

ARTICLE

Mobile Learning Effect through Tablet-Assisted Language Learning on Student Success in EFL Writing

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ABSTRACT

The purpose of this study is to explore the effect of mobile learning on writing achievement using tablet PCs. It used a pretest-posttest control group design to assess the effect at a private university in Türkiye. The study involved 55 students and two instructors who volunteered to participate. A 16-week tablet-assisted language learning (TALL) material was used for the treatment group while the control group was instructed in a regular way of using a coursebook pack and a notebook. A validated writing achievement test was used to collect data. To reveal a potential difference between the pretest and posttest results of the groups, a non-parametric equivalent to the t-test for dependent samples, Wilcoxon Signed-Ranks test was employed. To reveal a potential difference between posttest results of the groups, a non-parametric equivalent to the t-test for independent samples, Mann-Whitney U test was employed. In addition, some descriptive statistics were calculated to support the results. The findings revealed that TALL made a significant change in students' achievement scores in EFL writing; however, the treatment group scores were not statistically and significantly higher than the control group scores based on comparison of both groups' posttest scores. The findings show that TALL can impact educational practices by replacing traditional classroom practice if need be.

Keywords: Mobile Learning; Tablet PCs; EFL; Writing; Achievement; Higher Education

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1. Introduction

As mobile devices become more affordable overtime, device ownership has been growing for the last two decades ^[1]. Educational institutions have been increasingly eager to integrate mobile technologies into their teaching practices, a trend that has spiked further during Covid pandemic ^[2]. While some institutions adopted this trend by providing their students with mobile devices, others opted for BYOD (bring your own device), described as “explicitly implementing a policy of relying on student-owned technology, and providing the necessary support, infrastructure and evaluation to measure its efficacy” ^[3]. The most effective ones of these mobile devices are laptops, tablets and smartphones, but particularly tablets and tablet-assisted learning because tablets are not only portable and more accessible, but also provide more practicality in learning as they can provide eBooks, endless e-practice, and communication tools without a limit of location and with more space to make notes and read more comfortably.

As mobile technologies continue to evolve at a fast pace, mobile learning attracts the attention of researchers who are tracking the trends in educational technology in an effort to identify benefits provided and challenges posed by the use of mobile technologies in education. Researchers pay specific attention to aspects like increased time and effort in management; improved academic success; increased access to digital resources; transforming the quality of teaching; increase in independent study, motivation, and participation; and providing more effective and efficient learning; and differences in student success level ^[4-14]. As evidenced by a considerable number of research topics, mobile learning in higher education remains a growing field of research, and mobile learning tools and applications have been indicated to be effective improving the learning experience of students ^[15,16].

1.1. Mobile learning and TALL

Mobile learning can be defined as e-learning through and with the support or delivery by using mobile technologies such as portable application tools ^[17,18]. It is basically

the use of mobile phones, tablets, and laptops to learn. The emergence of the use of mobile technologies has been considerably bringing out new ways of teaching and learning. As new ways come out, mobile technologies’ potential positive impact on teaching and learning has been in the center of attention ^[18-21].

Considering research at different levels of education, the tendency to adapt mobile technologies can be seen without any hassle. The numerous uses and direct impacts on student learning are seen as more learner-centered with teaching practices and outcomes following a constructivist approach ^[22-24].

The primary interest of researchers has mostly been on the aspects that mobile learning has been providing such as flexibility, engagement, accessibility, motivation, and interactivity ^[25]. Mobile devices such as mobile phones and tablets provide flexible learning anytime and anywhere, in and out of the classroom ^[26,27]. They have become part of the daily routine of students because of their practical, portable, affordable, and interactive characteristics of usability. This paved the way to an encouraging demand for tablet use in educational environments that has grown pretty fast, more so in the pandemic ^[2]. Tablet-assisted teaching and learning plays an active role as tablets are more than a mobile phone and a notebook computer in a variety of ways. They combine the flexible use of a standard notebook computer with a stylus and a keyboard, and they allow easy input by typing, writing, noting, or drawing on the screen ^[28] with a wider screen than a mobile phone as studies report a meaningful screen size effect on efficiency and effectiveness ^[29]. Reference ^[28] also states that an easy and flexible environment can be provided in teaching and learning process by the ability to use tablets in different modes such as notebook computer and/or tablet, to carry and move around in the classroom in groups or individually, and to use with a long battery life that can enable students work for the entire class day. This might lead to a larger amount of research on this matter ^[30].

