

Using Digital Learning to Develop Secondary School Students' EFL Reading Comprehension Skills

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Abstract

The present study verified the effectiveness of utilizing digital learning instruction on developing the reading comprehension skills of Egyptian EFL first year secondary school students. Sixty students took part in the current study and were equally divided into a control group and an experimental group by assigning a class for each group. The experimental students were taught reading comprehension skills by using the digital learning-based instruction, whereas the control group studied the same skills by using the regular method. Elicitation of data relied on the research design of pretest and posttest. The study analyzed the collected data by adopting the mixed method of quantitative and qualitative approach. The quantitative analysis relied on descriptive and inferential statistics. The descriptive statistics used mean scores and standard deviations of the two groups' pre-and-posttest performances. The inferential statistics employed the paired samples t-test and the independent samples t-test. Gained mean scores of both groups were computed to verify the effectiveness of digital learning-based instruction and regular instruction on developing the participants' reading comprehension skills. The results showed the higher gained mean score was in favour of the experimental group compared to the control group. The study strongly recommended the use of digital leaning-based instruction in teaching reading comprehension skills to first year secondary school students.

Keywords: digital learning-based instruction, reading comprehension skills, secondary schools, Egyptian EFL students, implications

إستخدام التعلم الرقمي فى تنمية مهارات فهم القراءة باللغة الإنجليزية كلغة أجنبية

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المخلص

تحققت الدراسة الحالية من صحة فاعلية التدريس القائم على التعلم الرقمي فى تنمية مهارات فهم القراءة لدى الطلاب المصريين الدارسين للغة الإنجليزية كلغة أجنبية بالصف الأول الثانوى، حيث شارك فى الدراسة الحالية 60 طالبا تم تقسيمهم بالتساوى إلى مجموعة ضابطة و أخرى تجريبية عن طريق تخصيص فصل لكل مجموعة، و تم تدريس مهارات فهم القراءة للمجموعة التجريبية بإستخدام التدريس القائم على التعلم الرقمي بينما درست المجموعة الضابطة نفس المهارات بإستخدام الطريقة التقليدية، و أعتمد جمع البيانات البحثية على التصميم البحثى للأختبار القبلى و البعدى، و قامت الدراسة بتحليل البيانات البحثية بإستخدام الطريقة المختلطة للنهج الكمى و الكيفى، حيث أعتمد التحليل الكمى على الإحصاء الوصفى و الإستدلالى، و أستخدمت الإحصاء الوصفى المتوسطات الحسابية و الإنحرافات المعيارية لأداء المجموعتين فى الأختبارين القبلى و البعدى، و أستخدمت الإحصاء الإستدلالى أختبار "ت" للعينات المقترنة و أختبار "ت" للعينات المستقلة، و تم حساب المتوسطات الحسابية المكتسبة لكلا المجموعتين للتحقق من صحة فاعلية التدريس القائم على التعلم الرقمي و الطريقة التقليدية فى تنمية مهارات فهم القراءة للمشاركين، و أوضحت النتائج أن المتوسط الحسابى المكتسب المرتفع كان لصالح المجموعة التجريبية مقارنة بالمجموعة الضابطة، و أوصت الدراسة بشدة بأستخدام التدريس القائم على التعلم الرقمي فى تنمية مهارات فهم القراءة لطلاب الصف الأول الثانوى.

الكلمات المفتاحية: التدريس القائم على التعلم الرقمي، مهارات فهم القراءة، المدارس الثانوية، الطلاب المصريين الدارسين للغة الإنجليزية كلغة أجنبية لطلاب، مضامين

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Introduction

Reading comprehension is a fundamental skill for developing the English proficiency of Egyptian secondary school students. Generally, EFL students are in need for acquiring the ability of comprehending reading texts, particularly at the pre-university educational levels. The development of English reading comprehension skills is a pre-requisite for academic success. Mulatu, and Regassa (2022) explained that reading comprehension is a complex cognitive language skill which does not only require the mastery of different language skills, but the training to fulfill text-related skills as well.

Bonganciso and Bonganciso (2022) emphasized that successful understanding of English reading texts is an aspect of attaining good English proficiency levels. Successful achievement in reading comprehension does not only entail the ability to decode the contents of reading texts, but the ability to use the learned vocabulary in daily life activities. Successful foreign language (FL) classrooms should ensure students' interest and motivation in the teaching and learning process. For instance, memorization of English new vocabulary is no longer an effective way of learning.

