UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

United Nations Educational, Scientific and Cultural Organization

UNESCO-China Funds-in-Trust

ICT COMPETENCY STANDARDS FOR TEACHERS IN TANZANIA

Revised, JULY 2015

The Ministry of Education and Vocational Training in Collaboration with UNESCO Dar es Salaam Office under the support of UNESCO-China Funds-in-Trust (CFIT) Project for Enhancing Teacher Education to Bridge the Education Quality Gap in Tanzania

Table of Contents

List of Tables

List of Figures

List of Abbreviations

CFIT	-	China Funds-In-Trust
ETP	-	Education and Training Policy
F2F	-	Face-to-Face
ICT	-	Information and Communication Technology
ICT-CST	-	ICT-Competency Standards for Teachers
ISTE	-	International Society for Technology in Education
KD	-	Knowledge Deepening
MoEVT	-	Ministry of Education and Vocational Training
NACTE	-	National Council for Technical Education
OER	-	Open Educational Resources
TC	-	Teacher College
TCU		Tanzania Commission of Universities
TDev21	-	Teacher Development for 21st Century
BETTU	-	Basic Education Teacher Training Unit
TEP	-	Teacher Educators Programme
TIE	-	Tanzania Institute of Education
TL	-	Technology Literacy
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
VETA	-	Vocational Education and Training Authority

Foreword

Tanzania is a nation that sees its future in the knowledge and expertise of its people, recognizing the importance of a good education system to achieve a well-learned society. Prioritizing on the role of teachers work is therefore of paramount importance. It is evident that to achieve exemplary teachers education programmes there should be close integration of courses that create a coherent experience throughout the program, well-defined standards of practices and performance, a core curriculum with emphasis on student learning, assessment and content pedagogy; and use of problem-based teaching methods. Additionally, to be relevant and adaptable to future changes, our teachers must be equipped to meet the challenges and opportunities of an evolving and yet dynamic globalised economy. These include growing advancement in the sector of information and communication technologies (ICTs), the use of which can effectively enhance both the teaching and learning processes, and hence simplify and make learning more interesting and enjoyable. In this regard, there is urgent need to continually train our tutors and student teachers to acquire greater competency in the use of ICT in teaching and learning. ICTs can enable teachers to transform their teacher practices, given a set of enabling conditions. Teachers' pedagogical practices and reasoning influence their uses of ICT, and the nature of teacher ICT use impacts student achievement. Importantly also, exposure to ICTs can be an important motivation tool to promote and enable teacher professional development.

This document therefore comprises ICT Competency Standards for Teachers in Tanzania which defines the competency outcomes and the supporting knowledge and skills that are needed to utilize ICT in performing the job roles related to teaching. It provides the performance indicators to evaluate the level of knowledge and competence of teacher to apply ICT in the educational setting. Specifically, the set of competencies aims to build teacher capacity for mainstreaming ICTs in education, and to support the development of teachers as change agents in the education system as it faces the pressures and demand of dynamic technological advances in the world.

These competency standards, reviewed with support from the UNESCO-China Funds-in-Trust Project, have been contextualized for Tanzania adopting all six modules articulated in the global UNESCO ICT Competency Framework for Teachers, and two knowledge stages of the knowledge ladder namely, technology literacy and knowledge deepening.

It is my hope that the competency standards will be adopted and applied accordingly in the quest to reach the peak of excellence in preparing quality teachers with needed values, skills and knowledge to help improve student learning outcomes in this rapidly changing world.

Prof. E.P. Bhalalusesa
Commissioner for Education
Ministry of Education and Vocational Training

Acknowledgement

It is true beyond doubt that the preparation of ICT Competency Standards for Teachers in Tanzania could not be accomplished without the support and contributions from various people and institutions that are hereby acknowledged.

Preparation of this document is a collaborative effort of the Ministry of Education (MoEVT) and UNESCO through the support of the China Funds In – Trust all of whom I would like to thank for providing necessary guidance, financial and logistical support during the preparation of the ICT Competency Standards for Teachers in Tanzania.

Many thanks go to the consultant Dr. Said Jafari (Ph.D.) and Mr. Jaco Du Toit for tirelessly and technically guiding the review process. Your truthful and illuminating views on a number of issues in relation to the process are highly appreciated.

Special thanks and recognition goes to the review team for technically and tirelessly reviewing and rewriting this document as follows:

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Last but not least, I would like to recognize the contributions from the Tanzania Institute of Education (TIE), National Council for Technical Education (NACTE) and Vocational Education and Training Authority (VETA) through their participants in the stakeholders' workshop held on 23rd July, 2015 in Bagamoyo for their critical eye in finalizing this document.

Thank you all.

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Executive Summary

The ICT Competency Standards for Teachers in Tanzania are intended to equip Tanzanian teachers with competencies needed in the 21st century. The standards have been developed in line with the Education and Training Policy of 2014 that strives to develop skilled human resources with competencies in driving and contributing to the national development goals.

The ICT Competency Standards for Teachers in Tanzania is based on the UNESCO ICT Competency Framework for Teachers (ICT-CFT)and cover all six modules (Understanding ICT in Education, Curriculum 7 Assessment, Pedagogy, ICT, Organization & Administration and Teacher Professional Learning) articulated in the global ICT-CFT; referred to as skills areas in the Tanzanian context. Furthermore, based on the prevailing ICT integration trend in Teachers' Colleges in Tanzania, the revised standards opt to start with two knowledge stages of the knowledge ladder; technology literacy and knowledge deepening.

In addition to the standards, this document provides in annex, detailed Competency Standards for Integration of ICT in Teaching and Learning 1 (on the Technology Literacy level) and detailed Competency Standards for Integration of ICT in Teaching and Learning 2 (Knowledge deepening level) that are intended to assist tutors and facilitators to establish a lesson plan, based on the prescribed competencies. Finally in annex, an implementation strategy for pre-service and in-service teachers, as well as monitoring and evaluation modalities are proposed.

