

CHAPTER TEN

THE ROLE OF IN-SERVICE TRAINING PROGRAMS IN THE DEVELOPMENT OF SCIENCE TECHNOLOGY AND MATHEMATICS TEACHERS FOR SPECIAL NEEDS EDUCATION

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Introduction

It is an established fact that for any organisation to grow, it must take staff development programs seriously. This will ensure efficiency, increased productivity and also boost the morale of members of staff. This can be entrenched through the institution of various In-service programs for staff development. Alfaidi and Elhassan (2020) described In-service as planned courses to improve instructional professional knowledge, interest and skills. They further asserted that the continuous professional development for the teachers is the key factor in the success of the educational process. Alfaidi and Elhassan (2020) further defined In-service as any program or activity that is designed in order to have a positive impact on the education process which takes place within an educational institution. This includes all the practices and experiences that the teacher undergoes after joining teaching profession. Omar (2014) had earlier described In-service training program in an organisation as a process by which people are taught skilfully and given the necessary knowledge or attitude to enable them to carry out their responsibilities to the required standard. In the final analysis they are able to undertake greater, more demanding roles for effective job performance, this Omar (2014) states will improve the quality of education.

Adenike (2019) also informed that In-service training is any training acquired during employment, and undertaken usually as part of the appointment agreement between employer and employee. In-service training for teachers therefore is a training process that goes on throughout the working life of a teacher. Education is a dynamic process as such teachers' training is a continuous process aimed at improving teachers' skills and knowledge with the passage of time. In-service education and training refers to all the activities that contribute to professional growth and qualifications of a teacher. In other words, In-service training is a continuing education of teachers, leading to the improvement of their professional competence. With the rapid increase in human knowledge; new approaches, new methods of teaching, and new avenues for the teachers are being introduced. An overriding importance of In-service training program is that it orients both new and old comers as well as serving as a form of motivation for employees or employers. Indeed, constant training of teachers' is essential, if the educational sector of any society is to grow, achieve its goal and meet the needs of its teachers'. It is instructive to posit that for the development and transformation of any nation, the effective preparation of teachers' is a key instrument for achieving this. Adenike (2019) did inform that a good scheme for preparing teachers' will in the final analysis result in the production of good school leavers. Furthermore, staff development is a process designed to improve

job understanding, promote more effective job performance, and establish future goals or career growth.

Special Needs Education (SNE) is described in the National Policy on Education (NPE, 2013) Section 7(117) as a customised educational program designed to meet the unique needs of persons with special needs, who the general education program cannot cater for. In this category are people with visual, hearing, intellectual disability, emotional and behavioural disorder, speech and language impairment as well as those with physical and health impairments. It also, according to the document, includes people with learning disabilities, the gifted/talented and the Albinos. The government further reiterated that special education training and retraining should be provided for all categories of teachers in the regular schools, for the effective implementation of the inclusive education of the special needs persons. The government of the Democratic Republic of Ethiopia (2012) informed that special needs Education (SNE) refers to the range of provisions for learners with disabilities, impairments or social-emotional difficulties. These may include everything from special schools, through special classes, to inclusive education.

According to UNESCO (2017) Special Needs Education (SNE) refers to separate schools, classes, or instruction specifically designed for students categorized as having Special Education Needs (SEN). Special education is defined as an 'education designed to facilitate the learning of individuals who, for a wide variety of reasons, require additional support and adaptive pedagogical methods in order to participate and meet learning objectives in an educational programme. The reasons they reiterated may include different physical, behavioural, intellectual, emotional, and social capacities. Furthermore, the body informed that educational programmes in SNE may follow a similar curriculum as that offered in the parallel regular education system, however they take individuals particular needs into account by providing specific resources (e.g. specially trained personnel, equipment, or space) and, if appropriate, modified educational content or learning objectives.

