Hindawi
Education Research International
Volume 2022, Article ID 6233407, 10 pages
https://doi.org/10.1155/2022/6233407

Research Article

Effects of Training in ICT-Assisted English Language Teaching on Secondary School English Language Teachers' Knowledge, Skills, and Practice of Using ICT Tools for Teaching English

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Received 22 December 2021; Accepted 29 April 2022; Published 16 May 2022

Academic Editor: Ehsan Namaziandost

This quasiexperimental study was conducted in order to see the impact of training in Information Communication Technology-(ICT-) assisted English language teaching on secondary school English language teachers' knowledge, skills, and practice of using ICT tools for teaching English. To this end, a one group within-subject quasi-experimental design was applied. The study included 20 teachers from Hawassa City Administration in Sidama Regional State of Ethiopia using availability sampling. Repeated measures data were obtained using tests and questionnaires and analyzed quantitatively by using SPSS version 25. Friedman's test was computed so as to compare the related samples' mean scores for the tests as well as questionnaires. Related-samples Kendall's coefficient of concordance was computed on the SPSS in order to see the magnitude of the effect of the training. The results showed training in ICT-assisted English language teaching significantly improves teachers' knowledge and skills of ICT tools for teaching English and their practice of using ICT tools in teaching English. Recommendations were made in view of that. To be specific, there are needs for teacher training in information communication technology-supported English language teaching.

1. Introduction

Today, improving the quality of English education at secondary schools needs the utilization of Information Communication Technology (ICT). This is true, as Torsani [1] argues, because "Technology has become part of – and has revolutionized – our everyday life and that language education cannot afford to neglect this potential." As the todays' world is highly affected by a lot of ICTs, in order to effectively operate in this digital globe, digital literacy is needed. Regarding this point, UNESCO [2] strongly argues "In the 21st century, citizens and workers must be able to exhibit a range of functional and critical thinking skills such as information literacy, media literacy, ICT (Information, Communications and Technology) literacy." Hence, this forces us to utilize ICT tools in our English language teaching practices.

It seems that the government of Ethiopia has recognized this fact and is making efforts in this regard. A relatively recent document by the Federal Democratic Republic of Ethiopia (FDRE) Ministry of Education, ESDP V (2014/15-2019/2020), indicates the government is committed to expand ICT in education for improving the quality of secondary education [3]. It also shows integration of pedagogy, content, and technology is given primacy. Furthermore, it focuses on mainstreaming ICT across main subjects, including English, and furnishing schools at all levels with ICT resources. However, limited access to ICT tools and absence of trained teachers in ICT-supported teaching remain a dare [4].

According to the long-lasted Education and Training Policy [5] and the recent *Education Road Map* of the FDRE [6], secondary schooling in Ethiopia is a four years program which consists of two years of general secondary education

(1st Cycle: Grade 9 and 10) and other two years of second cycle or preparatory program (Grade 11 and 12). As the Education and Training Policy (p.23) indicates, the aim of secondary education is to "enable students identify their interests for further education, specific training and the world of work." This shows how much secondary school education is essential in determining the students' future life.

It is obvious teachers are the main actors in the teaching learning process [7, 8]. In foreign language education contexts like in Ethiopia, English language teachers are the primary sources of language learning inputs for their learners. As Young et al., cited in Richards [9], wrote, "For students at the elementary and secondary school levels, access to teachers who have the necessary professional knowledge and functional English language skills to teach English effectively is critical". Given this fact, in educational restructurings, the teacher is believed to be an important stakeholder.

In this 21st century, there is a demand on everyone, including ELT teachers, to be technologically literate. As many scholars such as Gilakjani [10], Buabeng [11], and Koehler et al. [12] argue, when we strive to apply ICT-supported English language teaching, the effective integration of it depends on the teacher's knowledge of the same in using various ICT tools. Consequently, as these scholars indicated, many school leaders perceive that teachers' lack of ICT-related knowledge is the key barrier to achieve ICT-related goals.

Although there can be other related enabling or hindering factors in integrating technologies in the classroom, the fundamental issue is whether teachers know how to use ICTs effectively in their teaching, as UNESCO [13] stated it clearly in its publication related with ICT in Education. According to a document published by TESOL [14], 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 for teaching have made it difficult for many teachers to know how best to use the ever-changing ICT tools that are emerging frequently.

A relatively recent report by the European Commission [10] also confirms the fact that unavailability of teacher training for Computer Assisted Language Learning (CALL) 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 has been emphasized by scholars like Stanley [15]. Although training teachers to use ICT tools in schools is recommended by the scholars in the field, there are gaps in the actual utilization of the potential of ICT in teaching/learning as the wide range of research findings in various contexts show the situation on the ground [16]. For instance, Buabeng [11] mentioned lack of teachers' ICT skills, confidence, and pedagogical teacher training as a barrier for introducing ICT in teaching/learning.

The effect of supporting teachers and training them to use ICT cannot be underestimated [1]. Belay et al. [17] argue that teachers need to know how to use ICT to help their students learn more efficiently. As these researchers pointed out, this is because teachers should have the knowledge, skills, and positive attitude to utilize digital tools to help their learners attain high academic standard.

