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Effects of ICT-assisted Teaching Training on Teachers' Skills of Integrating ICT Tools in Teaching English and their Attitude towards using ICT Tools for Teaching English

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Abstract

This paper reports the findings of a quasi-experimental study meant to examine the effects of training in ICT- assisted English language teaching on secondary school English language teachers' skills of integrating ICT tools in teaching English and their attitude towards using ICT tools for teaching English. To achieve this goal, a one-group within-subject quasi-experimental design (also called repeated-measures time series design) was utilized. Twenty (20) teachers were selected from Hawassa City Administration, Sidama Regional State of Ethiopia, as participants of the study using availability sampling. Three rounds of repeated measures data were collected using a test and a questionnaire. The collected data was analyzed quantitatively using the SPSS version 22. Consequently, inferential statistics was applied. Friedman's test was used to compare the mean scores of the related samples scores on the test and questionnaire. Related samples Kendall's coefficient of concordance (effect size) was also run using the same non-parametric test of Friedman's test on the SPSS to see the magnitude of the effect. The results revealed that training in ICT-assisted English language teaching has a significant effect on the English language teachers' skills of integrating ICT tools in their teaching of English and their attitude towards using ICT tools for teaching English. Therefore, there is a need for in-service teacher training in ICT-assisted English language teaching (ELT) and collaborations and purposeful efforts from teachers, schools, and government bodies to harness new technologies for ELT.

Key words: /Attitude/English language teaching/ICT-Assisted teaching training/ICT integration skills/ICT tools/

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1. Introduction

1.1. Background of the Study

There is common understanding among scholars and relevant organizations that the use of information and communication technologies (ICTs) in education is no longer optional (Cabrol & Severin, 2009; UNESCO, 2018; UNESCO, 2013). This is because of the need for preparing learners for the 21st century ICT-dominated work and life environments of the knowledge and information society (Law and Chow, 2008; Shyamlee & Phil, 2012). This is why there are increasing attempts to ICT integration into education around the world (Buabeng-Andoh, 2012). According to UNESCO (2012), addressing the challenges of education in this 21st century requires a range of interventions, including the integration and use of ICTs. This is true since ICT has become part of our life. Thus, we cannot deny its presence in education. However, the question is: "how effectively can we use ICT tools for subject- specific curricular goals to enhance learning outcomes?"

Although there can be other related enabling or hindering factors in integrating technology in the classroom, the fundamental issue is whether teachers know how to use ICT effectively in their teaching, as UNESCO (2011) stated clearly in its publication related with ICT in Education. According to a document published by TESOL (2008), although there are some practices where teachers try to use some form of technology in their teaching, the rapid changes and advancements in technological tools have made it difficult for many teachers to know how best to use the ever-changing ICT tools that are emerging frequently.

Qualified teachers are often seen as catalysts in the introduction and effective use of technology in schools (Harrison, 2010 et al., 2010; UNESCO, 2010; Ghavifekr & Rosdy, 2015). However, the problem related with availability of qualified teachers in their overall teaching ability is a concern to the education stakeholders. The situation is manifested both internationally and nationally. A report by the UNESCO (2012) indicates that Africa and Middle East (AME) region face a severe problem in their teaching and teacher development systems. The report further states that there is shortage of qualified and motivated teachers who can deliver quality teaching and learning within a twenty-first-century educational context.

A recent document by the Federal Democratic Republic of Ethiopia (FDRE) Ministry of Education (MoE, 2018) has reported the presence of poor quality and low motivation of secondary school teachers (including English teachers) in the country. When we keep considering school teachers' skills and practice of using ICT tools for instructional purposes, the situation gets more questionable in many contexts, particularly in developing countries like Ethiopia. Unfortunately, in many African countries, the lack of trained teachers and the low levels of teachers' ICT knowledge and skills have been identified as major impediments to effectively introducing technology into schools (Harrison et al., 2010).

A relatively recent report by Scott and Beadle (2014) also confirms the fact that unavailability of teacher training for CALL (Computer Assisted Language Learning) is one of the hindrances for ICT integration in schools. This is also the situation in the Ethiopian secondary schools setting. It is to fill this gap that supporting teachers and training them to use ICT is emphasized by scholars like Stanley (2013).

Although training teachers to use ICT tools in schools is recommended by scholars in the field, there are gaps in the actual utilization of ICT in the general education and in English language teaching (ELT) as the wide range of research findings in various contexts show the situation on the ground. For instance, Buabeng-Andoh (2012) mentioned lack of teachers' ICT skills, confidence, and pedagogical teacher training as a barrier in ICT integration in teaching and learning. Recent research conducted in Cameroon has recommended the implementation and use of ICT tools in the fostering of English language teaching/learning since these are not employed in the country's school system to enhance language learning (Ntongieh, 2016). A study conducted by Berhanu (2012) revealed that the *technological pedagogical content knowledg*e of secondary school teachers who were participated in the study was found low.

A policy document by FDRE Ministry of Education, ESDP(Education Sector Development Program) V (2014/15-2019/2020), states the government's commitment to expand the use of ICT in education with the aim of improving the quality of teaching and learning at secondary school level (MoE, 2015, p.70). The document further indicates that integration of pedagogy, content and technology will take priority in the plan

period of ESDP V. More specifically, in the ESDP V document, it is stated that mainstreaming ICT across core subjects, including English, and providing ICT resources to schools is the target in using ICT in education at all education levels. However, still there is no local or national level in-service teacher training organized for teachers on ICT-assisted English language teaching in the context of Ethiopia. Melaku (2020) conducted a survey on the e-readiness of secondary school English language teachers in Arba Minch and Sawla towns and reported the teachers' unpreparedness in this regard. Similarly, a study by Tesfaye (2016) implied that high school students in Ethiopia do not have exposure to technology-assisted education, including language education.

Teachers' attitude is another determining factor in the effective utilization of ICT tools for teaching and learning purposes (Scherer et al., 2018). Teachers may have different kinds of attitude towards ICT-assisted teaching. Their attitude may be influenced by various factors. Some teachers may have positive attitude to the technology, but refrain from using it in teaching due to low self-efficacy, tendency to consider themselves not qualified to teach with technology (Fishman et al., 2013).