The multimedia capabilities of the tablets also allow students to access materials of multimedia, and they motivate students to learn and improve learning with different levels of processing ^[31]. They facilitate equal opportunity as distance is not an issue for the learner. They are small

enough to be portable, and they allow learners to interact with other students or instructors anywhere and anytime to exchange information, complete a task, or work in a collaborative way synchronously or asynchronously on a project.

Another study utilized a quasi-experimental approach to assess how the use of tablets has an influence on children's learning in classrooms. Information was gathered from classrooms that used and did not use tablets for learning^[32]. The results collected from 255 students indicated that children who used tablets demonstrated improved learning outcomes.

Another study focused on performance of college students in grammar using an experimental design. They also compared proficiency outcomes and reported no significant difference in students' performances at the end of the process. However, they stated a motivational impact of tablet use as tablets increased student engagement in language learning studies, made classes more interactive, and gave more possibilities to the instructors for using a variety of learning tools for studying in and out of the classroom^[33].

In one-to-one programs, positive effects on student writing have been observed because of the frequent use of computers. A study, for 8th grade science students in nine schools of an experimental laptop program revealed a positive effect size on a large-scale test when 214 schools were assigned as the control group^[34].

Researchers similarly studied the engagement of students with mobile devices and found the motivational impact and interactivity tablets brought up in classroom activities^[35-38].

Research studies show that mobile learning offers flexibility and engagement with learning by its practicality and accessibility for educational tools and content. The studies also suggest that it can improve motivation, interaction, and learning outcomes. Still, some studies report it does not make a significant change in students' behaviour although it can replace traditional methods^[33,35]. A closer look at the existing research supports the idea of flexible, interactive, motivating, and engaging aspects of mobile learning use; however, its impact on performance remains under researched.

1.2. Mobile Learning and Writing Instruction

EFL writing instruction in digital environments and mobile learning has become an increasing trend with the developments mentioned. Technology-related topics, use of blogs and writing software, online writing courses at institutional level, or massive open online courses, classroom-based, school-based, and large-scale tests, AI-powered digital writing assistants are now used for improving writing quality and achievement in writing.

Additionally, with these aspects of mobile learning, the nature of literacy, reading and writing, has also been evolving. Students are usually expected to deal with information online in the learning process. Considering the enormous input provided by Internet and the teaching and learning environments such as schools and universities, students should be able to access and process information online, use a variety of resources of media, organize their ideas, and communicate through receiving and sending messages, composing information, and establishing information exchange with their teachers and/or instructors^[39]. These abilities have become an indicator of literacy and created a tendency to read and write in digital environments, changing the way that the students at all levels of education communicate and process information for learning and taking part in social life in today's world.

In a tablet PC study, held in a higher education setting, researchers studied student assessment outcomes using an experimental design. They compared classroom assessment scores for students studying with tablet PCs to the scores of students studying without a tablet PC in five different courses, which are Algebra, Composition, Information Systems, US History, and World Civilization. Among the courses, Algebra was the only one to show a significant difference in favor of tablet PC use^[40]. In another study, positive effects were observed when the effects of mobile computing on state achievement test scores in writing were examined^[41].

In a Canadian study, researchers investigated the impact of digital writing tools on college students' quality of writing in English as a foreign language (EFL)^[42]. They found that these tools could improve writing skills, but not significantly improve the quality of writing. The study also

highlighted the importance of classroom instruction where teachers can directly guide students on writing strategies.

An interventionist literature review also stated that digital writing assistants can boost English language proficiency in vocabulary growth, input, and writing, but only if they're part of a well-designed learning program ^[43]. Still, existing studies haven't explored whether these improvements last in the long term.

In another study involving 80 EFL students, they found that the students who were comfortable using digital writing assistants showed greater improvement in their written English compared to students who weren't familiar with the tools' features ^[44].

A large survey involving approximately 2500 teachers studied the impact of digital writing tools on student texts. The teachers found that modern digital writing tools like Google Docs, with all their bells and whistles, can have a positive impact on student writing ^[45].

Another study investigated the impact of using an AI writing tool called Wordtune ^[46]. Experimental group students who used Wordtune consistently scored higher on writing tests compared to the ones in the control group who didn't. The study also found qualitative improvements in the experimental group's writing. They used a wider range of vocabulary growing lexical resourcefulness and constructed sentences with more variety in sentence structure after using Wordtune regularly. Notably, these improvements showed no inconsistency for different genders, and all participants improved in vocabulary and sentence structure on tests and in their writing samples.