The general objective of this research was to see the impacts of training in ICT-supported English language teaching on secondary school English language teachers' knowledge, skills, and practice of using ICT tools for teaching English. The study had the following specific objectives. It aimed to

(1) Look at the effect of training in ICT-supported English language teaching on secondary school English language teachers' knowledge and skills of ICT tools for teaching English

(2) See the impact of training in ICT-supported English language teaching on secondary school English language teachers' practice of using ICT tools for teaching English

Based on the research objectives, the following two-tailed null and alternative hypotheses were formulated.

(1) *Ho*. Training in ICT-supported English language teaching does not result in statistically significant improvements on secondary school English language teachers' ICT knowledge and skills for teaching English

Ha. Training in ICT-supported English language teaching results in statistically significant improvements on secondary school English language teachers' ICT knowledge and skills for teaching English

(2) *Ho*. Training in ICT-supported English language teaching does not result in statistically significant improvements on secondary school English language teachers' practice of using ICT tools for teaching English

Ha. Training in ICT-supported English language teaching results in statistically significant improvements on secondary school English language teachers' practice of using ICT tools for teaching English

2. Theoretical Framework

As the review of literature in the field reveals, there are well-established theoretical foundations of technology utilization in language education. Thus, there are a good number of scientific publications which tell us the theoretical foundations of CALL or ICT-supported language teaching. Hubbard and Levy [18] argue this saying "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 utilization of technologies in language education is documented in numerous ways focusing on how the practice has influenced the profession and how the practices have been influenced by learning/teaching or linguistic and psychological theories [19].

Polat [19] stated the possibility of placing pedagogical use of technology within the framework of different schools of thought. As this scholar said, CALL in particular and pedagogical use of technologies in general was supported by

various theories of the time. Beginning with behaviorism and then going on with cognitive psychology and constructivism, the recent theories such as connectivism and especially the *Social Cognitive Theory* are the theories which are referred by researchers in stating the pedagogical use of technology and human learning.

A theoretical framework, based on Bandura's [20] Social Cognitive Theory (SCT), became a basis for the current research. Previous scholars such as Campeau and Higgins [21] and Cohen et al. [22] utilized the SCT for similar researches. The current research aimed at examining the impacts of ICT-supported English language teaching training on English language teachers' knowledge and skills of ICT tools and their practice of using the tools for teaching English. To this end, Bandura's Social Cognitive Theory was considered. These concepts are behavior modeling or computer usage (ICT tools use), computer self-effectiveness, and result expectations.

A study by Campeau ang Higgins [21, 23] has found worthwhile acumens into the cognitive, affective, and behavioral responses of persons to technology, and into the issues which affect these responses. Thus, the current researchers became interested in adapting the model utilized for that study as it is found appropriate.

As said above, the purpose of the present research was to see the effects of training in ICT-supported English language teaching on secondary school English language teachers' knowledge, skills, and practice of ICT tools for teaching English. Thus, in order to apprehend the process, variables, and results of the training as efficiently as possible, the appropriate theory was needed.

The other appropriate theoretical framework becomes the *Technological Pedagogical Content Knowledge* (TPACK). There is a noticeable change in the pedagogical practices of teachers when they utilize ICT tools for teaching purposes. As Gilakijan [7] reported, the presence of the association between teachers' teaching methods and computer technology utilization is one of the factors that should be taken into consideration. This scholar says computer technology has a 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 [24]. In relation to this, Gilakijan [7] says "Pedagogical change is a direct outcome of any computer technology training in which teachers are engaged."

Transmuting teachers' use of ICT tools through ICT-supported teacher training has been found the main encounter [25]. This has a direct indication for examining the impact of ICT- supported English language teachers' training on teachers over all competence. This is true as integrating ICT tools in teaching is not a rectilinear and an easy job. Teachers generally become unable to integrate technologies in their teaching because of some influences. Koehler [26] mentions the findings of previous researches which showed teachers' lack of knowledge on the educational uses of technology in order to effectively integrate technology with their language lessons, and their efforts seemed to be limited in scope, variety, and deepness. This implies to look for better ways of conceptualizing the variables involved in the process of integrating technology in various teaching/learning contexts.

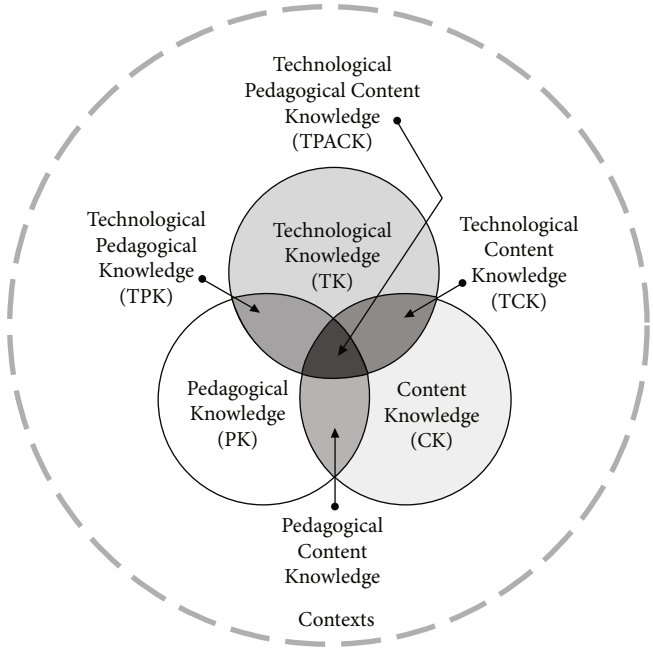

Figure 1: TPACK framework (adopted from [12]).