Fomunyam (2019) informed that the education system of Nigeria is divided into four stages; the kindergarten, the primary education, secondary education and the tertiary education which is overseen by the Ministry of Education with the Minister of Education at the helm of affair. Science Technology and Mathematics (STM) are courses commonly offered in schools the world over. The ever-increasing technological demands of the 21st Century require all citizens to become mathematically, scientifically, and technologically literate. Those without these capacities will become disadvantaged economically and socially within society (Ritchie and Norton, 2009). Walport (2010) is of the view that in order to increase the quantity and quality of specialist teachers there is the need to continue to recruit more STEM graduates into teaching, provide excellent training for them and retain excellent teachers within the profession by ensuring that their careers are rewarding in every respect. Fomunyam (2019) observed that the teacher is important in a nation for economic development as no nation can rise without good calibre of teachers (Federal Government of Nigeria, 2013). This typifies that the pace at which a nation develops is dependent on the quality of teachers present there.

The typical school in Nigeria is inclusive in nature as it is attended by all categories of students, both the able bodied and those with special needs. Jacob and Olisaemeka (2016) informed that children with disability deserve equal access to quality education which enable them develop into useful member of the society and contribute to the economic growth of their immediate community irrespective of their areas of special needs. Inclusion they further reiterated, refers to the "full-time placement of children with mild, moderate and severe disabilities in regular classrooms in recognition of this, the National Policy on Education (2013) unambiguously stated in Section 7 (118) that "persons with special needs shall be provided with inclusive education services in schools which normal persons attend in age appropriate general classes directly supervised by a general teacher". It must be understood that in some developing countries like Nigeria, inclusive education is thought as an approach to serving children with disabilities within general education settings. Consequently, the National Policy on Education in Nigeria states that Special Education is created as a formal special educational training given to people (children and adults) with special needs (Federal Government of Nigeria, 2013).

The thesis statement of this chapter includes the following

- The role of In-service training for teachers in an inclusive education system
- Special Needs Education (SNE) and the 21st century teacher of Science Technology and Mathematics (STM) education in an inclusive educational environment
- Types, benefits, impacts as well as challenges of in-service training
- Inclusive education
- Conclusions, implications and suggestions

In-service training programs and the development of teachers

This section dwells on the role of In-service training programs as a veritable tool for the development of teachers in institutions of learning, taking into cognisance the inclusive nature of the education system in Nigeria. It also discussed about the various forms of In-service programs a teacher can avail himself with, derivable benefits from participating in such programs as well as some challenges therein.

Alfaidi and Elhassan (2020) described In-service as planned courses to improve instructional professional knowledge, interest and skills. They further asserted that the continuous professional development for the teachers is the key factor in the success of the educational process. Alfaidi and Elhassan (2020) further defined In-service as any program or activity that is designed in order to have a positive impact on the education process which takes place within an educational institution. This includes all the practices and experiences that the teacher undergoes after joining teaching profession. Omar (2014) had earlier described In-service training program in an organisation as a process by which people are taught skilfully and given the necessary knowledge or attitude to enable them

to carry out their responsibilities to the required standard. In the final analysis they are able to undertake greater, more demanding roles for effective job performance, this Omar (2014) states will improve the quality of education.

Saleem and Zamir (2016) are of the view that the professional development of the teacher is the key factor in successful teaching and learning process. It helps teachers to keep abreast of changes in teaching learning process. It enables teachers to have awareness of the advancement in technologies and the development of curricula and instructional mode. In-service teacher training programs plays a significant role in the teachers' continuous professional development. It bothers on a systematic attempt to bring about changes in classroom practices and also in the teacher's beliefs and attitude. In-service training includes all the practices and experiences that teacher undergoes after joining the teaching profession. It is one of the important ways for developing a qualitative education system. In-service education can simply be defined as the relevant courses and activities in which a serving teacher may participate to upgrade his professional knowledge, skills, and competence in the teaching profession. Therefore, it encompasses all forms of education and training given to a teacher who is already on the job of teaching and learning (Osamwonyi, 2016).

Adenike (2019) informed that policy makers and practitioners in the educational sector have always exhibited an overriding interest in the improvement of teachers' quality, effectiveness and productivity. The researcher further reiterated that from the cultural perspective, various institutions may lay emphasis on knowledge, skills and norms suitable for their specific environmental needs. Hence schools most often at times design programs which will enable teachers familiarise themselves with requisite knowledge, skills, work ethos which are directed at attaining the acceptable behavioural patterns at work place. Programs such as seminars, workshops, conferences, study leaves and numerous types of developmental programs by the institutions are but a few examples of activities through which the teachers work behaviour can be reinforced.