Language learning has been experiencing the same shift, and institutions of higher education have been intensely using mobile learning for all kinds of activities, mostly in language teaching and learning. Still, a need for experimental studies to reveal the effects of mobile learning on student success exists, especially in language learning and writing.

In this sense, the current study investigates the effect of tablet-assisted language learning (TALL) in development of writing skill. TALL here refers to the use of educational tablets facilitating language learning with tools and materials such as Internet access, a keyboard, a stylus, a word processor, an English-English dictionary, a note

pad, a search engine, a learning management system, and the publisher's e-book package providing the coursebook, workbook, and synchronous and asynchronous supplementary activities.

The main purpose of the study at this point is to reveal the potential significance of TALL in writing achievement in college EFL classes using a true experimental design employing an experimental group, from now on EG, and a control group, from now on CG. For this reason, the study asks the following research questions:

Does TALL influence student success in EFL writing?

Do EG students' writing scores in the pre- and posttests differ significantly?

Do CG students' writing scores in the pre-and posttest differ significantly?

Do the posttest writing scores of EG and CG differ significantly?

2. Materials and Methods

2.1. Research Design

A true experimental design was employed for the study. Two groups of study were assigned from a subject pool randomly. One of these groups was randomly assigned as control group (CG), and the other group was also randomly assigned as experimental group (EG) ^[47,48]. The design is presented in **Table 1** below:

Table 1. Pretest-Posttest Control Group Design.

Groups	Pretest	Intervention (16 Weeks)	Posttest
Experimental Group	Writing Achievement Test	TALL	Writing Achievement Test
Control Group		Regular classroom practice	

Table 1 above shows EG used educational tablets as the main course material for daily practice and CG were not exposed to TALL or mobile learning in daily classroom practice for 16 weeks within the same course content and calendar.

2.2. Participants

A selected sample of students and two voluntary

instructors in an English Foundation program at a foundation university in Türkiye participated in the study. A convenience sampling method was employed to select the participants considering both the students' and the instructors' convenient accessibility and ease to reach^[49]. The students' English levels in writing subtest of the entrance test were also taken into consideration in the selection process. Later, the pretest and posttest results were collected from the participants of 55 students; 28 of them were in EG, and 27 of them were in CG. Although the number of participants is limited to two EFL classes because of the convenience of the procedure, the sample size is appropriate for nonparametric tests. This can still be taken as a potential limitation of this study.

The participants of the experiment are given in **Table 2** below.

Table 2. Participants in each group.

Groups	Experimental Group	Control Group	Total
Pretest	28	27	55
Posttest	28	27	55

Pretest results of the students were examined to establish the equality of the groups prior to the process. The writing achievement scores did not yield any significant difference between the groups ($Z = -1.307$, $p = .167 > .05$). This result gives evidence of the equality of the groups.

2.3. Procedure

Starting at an A2 level (on the Common European Framework Reference-CEFR scale), the students work towards becoming comfortable using English independently for writing tasks. By the end of the program, they should be at a B2 level in writing skills. The CEFR objectives are in the following^[50]:

Independent user ... can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

At B2 level achievement standard in writing, students, considering the objectives above, write for a wide range of purposes demonstrating an understanding and developing knowledge with the use of specific vocabulary,

structures, and features within a 16-week course calendar in the scope of this study.

EG used educational tablets as the leading material and tool in the teaching and learning process. The control group, on the other hand, followed the same course content and calendar without the educational tablet practice. Through collaboration with the instructors, the researchers, and the IT department, each tablet was provided by the management and preloaded with specific programs and applications. Each tablet had the same tools and materials such as a learning management system, Internet access, a keyboard, a stylus, a word processor, a note pad, an English-English dictionary, a search engine, and the publisher's e-book package providing the coursebook, workbook, supplementary activities. Students were provided with services such as the course syllabus, the course calendar, an emailing platform, a forum, and instant messaging in the learning management system. It also came with a functional course page for the instructor to build quizzes, supplementary materials, and labels for announcements beside the tools of synchronous and asynchronous communication such as email, instant messaging, and chatting/ foruming to contact the students individually or in groups. Based on the course calendar and the content, the instructors facilitated necessary teaching content and material they are supposed to cover using tablets and applications and tools provided with the tablets.