Mishra and Koehler [9] state "Thoughtful pedagogical uses of technology require the development of a complex, situated form of knowledge that we call *Technological Pedagogical Content Knowledge* (TPCK)." It is based on this notion that a conceptual framework, namely, Technological Pedagogical Content Knowledge (TPACK) was introduced into ICT in education [27]. For the purpose of better understanding of the practice of teachers' educational use of ICT, this framework became appropriate for the current research. This framework [15] describes the type of teacher knowledge required to teach efficiently with technology. As the scholars in the field come to an agreement, describing what teachers need to know can be tough since teaching is usually a complex and multidimensional job which happens in varied contexts. This is to mean that conceptualizing the practice by itself is not adequate as what actually exists in practice may be even the opposite.

Koehler et al. [12] argue "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 proposes taking into account technology as one additional knowledge base for teachers, in addition to the deep-rooted teachers' knowledge bases: content and pedagogy as long since we are worried about the pedagogical use of technology by teachers. This is true because as Koehler et al. [12] argue "Teaching with technology requires a flexible framework that explains how rapidly-changing technologies may be effectively integrated with a range of pedagogical approaches and content areas." Such arguments force us to consider the vibrant nature of technology and its interaction with pedagogy. Let us look at how the TPACK framework is denoted in a figure (Figure 1) to display the complex interaction between the variables involved in teachers' effort to integrate technology in their teaching practices.

The TPCK framework above (Figure 1) displays the interaction between the three main knowledge bases

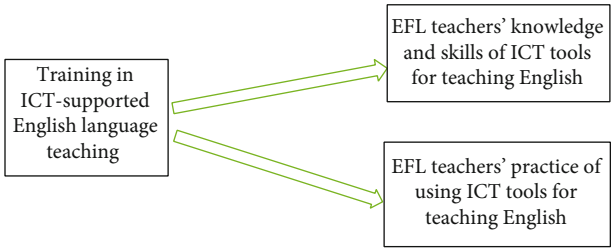

Figure 2: Conceptual framework of the study.

(content, pedagogical, and technological) of teachers needed when integrating technology in teaching/learning. Accordingly, the relationship between the three knowledge bases produces a knowledge base known as TPACK. On the other hand, when two of these three knowledge bases intermingle with each other, as demonstrated in the diagram, we can find their knowledge bases: pedagogical content knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK). The focus of this study is on the second component of the framework, Technological Content Knowledge (TCK), and teachers' use of ICT tools. Figure 2 below presents the framework as follows.

3. Materials and Methods

The aim of this research was to see if ICT-supported English language teaching training can positively affect secondary school EFL teachers' knowledge and skills of ICT tools for teaching English and their practice of using ICT tools for teaching English. A one group within-subject repeated measures time series quasiexperimental design was used to address the objectives of the study. This design allows collecting data repeatedly on the same behavior over a period of time. According to Creswell [5], such kind of design is a good experimental approach that can be used when the researcher has access to only one group to be studied over a period. In the literature, in a repeated measures design, a single group is exposed to the different stages of the independent variable. This in the current study refers to the different components of trainings provided to the teachers at the different times of the training.

By doing so, this quasiexperimental research design made the researchers repeatedly measure the study participants' behavior to see any possible changes resulted from the intervention. As Ary et al. [28] state, in such a design, individual participants serve as controls to themselves which make comparability easy. For Cohen et al. [22], time series design increases reliability. Moreover, a well-designed single-subject experimental design can fulfill the criteria for internal validity [28]. Similarly, regarding the advantages of repeated measures experimental design, Cipani [29] asserts "Repeated measurements of behavior within an experimental condition allow for a more accurate estimate and analysis of the level of behavior. Determining the level of behavior across time provides a more accurate picture of each individual participant." The following figure (Figure 3) presents the design of the study.

In this study, a quantitative approach was used to collect and analyze the data.

3.1. Research Site. The present quasiexperimental study was conducted in Hawassa City Administration. Hawassa is located in the Sidama National Regional State of Ethiopia at the shores of Lake Hawassa, about 273 km south of the country's capital city and 1,125 km north of Nairobi, Kenya.

Eight public secondary schools found in the city administration were considered for this study. The researchers selected this site for two main reasons. The first one was due to the relative geographical proximity of the location to save unnecessary financial, time, and labor costs. The second one is related with the relative advantage of easy access to the ICT resources found at Hawassa University which is the home-base for the first investigator and to which the corresponding researcher is a faculty member.

3.2. Study Population and Sampling Technique. The English language teachers in the secondary schools at Hawassa City Administration were the targets. All the available teachers (eight) from these schools were included in the study as one group only experimental group. Thus, comprehensive sampling technique was applied to involve all the available English language teachers ($n = 20$) from the public secondary schools in the city. Since the limited number of available teachers from the target schools was manageable for this quasiexperimental study, it was found good to include all of them. In addition to the existing condition (schools were closed due to the COVID-19 pandemic), it was not feasible to use other sampling technique rather than the aforementioned sampling technique to involve participants for the study.