Capodiecici, Cornoldi, Doerr, Bertolo, and Carretti (2020) indicated that some EFL learners might get bored receiving regular instruction while learning English reading comprehension. The regular way of reciting meaning, correct ways of pronunciation and spellings of new vocabulary in English reading classrooms might not attract EFL learners' attention or motivate them acquiring the new vocabulary. Giving lists of words to students is no longer a vital way of teaching English reading comprehension as students may lose interest in learning.

According to Nugroho and Atmojo (2020), digital learning of FL reading comprehension is a tool that motivates the students' interest of learning FL reading skills. It helps EFL students to understand the contents and reinforce their knowledge of FL vocabulary, sentence structure, proper pronunciation, and distinction of multiple meaning words. Digital learning of FL reading comprehension provides opportunities for EFL students to get involved in multimedia authentic

learning materials. Digital leaning of FL reading comprehension also sustains collaboration among EFL students. For instance, Vadivel, Shaban, Ahmed, and Saravanan (2023) asserted that students may work in pairs or groups to collaboratively learn FL vocabulary, deduce new textual information, and assist the low-achievement classmates. In providing digital learning-based instruction for reading comprehension, teachers should importantly encourage students to get involved in the learning activities. Those teachers should primarily have competence in utilizing classroom technology so as to spur the learning motivation of their students.

Potot, Kyamko, Reponte-Sereño and Bustrillo (2023) clarified that although different instructional techniques have been attested to improve EFL students' reading comprehension skills, their reading comprehension performance is far from being satisfactory. Many EFL learners lack interest in learning reading comprehension skills due to the seldom motivation and encouragement they received from language teachers. Furthermore, there is discrepancy between teachers' expectations and students' achievements in English reading comprehension. Teachers assume that students should understand what they are taught about the reading text. However, students are not adequately trained to improve the English language skills and text-related skills which are necessary for improving their reading comprehension skills. In this regard, several studies, such as Wu and Chen (2020), Wu and Lambencio (2022), Xu and Zhu (2023), and Zainuddin (2023), have asserted the importance of using technology-based instruction to elevate the proficiency levels of EFL learners. Other studies like Potot et al. (2023) and Saro et al. (2024) found that reading comprehension skills can be improved by using traditional methods. Therefore, it was necessary to examine the effectiveness of an up-to-date technique to improve the reading comprehension skills of secondary school students.

Context of the study

Boyle and Salah (2017) called for the reform of FL textbooks, particularly at the primary level, as a necessary step for developing the Egyptian EFL students' reading comprehension skills. Boyle and Salah explained that weakness performance of reading comprehension among Egyptian EFL students could be rapidly treated through textbook reform. Based on the researcher's observation while supervising teaching practice at different Egyptian secondary schools, it was noted that secondary school students are in need for developing their reading comprehension skills. Students can hardly recognize the specific meaning which some

multiple-meaning words convey in the text, they find difficult to infer textual information, determine synonyms and antonyms, etc. Pritchard and Nasr (2004) affirmed the weak performance of Egyptian students in reading comprehension at the tertiary level.

Results of the pilot study showed different trouble spots in the students' performance in the reading comprehension test. Table 1 introduces the percentage of students' errors of the reading comprehension skills.

Table 1: Results of the pilot study

No.	Skills	Percentage of Errors
A. Language skills		
1	Determining exact meaning of multiple meaning words	15
2	Recognizing synonyms and antonyms	10
3	acquiring different derivational forms of words	12
4	Comprehending different patterns of sentence structure	16
5	understand various grammar rules	13
B. Text-related skills		
6	Integration of the textual ideas with the background knowledge	9
7	analyzing, evaluating and synthesizing textual information	8
8	deducing new information	6
9	comprehending the meaning of the whole text	11

Statement of the Problem

The poor performance of students in the reading comprehension text entails the necessity of employing teaching intervention for the sake of improving their reading comprehension skills. Therefore, the present study examined the effectiveness of using digital learning instruction to develop the reading comprehension skills of Egyptian EFL first year secondary school students. These skills as clarified above include English language skills and text-related skills.