In the meantime, as the EG students were required to use tablets in the process, they enjoyed the freedom to learn on their own terms. They could access all course materials (syllabus, calendar, course slides, assignments, and homework) anytime, anywhere thanks to their tablets. This "anytime, anywhere" learning (as described by Geddes, 2004) was further enhanced by constant communication options^[51]. Students could receive feedback from teachers and peers through email, forums, and instant messaging, regardless of location or time.

Unlike EG students, CG students received hard copies of the course book and workbook, and they were expected to take notes by hand. While they had access to a learning management system (LMS) on their computers outside of class, they couldn't use it during class time. This LMS offered the syllabus, calendar, email, forums,

instant messaging, quizzes, assignments, additional materials, and communication tools. They were able to use their own computers outside the classroom or the library computers during certain times to access the learning management system.

The EG instructor used the provided tablet for all aspects of teaching. This included presenting lessons, conducting activities, creating quizzes and assignments, communicating with students, grading work, providing feedback, and making announcements while the CG instructor relied on traditional methods, utilizing physical course materials like textbooks, workbooks, and worksheets in class.

The teaching and learning process is given in **Table 3** below:

Table 3. The Teaching and Learning (TL) Process.

Groups	Pretest	Intervention (16 Weeks)	Posttest
Experimental	Writing Achievement Test	TALL Regular class- room practice	Writing Achievement Test
Control			

2.4. Data Collection

A writing achievement test, validated by the foundation program's testing committee and two language teaching and testing experts, was employed for the pretest-posttest design. These experts examined the objectives, the test, and the instruction and the language used in the test. After validation with expert judgments, the test included an essay question in 140–190 words. The question required a written response in the form of an opinion essay. The students are required to demonstrate their understanding of the topic, critical thinking skills, and ability to construct a well-organized and coherent essay giving their opinions with reasons. The students were given two keywords and asked to add of their own for the third one. They were also asked to give reasons for their opinion. The instructors used Cambridge English writing assessment scale ^[52], and they assessed the essays in terms of content, communicative achievement, organization, and language use. The band descriptors are detailed in **Table 4** below:

Table 4. Band descriptors of the writing test.

B2	Content	Communicative Achievement	Organization	Language
5	All content is relevant to the task. Target reader is fully informed.	Uses the conventions of the communicative task effectively to hold the target reader's attention and communicate straightforward and complex ideas, as appropriate.	Text is well organised and coherent, using a variety of cohesive devices and organisational patterns to generally good effect.	Uses a range of vocabulary, including less common lexis, appropriately. Uses a range of simple and complex grammatical forms with control and flexibility. Occasional errors may be present but do not impede communication.
4	Performance shares features of Bands 3 and 5.			
3	Minor irrelevances and/or omissions may be present. Target reader is on the whole informed.	Uses the conventions of the communicative task to hold the target reader's attention and communicate straightforward ideas.	Text is generally well organised and coherent, using a variety of linking words and cohesive devices.	Uses a range of everyday vocabulary appropriately, with occasional inappropriate use of less common lexis. Uses a range of simple and some complex grammatical forms with a good degree of control. Errors do not impede communication.
2	Performance shares features of Bands 1 and 3.			
1	Irrelevances and misinterpretation of task may be present. Target reader is minimally informed.	Uses the conventions of the communicative task in generally appropriate ways to communicate straightforward ideas.	Text is connected and coherent, using basic linking words and a limited number of cohesive devices.	Uses everyday vocabulary generally appropriately, while occasionally overusing certain lexis. Uses simple grammatical forms with a good degree of control. While errors are noticeable, meaning can still be determined.
0	Content is totally irrelevant. Target reader is not informed.	Performance below Band 1.		

For ensuring validation and rater reliability of scoring, the instructors took a workshop session on scoring using the scale and did blind marking on the same samples from the students' work (3 from each section, 6 in total) before they scored the essays. There was a slight difference (99% agreement) in the bands and total scores they assigned for the sample essays.

2.5. Data Analysis

To examine a potential difference between the pretest-posttest results of EG and CG individually, a Wilcoxon Signed-Ranks test, the non-parametric analogue of the t-test for dependent samples, was employed considering the limited number of participants. To reveal a potential difference between posttest results of the EG and CG, a Mann-Whitney U test, the non-parametric analogue of the t-test for independent samples, was employed. Besides, some descriptive statistics were computed to support the analyses results. The analyses were made with the use of SPSS.