However, the project site (Hawassa) and the type of schools (public schools) were selected 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 unlike the private schools. Most importantly, the researchers decided to conduct the study in Hawassa since they got the chance to use a full-fledged modern ICT laboratory (with internet access) at Hawassa University which served as a venue for the training and data collection.

3.3. Data Collection Tools. A test and a self-assessment questionnaire were utilized for collecting data for this research. It is believed that tests are valuable instruments for educational research. A test meant to assess the teachers' knowledge and skills of ICT tools was adapted from a relevant literature source, TESOL Technology Standards Framework [30]. The test included mainly objective items, and it was administered three times within a given interval: pre, during, and posttraining.

For scoring of the test, evaluators scored the participants' performance using the answer keys and specific directions provided to them. Each question carries one mark and the weight of each test is based on the number of items it carries. Later on, the weight of each test was converted into hundred by using an appropriate calculation method.

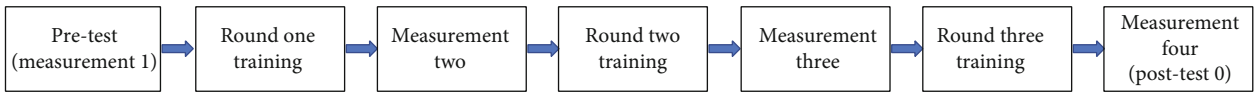

Figure 3: Design of the study.

On the other hand, a questionnaire was designed with the purpose of assessing the trainee-teachers' practice of using ICT tools for English language teaching. Accordingly, a five-point Likert scale measurement (in the form of never, rarely, sometimes, most of the time, and always) was provided for the study participants to let them respond to the items included in the questionnaire. The items were meant to find out the frequency of ICT tools used by the participant teachers for their professional (English language teaching/learning) purposes.

While Cronbach alpha was calculated to see the internal consistency of the questionnaire, test-retest reliability method was applied to check the reliability of the test. Accordingly, the internal consistency analysis of the questionnaire showed that the items of the questionnaire were reliable at above 0.823. Cronbach Alpha was chosen because the Likert Scale ranges from 1 to 5 point scale. Pearson's correlation coefficient result for the test-retest reliability of the test was found to have a significant and strong relationship ($r = 0.844$, $p < 0.001$).

3.4. Experimental Procedures. The first major activities implemented before the training include preparing training materials such as manuals, guidelines, and schedules, arranging training venue, and selecting trainers. Training manuals, guidelines, and schedules were prepared based on the guidelines of UNESCO and Federal Ministry of Education of Ethiopia.

Second, following the official permission obtained from Hawassa University for the training venue and getting access to the research participants at each school, 5 weeks' intensive ICT-supported English language teaching training was conducted between mid-July and the end of the month of August 2020. It was a face-to-face, 6 hours a day for 4 days per week (120 hours) training conducted by English language teachers and ICT professionals focusing on ICT-supported English language teaching. The data for the research were collected in three rounds: pre, while, and post-training. The following picture (Figure 4) was taken during one of the training sessions.

3.5. Methods of Data Analysis. The data for this study were analyzed using SPSS version 22. Accordingly, inferential statistics was carried out with a consideration of the assumptions, features, purposes, and procedures of this statistics [28]. As mentioned, the design of this study is a within-subject repeated measure time series design. This design allows one to conduct repeated measurements on a single-group quasiexperimental group sample at different times of the study.

Thus, as the samples were not selected randomly from the population, the research has required the use of nonparametric statistical tool for the data analysis. Unlike the parametric, the nonparametric techniques do not have that much strict assumptions [6, 31, 32].

Figure 4: Trainee-teachers attending the ICT-assisted ELT training in July 2020 (venue: Main Campus, Hawassa University).

The Friedman test was found appropriate due to its suitability to test the hypotheses of this research. This test is used to test differences between conditions when there are three or more related samples (same subjects) [11]. In other words, the Friedman's test is considered as an ideal statistical test to use for a repeated measures type of experiment like the present study to determine if a particular factor, an independent variable, has an effect on a dependent variable. It is with this understanding that the Friedman test which is a nonparametric test opted to be used for the data analysis in this study. The level of significance was taken at 0.05 (5 percent).

In order to make sure that the data collected can be analyzed through the Friedman's test, the following four assumptions were considered before analyzing the data:

(i) *Assumption #1.* One group is measured on three or more different occasions

(ii) *Assumption #2.* Dependent variable should be measured at the ordinal or continuous level

(iii) *Assumption #3.* Samples do not need to be normally distributed

However, 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 (effect size) was run. The magnitude of the effect size was labeled as follows:

(i) $<0.2 =$ *small* effect

(ii) $0.2 - 0.5 =$ *medium* effect

(iii) $>0.5 =$ *large* effect

3.6. Management of Threats to Validity and Reliability. Fortunately, since all the available English language teachers of the selected schools were included as the participants of the study and all of them were taken as one-group only

quasiexperimental design, some of the validity issues that may be raised regarding sample selection and assignment into groups were avoided. Specifically, the following attempts were made to ensure the validity and reliability of the data collection tools.