In Nigeria, the National Policy on Education (NPE) informed that institutions like the National Teachers' Institute (NTI), National Mathematics Centre (NMC), Colleges of Education and Faculties of Education in universities etc. are the organisations saddled with the responsibility of organising In-service training for teachers. Indeed, teacher education must recognise that methodology as well as curriculum is ever evolving or witnessing changes, as such it is necessary for teachers to be regularly updated with these innovations. Adenike (2019) also reported that despite the provisions of pre-service and in-service training programs, indicators do reveal that the quality of our teachers does leave much to be desired. The researcher further reported that available statistics from the Federal Ministry of Education indicated that only 49.96% of the teachers at the primary school level nationwide for instance are qualified and that some states in the northern part of the country, such as Bauchi 27%, Jigawa 30%, Yobe 31% and Katsina 32% as percentages of qualified teachers in their employ respectively.

Indeed, constant training of teachers' is essential, if the educational sector of any society is to grow, achieve its goal and meet the needs of its teachers'. It is instructive to posit that for the development and transformation of any nation, the effective preparation of teachers' is a key instrument for achieving this. Adenike (2019) did inform that a good scheme for preparing teachers' will in the final analysis result in the production of good school leavers. Furthermore, staff development is a process designed to improve job understanding, promote more effective job performance, and establish future goals or

career growth. Ramatlapana (2009) viewed teaching as a field that is dynamic, with innovations necessitating upgrading of skills and education of the teachers through In-service training. Adenike (2019) informed that In-service training is any training acquired during employment, and undertaken usually as part of the appointment agreement between employer and employee. In-service training for teachers therefore is a training process that goes on throughout the working life of a teacher. Education is a dynamic process as such teachers' training is a continuous process aimed at improving teachers' skills and knowledge with the passage of time. In-service education and training refers to all the activities that contribute to professional growth and qualifications of a teacher. In other words, In-service training is a continuing education of teachers, leading to the improvement of their professional competence. With the rapid increase in human knowledge; new approaches, new methods of teaching, and new avenues for the teachers are being introduced. An overriding importance of In-service training program is that it orients both new and old comers as well as serving as a form of motivation for employees or employers.

A major purpose of in-service training as highlighted by the researcher is that it aids in the re-orientation of teachers to new goals and values, to prepare them to cope with curriculum change, as well as train them in new teaching and learning methods and to provide them with the knowledge and skills to teach new learning areas. Also, In-service training for teachers is a vehicle for achieving educational change that will persist, since such changes are in tone with technological, social, political, and cultural changes in the society. Kazmi, Pervez and Mumtaz (2011) in Adenike (2019) are of the view that in-service training for teachers enables the teachers to be more systematic and logical in their teaching style. Adenike (2019) reported that studies by Ekpoh, Oswald and Victoria (2013) shows that, teachers who attend in-service training perform more effectively in their work in the aspects of knowledge of the subject, classroom management, teaching method and evaluation of students. Similarly, studies by Jahangir, Saheen and Kazmi (2012) also show that in-service training plays a major role to improve the teachers' performance in school.

There are several approaches to organising In-service training programs for teachers and they include the followings; workshops, seminars, conferences, study leaves, lectures, panel presentation and a host of other methods. Ramatlapana (2009) informed that an important role of In-service training is that it ensures that teachers are connected to their knowledge base. Saleem and Zamir (2016) also stated that one of the important and basic purposes of the in-service training is to enable individual teacher to succeed in their profession and will be able to develop professional knowledge, skills and to develop professionalism. In-service training help teachers in adopting new situations in their professional life. They also improve their skills and it has a positive influence in teacher performance and in their ability to meet the students' needs. This may increase learning outcomes of the student.

Types of In-service Training

There are several approaches institutions and organisations can adopt to provide In-service training for teachers in the area of Science Technology and Mathematics (STME) for Special Needs Education (SNE), some of these techniques are highlighted below.