Similarly, Torsani (2016, p.2) assert: "Though teachers knew that technology has the potential to improve ELT, due to their digital illiteracy to use it in their teaching practice, they are not committed to use it in their teaching practices." Harrison et al. (2010, p.67) also mentions 'lack of subject teachers trained to integrate ICT into classroom' as one of the teacher-related factors for integrating ICT in teaching-learning. This problem, teachers' negative attitude towards using ICT in their teaching, as Hare (2007) says, may be solved by providing training to such teachers to create their awareness and develop confidence on ICT application.

In the context of the present study, ICT tools means computer and information communication tools which are used for teaching English language. These include mobile devices including laptop computers and smart phones, websites, presentation tools such as PowerPoints, mobile apps, Facebook, e-learning platforms like Google Classroom, screen shot software, LCDs, etc.

1.2.Statement of the Problem

Based on their research findings, researchers such as Parvin and Salam (2015) and Ghavifekr and Rosdy (2015) state that the success of technology-based education depends on how the technology is designed and implemented and how the teachers are trained to use it. Thus, as the scholars suggest, effective training of teachers on the utilization of ICT tools for ELT is an important factor for the realization of the intended goal, improving the quality of English language teaching through ICT tools.

The effect of supporting teachers and training them to use ICT can also not be underestimated (Stanley, 2013). Bhattacharjee and Deb (2016) argue that teachers must know the use of ICT in their subject areas to help the learners learn more effectively. As these researchers pointed out, this is because teachers must have the knowledge, skills, and positive attitude to use new digital tools to help all students achieve high academic standard. Having reviewed conditions that affect successful use of technology in social science classrooms, Meskerem and Linda (2012) noted the importance of a strong technology-pedagogy alignment.

Introducing ICT tools and English language improvement programs to the Ethiopian education sector are some of the programs being implemented by the Ethiopian government to improve the quality of general education in general and English language education in particular (Berhanu, 2012). The *Curriculum for Ethiopian General Education* (K-12) recommends revising the curriculum of all subjects to integrate ICT so as to benefit from the pedagogical advantage of using ICT in education (MoE, 2009). Similarly, the other document published by the FDRE Ministry of Education (MoE, 2015) shows the government's commitment to expand ICT use in education in order to improve the quality of teaching and learning.

Nonetheless, although there is a clear policy direction and commitment from the part of the government and its stakeholders to promote using ICT tools in secondary school education in Ethiopia, there are limitations in access to ICT infrastructure and mainly in using ICT for pedagogical purposes in many of the secondary schools throughout the country (Hare, 2007; MoE, 2015). A recent study by Tesfaye (2016)

revealed that first year university students who participated in his study had nearly no prior experience of attending e-courses and only insignificant number of them had taken computer courses and trainings. This finding implies that there is no or limited practice of using ICT in education, including in ELT, in the secondary schools of Ethiopia even in the recent times.

There are evidences that show the presence of teachers' unpreparedness to integrate ICTs in their teaching. Regarding this, Moges (2021?) has reported the presence of limited knowledge and skills of teachers in using ICT tools in teaching and learning in the context of Ethiopia. He mentioned several barriers for this. In his study, he implied the need for teachers' professional development.

Moges (2021) conducted a study on the theme of "Digitalization in teaching and education in Ethiopia." In his study he indicated that the use of ICT for pedagogical purposes has generally been limited in Ethiopian schools and teacher training institutions. This shows the absence of empirical studies that investigate teacher aspect of technology integration in education, including English language education. Experimental studies like the present one is almost none, as the review of related literatures conducted by the present researchers revealed. This is why such kinds of study are opted as attempted in the present study.

Thus, the present researchers strongly believe that there is a felt-need for further empirical research in contexts like Ethiopia where the status and role of English is growing in one hand, and technology being part of our life on the other hand. It is with this rationale that the present study was conducted to examine the effects of training in ICT-assisted English language teaching on secondary school English language teachers' skills of integrating ICT tools in teaching English and their attitude towards using ICT tools for teaching English. More specifically, the researchers aimed to achieve the following two objectives.

1. Examine whether or not training in ICT-assisted English language teaching improves secondary school English language teachers' skills of integrating ICT tools in teaching English
2. See if training in ICT-assisted English language teaching improves secondary school English language teachers' attitude towards using ICT tools for teaching English

The following null and alternative research hypotheses were formulated and the alternative hypotheses were anticipated upon the already existing theory which favors the positive effects of training in ICT-assisted English language teaching on teachers' *skills of integrating ICT tools* in teaching English.

Ho: Training in ICT-assisted English language teaching does not make statistically significant improvement on secondary school English language teachers' *skills of integrating ICT tools* in teaching English.

Ha: Training in ICT-assisted English language teaching makes statistically significant improvement on secondary school English language teachers' *skills of integrating ICT tools* in teaching English.

Ho: Training in ICT-assisted English language teaching does not make statistically significant improvement on secondary school English language teachers' *attitude* towards using ICT tools for teaching English.

Ha: Training in ICT-assisted English language teaching makes statistically significant improvement on secondary school English language teachers' *attitude towards* using ICT tools for teaching English.

2. Review of Related Literature

2.1. Theoretical Framework

One may fail to recognize the theoretical basis of technology use in language teaching if s/he simply considers the use of technology in language education as something new or just a recent phenomenon. The truth is that, there are wide ranges of scholarly works which show us the theoretical basis of CALL (Computer Assisted Language Learning) or ICT assisted language teaching. Hubbard and Levy (2006, p.25) argue this point stating: "Although digital technology has only been a significant component of language teaching and learning for a few decades, the theoretical landscape captured by its researchers and practitioners is already wide-ranging." The use of technologies in language education has been explained in various ways by different scholars in the field depending on how the practice has influenced the profession

and how it has been influenced by Second Language Acquisition (SLA) and educational or relevant linguistic and psychological theories (Polat, 2017).

Polat (2017) wrote about the possibility of situating pedagogical use of technology within the framework of different schools of learning. As he argued, CALL in particular and pedagogical use of technologies in general, has been backed by the various theories of the time. Starting with the behavioristic approach and then continuing with cognitive psychology and constructivism, and recently proposed theories like connectivism and mainly the Social Cognitive Theory (SCT) are the theories which are referred by scholars in discussing pedagogical use of technology and human learning.