In the first place, following the right procedures, availing the required training resources and providing support to the trainees were assured during the training. Accordingly, the data collection tools were adapted and prepared based on the available pertinent literature sources. Most importantly, the data collection tools and training manual were given to experienced EFL instructors to evaluate the validity of the materials using evaluation checklist and provide feedbacks. Moreover, the internal consistency of the tests and questionnaire was checked by using test-retest reliability and Cronbach alpha, respectively.

Besides, the required ICT tools were made available for the purpose of providing the training and collecting the data for this study. In addition, instructors who are experienced in ICT-supported ELT and ICT expertise were assigned to provide the training. Furthermore, fairly enough time was devoted to conduct the training (120 hours) so that the teachers could get sufficient time to be trained in ICT-supported ELT at secondary school contexts of Ethiopia.

3.7. Ethical Considerations. In order to maintain the research ethics, the researchers followed appropriate ethical procedures. A letter of support for data collection was obtained from the Department of English Language and Literature, Hawassa University (HU). Having the letter of request for cooperation from the department, the researchers contacted the schools' principals in person to get access to the English language teachers available to participate in the study. Having understood the purpose, the school principals gave the list of available/volunteer teachers to be contacted. Accordingly, twenty-five (25) English language teachers confirmed their willingness to participate in the study. However, twenty-two of them could appear on the orientation/introduction day of the training. After being informed about the purpose, procedures, requirements, and schedule of the study, these teachers confirmed their willingness to participate in the study and signed on the training participation attendance as consent of their willingness. The researchers clearly informed the purpose, procedures, and requirements of the intervention to let the teachers (participants) have adequate information about what they were going to do during the training. It was assumed that the teachers' being free from their regular school works due to the COVID-19 pandemic and the nature of the research helped the teachers to be motivated to participate in the research. The study participants' anonymity was maintained.

4. Results

This section presents the results of the study. Accordingly, the presentations of the results are made beginning with the test results followed by the results of the questionnaire.

4.1. Effects of Training in ICT-Supported ELT on Secondary School English Language Teachers' Knowledge and Skills of ICT Tools for ELT. As the Friedman test result in the above table (Table 1) shows, the mean for the three rounds: round one (mean rank = 1.15), round two (mean rank = 1.93), and round three (mean rank = 2.93) was obtained for the three rounds of repeated measures on the test conducted on the teachers' knowledge and skills of ICT tools for teaching English. The means demonstrate that the test scores are highest in the third-round measurement followed by the second and first round measurements, respectively. The test analysis result of K-related samples (Friedman) has also the following output which is the most important result of the test.

The Friedman test, which evaluated differences in mean scores among the three rounds of measurements on the knowledge and skills of ICT tools for teaching English test results, is significant, $x^2\,(2, N = 20) = 32.009$, $p < 0.01$ (Table 2). As a result, the null hypothesis (H0) which stated that training in ICT-assisted ELT does not bring a statistically significant effect on the English language teachers' knowledge and skills of ICT tools for teaching English is rejected. Since the test statistics does not show the degree of effect, Kendall's coefficient of concordance was applied by employing Friedman test, and the result is presented below.

As the above table (Table 3) shows, the Kendall's coefficient of concordance of 0.823 was obtained and which shows large effect revealing the training brought large effect on the ICT tools utilization knowledge and skills of the English language teachers as measured over the intervention period in which data were collected in three different rounds.

4.2. Effect of Training in ICT-Assisted ELT on the Teachers' Practices of Using ICT Tools for ELT. The effect of training in ICT-assisted ELT on English language teachers' practice of using ICT tools for teaching English was tested based on the three rounds of repeated measurements of data collected through ICT tools practice questionnaire. Consequently, the following result was found out of the statistical test analysis undertaken.

Table 4 above displays the mean rank for each round: round one (mean rank = 1.68), round two (mean rank = 1.78), and round three (mean rank = 2.55) of the repeated measurements of the questionnaire on English language teachers' practice of using ICT tools for teaching English. The mean scores indicate that the test score is highest in the third-round measurement followed by the second and first round measurements, respectively. In addition to this, the *K*-related sample (Friedman) test analysis result of the questionnaire has provided the following result as presented in Table 5 below.

The Friedman test, which examined differences in mean scores among the three rounds questionnaire results for the teachers' practice of ICT tools for teaching English, is significant, $x^2(2, N = 20) = 63.466$, $p < 0.001$ (Table 5). Hence, the result forces us to reject the null hypothesis (H0) which stated training in ICT-assisted ELT does not bring statistically significant effect on English language teachers' practice of using ICT tools for teaching English. Since a statistically significant effect was obtained, conducting Kendall's coefficient of concordance was needed. Accordingly, it was performed and its result looks like as follows.

When the degree of effect for the teachers' ICT tools practice was analyzed, the Kendall's coefficient of

Table 1: Repeated measures results mean for the test on the EFL teachers' knowledge and skills of ICT tools for ELT.

Measurement	Mean rank
ICT skills round 1	1.15
ICT skills round 2	1.93
ICT skills round 3	2.93

Table 2: Test statistics table for the Friedman test on the knowledge and skills of ICT tools for ELT.