Questions

1. How do both groups differ in their posttest performance in EFL reading comprehension skills?
2. What are the reading comprehension skills of each group in the posttest?
3. What is the statistically significant difference in the posttest performance of the two groups?

4. What is the effectiveness of digital learning and regular method in developing the participants' reading comprehension skills?

Hypotheses

The current study scrutinized the following null hypotheses:

1. The posttest performances in reading comprehension skills of both groups indicate no difference.
2. Statistically significant differences do not exist in both groups' posttest performances.
3. Digital learning and regular method are equally effective in developing the participants' reading comprehension skills.

Aims

The present study aimed to attain the following aims:

1. Identifying the reading comprehension skills of both groups in the pre-and-posttests.
2. Determining the reading comprehension skills of each group in the posttest performance.
3. Stating the statistically significant differences in the reading comprehension skills of both groups' posttest performances.
4. Verifying the effectiveness of digital learning-based instruction and regular method in developing the participants' reading comprehension skills.

Significance of the Study

The present study is significant because it may:

1. Enrich the literatures of TEFL process in Egypt.
2. Devise up-to-date teaching strategies that can be adopted in the Egyptian EFL context.
3. Pay the attention of EFL curriculum planners and designers to integrate digital learning authentic materials for teaching reading comprehension skills to secondary school students.
4. Sustain the goals of Ministry of Education to enhance the Egyptian students' FL proficiency levels.
5. Highlight the importance of mastering reading comprehension skills among Egyptian secondary school students.
6. Emphasize the importance of using advanced technology and digital learning-based instruction for FL teaching to Egyptian students.

Delimitations

The delimitations of the present study are as follows:

- First year secondary school students at Official Saad Bin Abi Waqas Language School
- First term of the school year 2023-2024
- Reading comprehension skills

Literature Review

Noordan and Yunus (2022b) examined the effect of using digital comprehension on improving the reading comprehension skills of primary six Malaysian pupils. The digital comprehension was selected as the pupils were unable to provide correct answers for questions pertinent to textual reading comprehensions in which they revealed low interest. Data were collected through two-component worksheets which contained two sections of questions. The first section included arrangement of the storylines, while the second section contained questions related to the digital comprehensions. The findings showed that digital comprehension was effective in enhancing the participants' reading comprehension performance. Digital comprehension provided opportunities for the pupils to employ visual and audio learning styles. It sustains the pupils' cognitive abilities of comprehension, remembrance, application, evaluation, analysis, and creation. Digital comprehension also provided friendly-learning environment while the pupils were watching and listening to the digital comprehensions. This study was useful in conducting the digital learning-based instruction for the experimental students.

Potot et al. (2023) compared between the effect of using traditional method and differentiated instruction method in improving the reading comprehension skills of 50 grade seven EFL students. The differentiated instruction method is based on the students' needs for socialization, learning styles, background knowledge, and zones of comfort. Participants were divided into a control group and an experimental group. The former was taught reading comprehension by traditional method, while the latter studied reading comprehension by using the differentiated instruction. The design of pre-and-posttests was the main instrument of data collection. The findings indicated better performance in English reading comprehension skills in favour of the experimental group vis-à-vis the control group. The findings emphasized the effectiveness of using the differentiated instruction method for teaching reading comprehension skills to EFL students compared to the traditional method. The differentiated instruction method helped the experimental participants to effectively learn new vocabulary, induce knowledge, and understand main ideas of the reading texts. The differentiated instruction method

created an enjoyable classroom environment that positively affected the experimental students' learning motivation and increased their participation in reading activities. This study affirms the need for different-method instruction rather than relying on traditional method in teaching reading skills.

Rahman, Al-Qasri and Ofara (2023) discussed the impact of digital literacy on improving the learning of English language among Indonesian EFL secondary school students. The study was carried out in accordance with the UNESCO framework of *global digital literacy competence* to check for the integration of digital learning into secondary school FL classrooms. Data were elicited through semi-structured interviews of three secondary school principals and an observation sheet assessed by teachers of digital pedagogy experience. The findings asserted that digital learning is an integral part of the FL teaching and learning process at the secondary school level. Such integration cannot be overlooked in compliance with 21st century teaching competency. Digital literacy is indispensable at present because it caters for EFL learners' preferences of surfing the online webs to meet their learning needs. Digital learning also helped language teachers to reinforce dynamic learning classrooms where EFL students share, discuss, evaluate, and critically assess various learning knowledge. Digital literacy can lead to the improvement of EFL learners' English proficiency levels. This study helped to guide the training of experimental students by using digital tools.