Earlier researchers like Campeau et al. (1999) and Campeau and Higgins (1995) used the SCT for similar study purposes. The present study which aimed to test the effects of ICT-assisted English language teaching training on the English language teachers' technological pedagogical content knowledge (TPCK) and attitude employed Bandura's Social Cognitive Theory (SCT) as its basis. To do so, the theoretical constructs of Bandura's SCT were taken into consideration. These individual constructs are behavior modeling or computer usage (ICT tools use in this case), computer self-efficacy, and outcome expectations.

A research work by Campeau et al. (1999) has produced useful insights into the cognitive, affective, and behavioral reactions of individuals to technology, and the factors which influence these reactions. To this end, the present researchers were interested in adapting the model used for that research since it is found relevant. The concepts and constructs of Bandura's (1989) SCT will be discussed in in this paper. Since the purpose of this study was to examine the impacts of training in ICT- assisted English language teaching on English language teachers' skills of integrating ICT tools in teaching English and their attitude towards using ICT tools for teaching English, to better understand the process, variables, and possible outcomes of the training, a relevant theory was needed.

The other relevant theoretical framework is the TPCK. There are expected and marked changes in the pedagogical practices of teachers when they use ICT tools for teaching. As to Gilakijan (2013), the relationship between teachers' teaching methods and computer technology use is one of the personal factors that should be specially considered. He argued that computer technology has this potential to change teachers' teaching methods. When teachers use technology-assisted teaching methods, their traditional role changes, and they can no longer be the source of all information and direct all learning (Alayyar, 2011). Thus, as Gilakijan (2013, p. 264) states, "Pedagogical change is a direct outcome of any computer technology training in which teachers are engaged."

This is to say that transforming teachers' practice through ICT supported teacher training is found the major challenge (UNESCO, 2011). This has a direct implication for considering the effectiveness of ICT-assisted English language teaching training on teachers over all competence and attitude, as investigated in this study. This is true since integrating ICT tools in teaching is not a linear and an easy task. Teachers usually fail to integrate technologies in their teaching due to some factors. Koehler et al. (2013, P. 101) noted the findings of earlier studies which show teachers' lack of knowledge to successfully integrate technology in their teaching and their attempts seem to be limited in scope, variety, and depth. This suggests for better ways of conceptualizing the variables involved in the process of integrating technology in teaching and learning contexts.

Mishra and Koehler (2006) argue "Thoughtful pedagogical uses of technology require the development of a complex, situated form of knowledge that we call *Technological Pedagogical Content Knowledge* (TPACK)." It is based on this argument that a conceptual framework known as: *Technological Pedagogical Content Knowledge* (TPACK) was introduced to the field of ICT in education. For the purpose of understanding the practice of teachers' instructional use of ICT better, this TPACK framework has been found relevant for the present study. The TPACK Framework (Mishra & Koehler, 2006; Koehler et al., 2011) describes the type of teacher knowledge required to teach effectively with technology. As scholars in the field agree, describing what teachers need to know can be difficult since teaching is normally a complex and multifaceted activity which occurs in diverse contexts. This is to mean that conceptualizing the practice by itself is not sufficient since what actually happens on the ground may be even the opposite.

Koehler et al. (2013) argue that "Teachers must understand how technology, pedagogy, and content interrelate, and create a form of knowledge that goes beyond the three separate knowledge bases." This argument suggests considering technology as one additional knowledge base for teachers, in addition to the well- established teachers' knowledge bases: content and pedagogy as long as we are concerned about the pedagogical use of technology by teachers. This is true because, as Koehler et al. (2013) contend "Teaching with technology requires a flexible framework that explains how rapidly-changing, protean technologies may be effectively integrated with a range of pedagogical approaches and content areas." Such arguments force us to consider the dynamic nature of technology and its interaction with pedagogy. Let us see how the TPACK framework is represented in the following diagram to show the complex interplay between the variables involved in teachers' attempt to integrate technology in their teaching.

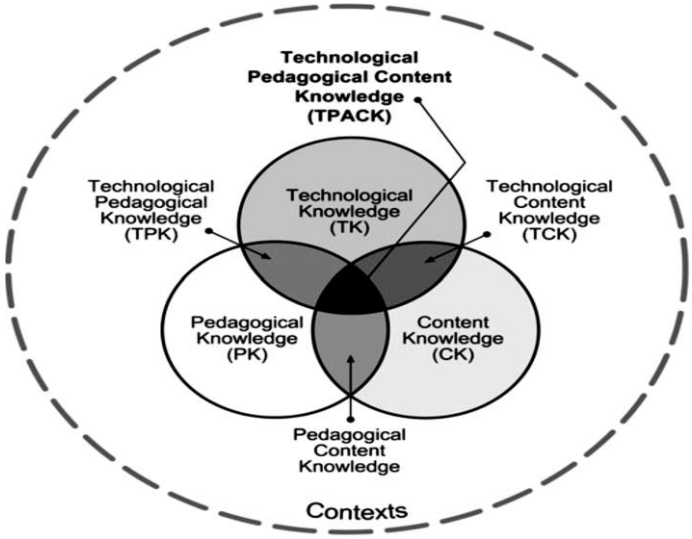


***Figure 1*:** The Technological Pedagogical Content Knowledge (TPAACK) Framework **(**Adopted from Koehler, 2011, p. 103**)**

The TPACK framework shows the interplay between the three main knowledge bases (content, pedagogical, technological) of teachers needed when integrating technology in education. Accordingly, the interplay between the three-knowledge bases creates a knowledge base called technological pedagogical and content knowledge (TPAKC). On the other hand, when two of these three knowledge bases interact with each other, as shown in the diagram, we can find other knowledge bases: pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), and technological content knowledge (TCK). The following diagram shows the conceptual framework of the present study.

