

# Teacher Education in Tanzania: Pre-Service Teachers Preparation for the 21<sup>st</sup> Century

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## Abstract

This study explored the required knowledge and skills during pre-services teachers' preparation for the 21<sup>st</sup> century based to Tanzania context. The qualitative study was employed at the selected universities with teacher education programme in Tanzania. The study discovered that some 21<sup>st</sup> century knowledge were not plentifully integrated during pre-services teacher preparation in while other skills are well integrated. Participants were the pre-service teachers' and tutors including Professors and Lectures from the teacher education programme. Although the study found some impediments to the integration of 21<sup>st</sup> century knowledge in teacher education programmes in Tanzania. This study endorses that, technological pedagogical content knowledge should be given highly priority without isolation during preparation of teacher for the 21<sup>st</sup> century.

**Key words:** *Teacher education, Pre-service teacher, knowledge and skills*

**DOI:** 10.7176/JEP/11-11-09

**Publication date:** April 30<sup>th</sup> 2020

## 1. INTRODUCTION

The future of any nation looks on how to alleviate poverty to its people by providing quality education which will be the panacea for archiving national development, to accomplish this objective the preparation of quality teachers is inevitable. In fact, these two terms have positive relationships, the national development and the quality education for archiving national development. Based on these arguments, education in Tanzania, as in many other countries around the world, is considered as a vehicle for social, political and economic development, with specific linkages to a country's science and technology systems, which in turn would contribute to poverty reduction (URT/VPO 2005:9). Nevertheless, quality of education is dependent upon many factors (i.e. inputs and processes), including the quality of teachers (Mgaiwa, 2018). Even though strength of any educational system is dependent upon many factors, scholars such as Mosha (2006) and Komba and Nkumbi (2008) argued that the quality of teachers in the education profession form an important component for effective education system delivery.

Over the past two decades there has been a great deal of focus on reform in teacher preparation aimed at improving learning outcomes for students in PK-12 schools (Hollins, 2011). The discussions and recommendations for reform have presented different perspectives on the process of learning to teach, the knowledge base for teaching, and the routines and practices of classroom teaching. Conventional pre-service teacher preparation programs have been criticized for being too often characterized by fragmentation, weak pedagogy, and a lack of articulation among courses and between courses and field experiences, as well as for the absence of a set of organizing themes, shared standards, and clear goals (Feiman-Nemser, 2001; Zeichner, 2006). Therefore, there is no way to achieve quality education if the quality of teachers we produce is of an unacceptable standard, even when the educational policies, plans, curriculum materials, and educational leadership are all of the requisite standard (Mgaiwa, 2018). Though, quality teachers are vigorous components of any education system as they form an important pillar for students' learning by converting national philosophy, educational policy and curriculum goals into instructional objectives and eventually create the environment for students' learning (Richmond & Floden, 2017). Logically, that is to say, the aforementioned national strategies themselves, they cannot generate new knowledge to the students in 21<sup>st</sup> century, rather than their task is to create the good environment for the well-prepared teachers to utilize for generating student knowledges. Therefore, having the quality teacher require a set of national philosophy, policies and good curriculum from the process of preparation to the market or employment. This argument is supported by prominent scholars in teacher education such as Schwille, Dembele, and Schubert (2007), who argue that teacher preparation should take into account the concept of "continuum of teacher learning" which encompasses a range of teacher learning, from the initial stages of training to early career years and throughout their teaching career.

Many studies proved the decline of teacher quality in many of developing countries in Africa including Tanzania (Lunenberg, 2010). This has been associated with many factors. Hollins, (2011) showed that, the decline of teacher quality is associated with poor teaching quality during process. Although Mgaiwa, (2018) showed that, the poor quality of teachers is associated with absence of specific policies to guide teacher education provision in Tanzania. However, he identified other problems like absence of teacher professional development, induction course for novice teacher and poor use of ICT during teacher's preparation. Also, Namamba, (2017) he argued

that, poor quality of teachers in Tanzania is associated with mushrooming of teacher education institutions from 2005, although in reality the quality was blamed even before 2005. Among all aforementioned researches they all based on assessing the quality of teachers as output from the process, but there's no specific research or any study which specialize on assessing the preparation of pre-service teachers who joining the teaching professional for the first time.

Therefore, this study strongly aimed to assess pre-services teachers' preparation by considering the knowledge and skills required in 21<sup>st</sup> century in teacher education programme including pedagogical, subject matter and technological knowledges in the process of pre-service teachers' preparation in Tanzania.