Nami and Asadnia (2024) explored the impact of using digital storytelling on enhancing the EFL learners' ability to learn FL vocabulary which constitutes one of the reading comprehension skills. Nami and Asadnia examined the effect which digital storytelling may have on the EFL learners' attitudes towards learning FL vocabulary. Data elicitation relied on the pre-and-post-administrations of FL vocabulary test. Nami and Asadnia adopted the mixed quantitative and qualitative method. Inferential statistics as used for the purpose of quantitative analysis whereas qualitative analysis compared the performance in FL vocabulary test between the control and experimental groups. The results showed the experimental group' supremacy in the FL vocabulary test achievement. The experimental students integrated the learned English vocabulary into their daily life activities due to the digital storytelling-based instruction. Digital storytelling promoted FL vocabulary learning on the basis of peers' collaboration. It provides opportunities for EFL learners to learn new vocabulary through contextualization. The EFL learners' cognitive involvement provided by digital storytelling facilitates FL vocabulary

learning. Nami and Asadnia emphasized that the utilization of digital storytelling instruction should be sustained by using other digital tools that enhance FL vocabulary learning. These digital tools include animation, games, and social multimedia. This study was utilized in the conduct of digital learning training course for the experimental students.

Saro, Barol1, Glodobe, Grana and Billuga (2024) investigated the effect of using Catch-up Fridays on enhancing the reading comprehension skills of grade 10 EFL students. Catch-up Fridays are traditionally tailored instruction sessions for teaching FL reading comprehension skills. The sessions relied on selected textual learning materials from different school subjects where reading instruction was delivered directly from the teacher based on face-to-face- instruction. Data were collected through the pre-and-posttests and semi-structured interview. The findings clarified the increased number of participants who could independently understand the reading texts derived from different school subjects. There was statistically significant difference between the participants' pre-and-posttests of reading comprehension. The findings indicated better improvement of the participants' reading comprehension skills owing to the employed intervention of Catch-up Fridays sessions. The findings asserted the importance of teachers' supervising and guiding role to improve students' school achievements. Selection of suitable learning materials can increase EFL students' interest in learning English reading comprehension. The findings revealed the interrelation between effective instruction, suitable classroom environment, and students' motivation in developing their FL reading comprehension skills. This study affirms the importance of intervention in developing the EFL students' reading skills.

Zuo and Ives (2024) conducted a systematic review of 32 articles handled the employment of technology-based reading instruction to EFL learners at different educational levels. Zuo and Ives asserted that technology-based reading instruction promotes progressive development of EFL learners' reading skills. It sustains language learning motivation, enhances FL reading performance, supports collaboration-based learning, and broadens learning materials. It exposes EFL learners to various types of communication so as they attempt to determine meaning of reading comprehension visually and aurally. Relying of different types of communication for the purpose of meaning derivation has become inevitable in the age of digital learning. Thus, it is imperative that FL reading instruction should depend on advanced technology to promote EFL learners' ability of evaluating, interpreting and producing exact meaning of the reading tasks. The digitalization of reading comprehension teaching methods has altered the learning environment

where EFL learners, in pairs or groups, collaborate to fulfill the reading tasks. This study was useful in developing the reading instruction employed to teach the experimental students.

Definition of Terms

Digital learning

Abutalebi and Clahsen (2022) defined digital learning as a learning approach utilizing the multimedia learning sources and advance technology-based teaching materials to enhance language skills of EFL learners. In the case of teaching reading comprehension skills, digital learning is sometimes referred to as digital comprehension and digital storytelling.

As for the present study, the term digital learning is employed in reference to the online authentic materials utilized for teaching reading comprehension skills to the experimental students.

Reading Comprehension Skills

Celadiña (2020) defines reading comprehension skills as the ability of readers to totally understand the meaning of the reading text as a whole. The reader's task is not only restricted to decoding the meanings of words, phrases and sentences, but rather getting full understanding of the whole reading text. This could be attained through understanding of word structure, different meanings that may be associated with multiple meaning words, synonyms and antonyms, patterns of sentence structure and comprehension of grammar rules.