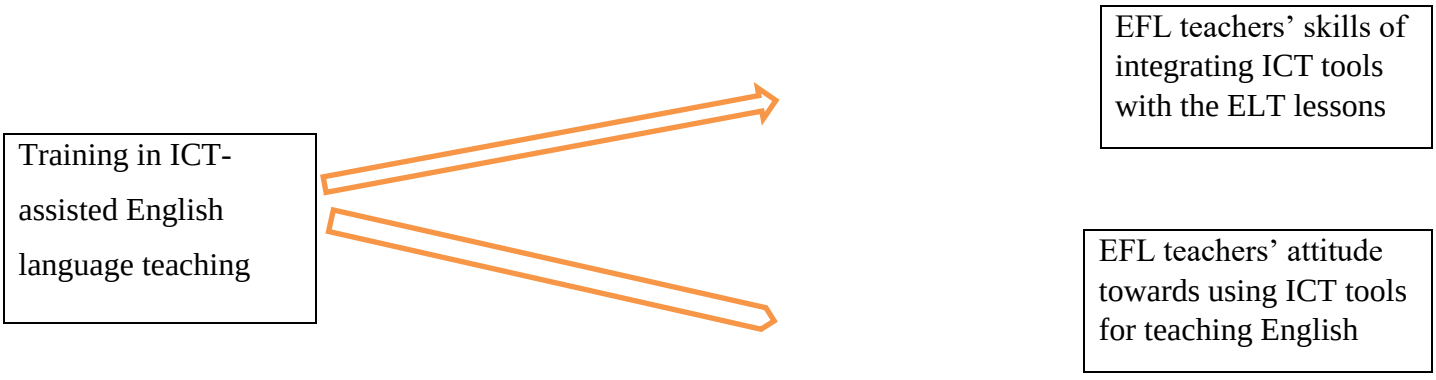


Figure 2: Conceptual Framework of the Study

2.2. ICT-Assisted Education in Ethiopia

The presence of national policy on ICT in education in Ethiopia is a mile stone in an attempt to integrate ICT in education (MoE, 2009). A relatively recent national ICT policy document, which is mainly drawn from the review of the earlier one, was also formulated just after seven years of the previous one (FDRE, 2016). Besides formulating national policy documents, the initiatives and attempts made to equip Ethiopian secondary schools with basic ICT tools, including plasma satellite television and access to the Internet, is another good thing that can be noted as an enabling factor for the utilization of ICT in the secondary education in Ethiopia. However, absence of teacher preparation along with no or limited school-based support and facilitation to utilize the available ICTs in the schools made ICT-assisted teaching and learning as something not yet utilized for pedagogical purposes. Consequently, this limited access to ICT tools and lack of qualified teachers in ICT-assisted teaching remain a challenge when the reality on the ground is considered.

There are some studies which investigated the practice of ICT use in education in Ethiopia. These limited studies, mainly survey and systematic reviews, attempted to shed light on some aspects of the issue over the last few years. Among these limited studies, many of them revealed the government's initiatives, along with its partners, to introduce ICT in the secondary school education in the country. Accordingly, the studies, many of which are unpublished MA and PhD theses (Berhanu, 2012; Tesfaye, 2016; Melaku, 2020) with some review reports, documented the practice of using Plasma TV at the secondary schools of Ethiopia. Its practice, effectiveness, and challenges were the focus of these few local studies.

For instance, Berhanu (2012), in his PhD research, has investigated the effectiveness of the practice of the plasma-channeled ELT in Addis Ababa preparatory schools, and reported findings related with the objectives of the study, including the low status of secondary school ELT teachers' technological pedagogical content knowledge. Similarly, Abebe (2012) has conducted a PhD study on the topic of "Teaching reading skills in English as a foreign language through interactive classroom teaching versus plasma teaching with reference to grade ten students in Addis Ababa." Based on the findings of his study, he recommended the need to give further training to classroom teacher on interactive classroom teaching.

On the other hand, Moges (2021) conducted a study on the theme of "Digitalization in teaching and education in Ethiopia." In his study, he noted the presence of 'the national ICT policy and strategy' (FDRE, 2016)), an updated version of the previous policy (FDRE, 2009), and indicated that the use of ICT for pedagogical purposes has generally been limited in Ethiopian schools and teacher training institutions. This shows the absence of empirical studies that investigate teacher aspect of technology integration in education, including English language education. Experimental studies like the present one is almost none, as the review of related literatures conducted by the present researchers revealed. This is why such kinds of study is opted as attempted in the present study. The insight obtained from it may help us better understand how English language teachers' technological pedagogical content knowledge and attitude improved.

3. Methods and Materials

3.1. Description of the Study Site

The present study was conducted in Hawassa which is the capital city of Sidama National Regional State of Ethiopia. It is located on the shores of Lake Hawassa in the Great Rift Valley, 273 km south of the country's capital city-Addis Ababa and 1,125 km north of Nairobi, Kenya.

3.2. Research Design

To achieve the objective of this study, a quasi-experimental design is found appropriate for its suitability when the objectives and nature of the study are considered. Particularly, among the different types of experimental designs, a one group within-subject quasi-experimental design, specifically, repeated measures time series design was used. One of the main characteristics of this design is it allows collecting data repeatedly on the same behavior (dependent variable) over a period of time. According to Creswell

(2012), such kind of design is called equivalent time series design which is a good experimental approach and can be used when a researcher has access to only one group and can study them over period.

As the literature tells us, in a within-subjects design or repeated measures design, a single group of subjects is exposed to all levels of the independent variable. The different levels of the independent variable in the present study mean the different components of trainings given to the teachers at the different stages of the training. These levels or components (phases) of the training (independent variable) are:

a) basic trainings on the knowledge and skills of ICT tools for ELT
b) trainings on integrating ICT tools with the English lessons

By doing so, this experimental research design type, within-subjects design or repeated measures design, allows the researchers to repeatedly measure the participants' behavior repeatedly to see any possible changes resulted from the intervention. As Ary, Jacob and Sorensen (2010) say, each participant serves as his or her own control, so comparability is not a problem. According to Cohen et al. (2007, p. 284), time series design has the potential to increase reliability. Moreover, a well-designed single-subject experimental design can fulfill the criteria for internal validity (Ary et al. 2010). The design of the present study is presented in the following figure. A quantitative approach was followed to collect and analyze the data. The tests and questionnaires were administered before, in-between and after the intervention as described below.