In this regard, the study focused on the following line of inquiry:

- What kind of knowledge and skills required during pre-services teachers' preparation for the 21<sup>st</sup> century based to Tanzania context?

### 1.1 Conceptual framework

To understand this study objective, a teacher education model for the 21<sup>st</sup> century was adopted from (Koehler & Mishra, 2009). The model does not consider three kind of knowledge in insolation. From the conceptual framework shown as Figure 1, The main assumption of the model being that the 21<sup>st</sup> century teacher should have technological pedagogical content knowledge as a teacher education goal and teacher should integrate these knowledges in the classroom setting. The model further assumes that preparation and development of teachers is not an end in itself, but a step towards achieving the desired outcomes for students in schools due to the change of science and technology in 21<sup>st</sup> century. The Skills such as creativity, flexibility, communication, interpersonal, collaboration, leadership, global and cross-cultural awareness they act as catalysts to ensure effectiveness integration of these knowledge in the classroom setting.

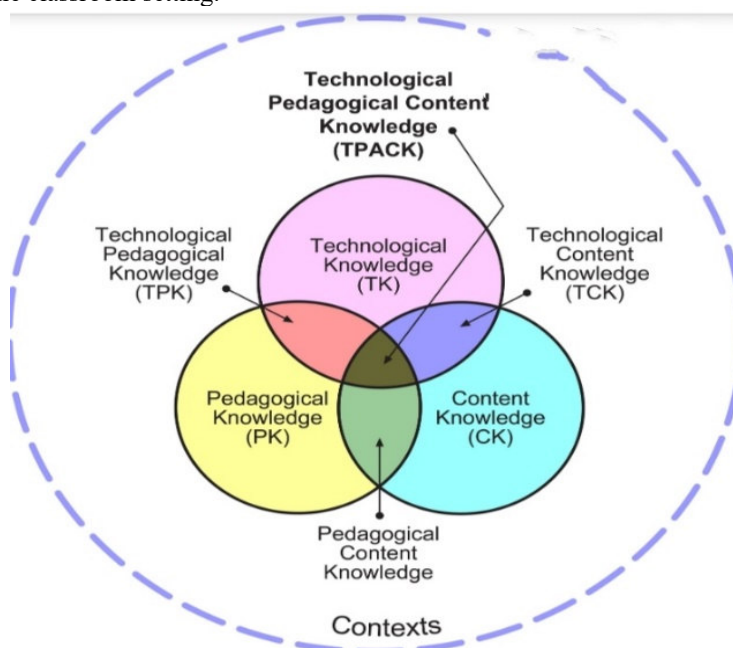


Figure 1. Teacher Education Model for the 21<sup>st</sup> Century

Source: Adopted from (Koehler & Mishra, 2009)

On the conceptual framework, the teacher education programmes should emphasis on different levels of knowledges which are more useful to improve teaching and to make educational innovations and more successful. Pre-service teacher preparation is one of the most important aspects of every teacher education curriculum as it prepares student-teachers to become qualified teachers in the future. Hence, Teacher education programmes in Tanzania must be oriented towards enabling both pre and in-service teachers become multitalented teachers, capable of thinking critically and competent in integrating all these level of knowledges without isolation in the classroom setting.

The *Canter's theory of assertive discipline* is structured system to enable trained teachers to manage their classrooms. The theory focuses on teachers developing a positive behavior management strategy rather than being dictatorial, hence teacher will be able to utilize the acquired skills and knowledge during teaching and learning. The *Canter's theory of assertive discipline* emphases on trained teacher to make the rules very clear and do not have any ambiguous also strongly to recognize the student's behavior. As such, the assorted approaches it will help the trained teacher to apply the acquired difference levels of knowledge and hence the teaching will be smoothly. Also, it needs strongly support from other educational stakeholders like Ministry of education and others

in making the educational goals clear through having good curriculum which allow right mix of different levels of knowledge.

## 2. LITERATURE REVIEWS

### 2.1 *Teacher education by considering the concept of pre-service teachers'*

The concept of teacher education has a varied meaning among scholars, many scholars define teacher education based to different perspectives and context. In most cases, teacher education has been defined based on two major aspects (i.e., pre-service and in-service). The National Council for Teacher Education NCTE, (1998) has defined teacher education as a programme of education, research and training of persons to teach from pre-primary to higher education level. They added that, Teacher education is a programme that is related to the development of teacher proficiency and competence that would enable and empower the teacher to meet the requirements of the profession and face the challenges therein.