The ICT Competency Standards for Teachers are based on a first version of standards of 2011 that were supported by the World Bank and Global e-Schools and Communities Initiative (GESCI) under the Development for 21st Century (TDev21) pilot project. It has further been revised in May to July 2015 by a team from the Ministry of Education and Vocational Training, Open University of Tanzania and UNESCO. Further input was obtained from a stakeholder workshop that was held on 23 July 2015 in Bagamoyo, Tanzania.

1.0 Introduction

"There is an emerging broad consensus, worldwide, about the benefits that can be brought to school education through the appropriate use of evolving information and communication technologies. The range of possible benefits covers practically all areas of activity in which knowledge and communication play a critical role. They range from improved teaching and learning processes to better student outcomes, from increased student engagement to seamless communication with parents, and from school networking and twinning to more efficient management and monitoring within the school. All in all, this is not surprising since the windows of opportunity that ICT offers for the development of knowledge economies and societies are open also for education"[1].

Tanzania is among the countries in Sub-Saharan Africa that have recognized the value and efficacy of Information and Communication Technology (ICT) in education. Various initiatives and strategies have been implemented by the Ministry of Education and Vocational Training (MoEVT) in honour of that appreciation. A decade into these initiatives, success stories have been documented, including an improvement in ICT infrastructure in schools and colleges, an increase in ICT awareness among teachers and learners, and an increase in the use of ICT to facilitate administrative functions in schools.

Despite these success stories, the country has yet to enjoy the full potential of the use of ICT in education. Specifically, ICT integration in teaching and learning in Tanzanian schools is still at its infancy. Among the challenges contributed to this state of affairs include: obsolete ICT infrastructure deployed in teaching and the learning environment, limited ICT competency among teachers and tutors as well as a lack of comprehensive ICT training that focuses on effective integration of ICT in teaching and learning.

Recognizing these challenges, and the desire to develop skilled human resources with competencies in driving and contributing to the national development goals, the Government of Tanzania launched a new Education and Training Policy in 2014 (ETP, 2014) [2]. This Policy comprehensively covers all education levels and replaces several existing policies which covered different education aspects such as the Education and Training Policy, 1995; the Technical and Vocational Education Policy, 1996; the Higher Education Policy, 1999; and the Information Communication and Technology Policy for Basic Education, 2007.

The new ETP broadly promote the use of ICT in teaching and learning. This is evident through policy statement 3.3.5 which states that, "*The Government shall facilitate and emphasise the use of ICT in teaching and learning at all levels*". Additionally, emphasis on science and technology education was echoed through policy statements 3.2.7 and 3.2.8. The former states that "*The Government shall enhance teaching practices of mathematics, science and technology at all levels of education*", while the latter states that "*The Government shall ensure improved use of science and technology in teaching and learning at all level*".

In spite of the policy statements, ICT integration in teaching and learning is still limited in schools and colleges. Little digital contents exist and curriculum does not point to specific use of ICT in accomplishing learning objectives. Teachers do not integrate fully the use of ICT into curriculum and assessment and where ICT is used in the classroom to enhance pedagogy, it is limited to the use of presentation packages. This situation does not fully support a learner-centred approach.

The limited introduction of ICT in schools and colleges could be linked to the shortage of ICT facilities and infrastructure. Where facilities exist, they are available in the computer laboratories and in most cases the computers are obsolete. Connectivity and internet is another challenge facing schools and colleges. However, ICT awareness among teachers is on increase to facilitate schools' administrative functions.

Moreover, the use of ICT potentially gives teachers improved access to learning opportunities and resources. There is demand for ICT to be used through distance learning courses to improve the pedagogical knowledge in support to their own professional development in Tanzania.

As teachers are valued as vital in leveraging ICT integration in education as model learners and facilitators a comprehensive teacher training framework in ICT is to be established. Therefore, MoEVT and UNESCO through the China Funds-In-Trust (CFIT) project agreed to review the draft ICT-Competency Standards of Teachers (ICT-CST) in Tanzania. The revised ICT-CST is intended to serve as comprehensive ICT training standards for teachers in Tanzania so as to become instrumental in improving quality in

teaching and learning. The overall objective is to contribute to the achievement of the EPT of producing qualified citizens who can drive the required change to reach desired national economic targets [2].

2.0 Conceptual Framework for ICT Integration in Education

2.1 A Global Perspective

Meeting international goals (e.g. Millennium Development Goals [MDGs], Education for All [EFA], World Summit on the Information Society [WSIS]) by 2015 and beyond requires substantial investment in teacher training institutions so that adequate pre-service and in-service training can occur [3]. The Education for All Global Monitoring Report, 2013/ 2014, states that an education system is only as good as its teachers. While the introduction of ICT in education plays a role in shifting responsibility for learning from teacher to learner, ICT does not however remove the need for teachers to serve as leaders in the classroom, nor does it invalidate traditional teacher leadership skills and practices which remain important [4]. Developing teachers' capacity to enhance the quality of learning is essential and evidence shows that education quality improves when teachers are supported and deteriorates if teachers are not [5].

UNESCO identifies four stages in ICT development emerges to be predominant for ICT integration in teacher development [4]. The stages depict a model as a *continuum of* maturity stages (See Figure 1) whereby the skills of teachers flow from *emerging* to *applying* to *infusing* to *transforming* stages of ICT integration. As teachers move through each stage, they develop increasing capability to integrate ICT in their day-to-day activities and master the use of ICT as an effective tool for teaching and learning.