Workshops: - this involves discussion sessions and hands on practical sessions on selected themes or topics or subject matter. It is collaborative in nature as the teachers share their knowledge and experiences.

Seminars: – Unlike the workshop, seminars are characterised with relatively smaller groups of teachers who meet to discuss topical issues as every participant has the opportunity to contribute in the discuss.

Conference: – Conferences are meetings organised for the discussion or exchange of views. Usually, the conference of teachers, principals, supervisors, and administrators can broaden their professional horizons and cultivate in the participants a professional team spirit.

Study Circle: – In using this method, teachers of a particular subject would have a meeting, and in that meeting, they discuss the ways and means of teaching that particular subject.

Lectures: – These are oral activities, the simplest of ways practiced for in-service education and teachers' re-orientation programs. They are suitable particularly for transmission of knowledge.

Demonstrations: – This is an activity pre-arranged for the observation of a group of teachers anchored by a demonstrator who is usually a skilful expert in the field being demonstrated. Efforts are usually made to make the demonstrations as genuine and natural as possible.

Project Group: – This method is employed when a specific task is to be accomplished or carried out.

Panel Presentation: – A panel is a technique in which two or more persons speak on a single topic. It can be of any of the following types; debate, symposium, and informal panel.

Film: -Presentation of films is also a very useful technique of in-service training. An ideal film presentation is when it is associated with discussion.

Field Trip: – This is used to provide an opportunity to the in-service teacher to see the activities of his field. It may be carried out inland or abroad.

Science Club: – This is a technique of science in-service education for the science teachers. The science teachers are given instructions in their science club to promote their understanding and the capacity of educating the young.

Vacation Institutes: – These institutes are of high value for the teachers for many reasons. First, they enrich teachers' treasury of knowledge and the teachers return to the school with renewed spirit. Secondly, they make full use of the vacation in a better way. Thirdly, the teachers have the opportunity of enjoying the life of studentship.

In-service training programs are obviously veritable tools for upgrading as well as updating teachers of Science Technology and Mathematics (STM) education to become more productive, efficient and effective teachers particularly for students with special needs.

Benefits of In-service training programs for teachers

The benefits ascribable to in-service education are overwhelming and include some enumerated below:

1. Accords teachers in the area of special needs education the opportunities of updating their knowledge base and honing their skills as such enhancing their productivity.
2. Allows institutions and organisation to maintain their better trained workforce who may be engaged in some sandwich programs.
3. In-service programs enable organisations to cut cost as they may not have to pay the full salaries of employees
4. It serves as an avenue for enhancing number of better trained and qualified workforce for the institutions.
5. A source of additional funds for participants who may embrace various sponsorship programs.
6. It could serve as an avenue for engaging in community development programs

Impacts of In-service Training on the Effectiveness and Productivity of Teachers.

Various researchers have reported that that promoting teacher's quality through in-service education is a key element in improving productivity among teachers in both primary and secondary schools Adenike (2019). Furthermore, it has been revealed that through in-service training, teachers become responsible for their own growth and effectiveness, and they therefore become more sensitive, insightful, open to more options, and less frightened to innovations and changes. The success on the program hinges on the fact that with the system, teachers in STME and Special Needs Education (SNE) become familiar with new and novel technologies and also acquire knowledge about new instructional methods of disseminating concepts and managing resources. They are as such able to curb incompetence, inefficiency and ineffectiveness in the school system. In the same vein, Quartey (2012) asserted that, the more workers are trained and are satisfied with their job and environmental conditions, the more they help enhance their organizations' performance. The revelation is that In-service training schemes boosts the teachers' zeal to perform and resultantly performance and efficiency at work witness growth of geometrical dimension. In the final analysis, it can be stated that provision of In-service training for STME and SNE teachers can improve productivity amongst the teachers appreciably.