Izuagba and Obiefuna (2005), in addressing the in-service perspective, defined teacher education by referring to all programs designed to help teachers already in-service to continuously update their knowledge, skills, and attitude in order to contend with continuing changes in methods, course content and resources used in teaching. Although UNESCO, (2016) with the idea to accommodate the two aspects (i.e., pre-service and in-service) defined teacher education as a combination of two broad categories; initial or pre-service training and continuous professional development in which the trainees generally attend courses in general and specific subject area contents, methods of teaching, developmental psychology, testing and assessment and educational management.

Oyekan (2002), while capitalizing on the pre-service dimension, defined teacher education as the provision of professional education and specialized training within a specific period for the preparation of individuals who intend to develop and nurture the younger generation into responsible and productive citizens (p. 12). Also, UNESCO, (2016) called it as initial training in which pre-service training is provided to trainees enrolled in teacher education institutions before they begin to teach. In most cases, pre-service training is provided on a daily basis or in a residential facility. This research adopts these two definitions in understanding teacher education and pre-service teacher, because they take into account the general concept of pre-service dimensions of teacher education as related to this study.

### 2.2 *Pre-service teachers' preparation in developing countries.*

Many developing countries especially in Africa the teaching professional is blamed and still looking as a last optional among many other best alternatives (Mgaiwa, 2018). This has been supported by Mashau, Mutshaeni & Kone (2016) who stated that, in South Africa the profession is surviving because of students who pass Grade 12 and find out that they are not qualifying to pursue their first prioritized, desired or chosen career in the university and hence turn to teaching as an alternative career. This limits to get professional individuals who are dedicated to work and who will practice roles of a teacher as per the norms and standards for educators.

Although, how developing countries prepare pre-service teacher who joining teaching professional for the first time remain as a question. In Ghana, Teacher education institutions generally expose their students to a teacher preparation curriculum made up of four key components: (1) liberal or general studies, (2) specialized subject-field or content studies, (3) professional and pedagogical studies, and integrative studies (Cruickshank, 1996). According to CETDAR (2004) stated that, traditionally, teacher education Programmes in Ghana have followed a curriculum structure in which a large part of instructional time (more than 90%) is devoted to the pursuit of theoretical aspects of education embodied in taught courses (general, content and professional studies) with very little time (less than 10%) available for practice teaching under clinical supervision (integrative studies).

However, Hollins (2011) argued that, the conventional pre-service teacher preparation programs have been criticized for being too often characterized by fragmentation, weak pedagogy, and a lack of articulation among courses and between courses and field experiences, as well as for the absence of a set of organizing themes, shared standards, and clear goals (Feiman-Nemser, 2001; Zeichner, 2006). The standards set in the program accreditation process have been helpful, but this has not alleviated these problems (Zeichner, 2006). They proposed that, it is important for teacher preparation programs to meet the minimum standards set by the National Council for the Accreditation of Teacher Education, but more is needed to prepare pre-service teachers for quality teaching (Feiman-Nemser, 2001; Zeichner, 2006).

Baumert et al. (2010) Stated that, professional knowledge including Content Knowledge, Pedagogical Content Knowledge and General Pedagogical Knowledge is one of the important cognitive disposition that impacts teaching quality and students learning. Pre-service teachers acquire a substantial amount of these types of knowledge during the course of their Initial Teacher Education training (Cheang, Yeo, Chan, & Lim-Teo, 2007). However, beginning teachers often struggle with the high demands in the classroom during their first years in school and often report difficulties in transferring what they have learned into practice (Klusmann, Kunter, Voss & Baumert, 2012)

Several studies have shown that pre-service teachers begin to develop different facets of knowledge during

their Initial Teacher Education and attempt to link these to teaching practice (Hammerness, Darling-Hammond & Shulman, 2002; Sturmer et al 2013). However, opportunities for practical experience in Initial Teacher Education such as internships at school are often limited. Moreover, it is assumed that they are not always related to the knowledge acquired in university courses (Allen, 2009; Korthagen, Loughran, & Russell, 2006)

The report from UNESCO, (2016) explained about the same issues in Sub Saharan African countries which complaints about initial teacher training which is over-reliance on theoretical contents and under-appreciation of strengthening teacher competencies. In many countries, the contents of pre-service training are not aligned with the national curriculum and assessment policy leading to the poor preparation for classroom practice. They also argued that, the content knowledge is not generally aligned to the contents of the school curriculum and the courses are also generally disconnected with the realities of teaching practice in the classroom.

