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Developing a Model for Effective Cascaded School Teacher Training on ICT Integration in Tanzania

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Abstract: Training school teachers has been one of the key developments that lead to improved teaching practices leading to overall student learning gains. In many cases, teacher training programme in different topics (Assessment, Lesson Planning, ICT integration, Curriculum planning, etc.) involves inviting teachers at a training centre, training them on selected modules for a specified number of days and letting them go back to their schools, with a hope that they will be able to share the experiences and learning with others. Even though no impact evaluation is conducted, teachers do not share what they learned with other teachers. The Align Attain Integrate Teach Train (A2IT2) model is developed to improve the effectiveness of such cascaded training programmes on technology integration in teaching and learning. Its different phases give the competences needed by the teacher to effectively train other teachers at school level on technology integration. Based on refinements of the methodology used, the model will help planners of teacher workshops to plan efficient and sustainable programmes.

Keywords: Teacher professional development, teacher training models, secondary trainers, cascade model, ICT in teaching and learning.

1. Introduction

Teacher professional development (TPD) has been defined as all activities that develop teacher's skills, knowledge and expertise (OECD, 2009). TPD involves structured professional learning activities that improve the teaching practice, leading to improved student outcomes (Darling-Hammond, Hyler, & Gardner, 2017). To improve the teaching quality and hence raising students' performance, several methods are involved. These can come in many forms including formal and informal settings. In the formal setting, teachers attend short courses, workshops, seminars, conferences or even longer qualification programmes. Informal teacher professional development involves activities such as mentoring, coaching, sharing of good practices, collaborative planning and teaching and informal dialogues on the ways that can best be used to improve teaching.

In Tanzania, for the past 8 years, we have been training teachers on integrating technology in their teaching and learning in using cascade mode of TPD. Cascade model of TPD involves training of teachers at different levels. At the top level, you have a number of trainers who are selected to meet the training demands. These are called primary trainers. The first level involves participants selected from a pool of teachers normally from different schools. These selected teachers are then trained by the primary trainers based on the content to be covered. This training may be for several days depending on the needs at that particular time. The trained teachers are called 'multipliers' or master trainers – here referred to as secondary trainers. The secondary trainers then have to go and train other teachers on the same content they have been trained on. Even though the cascade model has advantages such as use of existing teachers as trainers (Kennedy, 2005) leading to cost effectiveness. The model involves shorter periods out of schools (Gilpin, 1997). In this case, a large number of teachers is trained (Hayes, 2000). Apart from the mentioned advantages, the model is also associated with challenges such as one-way transmission with no feedback (McDevitt, 1998), lack of trainers confidence to execute the training curriculum (Box, 2002), curriculum misinterpretation (Suzuki, 2011), dilution of the teaching content at different levels (Hayes, 2000), longer periods between cascades (Dichaba, 2013) and lack of emphasis

on the instructional practices (Hooker, 2008). In this case, the cascaded training programmes were not successful as it was expected.

We developed the Attain Align Integrate Teach Train (A2IT2) model to improve the cascading effect by ensuring confidence of the master trainers while training other teachers on how to integrate technology in teaching and learning.

2. Research Goals

Broadly, the research aims at improving the effectiveness of cascaded teacher training on ICT integration in teaching and learning. The specific research goals are:

i. Developing a solution to improve effectiveness and sustainability of cascaded in-service teacher training programmes; and
ii. Implementation of the solution in different in-service teacher training programmes to evaluate its effectiveness.

3. Research Methodology

This research will follow a Design Based Implementation Research (DBIR) methodology (Fishman et al., 2013). DBIR is a suitable methodology because it involves a series refinements and iterations while implementing the solution to the persistent problems of cascaded teacher training programmes. In the first phase, we identified and defined the problem by collaborating with teachers who were involved in ICT teacher training sessions before and the trainers who were involved in those sessions. Designing of the solution (workshop on ICT integration) based on A2I2 model, was done during phase 2. An extension to A2I2 model was done by adding two phases: Teach and Train. We have completed the first iteration of Phase 3 which involved the implementation of A2IT2 model involved the implementing the solution by training teachers on selected ICT topics. Data were collected and analysed to evaluate and reflect on the refinements of the previous phases. Figure 1 shows the different phases and actions.