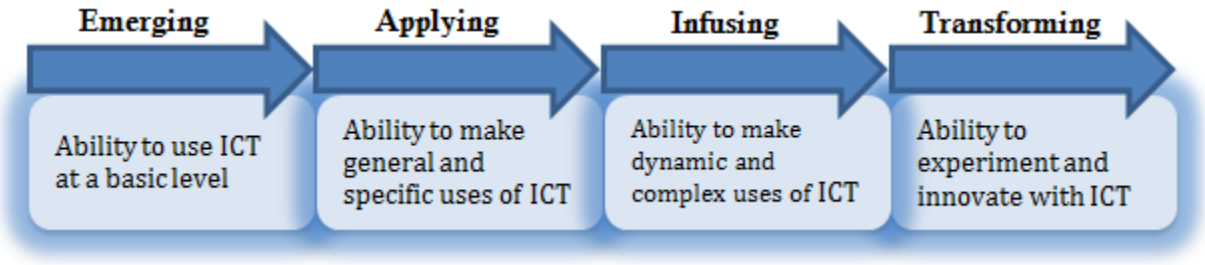

Figure 1: A Continuum of ICT Integration-Stages of ICT Development

On one hand, within the *emerging stage*, the teacher development focus is on the use of ICT as an add-on to the traditional curricula and standardized test systems. Teachers and learners are discovering ICT tools and their general functions and uses. The emphasis is usually on the basic ICT literacy and skills. On the other hand, the *applying stage* focuses on the development of digital literacy and how to use ICT for professional improvement in different disciplines. This involves the use of general as well as particular applications of ICT.

In the *infusing stage*, the teacher development focus is on the use of ICT to guide learners through complex problems and manage dynamic learning environments. Teachers are developing the ability to recognize situations where ICT will be helpful, and choosing the most appropriate tools for a particular task, using these tools in combination to solve real problems.

In the *transforming stage*, the learning situation is transformed through the use of ICT. This is a new way of approaching teaching and learning situations with specialized ICT tools. Teachers are themselves master learners and knowledge producers who are constantly engaged in educational experimentation and innovation to produce new knowledge about learning and teaching practice.

Progression through these stages takes time. And the transformation of pedagogical practice requires more than ICT skills training for teachers. Too often the approach taken to teacher development in ICT integration is the one-off crash course on computer literacy. This approach does not enable teachers to integrate ICT in their day-to-day activities and master the use of ICT as an effective tool for teaching and learning. The ICT-Competency Standards of Teachers (ICT-CST) in Tanzania recognizes these progressive levels and focuses on the first two stages of the knowledge ladder, namely technology literacy and knowledge deepening. By developing these standards the MoEVT adopts a framework for teacher development that reflects the prevailing international and regional shifts from 'training' to 'lifelong professional preparedness and development of teachers' on new modalities of professional development [4].

2.2 Overview of the UNESCO ICT-Competency Framework for Teachers (ICT-CFT)

The ICT-CFT is a global framework of standards which was designed by UNESCO in cooperation with Cisco, Intel and Microsoft, as well as the International Society for Technology in Education (ISTE). The framework consists of competencies needed in 21st century teachers. It covers six learning modules for teachers (See Figure 2) in 3 progressive levels. Any country can adopt and deploy this framework based on its own need and context.

Component: / *Approach:*	*Technology Literacy*	*Knowledge Deepening*	*Knowledge Creation*
UNDERSTANDING ICT IN THE CLASSROOM	Policy awareness	Policy awareness	Policy innovation
CURRICULUM AND ASSESSMENT	Basic Knowledge	Knowledge application	Knowledge society skills
PEDAGOGY	Integrate technology	Complex problem solving	Self-management
ICT	Basic tools	Complex tools	Pervasive tools
ORGANISATION AND ADMINISTRATION	Standard classroom	Collaborative groups	Learning organizations
TEACHER PROFESSIONAL DEVELOPMENT	Digital literacy	Manage and guide	Teacher as model learner

Figure 2: UNESCO's Six Modules in the ICT-CFT

The framework can be deployed at pre- and in-service teacher training level, as a benchmark against which teachers are trained, assessed, and certified. The framework is not just about technology but holistic competencies in teachers for content, pedagogy, administration and leadership. The global ICT-CFT was developed to address the following objectives:

i. To constitute the common core syllabus (defining various ICT competency skills for teachers) which professional development providers can use to develop learning material sharable at global level;

ii. To provide a basic set of qualification that allows teachers to integrate ICT into their teaching;

iii. To extend teacher's professional development so as to advance their skills in pedagogy, collaboration, and school innovation using ICTs; and,

iv. To harmonize different views and vocabulary regarding the uses of ICTs in teacher education.

The ICT-CFT being a theoretical framework requires the adoption and the contextualization to suite country-specific needs. This global theoretical framework has been adopted and contextualized to the Tanzanian context as Information and Communication Technology-Competency Standards for Teachers (ICT-CST).

2.3 The ICT-Competency Standards for Teachers (ICT-CST) in Tanzania

2.3.1 Overview of the ICT-CST in Tanzania

The initiatives to develop the ICT-CST in Tanzania can be dated back to 2009 when the Ministry of Education and Vocational Training (MoEVT) implemented the Teacher Development for 21st Century (TDev21) pilot. The initiative was supported jointly by the World Bank1 and Global e-Schools and Communities Initiative (GESCI) [6].

The TDev21 pilot was implemented in Tanzania to accomplish a critical task of contextualizing the global ICT CFT in Tanzania. The pilot led to the development of the first draft of the ICT-CST in Tanzania [5] in 2011. However this ICT-CST has never been implemented in Tanzania even though it was the first initiative in adopting and contextualizing the global ICT-CFT in Sub-Saharan Africa. Recently, other countries in East Africa, for example Kenya [7] and Rwanda [8], have also started to adopt and contextualize the UNESCO global ICT-CFT.

2.3.2 The Revised Competency Standards for Teachers

In order to take the ICT-CST to the implementation level, the MoEVT requested UNESCO to update the draft ICT-CST. The current revised ICT-CST for Tanzania has adopted all six

[1] World Bank's New Economy Skills for Africa Program—Information and Communication Technologies (NESAP-ICT)

modules (See Figure 2) articulated in the global ICT-CFT; referred to as skills areas in the Tanzanian context. Furthermore, based on the prevailing ICT integration trend in Teachers' Colleges in Tanzania, the revised standards opt to start with two knowledge stages of the knowledge ladder; technology literacy and knowledge deepening. Therefore, the structure of the revised ICT-CST in terms of six skills areas and two knowledge stages is presented in Figure 3.