Even thro, some education systems in developing countries are actively involved in reviewing pre-service teacher education models through trialing new methodologies, for example, through greater collaboration between training institutions and schools (Florian & Rouse, 2009).

### *2.3 Pre-service preparation in Tanzania context.*

In Tanzania pre-service teachers' preparation is done under teacher education colleges and universities, currently managed by the Ministry of Education, Science, and Technology. The ministry of education of Tanzania now manages a total of 40 public teacher's colleges and provides guidance to about all other registered privately-owned colleges that prepare teachers for certificate and diploma levels (MoEST, 2019).

Tanzania Commission for Universities (TCU) manage all universities in the country. It has a mandate to recognize, approve, register and accredit universities opening in Tanzania, and local or foreign university and programmes by registered higher institutions. The directorate of higher education at the MoEST are responsible for the preparation of undergraduates and post-graduates' teachers (MoEVT, 2010). The teacher education directorate at the ministry is responsible for the management of teacher education nationwide. The directorate deals with the preparation of "Grade A" (certificate) and Diploma teachers to satisfy teachers' needs for pre-school, primary and secondary education (Ministry of Education and Vocational Training [MoEVT], 2010). For Certificate and Diploma teachers there is National Examination Council of Tanzania (NECTA) whereby it is responsible to ensure quality by supervision and conducting examinations for, and to grant, diplomas, certificates and other awards of the council to the graduates of the colleges.

In order to improve teacher education in Tanzania the Ministry of education science and technology developed National Curriculum Framework for Basic and Teacher Education which intends to energize the efforts towards realization of competence-based teaching and learning in our schools and colleges. (MoEVT, 2019)

Despite these reforms, the educational sectors, including higher education, are all face quality challenges. For example, Mgaiwa (2018) and Mgaiwa & Ishengoma, (2017) identified several institutional challenges which curtailed the quality of higher education, including the quality of teaching graduates. Teacher training is currently offered through three clusters as follows:

Grade A' teachers are prepared to teach pre-primary and primary school students. Normally, teachers who eligible are supposed to complete form four (ordinary level of secondary education certificate) and get qualifications for entrance. This including getting Division IV-27 but more emphasize put under Mathematics and English.

Diploma holders are prepared to be secondary school teachers, although most also teach in primary schools. Normally employment will follow completion of teacher training college course from form six graduate are formed (advanced level secondary education certificate). Likewise, entry qualification increased to, at least Division III with two principal passes in teaching subjects from form six certificate. This diploma least for two years, but for students under government special program (science subjects) who complete form four they took a course for three years and the entry qualification is at least Division III with credits in science subjects (MOE, 2019). It including two years for diploma course and one-year setting for form six education examination, those who pass will be awarded certificate and being employed by the government.

Bachelor Degree graduates. This is regarded as the highest level of teacher education in Tanzania, teachers are prepared to teach in secondary schools, but mostly high schools and teacher training colleges. The admission requirements are same across all universities including public and private universities. Tanzania established Central Admission System (CAS) that helped in integrating the activities of universities as against the manual system that had a lot of flaws. Students with Advanced Certificate of Secondary Education with at least Division III and having two principal passes they can be eligible for teaching profession. Currently the course is offered for three years, before 2005 the training was offered for four years, but the demand for teachers in Tanzania make the program to be offered for three years. However, for this level students can be categorized based to their specialization including; One teaching subject with many educational courses, they normally prepared to work as tutors in colleges. Second streams including; two teaching subjects with few educational courses, they normally prepared to teach secondary school students.

Based on the reviewed literature, it is evident that there is a problem or misunderstandings on how pre-service teachers are prepared in Tanzania in different teacher education colleges if they meet the quality of 21<sup>st</sup> century knowledge and skills. Besides, there has been no research or any study that have examined or assessing specifically the pre-service preparation process in Tanzania teacher education collages. Most previous studies and researches concentrated on teacher education in general by assessing qualities of teachers as output in general whilst ignoring pre-service preparation as independent aspect for assessing the quality of teachers.