According to Afaidi and Elhassan (2020) In-service training program is a crucial element for the professional development of teacher. It enhances teacher teaching and contributes to view from a new angle, an avenue to meet classroom needs. They further reiterated that Continuous and efficient training program of teacher development is the key factor in the success of the educational process. Stating that it helps teachers to follow the changes in this process, and enables them to advance in technologies, development of curricula and modern teaching techniques. In-service training programs play significant role in teacher's continuous professional development. In addition, teacher professional development plays a crucial role on the quality of education in schools and improve the academic achievements of students

Challenges of In-service training

Like with any activity universally, despite the laudable benefits ascribable to In-service training, there are however some challenges, some of these as itemised by

Osamwonyi (2016) are discussed following:

2. In-service education programme is capital intensive and most of the participants are self-sponsored. So most often at times, participants are unable to cope with rather high school fees and other incidental expenses for textbooks and personal upkeeps.
3. Inadequacy of time allowed is a major constraint as contact hours for lectures and examinations are inadequate.
4. Non uniformity of techniques adopted by the different institutions involved in in-service education programmes which imply lack of uniformity in course content and methodology.
5. There is the problem of poor planning and organization and irrelevant curriculum.
6. There are problems of inadequate facilities in terms of classrooms, laboratories and boarding facilities to accommodate the size of enrolment often too large and this does not augur well for meaningful interaction.
7. The size of the enrolment is often too large to allow for any meaningful instruction.
8. The desire to admit as many students due to budgetary considerations has allowed several unemployed pre-service teachers to find their way into the programmes originally designed as in-service for practicing teachers.
9. The effectiveness of the intensity and scope of instruction in the various subjects leave much to be desired as there is always not enough content hours to cover the syllabus. Thus, the in-service education programme is characterized by 'mad' rush and the quality of the products is in doubt.
10. Most lecturers, in an attempt to make more of the extra money, take on many courses and overload themselves. Such overloading causes time-tabling problems. The lecturers can hardly be effective in such circumstances.
11. The in-service teacher education programmes are characterized by excessive sales of handouts, some of which are worthless.
12. The unpredictable nature of the academic year in the universities and other teacher education.
- x. Many of the teacher education institutions have often embarked on sandwich programmes in areas/fields where they do not have the basic instructional facilities, infrastructure and staff.
- xi. The rate and manner at which the students on sandwich teacher education programmes in the various universities and colleges, leave and return to their base (school) have been causing some disruptive effects on their schools academic and other programmes. There have been cases when teachers on sandwich teachers education programmes were not available to teach their classes and even to conduct examinations etc. because they either left too earlier or returned very late from the programmes.

From the discussions thus far, it is observed that the world is indeed dynamic and as such changes occur in all spheres including the education sector. The 21st century is an era of digitisation and new ways of disseminating knowledge using digital technology has emerged. It is obvious that with the only way proper teaching and learning of subject matters in STM can occur in an inclusive education setting as is the scenario in Nigeria, is for teachers to constantly undergo trainings and retrainings to acquaint themselves with emergent innovations in the field.

Special Needs Education (SNE) and the 21st century teacher of Science Technology and Mathematics (STM)

Nigeria operates an inclusive educational model as such the schools are not segregated as both the able bodied persons and people with disabilities study in the same learning environments. Not losing sight of this, the federal government does give cognisance to people with special needs as manifested in the National Policy on Education (NPE). Special Needs Education (SNE) according to the National Policy on Education (NPE, (2013) is a customised educational program designed to meet the unique needs of persons with special needs, who the general education program cannot cater for. In this category are people with visual, hearing, physical and health impairments. It also, according to the document, includes people with learning disabilities, the gifted/talented and the Albinos. The government further reiterated that special education training and retraining should be provided for all categories of teachers in the regular schools, for the effective implementation of the inclusive education of the special needs persons. Buttressing the assertion that it is of utmost importance to constantly train and retrain teachers Ikpe (2014), informed that the 21st century has witnessed rapid change in Information and Communication Technologies (ICTs) which have also been effectively deployed for use in education. The internet age has just become a part of the education community, when along came e-business and e-education and it is worthy to note that currently, Artificial Intelligence (AI) is trending. It is however pertinent to note that, with every change in technology comes a transformation in educational pedagogy and learning paradigms. The nation operates an inclusive model of education and as such has citizens with special needs yearning to be educated. In order to be able to impart knowledge effectively to all the categories of scholars particularly in the field of Science Technology and Mathematics (STM) education, it is indeed imperative to constantly train and retrain teachers in the relevant disciplines, since most may not be conversant with the current trend or innovations in the field of teaching and learning of STM. The Nigerian education system allows for the participation of all categories of students as the government sets out to provide quality education for all, as such aside from the able bodied, people with 'Special Needs' are also to be provided with qualitative education.