Test statistics	
N	20
Chi-square	32.909
Df	2
Asymp. Sig.	0.000

a. Friedman test.

Table 3: Effect size (Kendall's coefficient of concordance) for the mean scores of the test on the knowledge and skills of ICT tools for teaching English.

Test statistics	
N	20
Kendall's W[a]	0.823
Chi-square	32.909
Df	2
Asymp. Sig.	0.000

a. Kendall's coefficient of concordance.

Table 4: The *K*-related samples (Friedman) test analysis result (mean ranks) for the test on EFL teachers' practice of using ICT tools for teaching English.

Ranks	
Measurements	Mean rank
ICT practice R1	1.68
ICT practice R2	1.78
ICT practice R3	2.55

Table 5: Test statistics table for the Friedman test of the teachers' practice of using ICT tools for ELT.

Test statistics	
N	20
Chi-Square	9.291
Df	2
Asymp. Sig.	0.010

a. Friedman test.

concordance of 0.232 (Table 6) is found and which shows medium effect indicating the ICT-assisted ELT training brought medium effect on the English language teachers' practice of using ICT tools for teaching English as measured from the three rounds of measurements taken at the different stages (pre, in-between, and post) of the intervention.

Table 6: Effect size (Kendall's coefficient of concordance) for the mean scores of the questionnaire on EFL teachers' practice of using ICT tools for teaching English.

Test statistics	
N	20
Kendall's W[a]	.232
Chi-Square	9.291
Df	2
Asymp. Sig.	0.010

a. Kendall's coefficient of concordance.

5. Discussion

The present study attempted to fathom the effects of ICT-assisted English language teaching training on secondary school English language teachers' knowledge, skills, and practices of using ICT tools for teaching English. The statistical analysis of the quantitative data collected through a test and a questionnaire showed that providing the training improved the ICT tools utilization knowledge, skills, and practice of the English language teachers.

The repeated measures further revealed that the English language teachers' preintervention knowledge, skills, and practice of using ICT tools for teaching English was almost limited to the level of none or insignificant. However, the second and third round repeated measurements indicated that their knowledge, skills, and practice of using ICT tools have been improved significantly as compared to the pretest results. This shows that the intervention, training in ICT-assisted English language teaching, has statistically significant effect on the dependent variables (knowledge and skills of ICT tools and practice of using ICT tools for teaching the language). However, the effect size test was found moderate indicating despite the knowledge and skills the teachers obtained from the training, their practice of using the ICT tools in their teaching was not large. There might be various factors for that.

The results of the present research imply that secondary school English language teachers in Ethiopia lack the knowledge and skills of using ICT tools for ELT and almost never practiced teaching English using ICT tools before the intervention as this study revealed.

An experimental study conducted in tertiary education in Thailand demonstrated that technology-enhanced content and language-integrated learning instruction enhanced the TPACK of preservice teachers [33]. This study is in agreement with the present study in that it supports the findings of the present study which found that ICT-supported English language teaching training improves teachers' knowledge and skills of using ICT tools in their teaching of this language.

Bati and Workineh [34] conducted a survey with the aim of examining the level of readiness of Ethiopian secondary education systems in terms of access to technologies and

preparedness in skills and motivation for the integrated use of information communication technologies (ICT) for quality education. Accordingly, the researchers reported the presence of insufficient capacity building training for teachers. This suggests the need for in-service teacher training like the one employed in the present study to see its effects on the teachers' knowledge, skills, and practices of using ICT tools in teaching. Similarly, Moges [35] reported the presence of teachers' limitations in utilizing ICT tools in teaching/learning in Ethiopia. He mentioned several barriers for this and implied the need for teachers' professional development.

A recent study conducted on the secondary school Biology teachers in southern Eritrea revealed more or less similar findings with the present one. That is, Belay et al. [17] investigated teachers' ICT integration skills in their Biology class and reported that majority of the teachers had received inadequate training on using computers for pedagogical purposes. As the researchers added, despite the limited basic computer skills the participant teachers acquire through short-term trainings, majority of them did not receive any formal training on how to integrate ICT in teaching/learning practices. The researchers further noted that there was low integration of ICT in teaching and learning Biology. This is what the present study uncovered about the teachers' skills and practice of using ICT tools for teaching English in secondary schools' context in Ethiopia.

Koehler et al. [12], in his recent research which he conducted in Indonesian EFL context, similarly disclosed that EFL teachers faced difficulties such as a lack of CALL training and accessible technology to facilitate learning and practice of CALL-based EFL instruction. Similarly, after investigating Libyan EFL teachers' attitude toward ICT adoption in the field of English language teaching, Richards [8] argued that it is usually due to lack of the required ICT skills that teachers resisted the use of ICT tools. After conducting a systematic review of research works on the factors affecting ICT integration in Turkish education system, Turgut and Aslan [36] noted teacher factor as one of the factors when considering ICT in education and noted the technological and pedagogical knowledge of teachers as the prominent one among others.