### 3. METHODOLOGIES

This study involved two universities, including public and private university in Tanzania. The selection of universities was based on four main criteria: accreditation status, nature of ownership, prominent and oldest of the university and geographical location. This study employed a qualitative research design because it provides the possibility of a detailed description and better-off clarification of complex problems. The analysis of pre-service teachers' preparation in Tanzania needed a diverse participant like tutors or lecturers, pre-service teachers in which the analysis is complex by nature. Thus, the opinions, perceptions, views, feelings, and experiences of those who joining the teaching professional for the first time was detected.

In this study the two main data collection methods were employed: in-depth interviews and documentary review as the data collection methods. In accordance with the observance of ethical research principles, the research sites and the interviewees were anonymized. Convenience sampling technique was used to select participants from the population including pre-service teachers and academic staffs from teacher education colleges. However, respondents were chosen on the basis of the program; in this case teacher education programme. Face to face in-depth interviews were used to solicit data from pre-service teacher trainees a total of 30 participants and the academic staffs including professors, and lecturers a total of 6 participants from the from these two selected universities in Tanzania. Therefore, in order to make a generation of information feasible through document analysis, the libraries of Zhejiang Normal University and Mkwawa University (A Constituent College of the University of Dar es Salaam) of Tanzania were used.

Nevertheless, the researchers also accessed and reviewed some official documents such as curriculum for the teacher training programme. According to Creswell (2003) document review has advantages over other data collection methods mainly because the researcher can access the documents at his or her convenient time. Based on the main objective of the research, two main criteria were employed in sorting documents for review; namely the document type (i.e., peer review journal articles, books, and official reports from the United Republic of Tanzanian government, universities, and supranational organizations such as the UNESCO). For the purpose of making sure that selected documents elicit dependable data, the author followed the four conditions for managing documentary review sources in social sciences as developed; viz., authenticity, credibility, representativeness, and meaning (Mgaiwa, 2018). Therefore, original documents published by individual scholars were scrutinized and synopses noted.

### 4. RESULTS AND DISCUSSIONS

The study found that the Tanzania pre-service teacher training programme at the university level has managed to slightest integrate some of the 21<sup>st</sup> century knowledge and skills into the programme. This has been associated with frequently reformation of teacher education in Tanzania since independent. It true that, Tanzania benefited with different plans and policies in education which act as a tool for quality education. The study has found that, these integrated skills and knowledge has contributed to the preparation of teachers through capturing some required skills and knowledge for the 21<sup>st</sup> century. Nevertheless, through depth interview with many respondents, they proved that, there are some knowledges and skills which are left behind and partially integrated during pre-service teachers' preparation for the 21<sup>st</sup> century. This section discusses the knowledge and skills that have been integrated and partially integrated, challenges that are faced in integrating some knowledge and skills also, recommendations that could be used to help in the integration of these knowledges which have not been fully integrated into the teacher training programme.

#### 4.1 *Current Practice*

The researchers explained the 21<sup>st</sup> century knowledges and skills to the research participants for them to have a clear understanding of the terms used in 21<sup>st</sup> century as a tool for improvements. The knowledges included content or subject matter, pedagogical and technological knowledges. The skills included critical thinking, problem solving, knowledge application, creativity, flexibility, communication, interpersonal, collaboration, leadership, global and cross-cultural awareness. After clarifications of these knowledges and skills to the participants they were asked whether they learn these knowledges and skills also, whether tutors are incorporate during preparation of teachers for 21<sup>st</sup> century. Nevertheless, participants were asked to provide examples of how they learn those particular knowledges and skills. The majority of the participants indicated that most of the knowledges outline above have been full integrated into their programme in one way or another. It was found that most of students'

teachers dedicate their effort in subject matter or content knowledge with a notion that it value compared to other levels of knowledges. For example, the participants noted that once they are going for job application especially in private schools, they assessed in only one level of knowledge which is subject matter. The participate added that, during interview they have to seat for the same written examination done by the students in a specific level, once they pass the examination, they automatically got employment. In additional of the previous argument, another participant has the following says; "... the way teacher trainers teach teacher trainees course (subject matter) they normally emphases us to put more effort in content knowledges and emphasize that other knowledges are just guideline during teaching and learning" But, authenticity students-teachers are supposed to be equipped with all levels of knowledges.