3. Results

The results are presented in this section focusing on some descriptive statistics and a potential difference in pretest-posttest scores of EG and CG students as individual groups. Next, posttest scores of both groups are examined to find out a potential effect of TALL in students' performance in EFL writing compared to regular classroom practice.

The Effect of TALL on Student Success in EFL Writing

To examine the effect of TALL on student success in EFL writing during the process, EG and CG students' pre-post test results were studied in the first place. Later, EG and CG students post test results are examined. The posttest results of the groups are compared to see the potential difference that TALL made compared to regular classroom practice.

First, the descriptive statistics for EG are given in **Table 5** below.

Table 5. EG Descriptive Statistics.

	N	Mean	SD	Min	Max	Median
EG pre	28	11.800	2.044	8.400	15.200	12.000
EG post	28	15.684	2.963	10.750	18.500	15.700

The group has 28 students. The mean score is 11.8 for pretest results and 15.684 for posttest results. The standard deviation is 2.044 for pretest results and 2.963 for posttest results. The standard deviation for the posttest results (2.963) and the pretest results (2.044) suggests that the scores were more heterogenous among the students' posttest scores than their pretest scores. The minimum score in the pretest results is 8.40 while it is 10.75 in the posttest results. The maximum score is 15.5 in the pretest results, and it is 18.5 in the posttest results. Median is 12.0 in the pretest results and 15.7 in the posttest results. A Wilcoxon Signed-Ranks test for dependent groups gives the results to see if the difference is significant statistically as in **Table 6** below.

Table 6. Results for EG pretest and posttest scores.

	N	Mean Rank	Sum of Ranks
Negative Ranks	0	0.00	0.00
Posttest – Positive Ranks	28b	14.50	406.00
Pretest Ties	0		
Total	28		

a Posttest < Pretest

b Posttest > Pretest

c Posttest = Pretest

The ranks table presents the comparison of EG pretest-posttest scores. The legend indicates EG students clearly had higher scores at the end of the process. To examine, **Table 7** presents the test statistics.

Table 7. EG test statistics (b).

	Posttest – Pretest
Z	-4.623
Asymp. Sig. (2-tailed)	0.000

a Based on negative ranks.

b Wilcoxon Signed Ranks Test

The table shows that TALL made a change in students' achievement scores in EFL writing, and a Wilcoxon signed-rank test indicates a 16-week TALL process revealed a statistically significant change in EG's achievement scores ($Z=-4.623$, $p=0.000$). Moreover, the control

group (CG) results are given in **Table 8** below.

Table 8. CG Descriptive Statistics.

	N	Mean	SD	Min	Max	Median
CG pre	27	12.474	2.224	7.200	16.000	12.400
CG post	27	15.000	2.841	10.500	20.000	14.600

As seen in the table, there are 27 students in the group. The mean score is almost 12.5 for pretest results, and it is 15.000 for posttest results. There is an increase in the mean score, and the standard deviation for the posttest results (2.841) and the pretest results (2.224) suggests a slight heterogeneity among the students' posttest scores than their pretest scores as it is slightly higher. The minimum score in the pretest results is 7.20 while it is 10.50 in the posttest results. The maximum score is 16 in the pretest results, and it is 20 in the posttest results. Median is 12.4 in the pretest results and 14.6 in the posttest results. To see if the difference is significant statistically, a Wilcoxon Signed-Ranks test for dependent groups gives the results in **Table 9** below.

Table 9. Results for CG pretest and posttest scores.

	N	Mean Rank	Sum of Ranks
Negative Ranks	0a	.00	.00
Posttest – Positive Ranks	27b	14.00	378.00
Pretest Ties	0c		
Total	27		

a Posttest < Pretest

b Posttest > Pretest

c Posttest = Pretest

The ranks table presents the comparison of CG pretest and posttest scores. The legend indicates CG students had a higher score at the end of the process. The test statistics of the group are given in **Table 10** below.

Table 10. CG test statistics (b).

	Posttest – Pretest
Z	-4.542a
Asymp. Sig. (2-tailed)	0.000

a Based on negative ranks.

b Wilcoxon Signed Ranks Test

The table shows that regular classroom practice paved the way to a change in students' achievement scores in EFL writing, and a Wilcoxon signed-rank test indicates

a 16-week process with regular classroom practice elicited a significant change in CG's achievement scores statistically ($Z=-4.542$, $p=.000$).