One thing to note here is that providing English language teaching training that is supported by ICTs to English language teachers and letting them practice it in their actual teaching practices may not be sufficient enough by itself when considering ICT in education. This is true because there are other factors that play determinant roles in facilitating or hindering it. Therefore, as Coax [31] noted, beyond the knowledge and skills training and waiting the teachers to practice it, "the most effective way to bring about the adoption of an innovation in schools is to engage the whole school in a democratic process of planning a change" (p. 8). Unfortunately, the present study did not address these factors. Thus, any interested researcher can look into this aspect of the subject.

There are a lot of studies in the area of ICT in education, but very little empirical research has been conducted to examine this phenomenon from the teachers' perceptive [36]. The present study is an empirical and original study in its kind. For one thing, the study demonstrated not only the efficacy of teacher training on English language teaching supported by ICT tools in improving English language teachers' knowledge, skills, and practice of using ICT in their teaching but also how and in what kinds of situations it could be realized.

Therefore, the findings of the study would provide invaluable insights into the research literature in ICT-supported teaching training. It would also influence policy makers and practitioners in the field of English language education in a foreign or second language context to see the options and effects of ICT in teacher training. Using training as a tool of instruction to prepare teachers in an effort to introduce ICT in education is a lesson that can be drawn from the findings of the present study. Moreover, the use of repeated measurement to measure ICT in teaching-related knowledge, skills, and practice of teachers in a school context is another takeaway one would consider as a research design in a small-scale study like the present one. In addition, as it is noted in the present study, English language teachers, school leaders, and government bodies are expected to recognize the fact that access to ICT tools and technical support as well as possible collaboration among teachers themselves and teachers and teacher educators along with university school partnership is more feasible and effective if wisely planned and implemented.

6. Conclusions and Recommendations

The role of ICT in education has been widely recommended by so many scholars around the world. Scholars suggest using ICT tools for teaching/learning emphasizing their role in improving teaching and learning. However, many of the empirical studies conducted so far did not tell specifically how this recommendation could be realized in practice. This is true because there are complex issues that facilitate or hinder the use of ICT tools for teaching and learning purposes. Teachers' knowledge, skills, and commitment to use the technology in their pedagogical practice have been noted by recent research works.

The present study has tried to find out whether or not training in ICT-assisted English language teaching could improve secondary schools English language teachers' knowledge and skills of ICT tools for teaching English and their practice of using ICT tools for teaching this language. The results of the statistical analysis of data collected through tests and questionnaires showed statistically significant effects of ICT-assisted ELT training on secondary school English language teachers' knowledge and skills of ICT tools for ELT and their practice of ICT tools for teaching English; however, the effect on their practice of using the ICT tools was not strong. This implies that teachers' commitment or attempt to actually practice the ICT tools in their teaching is limited, if not to a great extent, due to a certain factor which is not addressed in the present study.

The findings of earlier researchers such as Mirzajani et al. [30] reported the necessity of teachers' ICT skills and knowledge as well as adequate ICT resources as important

factors that influenced the utilization of ICT in teaching/learning.

As Judson [15] noted, since there is less research on how frequently and in what manner technologies are being used in foreign language teaching, the present study sheds some light on the practice of ICT tools by the teachers. Thus, the findings of the present study, in this regard, could never be underestimated.

Thus, based on the findings of the present study which is consistent with many of the earlier studies, it has been noted that if a context specific and systematically designed and sufficient ICT-assisted English language teaching training is given to in-service English language teachers, both the teachers' knowledge and skills of ICT tools for teaching English and their practice of the ICT tools for ELT would be improved. Realizing this effort is the first step in the process of integrating ICT into school curricula.

Data Availability

A set of experimental data are available from the principal investigator of this project, and it will be shared whenever requested.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgments

The authors of this research recognize Arba Minch University for funding the research work. In addition, the authors would like to acknowledge the study participants.

References

[1] S. Torsani, *CALL Teacher Education: Language Teachers and Technology Integration*, Sense Publisher, Rotterdam, The Netherlands, 2016.

[2] UNESCO, *Mobile Learning for Teachers in Africa and the Middle East: Exploring the Potential of Mobile Technologies to Support Teachers and Improve Practice. Teachers Focus*, UNESCO, Paris, 2012.

[3] A. Field, *Discovering Statistics Using IBM SPSS Statistics*, Sage, 2013.

[4] A. Berhanu, "The plasma-based instruction in Ethiopia: utopia or dystopia?," *Educational Research and Reviews*, vol. 8, no. 24, pp. 2325–2338, 2013.

[5] J. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approach*, Sage Publications, Thousand Oaks, CA, 3rd ed. edition, 2009.

[6] FDRE Ministry of Education, *Ethiopian Education Development Road Map (2018-30)*, FDRE Ministry of Education, Addis Ababa, 2018.

[7] FDRE Ministry of Education, *Education Sector Development Program V (ESDP V): 2008 - 2012 E.C. 2015/16 - 2019/20 G. C*, FDRE Ministry of Education, Addis Ababa, Ethiopia, 2015.

[8] J. Richards, "Teaching English through English: proficiency, pedagogy and performance," *RELC Journal*, vol. 48, no. 1, pp. 7–30, 2017.

[9] P. Mishra and M. J. Koehler, "Technological pedagogical content knowledge: a framework for teacher knowledge," *Teachers College Record*, vol. 108, no. 6, pp. 1017–1054, 2006.