Component: / *Approach:*	*Technology Literacy*	*Knowledge Deepening*
UNDERSTANDING ICT IN THE CLASSROOM	Policy awareness	Policy awareness
CURRICULUM AND ASSESSMENT	Basic Knowledge	Knowledge application
PEDAGOGY	Integrate technology	Complex problem solving
ICT	Basic tools	Complex tools
ORGANISATION AND ADMINISTRATION	Standard classroom	Collaborative groups
TEACHER PROFESSIONAL DEVELOPMENT	Digital literacy	Manage and guide

Figure 3: Adopted Six Skills Areas for ICT-CST

Specific skills areas and their related competencies in Technology Literacy (TL) and Knowledge Deepening (KD) stages are presented in Table 1. Additionally, these standards adopts for a modular approach whereby each stage can be covered separately. This approach facilitates simplicity in its implementation for both pre- and in-service teachers. Simplification of implementation of these standards is one of the silent features of this revision.

Table 1: Competencies for ICT Integration in Teaching and Learning 1 (TL) and ICT Integration in Teaching and Learning 2 (KD)

S/N	Skills area	Competencies in TL level	Competencies in KD level
1.	Understanding ICT in Education	Be aware of the ETP and articulate in consciously skilled ways how usages of ICT that correspond to and support the ETP.	Integrate ICT in the development of a shared school vision and planning based on the ETP.
2.	Curriculum and Assessment	Integrate the use of ICT into teaching, learning and assessment	(a) Design or adapt learning activities according to the curriculum that incorporate a range of ICT tools and digital content to suite diverse learning needs. (b) Apply ICT tools and digital content in a variety of learning situations to allow learners/teachers to assess learner's understanding of key subject matter concepts, skills and processes.
3.	Pedagogy	Identify appropriate technology (where, when and how) to be used in the teaching and learning.	(a) Design activities that engage learners with diverse needs to work collaboratively in solving real world problems. (b) Support learner-centred teaching approach using ICT tools and digital content.
4.	ICT	Use basic hardware and software (multimedia software, office application, web browser and presentation software).	Select and use a variety of subject-specific ICT tools and digital resources.
5.	Organization and Administration	Use basic ICT technology in various class situation including computer laboratory, small groups and individual activities and ensure equitable access is provided to all learners	Create flexible learning environment that integrate problem-based activities in a learner-centred approach and apply technology to support collaboration
6.	Teacher Professional Development	Have the technological skills and knowledge of web resources necessary to acquire additional subject matter and pedagogical knowledge in support their own professional development.	Have skills to use digital resources and online collaboration to network with internal and external experts to support own professional development.

These skills areas can be used in order from 1 to 6, or if need be the order can be changed. These competencies will enable learners/teachers to play an active role in the integration of ICT in teaching and learning and lead to two progressive levels of expected outcomes (see Table 2) corresponding to each one of the skills areas.

Table 2: Expected Outcomes

Expected Outcomes	Technology Literacy	Knowledge Deepening
Outcome 1	Quality of education improved through Technology Literacy.	Quality of education improved through Knowledge Deepening.
Outcome 2	Improved teaching and learning through basic skills in using ICT.	Improved teaching and learning through knowledge application.
Outcome 3	Quality of education improved through integration of technology in teaching and learning.	Quality of education improved by problem solving in the learning environment.
Outcome 4	Enhanced teaching and learning through use of basic ICT tools and the internet.	Improved teaching and learning through the use of advanced tools.
Outcome 5	Improved teaching and learning through use of ICT in the classroom and in computer laboratories.	Improved learner-centred learning through a technology-enhanced learning environment.
Outcome 6	Improved teacher professional learning through ICT.	Quality of teachers improved through 21st century technology skills.

3.0 Annex 1: Detailed Competency Standards for Integration of ICT in Teaching and Learning 1 (TL)

1) UNDERSTANDING ICT IN EDUCATION

Table 3: Understanding ICT in Education (TL)

Level	Technology Literacy (TL)
Title	Policy Awareness
Sub-Title	Awareness on *ETP 2014*
Competency	Be aware of the ETP and articulate in consciously skilled ways how usages of ICT that correspond to and support the ETP.
Estimated Time	3 hrs
Learning Objectives	(a) Identify various parts of the ETP related to ICT (b) Relate various parts of the ETP related to ICT
Performance Indicator	(a) Ability to identify various parts of the ETP related to ICT (b) Ability to link ICT issues to the ETP
Teaching and Learning Strategies	Tutor/facilitator to engage learners/teachers in a discussion of the ETP to identify parts which relates to ICT
Examples of Learning Activities	(a) Groups of learner/teachers discuss the ETP statements, vision, goals and objectives (b) Groups of learner/teachers discuss the ETP to identify parts that relate to ICT
Teaching and Learning Resources	*ETP 2014* Minimum ICT requirement : None
Examples of Assessment Tools	Written assignment

2) CURRICULUM AND ASSESSMENT

(a) Curriculum Planning and Assessment

Table 4: Curriculum Planning and Assessment (TL)

Level	Technology Literacy (TL)
Title	Curriculum and Assessment
Sub-Title	Elements of ICT in Curriculum and Assessment
Competency	Integrate the use of ICT into teaching, learning and assessment
Estimated Time	5 hrs
Learning Objectives	(a) Match the curriculum to particular software packages and ICT tools (b) Describe how the curriculum is supported by these applications and digital content (c) Match existing assessment methodology with ICT applications
Performance Indicator	Ability to use software packages, ICT tools and digital content in teaching, learning and assessment.