The results of the Mann Whitney U test analysis are presented in **Table 11** in the following.

Table 11. Posttest results for EG and CG.

	N	Mean Rank	Sum of Ranks
Posttest TALL	28	31.41	879.50
EG– Regular Practice	27	24.46	660.50
Posttest CG. Total	55		

The ranks table provides evidence for the comparison of EG and CG students' EFL writing achievement scores. It shows that EG students have higher scores at the end of the process. The final posttest statistics can be seen in **Table 12** below.

Table 12. Posttest statistics (a).

	Posttest
Mann Whitney U	282.500
Wilcoxon Z	660.500
	-1.610
Asymp. Sig. (2-tailed)	0.107
a Grouping variable	

The final posttest statistics in the table shows that EG scores are not statistically and significantly higher than the CG scores ($U=282.500$, $p=0.107$).

4. Discussion

The study looked at the effect of tablet-assisted language learning using a true experimental design. It is limited to TALL and EFL writing achievement in a 16-week semester of a foundation program, and some interesting results were reached out when the data were analyzed.

First, EG students' pre-post test results were studied to examine the effect of TALL on student success in EFL writing during the process. The descriptive statistics computed at this phase of the study gave evidence of an increase in the mean score, but with a higher deviation than the pretest scores. This might mean that the scores were more heterogeneous at the end of the process although

they were higher than the pretest scores. The results also indicated a significant difference with the use of TALL in the process statistically. This was evidenced by a Wilcoxon signed-rank test ($Z = -4.623$, $p = 0.000$). The positive results suggest that TALL interventions can be effective for enhancing writing skills, even when all coursework is conducted using tablets. This might lead the way to the use of TALL even when the teaching and learning process require particular conditions like in a pandemic or so.

Next, CG students' pre-post test results were studied to examine the effect of TALL on student success in EFL writing during the process. The descriptive statistics computed at this phase of the study also gave evidence of an increase in the mean score, but again with a higher deviation than the pretest scores. The mean scores this time were a bit lower than the mean score of EG, but there is still a similar progress. Additionally, the maximum score this time is the top score of the test (20/20). The results, in the meantime, elicited a significant change with the use of regular class material in the process. This was statistically confirmed by a Wilcoxon signed-rank test ($Z = -4.542$, $p = 0.000$). These findings suggest that using regular course materials is also effective in enhancing writing skills. This result gave evidence that regular class practice with regular class material such as hard copies of the course book, workbook, and notebook in EFL writing classes can and do reveal positive outcomes as well. Progress can also be expected even if all the classwork is done without TALL. This might mean that both processes worked well and made a positive change in students' performance in EFL writing class.

At this point, the posttest scores of both groups were examined to see if there is a significant difference between the posttest scores in favor of one of the groups. The final posttest statistics gave evidence that a Mann Whitney U test did not reveal a significant difference between the scores of both groups although EG mean ranks and the sum of ranks were higher than the CG mean and sum of ranks ($U=282.500$, $p=0.107$). This result provides evidence and suggests that TALL contributes to EFL writing achievement and satisfactory outcomes just like regular class practice with regular class material, but it does not improve the outcomes significantly. There was no sta-

tistically significant difference between the scores when they are examined although TALL use was able to lead to slightly higher scores after the teaching and learning process.

At primary and secondary school levels, research findings showed that using tablets boosted online communication skills of students, enhanced the support for learning among others ^[53], enhanced social interactions ^[54,55], and expanded their overall awareness and audience perception ^[56]. Additionally, the studies indicated that students' ability to perceive compositions and create new meanings improved with multimodal composition instruction ^[57,58], leading to changes in traditional writing processes and writing knowledge ^[40,59,60].

Some other studies report that mobile learning has a positive effect on students' performance ^[20,61-64]. Mobile learning here refers to the use of smart phones, computers, and some applications, but not tablets. Some prior research also supports these results. Consistent with some previous research on TALL use and students' achievement, it seems tablet use does not make a significant effect specifically on EFL students' writing achievement either ^[65-70], when compared to traditional methods.