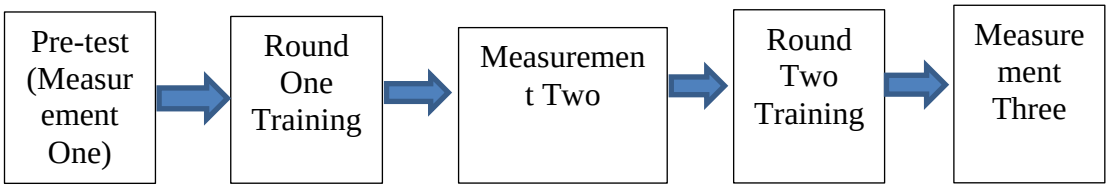


Figure 2: Research Design

3.3. Study Population and Sampling Technique

The target population of the study was public secondary school English language teachers at Hawassa City Administration, Sidama National Regional State of Ethiopia. All the available English language teachers from these schools (14) were included in the study as one group only quasi-experimental group. Thus, availability sampling technique was applied to involve all the available English language teachers (N=20). Since the limited number of available teachers from the target schools was manageable for this quasi-experimental study, it was found good to include all of them. In addition to the existing condition, since schools were closed due to the COVID-19 pandemic when the data collection for this research was carried out, it was not feasible to use another sampling technique to involve participants for the study.

However, the project site (Hawassa) and the type of schools (public schools, unlike the private schools) were taken purposefully due to the geographical proximity and familiarity of the context to the researchers and the relative similarity of the schools in their ICT infrastructure. Most importantly, the researchers decided to conduct this study in Hawassa since they got the chance to use a full-fledged modern ICT laboratory (with internet access) of Hawassa University which served as a venue for the training.

3.4. Data Collection Tools

A test and a questionnaire were utilized for the purpose of data collection for this research.

***Test*:** As many scholars believe, tests are valuable measuring instruments for educational research. A test meant to assess the teachers' skills of integrating ICT tools with the English lessons was adapted from TESOL Technology Standards Framework (TESOL, 2008). The test included 17 items which are mainly objective type. The nature of the test items is performance demonstration tasks related with the teachers' TPACK. Making the tests pre-dominantly objective was done with the intention of avoiding subjectivity

while correcting. The test was administered repeatedly (three times) within a given interval: before, in-between, and at the end of the training.

Regarding scoring of the test, selected instructors evaluated the performance of the study participants based on the orientation given by the researchers using evaluation guideline. Each question carries one mark. Missing the right answer for the questions, results in zero mark. The weight of each test is based on the number of items it carries. Later on, the weight of the test (17 items each carrying 5.8 points) was converted to hundred by using appropriate calculation method (17 items multiplied by 5.8).

***Questionnaire*:** A questionnaire on the attitudes of teachers towards using ICT tools for teaching English was administered to the study participants. A five-point Likert scale questionnaire, which is one of the most widely used techniques to measure attitude, was adapted from the literature (https://www.sciencedirect.com/science/article/pii/S0747563217306246?via%3Dihub#appsec1) and administered to the study participants. The measurement of teachers' attitude in such a way helps the researchers to categorize the study participants on a continuum of favorableness to un-favorableness of attitude towards the subject, as Ary et al. (2010) indicated. The questionnaire has included appropriate and sufficient items (20 items) to gather the required data on the teachers' attitude. The questionnaire included items related to general attitudes towards ICT tools (6 items), educational use of ICT tools (8 items) and perceived ease of ICT use (6 items). The teachers were asked to respond to each item of the questionnaire by indicating their level of agreement from 5-Strongly Agree (SA) to 4-Agree (A), 3-Neutral (N), 2-Disagree (D) and 1-Strongly Disagree (SD).

Cronbach alpha test was conducted to examine the internal consistency of the questionnaire. Accordingly, the result showed that the items of the questionnaire were reliable at above 0.823. The questionnaire was administered before, during, and after the training. The items of the questionnaire for the pre-, in between, and post training intervention was the same. Appropriate measures were taken into account to maintain the validity and reliability of the questionnaire. Firstly, the items of the questionnaire were adapted from relevant literature in the field. Second, a cover page which introduces the purpose and nature of the questionnaire and gives direction was included. Moreover, the questionnaire was commented by the researchers' senior colleagues focusing on the extent to which the items of the questionnaire were representative of the entire theoretical construct the questionnaire was designed to assess and on the appearance of the questionnaire in terms of feasibility, readability, consistency of style and formatting, and clarity of the language used.

3.5. Experimental Procedures

Designing training resources such as manuals, guidelines, schedules and arranging the training venue and selecting trainers were the key pre-training activities carried out in this research. Training manuals and guidelines as well as schedules were designed based on the directions and guidelines set by the UNESCO and the FDRE Ministry of Education. The ICT tools which were utilized for the purpose of the study are: desktop and laptop computers, smartphones, broadband and Wi-Fi Internet, LCD projector, English language teaching/learning websites, social networking sites such as Facebook, online teaching/learning platforms provided by Google such as Google Classroom and etc.

After getting official permission from Hawassa University and the schools to get access to the training venue and to the research participants respectively, the five weeks long ICT-assisted English language teaching training was conducted between July and August 2020. It was face-to-face, six hours a day, and four days a week (120 hours) intensive training conducted by EFL and ICT instructors who have the knowledge and skills of ICT-assisted English language teaching. The required data for the research were collected before, during, and after the training in three rounds.

3.6. Data Analysis

The data analysis was done using SPSS version 22 for testing the hypotheses of the research. Accordingly, inferential statistics was carried out. As mentioned in the earlier section, the design of the present study is a *within-subject repeated measure time series design* and this allows repeated measurements on a single-group quasi-experimental group sample at different times of the study. The data collected for this study mainly involves interval type of data which were collected through tests and questionnaires.