Also, it was found that pedagogical knowledge is well integrated in teacher education programmes and helpful during preparation of pre-services teacher. Many participants responded positively to the pedagogical courses and they help them during teaching practice. However, main challenge to pedagogical knowledges was, some participants complained to have many educational courses per semester, which make them incompetent to some courses. This has been proved by one participant who says; "I have seven educational courses per semester, this limit my effectiveness in managing all these courses per one semester..." However, the tutor in one of the institutions responded as follows to the above argument; "... we equip students to join teacher education, and our target as institution is to produce quality teacher who have effect to the development of the country, its true we have set of courses per semester and each course have its unique advantage during teacher preparation. Even thro, the time for teacher preparation is only three years, hence we try for our level best to make at least each course well taught." Based to this response it shows that pedagogical knowledge in Tanzania context is well integrated in teacher education programme and effective utilized.

The researchers explained the 21<sup>st</sup> century skills to the research participants for them to have a clear understanding of the skills. The skills explained included critical thinking, problem solving, knowledge application, creativity, flexibility, communication, interpersonal, collaboration, leadership, global and cross-cultural awareness. The majority of the participants after depth discussion indicated that most of the skills outlined above have been integrated into the teacher education programme in one way or another the same as to knowledge.

The study has found that some of the skills are acquired through classroom activities such as group work which involves highly teamwork among the learners. One of the tutors reported that "I always form students' groups and students within a group I assign them to conduct individual research, which require the group to make use of all the individually collected elements to write or present a report that depends on each individual's contribution. In this way, students can simultaneously be taught subject matter, research and presentation skills, and how to work well with others. They may also discover startling but valuable connections between various aspects of a topic." Working together in a small or larger group can facilitate more frequent and insightful communications. In a classroom of thirty, for example, a student might be expected to speak only one-thirtieth of the time. In a group of two students, a student might speak for half of the time and listen for half of the time, and both the speaking and the listening can be concentrated on what the students need to know or desire to investigate.

However, the participants noted that at times they could be given a group or individual task which could involve critical thinking. One of the tutors in another institution reported that "To enhance thinking in my classroom, at some point in the lecture, I ask students a key question and I let them first sit quietly and write down some notes on their own, then I keep them in pair to discuss the question with another student. Lastly, I form groups, depending on the class size, which they supposed to share their thoughts with the larger group; It is called think pair share" This has been supported by Dewey (1916), who roots critical thinking in the problem solving, stated that "only by wrestling with conditions of the problem at first hand, seeking and finding his way out, does the student think" (p, 188). Therefore, the acquisition of critical thinking skills enables the teacher trainees to be able to think critically and rationally when they deal with any educational problem in the classroom setting.

#### *4.2 Not Full Integrated*

Although it was found that some 21<sup>st</sup> century knowledges were at least slightest integrated, through deep interview with participants noted that, some knowledge such as technological knowledges were not fully integrated in teacher education programmes. They were however quick to note that technological knowledges are very important in today's world due to rapidly change of science and advanced technology. In August 2005, the Government of the United Republic of Tanzania in collaboration with the Swedish Government through the Swedish International Development Cooperation Agency (SIDA) initiated a project for introducing ICT in all government teachers' colleges assisting during teacher preparation (URT, 2007). The project's main goal was to improve the quality of pre-service and in-service teacher education by using ICT. Due to many challenges the policy failed to work effectively in Tanzania context teacher education. One respondent argued, "... yes, I think technological knowledges especially computer skills and how to use internet is very important in the 21<sup>st</sup> century in Tanzania teacher education, so we can make full use of the plentiful information and resources on the internet to improve our teaching in our collages". The majority of respondents reasoned that learning how to use internet is very

important in the 21<sup>st</sup> century even thro in Tanzania the information explosion is not very high compared to other developed countries.

It true that, the Tanzania government take many initiatives towards enhancing technology in teacher education programmes. MoEST, (2019) stated that Teacher education programmes will be oriented towards enabling both pre and in-service teachers become multitalented teachers, capable of thinking critically and competent in integrating technology in leaner - centered teaching situations. In the same light, the teachers must exhibit abilities to facilitate and inspire student learning and creativity so that all students in Tanzanian schools and colleges achieve specified competencies. Such competencies or skills include the ability to express oneself well in speech, writing, and research skills. However, it was noted that internet and related information technology is not adequately taught in teacher education programmes in Tanzania.