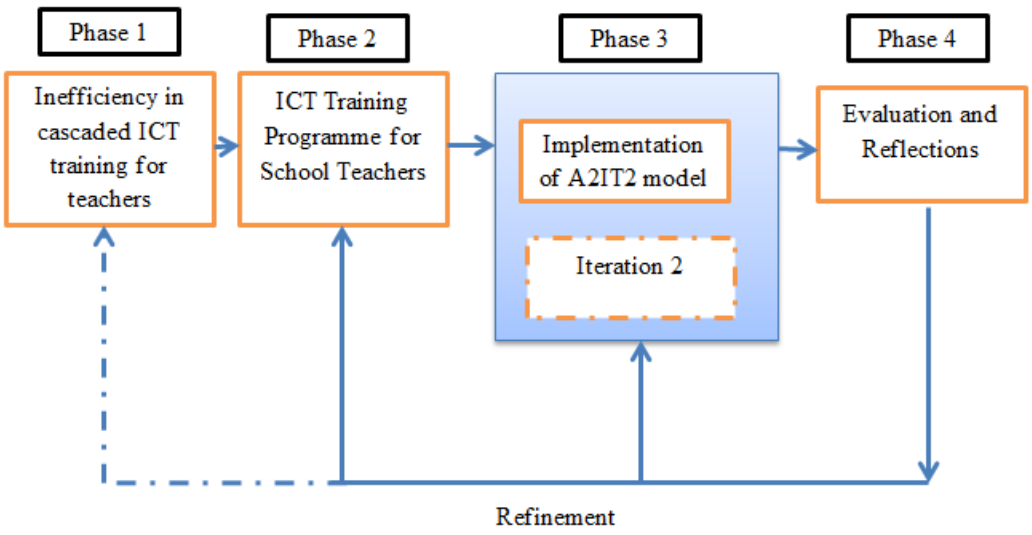

Figure 1: Phases of the Research Methodology

4. A2IT2 Model and its Phases

This model has five phases, each with its function. The different functions of each of the phases and their focus and outputs of the model are shown in Table 1.

Table 1

Focus and output at each phase of the A2IT2 Model

Phase	Focus	Output
Attain	Introduces the teachers to student-centred design	Ability to create measurable learning objectives, assessment strategies
Align	Aligning instructional strategies and assessment strategies to the learning objectives	Knowledge of constructive alignment
Integrate	Creating technology-enhanced lesson plans	A lesson plan with a technology integration plan
Teach	Immediate practice: teachers micro-teach a lesson of their preference to the rest of the training participants	A fully technology integrated lesson as taught in the class.
Train	Trained teachers train other teachers in their respective schools	Teacher trainers

5. Research Studies

I conducted two studies with different teachers. Six (6) topics were selected for the 4 days' workshop for teachers. These topics included: Internet Searching for educational Content; YouTube in Teaching and Learning; Mentimeter for classroom engagement; Padlet for classroom collaboration; MS PowerPoint Presentation and Windows Movie Maker. Preliminary study was done during a workshop with college teachers to determine the features and roles of primary and secondary trainers. Two other studies (study 1 and Study 2) were completed with school teachers in Tanzania. Next research studies are planned to start in December 2018 to determine effectiveness of the teacher training sessions and the role of primary trainers in the cascade process.

Table 2
Research Plan and Activities

Studies	**Research Goal**	**Research Question**	**Data Collection tools**	**Analysis**	**Results**
Preliminary study (N=6)	Characteristics of secondary trainers	What is expected of teachers selected as secondary trainers?	Semi structured Interview	Thematic analysis	Knowledge of workshop, experience and personal skills
	Role of primary trainer to secondary trainers	What kind of support do secondary trainers need from primary trainers?	Semi structured Interview	Thematic analysis	Support during the sessions, mentoring
Study 1 (N= 19)	To determine the confidence levels to use technology tools in teaching and learning?	What are the teachers' confidence levels to use technology tools in their teaching and learning?	5 point Likert Scale Pre-post survey, Feedback survey	Man-Whitney U test, frequency analysis	*High perceived confidence to use technology tools*
	To identify the factors that hinder teacher training on ICT in schools	What are the factors that hinder effective teacher training on ICT in schools?	3 semi-structured interviews	Thematic analysis	Infrastructure, time limitation, motivation,

					attitude to change
Study 2 (N=24)	To measure the level of ICT integration by teachers	1. How well are teachers aligning technology to the learning objectives during microteaching? 2. What is the perceived content knowledge gained for transfer of training?	Classroom observation protocol, Microteaching assessment rubric, Group Reflection summary	Observation, rubric evaluation	Improved integration of technology, challenge in setting up technology tools
	To identify workshop design considerations to improve transfer of training	What are the workshop design considerations for effective transfer of training?	Focus group interviews, semi-structured interviews	Thematic analysis	Software knowledge, computer basics, device connections

6. Research Contribution

This research will generate a model to improve effectiveness of cascaded school teacher training programmes on ICT integration in Tanzania. TPD planners can use this model while planning to ensure effectiveness. Teachers who will participate in teacher training workshops will develop their professional career. On the other hand, use of technology in teaching and learning will increase and hence improving performance (Higgins, 2003).

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