[10] A. Gilakjani, "Factors contributing to teachers' use of computer technology in the classroom," *Universal Journal of Educational Research*, vol. 1, no. 3, pp. 262–267, 2013.

[11] A. Buabeng, "An exploration of teachers' skills, perceptions and practices of ICT in teaching and learning in the Ghanaian second-cycle schools," *Contemporary Educational Technology*, vol. 3, no. 1, pp. 36–49, 2012.

[12] M. Koehler, P. Mishra, M. Akcaoglu, and J. M. Rosenberg, *The Technological Pedagogical Content Knowledge Framework for Teachers and Teacher Educators*, Commonwealth Educational Media Center for Asia (CEMCA), 2013.

[13] UNESCO, *UNESCO ICT Competency Framework for Teachers' Version 3*, UNESCO, France, 2018.

[14] TESOL, *TESOL Technology Standards*, TESOL, USA, 2008.

[15] E. Judson, "How teachers integrate technology and their beliefs about learning: is there a connection?," *Journal Information Technology and Teacher Education*, vol. 14, no. 3, pp. 581–597, 2006.

[16] J. Lawrence, A. Usman, and U. Tar, "Factors that influence teachers' adoption and integration of ICT in teaching/learning process," *Educational Media International*, vol. 55, no. 1, pp. 79–105, 2018.

[17] M. Belay, D. Khatete, and D. Mugo, "Teachers' skills for ICT integration in teaching and learning biology in secondary schools in the southern region, Eritrea," *African Journal of Education And Practice*, vol. 6, no. 2, pp. 44–61, 2020.

[18] P. Hubbard and M. Levy, *Teacher Education in CALL*, John Benjamins Publishing, Amsterdam: Philadelphia, 2006.

[19] M. Polat, "*CALL in context:* a brief historical and theoretical perspective," *Issues and Trends in Educational Technology*, vol. 5, no. 1, pp. 17–23, 2017.

[20] A. Bandura, "Social cognitive theory," in *Annals of Child Development*, R. Vasta, Ed., vol. 6, JAI Press, Greenwich, CT, 1989.

[21] D. Compeau and A. Higgins, "Application of social cognitive theory to training for computer skills," *Information Systems Research*, vol. 6, no. 2, pp. 118–143, 1995.

[22] L. Cohen, L. Manion, and K. Morrison, *Research Methods in Education*, Routledge, USA, 6th Edition edition, 2007.

[23] D. Compeau, A. Higgins, and S. Huff, "Social cognitive theory and individual reactions to computing technology: a longitudinal study," *MIS Quarterly*, vol. 23, no. 2, pp. 145–158, 1999.

[24] G. Allayer, *Developing Pre-Service Teacher Competencies for ICT Integration through Design Teams, [Ph.D. thesis]*, University of Twente, Enschede, 2012.

[25] N. Salem and B. Mohammad-zadeh, "A study on the integration of ICT by EFL teachers in Libya," *EURASIA Journal of Mathematics, Science and Technology Education*, vol. 14, no. 7, pp. 2787–2801, 2018.

[26] P. Hubbard and M. Levy, *Theory in Computer-Assisted Language Learning Research and Practice from: The Routledge Handbook of Language Learning and Technology*, Routledge, 2016.

[27] M. Koehler, P. Mishra, E. C. Bouck et al., "Deep-play: developing TPACK for 21st century teachers," *International Journal of Learning Technology*, vol. 6, no. 2, pp. 146–163, 2011.

[28] D. Ary, L. C. Jacobs, C. Sorensen, and D. Walker, *Introduction to Research in Education. Cengage Learning*, Wadsworth, Cengage Learning, 8th ed. edition, 2006.

[29] FDRE, *Education and Training Policy*, Addis Ababa: Transitional Government of [2], Ethiopia, 1994.

[30] H. Mirzajani, R. Mahmud, A. Fauzi, M. Ayub, and S. Wong, "Teachers' acceptance of ICT and its integration in the classroom," *Quality Assurance in Education*, vol. 24, no. 1, pp. 26–40, 2016.

[31] K. Bordens and B. Abbott, *Research Design and Methods: A Process Approach*, McGraw-Hill, New York, 2011.

[32] J. Larson-Hall, *A Guide to Doing Statistics in Second Language Research Using SPSS*, Tylor and Francis, 2010.

[33] S. Adipat, "Developing technological pedagogical content knowledge (TPACK) through technology-enhanced content and language-integrated learning (T-CLIL) instruction," *Education and Information Technologies*, vol. 26, no. 5, pp. 6461–6477, 2021.

[34] T. B. Bati and A. W. Workineh, "Evaluating integrated use of information technologies in secondary schools of Ethiopia using design-reality gap analysis: a school-level study," *The Electronic Journal of Information Systems in Developing Countries*, vol. 87, no. 1, article e12148, 2021.

[35] Y. Moges, *Digitalization in Teaching and Education in Ethiopia*, Digitalization, the Future of Work, 2021.

[36] Y. Turgut and A. Aslan, "Factors affecting ICT integration in TURKISH education: a systematic review," *Education and Information Technologies*, vol. 26, no. 4, pp. 4069–4092, 2021.