Teaching and Learning Strategies	(a) Tutor/facilitator to lead learner/teachers to identify and select various software packages with respect to the curriculum. (b) Tutor/facilitator to demonstrate to learner/teachers on the use of ICT tools and software applications including special needs learners
Examples of Learning Activities	(a) Groups of learners/teachers map identified ICT tools, software applications and digital content against the curriculum (b) Groups of learners/teachers discuss how the curriculum are supported by the ICT tools, software applications and digital content
Teaching and Learning Resources	Curriculum/syllabus Web content including OERs. Minimum ICT requirement: Classrooms fitted with computer and projector; Software packages (word processing and presentation software)
Examples of Assessment Tools	Written and practical assignments. Portfolio

3) PEDAGOGY

Table 5: Pedagogy (TL)

Level	**Technology Literacy (TL)**
Title	Elementary ICT in Pedagogy
Sub-Title	Use of ICT in Teaching and Learning
Competency	Identify appropriate technology (where, when and how) to be used in the teaching and learning.
Estimated Time	5 hrs
Learning Objectives	(a) Describe didactical teaching approaches and use ICT to support learners' acquisition of school subject matter knowledge; (b) Identify tools and software suitable for a particular learning experience (c) Incorporate appropriate ICT activities into lesson plan so as to support learners' acquisition of school subject matter Knowledge; (d) Use presentation software and digital resources to support instruction.
Performance Indicator	Ability to select, use and incorporate the appropriate software and tool for teaching and learning.
Teaching and Learning Strategies	(a) Describe how the use of ICT and specific types of software can support learner acquisition of school subject matter knowledge (b) Demonstrate ways in which the use of this ICT can supplement deductive teaching (c) Provide a variety of examples of instructional presentations

Examples of Learning Activities	(a) Learner/teachers to design lesson plan that incorporate applications of different software, ICT tools and digital resources. (b) Learner/teachers to share lesson plan and receive recommendations from peers. (c) Learner/teachers to transform a lesson plan using presentation software.
Teaching and Learning Resources	Curriculum, Word processor, Presentation software; Minimum ICT requirement: Classrooms fitted with computer and projector; presentation. software and ICT tools
Examples of Assessment Tools	Written and practical assignments

4) INFORMATION AND COMMUNICATION TECHNOLOGY

Table 6: Information and Communication Technology (TL)

Level	**Technology Literacy (TL)**
Title	Application of ICT Basic Tools
Sub-Title	Hardware and software
Competency	Use basic hardware and software (multimedia software, office application, web browser and presentation software).
Estimated Time	10 hrs
Learning Objectives	(a) Describe and demonstrate the use of hardware. (b) Describe the basic features and uses of office applications and digital resources. (c) Describe the basic functions of multimedia software and use a multimedia software package to create a simple graphic display (d) Describe the internet and elaborate on the uses including search engines. (e)Use common communication and collaboration technologies, such as text messaging, video conferencing, web based collaboration and social environments. (f) Do basic troubleshoot and maintenance of hardware and software;
Performance Indicator	(a) Ability to select, describe and use hardware. (b) Ability to use office applications and digital resources (c)Ability to select and use appropriate multimedia software packages to create simple graphic display (d) Ability to select, describe and use various internet services (e)Ability to select, describe and use common communication and collaboration technologies (f) Ability to do basic troubleshooting and maintenance of hardware and software
Teaching and Learning Strategies	(a) Discussion and demonstration on use of hardware (b) Demonstration and practice on office applications and multimedia software

	(c)Discussion on internet uses and common communication collaboration technologies and demonstration and practice of the uses of search engines (d) Discussion and demonstration of basic troubleshooting and practice on maintenance of hardware and software
Examples of Learning Activities	(a) Learner/teachers discuss the use of software and hardware, (b) Learner/teachers to perform basic troubleshoot activities and maintenance of hardware and software (c) Learner/teachers to perform practical exercises on use of software and hardware as well as troubleshooting and maintenance activities.
Teaching and Learning Resources	Curriculum, syllabus curriculum content Web content including OERs Minimum ICT requirement: Computer laboratory
Examples of Assessment Tools	Theoretical and practical assignments

5) ORGANIZATION AND ADMINISTRATION

Table 7: Organization and Administration (TL)

Level	**Technology Literacy (TL)**
Title	Standard Learning Environment
Sub-Title	ICT enabled learning environment
Competency	Use basic ICT technology in various class situation including computer laboratory, small groups and individual activities and ensure equitable access is provided to all learners
Estimated Time	5 hrs
Learning Objectives	(a) Organize the classroom and computer laboratory facilities for use in teaching and learning processes. (b) Manage the use of supplementary digital resources by individuals and/or small groups of learner/teachers in classroom and computer laboratories (c) Identify the appropriate socio-cultural arrangements to use with various technologies
Performance Indicator	(a) Ability to organize and manage the use of ICT in the learning environment (b) Ability to identify appropriate social cultural arrangements to use with various technologies in the learning environments
Teaching and Learning Strategies	(a) Discuss and give examples of different ways that computer laboratories (a set of learning environment laptops/tablets) can be used to supplement teaching (b) Discuss and give examples of different ways that digital resources and ICT tools can be used by individual learners. (c) Identify different hardware and software technologies and discuss corresponding social arrangements appropriate for their

	instructional use by individuals, pairs, small groups and large groups.
Examples of Learning Activities	(a) Learner/teachers identify various ICT tools and software that can be used in the classroom (b) Use networked record keeping software to take attendance, submit grades, and maintain learner records
Teaching and Learning Resources	Curriculum Web content including OERs Minimum ICT requirement: Computer laboratory
Examples of Assessment Tools	Oral Written and practical assignments Portfolio

6) TEACHER PROFESSIONAL DEVELOPMENT

Table 8: Teacher Professional Development (TL)

Level	**Technology Literacy (TL)**
Title	Fundamentals of ICT in Teacher Management
Sub-Title	ICT Skills for Teacher Professional Development
Competency	Have the technological skills and knowledge of web resources necessary to acquire additional subject matter and pedagogical knowledge in support their own professional development.
Estimated Time	7 hrs
Learning Objectives	(a) Use ICT to enhance learner/teachers' performance (b) Use digital resources to support learner/teachers' acquisition of subject matters and pedagogical knowledge. (c) Identify and manage internet safety issues
Performance Indicator	(a) Ability to use digital resources to enhance productivity in teaching and personal development through acquisition of subject matters expertise and pedagogical knowledge (b) Ability to identify and manage internet safety issues
Teaching and Learning Strategies	(a) Discuss different ICT tasks that occupy learner/teachers' time during the work day (b) Demonstrate how ICT application can use these tasks to enhance productivity (c) Discuss different digital resources that learners can use to increase their subject matter and pedagogical knowledge (d) Discuss internet security, safety and privacy; cyber bullying; intellectual property rights; digital citizenship; email etiquette; legal and ethical issues;
Examples of Learning Activities	(a) Learner use desktop computers, laptops, handheld devices, and software such as word processor, blogs, wikis and other productivity and communication tools to help with one of the

	identified tasks. (b) Learners identify a personal professional development goal and create a plan for the use of various ICT tools to accomplish the planned goal
Teaching and Learning Resources	Web content including OERs Minimum ICT requirement : ICT tools such as computers, laptops, hand-held devices Software
Examples of Assessment Tools	Oral Observation checklist Practical assignment Portfolio Peer assessment