The 21st century as earlier stated, has brought along a lot of innovations especially in the teaching and learning enterprise. The vogue in the 21st century is the deployment technologically mediated learning environments particularly in the area of Science, Technology and Mathematics (STM) education. E-Learning platforms for the conduct of teaching, learning and assessment is a common place now, some examinations such as those conducted by the Joint Admission and Matriculation Board (JAMB) and the West African Examination Council (WAEC) are currently conducted via Computer Based Tests (CBT). Other vistas currently are the use of technology for science practical works via the Virtual Laboratories and with Artificial Intelligence (AI), new challenges are on the horizon. It is therefore imperative that purveyors of knowledge to students in the inclusive setting as described and especially in the fields of Science Technology and Mathematics (STM) education in the 21st century must be abreast with these innovations. The best way to arm teachers of STM who will be involved in providing the learning experiences to the 'inclusive learners' is through constant

training and re-training of the teachers through In-service training programs. This will obviously enable him to be an effective, efficient and productive player in the inclusive environment he operates in, more so taking into cogniscance, the advances made in the field of technologically mediated learning environment in the 21st century, the 21st century STM education teacher must as a matter of necessity be savvy in the field of technologically mediated learning.

Inclusive education

Nigeria to a large extent operates an inclusive educational system as there is no segregation among attendees, as such both the able bodied and those with special needs attend same institutions. Inclusive education was defined by Adetoro (2014) citing the Centre for Studies on Inclusive Education (2002) as a programme for all children and young people with or without disabilities or difficulties learning together in ordinary pre-primary provisions, schools, colleges and universities with appropriate network. The aim of inclusive education he further reiterated is not to erase differences in children but to enable all children to belong to the same educational community, while at the same time eliminating social exclusion arising from attitudes and responses to diversity in race, social class, ethnicity, religion, gender and ability. Adetoro (2014) also informed that inclusive education aims at providing for all students, including those with significant disabilities, equitable opportunities with which they could access effective educational services, with the provision of required aids and supports which will enable them become productive and well integrated members of their society or community. Inclusive education instructively, aims at eliminating social exclusion arising from attitudes and responses to diversity in race, social class, ethnicity, religion, gender and ability. Children with disability deserve equal access to quality education which will enable them develop into useful member of the society and contribute to theeconomic growth of their immediate community irrespective of their areas of special need experts have suggested that an inclusive education should be encouraged by governments by way of providing infrastructure and other facilities that enhance learning, socialization and the overall development of children with disability.

The major goal of inclusive education is to expunge any form of discriminatory act towards the participation of people with disabilities or who are disadvantaged towards education. In Nigeria schools are inclusive in nature as it is attended by all spectrum of students, whether able bodied or requiring special needs. Jacob and Olisaemeka (2016) informed that children with disability deserve equal access to quality education which enable them develop into useful member of the society and contribute to the economic growth of their immediate community irrespective of their areas of special needs. Inclusion they further reiterated, refers to the "full-time placement of children with mild, moderate and severe disabilities in regular classrooms in recognition of this, the National Policy on Education (2013) unambiguously stated in Section 7 (118) that "persons with special needs shall be

provided with inclusive education services in schools which normal persons attend in age appropriate general classes directly supervised by a general teacher". It must be understood that in some developing countries like Nigeria, inclusive education is thought as an approach to serving children with disabilities within general education settings. Consequently, the National Policy on Education in Nigeria states that Special Education is created as a formal special educational training given to people (children and adults) with special needs (Federal Government of Nigeria, 2013).