The results of this study may have occurred because of some reasons. One of the reasons might be the integration of tablets into an ongoing system. Although tablet use might have been considered to make a significant effect, it may not have significantly enhanced learning because of some uncontrollable factors such as passive consumption of content or misuse of digital material by the instructors or students. Instructors might have needed more training to effectively utilize tablets as instructional tools. Besides, the students might have lacked basic digital literacy skill, so they might not have been able to utilize the potential of tablets completely. Also, technical issues might have hindered the learning experience such as battery or Internet connectivity issues. These factors might be taken into consideration by the institutions.

This might mean that more research on tablet-assisted learning, especially on performance assessment in language learning and higher education, is needed at this point. It can be considered interesting that students do welcome innovative approaches, especially those ones

that involve technology. Some research show that students demonstrate a positive attitude on the usefulness of tablets, and they accept it quickly as it creates and improves a positive environment, motivation, autonomy, and independence, but this does not mean that there will be an increase in their performance in time^[28]. From a pedagogical perspective, TALL may require a special curriculum developed based on the objectives and the needs of the students. At this point, it remains as an effective tool that can replace traditional methods. Here, considering the variety of results in this study and other research, apparently, the need continues for a scrutinized look at the implementation of mobile learning and tablet use. Like this study, empirical and experimental studies with specific variables and larger groups of learners under specific conditions, possibly in a larger time frame, should be implemented in a well-planned manner and grown in number.

Even though, when compared to regular class practice, the analyses did not elicit significant results in favor of TALL statistically, they did not elicit statistically significant results in favor of regular classroom practice, either. In brief, considering the results here, the idea of using TALL in EFL writing classes might be considered as an alternative for potential extraordinary circumstances or some other conditions the institutions see necessary.

5. Conclusions

TALL can offer new ways and methods in the language classroom. It helps instructors and students in different ways. Students can use a variety of online resources in no time and place, do research, and communicate instantly whenever and wherever possible. For more practical use in language learning, online applications can provide valuable number of interactive exercises, quizzes, worksheets, and games to reinforce not only writing but also different language skills such as reading, listening, and speaking. Students can also experience real time interactions with their peers and instructors. They can collaborate on projects, share documents and presentations, and facilitate discussions.

Additionally, instructors can deliver a high number of materials easily and fast, synchronously and/or asyn-

chronously. Still, TALL can create distraction, too. Using TALL in the classroom should be carefully and elaborately planned. Technical specifications, operating systems, bandwidth, multitasking, battery life, technical support, carbon emission despite no paperwork, and some other technicalities should be studied and wisely selected.

Instructors' readiness and awareness are also important factors in such a process. Their core beliefs about teaching and learning make an impact on their teaching approach and practices with additional factors such as engaging students and managing classrooms^[71-75]. The TALL approach should lead teachers to believe TALL practice is useful and effective.

Institutions also can provide multi-media content such as videos, ebooks, and/or textbooks and virtual classrooms for real-time interactions and collaborative learning in a synchronous or asynchronous way. In this way, they can offer effective and flexible learning experiences that empower students to learn languages more independently and collaboratively, without any limits of time and location.

Apart from institutions, the developers of teaching applications and learning management systems that can be used in tablets present these tools claiming they have real educational value; however, researchers, professionals, and educators may have limited knowledge on their content for promoting learning as there is limited research evidence on this matter^[76,77]. Institutions and educators can be more sceptical about these tools to deliver an ideal experience of education^[78].

More importantly, pedagogical and theoretical frameworks should also be carefully founded if a TALL initiative is to be implemented. The goals and objectives should be developed based on a TALL system. The supplementary materials, online resources, interactive eBooks, test development process, accessibility of content, teacher training and development are of high significance. Any initiative should focus on the educational goals and objectives of the designed curriculum instead of motivational tendencies against TALL as a new and technological change with high publicity on the surface structure. For this reason, educators, curriculum planners and developers should see into ways of TALL use in the language classroom. In this

way, TALL can add value to traditional ways of teaching, integrate, and replace when need be. The study has its own limitations such as sample size and homogenous demographical features. For this reason, it might be difficult to generalize the results of this study. Further research can be done on larger and/or more diverse samples for future research.

Author Contributions

Conceptualization, U.K. and S.E.; methodology, U.K.; software, U.K.; validation, U.K.; formal analysis, U.K.; resources, S.E.; writing—original draft preparation, U.K.; writing—review and editing, S.E.; visualization, U.K. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data will be provided upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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