4.0 Annex 2: Detailed Competency Standards for Integration of ICT in Teaching and Learning 2 (KD)

1) UNDERSTANDING ICT IN EDUCATION

Table 9: Understanding ICT in Education (KD)

Level	**Knowledge Deepening (KD)**
Title	Policy Understanding
Sub-Title	Understanding of *ETP 2014*
Competency	Integrate ICT in the development of a shared school vision and planning based on the ETP.
Estimated Time	3 hrs
Learning Objectives	(a) Analyse policy statements in ETP related to ICT in Education and training. (b) Translate the ETP statements into the actual teaching and learning environment taking into account the syllabus.
Performance Indicator	Ability to design and develop classroom practices for ICT integration into the school context in accordance to ETP.
Teaching and Learning Strategies	(a) Tutor/facilitator to provide opportunities for learners/teachers to plan and develop activities that illustrate application of ETP on ICT related issues in education. (b) Learners/teachers should use Word Processing programs, Presentation programs and interactive forums to enhance teaching and learning.
Examples of Learning Activities	Learner/teachers to prepare and implement learning sessions which combine content, pedagogical and technological knowledge as application of ETP.
Teaching and Learning Resources	*ETP 2014* Tanzania Vision 2025 Web contents including OERs Minimum ICT requirement: Classrooms fitted with computer and projector
Examples of Assessment Tools	Observation checklist Written assignment Portfolio

2) CURRICULUM AND ASSESSMENT

a) Curriculum Planning and Assessment

Table 10: Curriculum Planning and Assessment (KD)

Level	Knowledge Deepening (KD)
Title	Integration of ICT in Curriculum and Assessment.
Sub-Title	Curriculum Planning and Assessment.
Competency	Design or adapt learning activities according to the curriculum that incorporate a range of ICT tools and digital content to suite diverse learning needs.
Estimated Time	3 hrs
Learning Objectives	(a) Identify key concepts and processes in the subject area. (b) Describe the function and purpose of subject-specific ICT tools and digital content and how they support learner's understanding.
Performance Indicator	(a) Ability to design or adapt units or learning activities that incorporate a range of ICT tools and digital content. (b)Ability to identify ICT tools and digital content that can support learning environments for enabling learner's understanding of key subject-specific concepts.
Teaching and Learning Strategies	Tutor/Facilitator to assign learners/teachers to design or adapt learning activities according to the curriculum that incorporate a range of ICT tools and digital content.
Examples of Learning Activities	Learners/teachers describe key curriculum objectives and content to be covered in a subject area using ICT tools and digital content.
Teaching and Learning Resources	Curriculum/syllabus Web content including OERs. Minimum ICT requirement: Classrooms fitted with computer and projector; multimedia laboratory
Examples of Assessment Tools	Portfolio Written and practical assignment

b) Curriculum Implementation and Assessment

Table 11: Curriculum implementation and Assessment (KD)

Level	Knowledge Deepening (KD)
Title	Integration of ICT in Curriculum and Assessment
Sub-Title	Curriculum Implementation and Assessment.
Competency	Apply ICT tools and digital content in a variety of learning situations to allow learners/teachers to assess learner's understanding of key subject matter concepts, skills and processes.
Estimated Time	3 hrs

Learning Objectives	(a) Assess and evaluate ICT tools and digital content suitable for use in a specific learning context. (b) Use ICT tools and digital content to the teaching and learning goals as articulated in the set curriculum.
Performance Indicator	(a) Ability to select and evaluate technology effectively to communicate and collaborate with others. (b) Ability to use ICT tools and digital content to address curriculum objectives and learners with special educational needs.
Teaching and Learning Strategies	Tutor/Facilitator to assign learners/teachers to use ICT tools and digital content in a variety learning situations to allow them to assess understanding of key subject matter concepts, skills and processes.
Examples of Learning Activities	Let learners/teachers analyse and select appropriate digital resources to facilitate curriculum implementation.
Teaching and Learning Resources	Curriculum Web contents including OERs. Minimum ICT requirement: Classrooms fitted with computer and projector; multimedia laboratory
Examples of Assessment Tools	Observation checklist. Portfolio.

3) PEDAGOGY

Table 12: Pedagogy (KD)

Level	**Knowledge Deepening (KD)**
Title	Advanced ICT in Pedagogy
Sub-Title	Complex Problem Solving with ICT
Competency	(a) Design activities that engage learners with diverse needs to work collaboratively in solving real world problems. (b) Support learner-centred teaching approach using ICT tools and digital content.
Estimated Time	6 hrs
Learning Objectives	Demonstrate how collaborative, problem-based learning and ICT can support learners thinking and social interaction, as learners come to understand key concepts, processes, and skills in the subject matter to solve real world problems.
Performance Indicator	Ability to design learning activities to engage learners in exploring societal issues and solving problems using ICT tools and digital resources.