#### 4.3 *Challenges to Integration of 21<sup>st</sup> Century Knowledges*

Although, Tanzania government take many initiatives towards enhancing technology in teacher education programmes but faced with many challenges. Shortage of trained staffs who are competent in technological courses including Educational Media, Information and Communication Technology in teacher education collages; as it well known that the integration of technology in teacher education is the one among new approach in most of the developing countries in Africa especially in 21<sup>st</sup> century. The study proved that in many teacher education collages pre-service teachers are taught the technological courses with the tutors who do not undergo pedagogical knowledges. Also, the study proved that, in all selected universities these courses are taught in the combination of all student who take these courses pre-semester, whereby the number of students in the particular venue is above the venue capacity. Based to these arguments it verifies that we have shortage of trained staffs who undergo the pedagogical skills. However, Davidson, (2004) stated that, the teaching and learning process needs to be transformed to become participatory, interactive, gender sensitive, child-focused in safe and supportive school environments. Hence without having the qualified tutors who undergone pedagogical knowledges it will be difficult as a country to produce teachers who can fit in 21<sup>st</sup> century.

Another challenge is that Tanzania teacher education focuses more on theory and less on practice. Moreover, the time for practice is not sufficient to prepare the teachers for working in the field. With the depth-interview with some of the respondents, who complained that many courses especially technological courses are taught theoretically due to the large number to students who talking the course and also shortage of teaching and learning resources. This includes computers, internet access in the collage, projectors. Although this argument has been supported by UNESCO, (2016) which complaints about initial teacher training in Sub Saharan African is over-reliance on theoretical contents and under-appreciation of strengthening teacher competencies. They proposed that in order the course to be well understood, the tutors should be more practically rather than theoretically. Also, another respondent complained on the time used for training them on the use of these technologies which is only one semester, is not enough for them to be competent in technology. They suggested that, the time for preparation on technological integration in education should be added based to the need of the course in 21<sup>st</sup> century and the change of learner in this century.

The study identified that, there's insufficient prioritization of technology in the implementation of teacher education and during formulation of educational policies; One of the participants has the following says; "... it's true that, Tanzania like other developing countries benefited from having different educational policies and curriculum development. But among all these educational policies, technology is not given much priority as a main tool for transformation of teacher education in developing country like Tanzania." Based to this argument it's clear that the technology is given less priority especially during preparing the teacher education programme in Tanzania. Mgaiwa, (2018) suggested that, for the current state of the world of science and technology, equipping teachers with ICT and developing ICT infrastructure is unavoidable for a country that wants to improve its education system and graduate from ignorance.

## 5. CONCLUSION

Preparing teachers for 21<sup>st</sup> century who have required knowledge and skills is inevitable in any developing countries like Tanzania. However, Tanzania passed through different reformations of teacher education at least to capture these required skills and knowledge of 21<sup>st</sup> century during pre-service teachers' preparation. The proposed framework discovered the need of technological pedagogical content knowledge that should be given highly priority in these centuries which does not isolate other elements of knowledges in the same proportion.

Future initiatives of the Ministry of education and the professional development program should focus on coupling changes in teachers' pedagogical cultures and philosophies for teaching and learning with other training on how to integrate technological knowledge in education. Also, this paper strongly suggests that, the time for preparation on technological knowledge during teacher preparation should be added and not only one semester as per currently status, this is based to the need of the course.

Student-teachers should be equipped with 21<sup>st</sup> century problem solving skills which involve critical thinking.

In the classroom exercises of short problem-solving activities tutor can demonstrate the difference steps, such as defining problem very clear, understanding and stating the background of the problem (who, why, where...) brainstorming the solutions, checking the pros and cons of each solution, deciding on the solution based to the criterial involving logic and justifying to the class, can help student to evaluate problems and provide solutions with confidence. This can be followed by the longer assignments on issues relevant to the student's study, issues of immediate social context or global impact.

There is also need to strengthen the interpersonal skills, leadership skills and other form of skills which will enable pre-service teacher to have self-expression, motivational, delegating, creativity and innovations, responsibility and trustworthiness. Teaching methodologies need to change from Socratic teaching methods including lecture methods, teacher centered method to learner-centered approaches as tools for teacher education reformation to capture the skills and knowledge for 21<sup>st</sup> century.

Accordingly, this paper strongly suggests the Ministry of education through universities to revise the teacher education programmes and at least copy with these changes of 21<sup>st</sup> century during teachers' preparation. Also, the global experience including to learn from well developed countries with good educational system on how to integrate these skills and knowledges in teacher education programmes should be given highly priority.

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