Thus, the type of sample used and the nature of data collected have required the use of non-parametric statistical tool for the data analysis. This statistical tool was selected because the type of sample selected (single group) and the type of data collected (repeated measure) do not fulfill some of the assumptions of the parametric test such as random assignment of samples and normal distribution of data. Since such parametric assumptions are not strictly fulfilled, the researchers were forced to use the non-parametric statistical tool to analyze the collected data. This is mainly because of the assumption that the non-parametric techniques do not have those much strict assumptions unlike the parametric ones (Larson-Hall, 2010; Bordens & Abbot, 2011; Field, 2013).

Among the different non-parametric tests, it was the Friedman test that was found appropriate for the present research due to its suitability to test the hypotheses of the research. The Friedman test is a test that can be used to test differences between conditions when there are more than two (three or more) samples which are related (Cohen, Manion & Morrison, 2007; Field, 2013). Thus, in such kinds of conditions, it is the same subjects which provide the research data. The Friedman's test is considered an ideal statistic to use for a repeated measures type of experiment as is the case with the present study to determine if a particular factor, an independent variable, has an effect on the dependent variable (Cohen & Lea, 2004). It is with this understanding that the Friedman test which is the non-parametric test opted to use for the data analysis in this Study. Significance level was taken at 0.05 (5 percent).

Before analyzing the data, to make sure that the data collected can be analyzed through the Friedman's test, the following three assumptions were considered:

- Assumption #1: One group is measured on three or more different occasions.
- Assumption #2: Dependent variable should be measured at the ordinal or continuous level.
- Assumption #3: Samples do NOT need to be normally distributed.

Since the basic Friedman test does not tell us the effect size, further analysis of the result is needed. To do so, related-samples Kendall's coefficient of concordance (effect size) was run using the same non-parametric test of the Friedman's test on the SPSS (following an alternative procedure of the normal one). The magnitude of the effect size is labeled as follows.

- <.2=Small effect
- .2 - .5=Medium effect
- >.5=Large effect

3.7. Ethical Considerations

A letter of support for data collection was obtained from the Department of English Language and Literature, Hawassa University. Accordingly, the researchers contacted the principals of the schools in person to get access to the schools ICT facilities and the English language teachers who would participate in the study. The principals gave the list of available/volunteer English language teachers to be contacted, and the available teachers (25) confirmed their willingness to participate in the study. However, after being informed about the purpose, procedures, requirements, and schedule of the study, twenty (20) of them confirmed their willingness to participate in the study and signed on the *training participation attendance* as a consent of their willingness to participate. These teachers managed to complete the study. In the process of data collection and processing and reporting results, the anonymity of the participants was maintained.

4. Results

4.1. The Effects of Training in ICT-assisted ELT on English Language Teachers' Skills of Integrating ICT Tools with the English Lessons

The related samples (one group only experimental group) mean scores for the ICT tools integration three round repeated measures were compared using the non-parametric Friedman test on the SPSS version 22. The comparisons were made to see whether there were statistically significant differences or not between the three repeated measures taken at the different time of the intervention (pre, in-between and after the intervention) on the teachers' skills of integrating ICT tools with ELT lessons. The results are shown in Table 1.

Table 1: Test statistics table for the Friedman Test on the English language teachers' skills of integrating ICT tools with English lessons

Test Statistics

N	20
Chi-Square	32.076
Df	2
Asymp. Sig.	.000

a. Friedman Test

As the SPSS output shows (Table 1), there is a significant effect of the ICT-assisted English language teaching training given at the different level of the independent variable on the secondary school English language teachers' skills of integrating ICT tools with their ELT lessons ($x^2(2) = 32.076$, $p<0.001$).

*Effect size of the ICT tools integration skills test***:** Since the basic Friedman test does not tell us the effect size, further analysis of the result was needed. To do so, *Related-Samples Kendall's Coefficient of Concordance* was run using the same non-parametric test of the Friedman's test using alternative analysis procedure. Table 2 shows the output of the analysis.

Table 2: Hypothesis test summary for the Friedman Test on the English language teachers' skills of integrating ICT tools with English lessons

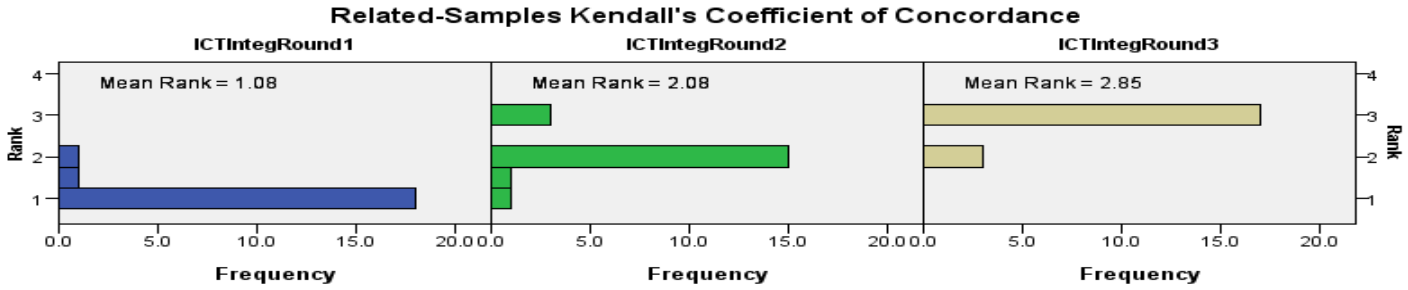
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of ICTIntegRound1, ICTIntegRound2 and ICTIntegRound3 are the same.	Related-Samples Kendall's Coefficient of Concordance	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

As Table 2 shows, the hypothesis test summary of the *related-samples Kendall's coefficient of concordance* indicates that there is a significant difference ($p < .05, <.001$) between the mean scores of the related samples' ICT tools integration skills test results. Accordingly, it is possible to reject the null hypothesis which states that training in ICT-assisted English language teaching does not make statistically significant effect on the secondary school English language teachers' skills of integrating ICT tools with their English lessons. This means, there is evidence to conclude that the intervention has brought the observed significant improvement on the ICT tools integration skills of the teachers. Furthermore, the Friedman test analysis also provided the following outputs related with the effect size of the teachers' ICT tools integration test result analysis.