Teaching and Learning Strategies	Guide learner/teachers to deduce problems in society, translate them into learning experiences and work collaboratively to solve and communicate solutions.
Examples of Learning Activities	(a) Learner/teachers to identify complex problems in society, structure them in activities that incorporate key subject matter concepts and serves as the basis for learner projects. (b) Learner/teachers to design online/digital resources based on case studies that demonstrate learner's understanding and enhance knowledge construction. (c) Learner/teachers to implement learning activities that engage students in reasoning and using key subject concepts and processes while they collaborate to attain deep understanding, solve problems in society, reflect on and communicate solutions.
Teaching and Learning Resources	Curriculum, Web contents including OERs. Minimum ICT requirement: Classrooms fitted with computer and projector.
Examples of Assessment Tools	Observation checklist. Self-assessment Portfolio

4) INFORMATION AND COMMUNICATION TECHNOLOGY

Table 13: Information and Communication Technology (KD)

Level	**Knowledge Deepening (KD)**
Title	Application of ICT Advanced Tools
Sub-Title	Advanced ICT Tools in Teaching and Learning.
Competency	Select and use a variety of subject-specific ICT tools and digital resources.
Estimated Time	9 hrs
Learning Objectives	(a) Use various open-ended software packages appropriate to specific subject matter area, like online references, visualization, data analysis and role-play simulations. (b) Use search engines and online repositories and evaluate their accuracy and usefulness to support learners in different learning environments. (c) Use authoring tools to design digital content. (d) Use appropriate software to support learners' collaboration and communication as well as manage, monitor and assess progress of various learners' tasks.

Performance Indicator	(a) Ability to select software packages with reference to specific subject area. (b) Ability to use internet services such as search engines, databases, to communicate and to collaborate applications to facilitate learning process. (c) Ability to set up and use authoring tools to create suitable digital resources.
Teaching and Learning Strategies	(a) Guide learner/teachers to use a variety of subject-specific ICT advanced tools and digital resources. (b) Guide learner/teachers to acquire techniques for authoring digital resources, accessing information, identifying, analysing and collaborating to solve problems.
Examples of Learning Activities	(a) Learner/teachers use various software packages to facilitate learning in specific subject area. (b) Learner/teachers search and evaluate web content to facilitate learning. (c) Learner/teachers author online resources. (d) Learner/teachers create and manage online task-oriented forums, email accounts and other collaborative spaces.
Teaching and Learning Resources	Web content including OERs Minimum ICT requirement: Computer laboratory
Examples of Assessment Tools	Online assessments Online portfolio.

5) ORGANIZATION AND ADMINISTRATION

Table 14: Organization and Administration (KD)

Level	**Knowledge Deepening (KD)**
Title	Management of Learning Environment
Sub-Title	Enhancing Group Collaboration
Competency	Create flexible learning environment that integrate problem-based activities in a learner-centred approach and apply technology to support collaboration
Estimated Time	4 hrs
Learning Objectives	(a) Organize ICT tools within the learning environment so as to support and reinforce learning activities and social interactions

	(b) Manage learner-centred problem-based activities in a technology-enhanced environment
Performance Indicator	(a) Ability to demonstrate a leadership role in creating a vision for technology infusion into learning environments. (b) Ability to address learner diverse needs by using learner-centred strategies and managing individual, group and class access to digital resources.
Teaching and Learning Strategies	(a) Guide learner/teachers to set up an ICT-supported learning environment. (b) Guide learner/teacher to manage a collaborative learning technological-enhanced environment.
Examples of Learning Activities	(a) Learner/teachers organize ICT tools within the learning environment so as to support and reinforce learning activities and social interactions. (b) Learner/teachers manage learner-centred problem-based activities in an ICT-enhanced environment.
Teaching and Learning Resources	Web content including OERs Minimum ICT requirement: Computer laboratory
Examples of Assessment Tools	Practical assignments Self-assessment Portfolio

6) TEACHER PROFESSIONAL DEVELOPMENT

Table 15: Teacher Professional Development (KD)

Level	**Knowledge Deepening (KD)**
Title	Teacher Development
Sub-Title	Manage and Guide Teacher Self-Learning
Competency	Have skills to use digital resources and online collaboration to network with internal and external experts to support own professional development.
Estimated Time	7 hrs
Learning Objectives	(a) Use ICT to access and share digital resources to support own professional development.

	(b) Use ICT to collaborate with internal and external experts and communities to support own professional development. (c) Use ICT to search for, evaluate and contextualize information to support own professional development
Performance Indicator	(a) Ability to use ICT to access and share digital resources to support own professional development (b)Ability to use ICT to collaborate with internal and external experts and communities to support own professional development. (c) Ability to use ICT to search for, evaluate and contextualize information to support own professional development.
Teaching and Learning Strategies	(a) Guide learner/teachers to use digital resources to enhance own professional development. (b) Guide learner/teachers to use online collaboration to network with internal and external experts to support their professional development.
Examples of Learning Activities	(a) Search, evaluate and share digital resources in subject-specific area. (b) Searching locating and reaching experts using ICT in subject-specific area. (c) Establish a network and collaborate with subject experts.
Teaching and Learning Resources	Web content including OERs Online communities. Minimum ICT requirement: Computer laboratory
Examples of Assessment Tools	Online portfolio Peer assessment Reflection journal

5.0 Annex 3: Implementation Strategy

5.1 Mode of Delivery

The ICT-CST adopts a flexible implementation style in order to suite various delivery approach and diverse groups of teachers. The choice is based on the fact that the competencies for technology literacy should be attained by all teachers (pre-service and in-service) while the competencies for knowledge deepening should be attained on a voluntary basis by in-service teachers. As a result, the approach in which pre-service teachers acquire these competencies may differ from in-service teachers. Furthermore, different approaches may be adopted for different groups of in-service teachers.

Moreover, the competencies can be delivered in a modular style; delivering one module at a time beginning with the Technology Literacy level. The overall objective is to ensure teachers are equipped with these competencies regardless of the delivery approach.

The delivery of the teacher training is dependent on adequate preparation of teacher educators. Teacher educators will be trained through the Teacher Educator Programme (TEP) or dedicated training sessions.

It is to be noted that the ICT-CST would be translated into Swahili language to cater for teacher in all levels.

5.1.1 Pre-service Training

Pre-service teachers must acquire the prescribed competencies of Integrating ICT in Education 1 before graduating their teaching qualifications. The institutions responsible for implementation of ICT in Education 1 are Teachers' Colleges, Tertiary Institutions and Universities. The MoEVT will ensure that the training institutions are resourced to ensure that teachers acquire the required competencies.

