing the quality of teaching and learning. The results suggest that the individual conferences were not as effective as expected by the teaching staff. The findings are in agreement with those in a study by Deneme (2017) who established that individual conferences (dependent of feelings of mutual understanding and support existing between teacher and supervisor) were effective in enhancing the quality of teaching and learning.

The findings provided in Table 3 reveal that majority of the respondents (89.4%) indicated that use of visits and demonstrations mode of in-service training was somehow effective in enhancing the quality of teaching and learning. The results also show that 10.6% indicated that visits and demonstrations were effective, while 11.9% were slightly effective in enhancing the quality of teaching and learning. The results suggest that the visits and demonstrations mode of in-service training was not as effective as expected by the teaching staff. The findings were also in line with the responses captured through interview schedules for principals. The principals mentioned that the main methods used were workshops and seminars. One principal is quoted saying.

“Even though we use various approaches for in-service training, the main type used is the School Based INSET, which takes the form of workshops and seminars.” Another Principal stated: “Our choice of type of In-Service depends on the thematic area and scope. For example, in the case of sciences, we would use demonstrations in our Laboratories”. This means that the type of in-service training used greatly depended of the nature of INSET program.”

c. Effectiveness of Types of In-Service Training

The mean results for the effectiveness of types of in-service training modes in enhancing the quality of teaching and learning were as shown in Table 4.

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Table 4: Descriptive Statistics for the effectiveness of types of in-service training
=151

	Response	F	%	Mean	Std. Dev
Conferences	Slightly Effective	12	7.9	3.07	0.477
	Neutral	116	76.8		
	Effective	23	15.2		
Workshops	Slightly Effective	15	9.9	3.15	0.574
	Neutral	98	64.9		
	Effective	38	25.2		
Committee	Neutral	108	71.5	3.28	0.453
	Effective	43	28.5		
Professional reading	Slightly Effective	18	11.9	2.99	0.4756
	Neutral	117	77.5		
	Effective	16	10.6		
Individual conferences	Neutral	137	90.7	3.09	0.291
	Effective	14	9.3		
Visits and demonstrations	Neutral	135	89.4	3.12	0.369
	Effective	14	9.3		
	Very Effective	2	1.3		

Source: Field Data 2020

The results show that according to the teachers the most effective type of in-service training modes in enhancing the quality of teaching and learning was the committee mode (28.5%), followed by workshops (25.2%) and then Conferences (15.2%). The scores also reveal that the select type of in-service training modes were somehow effective in enhancing the quality of teaching and learning.

The mean results were as follows: Conferences (3.07), Workshops (3.15), Committee (3.28), Professional reading (2.99), Individual conferences (3.09), and Visits and demonstrations (3.19). All these scores were within the range above 3.0 and below 4.0 (neutral score). The results suggest that according to the teachers, none of the methods recorded desired effectiveness in enhancing the quality of teaching and learning.

The smaller the standard deviation is, the less spread out the observations are. In this case, the SD spread is between 0.291 and 0.574, implying that the observations are spread fairly to a significant segment of respondents.

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The results are not similar to those in a study by Eduwen (2016) who reported that these in-service training modes were effective in enhancing the quality of teaching and learning.

d. Correlations between Types of In-Service Training Modes and Quality of Teaching and Learning

The results for Pearson correlations between types of in-service training modes and quality of teaching and learning were as presented in Table 5.

Table 5: Correlations between Types of In-Service Training Modes and Quality of Teaching and Learning

		Types of In-Service Training Modes	Quality of Teaching and Learning
Types of In-Service Training Modes	Pearson Correlation	1	.567*
	Sig. (2-tailed)		.000
	N	151	151
Quality of Teaching and Learning	Pearson Correlation	.567*	1
	Sig. (2-tailed)	.001	
	N	151	151

** . Correlation is significant at the 0.05 level (2-tailed).

Source: Field Data 2020

The findings in Table 5 show that there was a positive Pearson correlation between types of in-service training modes and quality of teaching and learning as follows: ($r = 0.567$, $p = 0.001$). This shows that there was an association between types of in-service training modes and quality of teaching and learning. Given that, the p-value (0.001), was less than the test significance level ($p < 0.05$), this relationship is statistically significant. This shows that a shift or change in the type of training modes has an effect on the way teachers work and subsequently, the quality of teaching and learning. The results were similar to those in a study by Akhter *et al* (2011) where majority of teachers were interested toward in-service training and they linked the effective teaching to in-service training modes.

Discussion of Findings

The study intended to examine the types of In-Service Programs that are offered to enhance the Quality of Teaching and Learning, techniques used in enhancing the quality of teaching and learning in public secondary schools, effectiveness of in-service training content influence the quality of teaching and learning in public secondary schools, the various types of in-service programs that are offered to enhance the quality of teaching and learning in public secondary schools, and the measures to be put into place for effective in-service training in public secondary schools of Nakuru North Sub-County. Based on these key themes which were derived from the research questions, and based on the data analysis in the previous section, the following is the summary of the findings.

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The key question that the study sought to answer was on what are the various types of in-service programs that are offered to enhance the quality of teaching and learning in public secondary schools of Nakuru North Sub-County? The results show that majority of the principals indicated that use of conferences, use of workshops, use of committee mode, use of professional reading mode, use of individual conferences, and use of visits and demonstrations mode were somehow effective in enhancing the quality of teaching and learning. The finding further shows that: There was a positive Pearson correlation between types of in-service training modes and quality of teaching and learning as follows: ($r = 0.567$, $p = 0.001$). This showed that, there was an association between types of in-service training modes and quality of teaching and learning.

Conclusions

The study concludes that the types of INSETS that teachers have been able to attend at their various schools over the last three years included conferences, workshops, committee mode and visits and demonstrations. The study concludes the type of in-service training program did not have a significant relationship with quality of teaching and learning in public secondary schools in Nakuru North Sub-County. Use of conferences, use of workshops, use of committee mode, use of professional reading mode, use of individual conferences, and use of visits and demonstrations mode were not effective in enhancing the quality of teaching and learning in public secondary schools.

Recommendations

On the types of in-service programs that are offered to enhance the quality of teaching and learning: The Ministry of Education should consider encouraging participants in in-service training through adequate funding to cater for facilities that allow the use of varied types of in-service programs such as setting up of laboratories and purchase of relevant training equipment.

The Ministry of Education should consider avoiding spending resources on Types of in-service programs that are not effective. Better still the Ministry can fund research activities or evaluations to find out why these types are not performing well. The Ministry of Education should consider establishing an active learning culture, and make all employees feel like a part of that culture, can boost emotional engagement. This emotional investment leads to increased learning and appreciation of various types of in-service programs

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