Table 3: Kendall's coefficient of concordance test (effect size) results for the English language teachers' skills of integrating ICT tools with English lessons



Total N	20
Kendall's W	.802
Test Statistic	32.076
Degrees of Freedom	2
Asymptotic Sig. (2-sided test)	.000

As the related-samples Kendall's coefficient of concordance test (effect size) analysis shows (Table 3), training in ICT-assisted English language teaching has statistically significant effect on the secondary school English language teachers' skills of integrating ICT tools with their English lessons ($x^2(2)$ =32.076, p< .001, W=.802). Thus, it is noted that the magnitude of the effect size is large (since it is >.8).

4.2. The Effects of Training in ICT-assisted ELT on English language Teachers' Attitude towards ICT Tools for Teaching English

The three rounds repeated measures of the related samples mean scores of the questionnaire on the attitudes of the English language teachers were compared using the non-parametric Friedman test on the SPSS version 22. The comparisons were made to see whether there were statistically significant mean differences or not between the three repeated measures (pre-, in-between, and after the intervention) on the teachers' attitude towards using ICT tools for teaching English taken at the different times of the intervention. The results are shown in the following three tables (descriptive statistics, ranks table and test statistics table consecutively).

Table 4: Descriptive statistics results of the questionnaire for teachers' attitude towards using ICT tools for teaching English

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Attitude Round 1	20	41.00	53.00	47.90	3.33
Attitude Round 2	20	35.00	55.00	48.05	5.38
Attitude Round 3	20	44.00	55.00	51.30	2.81
Valid N (list wise)	20				

As the descriptive statistics indicates (Table 4), the mean scores for the repeated measures on the attitude questionnaire is highest in the third round (M=51.3000) followed by the second round (M=48.0500) as compared to the first round (M=47.9000). This shows the positive change of teachers' attitude towards using ICT tools for teaching English.

Table 5: Mean ranks for the Friedman Test on the teachers' attitude towards ICT tools for teaching English

Measurements	Mean Rank
Attitude Round 1	1.58
Attitude Round 2	1.88
Attitude Round 3	2.55

The ranks **(**Table 5) show the mean rank for each of the related groups' repeated measures questionnaire on the teachers' attitude towards ICT tools for teaching English. The Friedman test compares the mean ranks between the related groups and indicates how the groups differ. However, it is the Test Statistics (Table 6) which tells us the actual result of the Friedman test, and whether there is an overall statistically significant difference between the mean ranks of the related groups on the repeated measures of the dependent variable. Accordingly, the following SPSS output of the Friedman's test analysis was obtained.

Table 6: Test statistics for the Friedman Test on the attitude of teachers towards ICT tools for teaching English

Test statistics

N	20
Chi-Square	10.500
Df	2
Asymp. Sig.	.005

a. Friedman Test

As the result indicates, a significant improvement was found on the teachers' attitude towards ICT tools for teaching English after taking the training in ICT-assisted English language teaching which was given at different levels (components) of the independent variable (training in ICT-assisted English language teaching) ($x^2(2) = 10.500$, $p < .005$).

*Effect size of the r*esults *of the attitude questionnaire.* To see the magnitude of the effect size, *related-samples Kendall's coefficient of concordance* was run using the same non-parametric test of the Friedman's test. The following output was obtained from the SPSS analysis.

Table 7: Hypothesis Test summary for the Friedman Test on the attitudes of teachers towards using ICT tools for teaching English

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of AttitudeRound1, AttitudeRound2 and AttitudeRound3 are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.005	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

As Table 7 shows, the hypothesis test summary of the *related-samples Kendall's coefficient of concordance* indicates that since there is significant difference ($p < .05$, .005) between the mean scores of the related samples' attitude scales results, it is possible to reject the null hypothesis which states that training in ICT-assisted English language teaching does not make statistically significant change on

secondary school English language teachers' attitude towards ICT tools in general and for teaching English in particular. On the other hand, there is evidence to conclude that the intervention has brought the observed significant improvement on the attitude of the teachers. Furthermore, the analysis also provided the following outputs related with the effect size of the attitude scales result analysis.

Table 8: Effect size analysis output table for the Friedman Test on the attitudes of teachers towards using ICT tools for teaching English

N	20
Kendall's W[a]	.262
Chi-Square	10.500
Df	2
Asymp. Sig.	.005

a. Kendall's Coefficient of Concordance

As the related-samples Kendall's coefficient of concordance test (effect size) indicates, there is a significant effect of the training in ICT-assisted English language teaching on secondary school English language teachers' attitude towards ICT tools for teaching English ($x^2(2) = 10.500$, $p < .005$, $W = .262$). Thus, it can be noticed that the magnitude of the effect size is medium (since effect size of $>.2$ is considered medium/moderate effect where Kendall's W .2=small, .5=medium, and .8=large effect size).

5. Discussion

The findings of the present study show that enhancing EFL teachers' TPACK results in the teachers' ability of integrating ICT tools for teaching English and their attitude towards using ICT tools for teaching English. The ICT integration skills test and attitude questionnaire results statistical analysis confirmed the potential of ICT-assisted teacher training in improving the teachers' skills required to utilize appropriate ICT tools in their teaching and attitude towards using the ICT tools for teaching English.

Integrating ICT tools in teaching and learning is still not widely practiced in many contexts around the world. This is mainly due to different individual and institutional factors which either facilitate or discourage teachers, schools, and governments in integrating ICT tools in education. Thouësny and Bradley (2011) noted that despite the wide availability of technology in everyday life, incorporating technology in education is a challenging endeavor.

Carpini (2012) indicated that incorporating technology into language classrooms requires teachers' technology knowledge, time, and positive beliefs. Results from her study revealed that 85% of the study participants (N = 53) had access to computers at work but 49% responded that they rarely used the computer for classroom activities. This implies that it is not only access to ICT tools, but also other variables such as commitment and attitude are important to actually use ICT tools for teaching and learning purposes.

A study conducted by Nazari et al. (2019) suggests that developing technology integration skills in a highly contextualized setting enhances EFL teachers' knowledge, skills, and beliefs of the use of technology in EFL classrooms. This is what the findings of the present research demonstrated.