Summary

This chapter discusses the role of In-service training programs in the development of teachers of Science Technology Mathematics (STM) education for Special Needs Education (SNE). It dwells on the role of In-service training programs as a veritable tool for the development of teachers in institutions of learning, taking into cogniscance the inclusive nature of the education system in Nigeria. It also discussed about the various forms of In-service programs a teacher can avail himself with, derivable benefits from participating in such programs as well as some challenges therein. The chapter further informed on the concept, Special Needs Education (SNE) and the 21st century teacher of Science Technology and Mathematics (STM). The Federal Government of Nigeria recognises the need to provide qualitative education for its citizens irrespective of one's status and disposition as enshrined in section 7 (123) of the National Policy on Education (NPE, 2013). The section does project the government's position on providing for citizens with special needs, that the general education program cannot cater for. In this category are people with visual, hearing, physical and health impairments.

The 21st century has brought about a lot of innovations especially in the teaching and learning enterprise which is bedecked with numerous technologically mediated learning environments. Using various E-Learning platforms for teaching, learning and in assessment is a very common place currently. It is therefore imperative that purveyors of knowledge to students with special needs especially in the fields of Science Technology and Mathematics Education (STME) be kept abreast with these innovations. The best way to achieve this is through constant training and re-training of teachers involved in providing the learning experiences to the learners with special need which is possible through In-service training. The article also highlighted some types of In-service training as well as some pros and cons of the program. It was concluded that the In-service scheme is a veritable tool for the professional development of competent teachers of (STME), for the purpose of disseminating knowledge to student of (SNE). Currently, teachers are facing new challenges in the education sector as the world been dynamic is witnessing new and novel challenges and changes. It is therefore imperative for teachers in this 21st century to keep abreast with these emergent knowledge, skills and technology by constantly participating in In-service training programs.

Nigeria, it is informed operates an inclusive educational system as there is no segregation among attendees in institutions of learning, as such both the able bodied and those with special needs attend same institutions. Inclusive education was defined by Adetoro (2014) citing the Centre for Studies on Inclusive Education (2002) as a programme for all children and young people with or without disabilities or difficulties learning together in ordinary pre-primary provisions, schools, colleges and universities with

appropriate network. The aim of inclusive education is said to help enable all children to belong to the same educational community, while at the same time eliminating social exclusion arising from attitudes and responses to diversity in race, social class, ethnicity, religion, gender and ability.

Conclusion

From the discussion above, it is instructive to note that Nigeria practices an inclusive educational model and a very important way of preparing teachers to operate effectively and efficiently in such a climate is to avail them with opportunities of participating in activities like the In-service scheme which is a veritable tool for the professional development of competent teachers of Science Technology and Mathematics (STM) education for the purpose of disseminating knowledge to students. It can help enhance their knowledge and invariably impact on the quality of teaching and learning carried out in schools. Currently, teachers are facing new challenges as the world which has been dynamic is witnessing new and novel challenges and changes in all spheres of life including the education sector. It is therefore imperative for teachers to keep abreast with these emergent knowledge, skills and technology by constantly participating in In-service training programs.

Implication of In-service training for STM teachers for Special Needs Education (SNE)

The National Policy on Education (NPE) clearly conveys the government's position on providing quality education for the citizenry taking into cognisance the fact Nigeria operates an inclusive model of education. As such all developmental activities engaged in must include that which will take into consideration, the people with special needs in education. The trend in the 21st century is the deployment of technologically mediated learning environments particularly in the area of Science, Technology and Mathematics (STM) education. For proper teaching and learning of STM courses to take place for students with special needs, the teachers of these courses must be abreast with these novel methods of teaching and learning. The convenient way of achieving this is through the use of In-service training programs for the teachers. This way, there will be better productivity from the teachers and they are bound to discharge their duties more effectively and efficiently. In the final analysis, this will impact positively on the students with special needs morally and academically.

Suggestions

The following suggestions are advanced:

- i. It is suggested that all teachers should endeavour to embrace refresher courses or other forms of trainings periodically so as to keep abreast with innovations in their fields.
- ii. Government agencies and other stakeholders in the education sector should assist in financing In-service programs for teachers of students with special needs.
- iii. Teachers in Special Need Education (SNE) should endeavour to be computer literate especially in this 21st century which is an era of digitalisation of the learning environment.

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