5.1.2 In-service Training

In-service training of teachers will be delivered through existing structures from national to school levels. The structure includes Zonal Training Centers (Zonal Teacher Colleges), Regional Training Centers (Nucleus Schools), Teacher Resource Centers (TRC)/Clusters and Schools. The relevant structure will be identified according to available resources and proximity.

In-service teachers need to obtain obligatory ICT in Education 1 but ICT in Education 2 is optional for those teachers that want to excel in ICT integration in education. The training will be provided through blended learning modalities including face-to-face sessions. The MoEVT will put various incentives in place, including certification so that teachers accomplish the training.

5.2 Monitoring and Evaluation

Monitoring and evaluation is an important component in any training programme. In this regard, the MoEVT should build capacity to its quality assurance division to undertake the assignment. The feedback from monitoring and evaluation will be used to update these standards every two years.

5.3 Implementation Plan

Implementation plan serves to determine key elements for implementation. Table 16 covers various elements of the ICT-CST for implementation and where possible its indicative implementers.

Table 16: Implementation Plan

General Information	Responsibility / Specific Information	
	Technology Literacy	**Knowledge Deepening**
Course Name:	Integration of ICT in Teaching and Learning 1	Integration of ICT in Teaching and Learning 2
Course Code:	As per NACTE/TCU/VETA system or MoEVT-TED	As per NACTE/TCU/VETA system or MoEVT-TED
Coordination, Monitoring and Review:	MoEVT – TED	MoEVT – TED
Validation, Supervision:	MoEVT	MoEVT
Certification:	As per NACTE/TCU/VETA system or MoEVT-TED	As per NACTE/TCU/VETA system or MoEVT-TED
Implementation:	TCs, Institutions, Universities, & MoEVT,	TCs, Institutions, Universities & MoEVT
Learner Profile: Prior Knowledge & Experience:	None	Integration of ICT in Teaching and Learning 1
Target Audience:	Pre-service & In-service teachers	In-service teachers
Delivery Approach:	Blended	Blended
Course Duration (Contact Hours):	35 Hours	35 Hours

6.0 References

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7.0 Glossary

Application – a computer program (see **program** below)

Authoring tool - software for creating digital content

Competency – the skills, knowledge and understanding needed to do something successfully

Computer laboratories – a classroom full of computers so each student has their own computer to work on

Course – a programme of study

Curriculum – a list of the modules to be learnt and general information associated with the programme of study

Didactic teaching – teaching by telling students about the subject; teaching by talking, explaining, demonstrating, lecturing, posing questions to students, answering students' questions and conducting discussions with students. This is in contrast to teaching by helping students to learn through experimenting and reflecting, by getting students to do things rather than primarily listening to the teacher

Digital – (as in digital content, digital devices, digital resources, digital technology) – essentially, another word for computers and computer technology (Computers store and process information by converting it all to single-figure numbers – digits)

Digital literacy – basic computer skills such as being able to do word-processing or go online

Facilitator – teacher educator who trains in-service teachers

ICT – Information and Communication Technology, which means computers, mobile phones, digital cameras, satellite navigations systems, electronic instruments and data recorders, radio, television, computer networks, satellite systems … almost anything which handles and communicates information electronically. ICT includes both the hardware (the equipment) and the software (the computer programs in the equipment)

ICT Integration - refers to use of ICT to enhance teaching/learning practices and impact competencies on learners

Internet – the internet and the World Wide Web (or web, or websites) are often used inter-changeably, but strictly speaking the internet is the network which connects computers around the world, and the websites are the documents, images and other material on the network

Learner – a student-teacher or teacher trainee who is attending teaching training courses in an institution

Learner-centred – both the teacher and the learners drive the learning process

Minimum ICT requirement – minimum ICT facilities required in teaching/learning of a particular module

Module – a separate component which covers particular skills area in a programme of study

Networks – linked computers; Computers may be linked together either by wires or wirelessly. The linked computers could be just the computers in a classroom or an office building or a set of computers in different parts of the world

Online – connected to the internet or a computer network, for example accessing websites and email

Open-ended tools – computer programs which can be used for many different purposes, for example word-processing or spreadsheet programs. This in contrast to a computer program which can only be used for a specific purpose, such as program which provides a visualisation of a particular scientific process

Package – computer program (see program below)

Pedagogy – this usually means teaching methods, styles and techniques, the way in which the teacher teaches. It can also mean simply teaching, or the study of teaching.

Presentation software – computer programs, like PowerPoint, which are used to create and display a series of slides (text and images) typically to an audience watching a large screen.

Productivity applications – word-processing, spreadsheet and presentation software

Professional development – refers to a wide variety of specialized training (formal and informal professional learning) intended to help teachers improve their professional knowledge, competence, skill, and effectiveness.

Program – another word for software, application, package, for example Microsoft Word, or Photoshop, the set of instructions loaded into a computer which enable it to provide specific functions such as word-processing, spreadsheets, presentations, databases, and image editing.

Resource – (as in digital, ICT, web, online resource) – digital information, and digital hardware and software

Skills area – a set of competencies bundled in a module

Software – (software package etc.) – computer program (see program above)

Syllabus – an outline of the main points of a module for teaching purposes

Teacher education – refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviours and skills they require to perform their tasks effectively in the classroom, school and wider community

Teacher – in-service teacher who has been qualified to a particular level of teacher education

Technology – often used as another word for ICT, although strictly speaking 'technology' can mean almost any type of tool or applied knowledge. For example, pencil and paper, slates, blackboards and whiteboards are all types of writing technology.

Technology-enhanced – refers to the application of information and communication technologies (ICT) to learning and teaching

Tool – (as in digital tools) - digital hardware and software

Tutor – a qualified teacher educator in teacher colleges, institutions or universities

Tutorials – (as a type of software) – usually a video explanation or demonstration

21st century technology skills – refers to a broad set of knowledge, skills, work habits, and character traits to be critically important in today's world. These skills can be applied in all academic subject areas, and in all educational, career, and civic settings throughout a learner's life

Web content – information on websites