The findings of this research which indicated the need for to enhance teachers' TPACK support the earlier research work by Meskerem and Linda (2012). Their review of technology assisted educational projects showed the importance of strong pedagogy-technology alignment which is also emphasized in the TPACK framework by Mishra and Koehler (2006).

Similarly, Mainake's (2020) study reported the significant importance of teachers' skills and knowledge in integrating technology in EFL classrooms. This is why teacher training and support is needed to align technology and pedagogy for successful integration in teaching English as the present research uncovered.

Recent research conducted by Raygan and Moradkhani (2020) examined the correlation among EFL teachers' school climate, TPACK, and attitude with regard to their success in technology integration throughout their teaching indicated a significant association between their TPACK and attitude and their technology use.

Teachers' attitude towards ICT tools for teaching and learning has already been identified as an important factor to the successful integration of new technologies (Christensen, 2014; Eickelmann & Vennemann, 2017). Moreover, Cahyani and Cahyono (2012) reported that teachers have the belief that integration of technology is inseparable from successful teaching and learning.

In the debate regarding the integration of ICTs into schools, the beliefs and attitudes of teachers towards ICT in teaching and learning have always been regarded as central criteria for successful implementation of new technologies (Arzal & Chen, 2017).

After exploring the perceptions towards integrating ICTs in teaching and learning programs among in-service primary school teachers in Zambia, Walubitaa and Mulauzi (2016) reported that the majority of the teachers were optimistic about the use of ICTs in the teaching and learning setting. Accordingly, the researchers recommended the need for in-service teacher technology training, access to computers and technical support. In summary, the present study showed that training in ICT-assisted English language teaching can significantly improve the English language teachers' skills of integrating ICT tools and their attitude towards using ICT tools for teaching English. The present study which is a quasi-experimental in its design was conducted on a small sample size which is one of the limitations of the study. Hence, further studies with larger sample size are recommended.

6. Conclusions

This quasi-experimental research revealed that training in ICT-assisted ELT has significant effects on secondary school EFL teachers' ICT tools integration skills in their teaching of English and on attitude towards ICT tools for teaching English.

The study participants' skill of integrating ICT tools with their English lessons was progressively improved from the first round of measurement (pre-intervention) to the final (third and post-intervention). This was happened when the study participants received the various components of the training package starting with the basic ICT skills for teaching English to skills of integrating ICT tools in more practical pedagogical contexts. This implies providing just basic ICT skills training could not ensure confidence and competence for teachers to demonstrate the skills of integrating ICT tools in their teaching practice. Rather, providing a well-designed series of training could bring significant effects on the teachers' skills of ICT tools integration in their English language teaching.

As discussed in the previous sections (mainly in the introduction and review of related literature) of the present study, teachers' attitude towards using ICT tools for teaching English has been acknowledged as an issue when considering ICT in education in general and in language education in particular. Concerning the attitude of secondary school EFL teachers towards using ICT tools for teaching English, a statistically significant and large effect of the ICT-assisted ELT training was found in the present study. This does not mean that the teachers had negative attitude prior to the intervention; they actually had positive attitude even before the intervention. However, the three rounds of repeated measurements on the teachers' attitude towards using ICT tools for teaching English showed significant and large improvement over the intervention period which lasted for months.

Many studies are conducted on the issues of ICTs in education in general and with special focus on the roles, practices, and opportunities and challenges of using ICT. However, the scholarly works on the impacts of ICTs and ICT integration training for teachers is scanty. As Hafifah (2020) noted, many of the earlier research works are mostly done quantitatively investigating factors that affect teachers' perspectives on ICT integration in ELT using survey design. Hence, the present study sheds light on the effects of training in ICT assisted training on EFL teachers' skills of integrating ICT tools in their teaching and their

attitude towards using ICT tools for teaching English. Therefore, it is believed that the findings of the present study have relevant contribution to the existing body of knowledge in the field.

7. Recommendations

If teachers do not see the value of a technology, do not know how to use it, or are not comfortable using it, they will not practice it. Thus, according to the finding of the present study, it is implied that the study participants managed to improve their skills of integrating ICT tools with the lessons in the ELT textbooks and developed more favorable attitude towards using ICT tools in their teaching after they received the training. Since majority of the current secondary school English language teachers in Ethiopia have not been trained in ICT-assisted ELT during their pre-service and in-service trainings, addressing this gap is very important if we want them to be competent teachers who are capable of addressing their students' need. This can be realized through arranging on-going professional development opportunities for teachers.

As it is noted in this study, some types of ICT tools were found more accessible and favorable than others by the EFL teachers. This means, the traditional computers and computer labs that are fixed in a single room at school are not that much effective and the choice of teachers. Since there are other recent technologies, commonly known as 'mobile devices', such as: laptop computers, tablets, and smart phones that can be connected to the wireless internet (Wi-Fi) access so that teachers can access the resources they want anytime and anywhere. Therefore, when trying to make ICT tools available for schools and teachers, the government and other partners (may be schools themselves) shall take account of this new trends that may determine teachers' access, skills, attitude, and practice of using ICT tools for teaching English.

Despite the increasing number of studies on the importance of ICTs on teaching and learning, including foreign language learning, the evidence base for ICT integration in classroom remains limited. This implies the need for further studies to be conducted on various settings. More specifically, future studies should take account into teachers' qualification, teaching experience, gender, age, access to ICT tools at home and individually, and school culture to get the full picture of factors that influence teachers' e-readiness, motivation to integrate ICT tools in their teaching in particular and professional development in general.

In general, based on the findings of the study, the researchers recommend the need for in-service teacher training in ICT-assisted English language teaching, collaboration and purposeful efforts from teachers, schools, and government bodies to harness the potential of new technologies for ELT.

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Contribution of authors

All the authors contributed to the study's conception and design. To be specific, material preparation, data collection, and analysis were performed by Mihireteab Abraham. The first draft of the manuscript was also written by him. Zeleke Arficho, a corresponding author, and Tesfaye Habtemariam commented on the draft and revised versions of the manuscript as well as read and approved the final manuscript.

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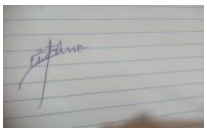
We have agreed to submit for Journal of Social Sciences and Language Studies and approved the manuscript for submission.

Signature: 

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