The present study employs the term reading comprehension skills in reference to first-year secondary school students' English language skills and text-related skills information. English language skills include the ability to determine the exact meaning of multiple meaning words, recognize synonyms and antonyms, acquire different derivational forms of words, comprehend different patterns of sentence structure, and understand various grammar rules employed in the reading texts. The text-related skills comprise the students' ability to integrate the textual ideas with the background knowledge, analyze, evaluate and synthesize textual information, deduce new information, and comprehend the meaning of the whole text.

Method

On the basis of experimentation, the present study made use of the mixed method of quantitative and qualitative approach (Mohammed and Ali, 2021; Valizadeh, 2021; Liu and Ma, 2023; and Marghany, 2023). Quantitative analysis used the descriptive and inferential statistics. Descriptive statistics includes mean scores and standard deviations,

whereas inferential statistics employed the paired samples t-test, the independent samples t-test and gained mean scores. Qualitative analysis described the participants' pre-and-posttest performances in the reading comprehension skills.

Participants

The participants are 60 first year secondary school students at Official Saad Bin Abi Waqas Language School. They include 35 females and 25 males whose age ranges between 16-17 years old. Most of the participants have unsatisfactory levels of reading comprehension skills. They were equally divided into a control group and an experimental group on the basis of assigning a class for each group. The current study was carried out in the first term of the school year 2023-2024.

Data Collection Instruments

In the present study, data were elicited by using the instruments of a pretest (Appendix A) and a posttest (Appendix B) of reading comprehension skills and evaluation checklists of reading comprehension skills for control and experimental students (Appendices C & D). As for the pre-and-posttests, the reading comprehension passages used in both tests are derived from *English New Hello* taught first year secondary school students during the first term of 2023-2024. Two different tests were used in the pretest and posttest for the purpose of validity and reliability to avoid testing the participants using the same types of materials and test. Each test consists of thirty multiple choice questions bearing 30 total marks.

Two evaluation checklists for reading skills were designed to assess the reading comprehension skills of both groups. The design of these two checklists covered all reading comprehension skills mentioned in table 1. The two checklists were adapted from several studies such as Perfetti and Stafura (2014); Ahmed, Francis, York, Fletcher, Barnes and Kulesz (2016); and Kendeou, McMaster and Christ (2016). A jury of the research herself and two senior English teachers assessed the effect of using digital learning based instruction and traditional method on developing the reading comprehension skills of both groups of participants. Each evaluation checklist is based on four-point scale, namely Always=1, Often=2, Rarely=3, and Never=4.

Treatment

The pretest and posttest were administered in the current study to explore both groups' reading comprehension skills in accordance with first year secondary school English syllabus taught during the first term of the school year 2023-2024. Initially, the pretest was administered to the sixty participants who represent two different classes of first year

secondary school students. After the pretest, one class was assigned as the control group and another class was assigned as the experimental group. Both groups were taught the content of reading comprehension skills. The control group studied reading comprehension skills by using the regular method, whereas the experimental group was taught these skills by using digital learning-based instruction during a 10-week period (Appendix E). The researcher ascertained that the experimental classroom was equipped with the necessary data show for displaying the digital authentic learning materials used to develop the experimental participants' reading comprehension skills. The experimental students were also optionally allowed to use their smartphones and/or mobile phones to be connected to these digital learning materials. The research also made sure of the availability of technical support to render any possible technical assistance when necessary. This procedure ensured providing clear and accessible digital authentic materials to the experimental students and overcoming any technical difficulties that might arise during the class time. Websites of the digital learning activities to develop the experimental students' reading comprehension skills are introduced as well (Appendix E). A pilot study using 20 participants was conducted to test the internal and external validity of the pre-and-posttests. Determination of the internal and external validity of both tests was important as the two tests were devised based on the English syllabus taught to first year secondary school students. In addition, a jury of three senior English teachers was consulted to comment on the internal and external validity of both tests. The pilot study asserted the clarity, suitability and applicability of both tests. The reliability coefficients of pre-and-posttests were computed as the Cronbach's Alpha coefficients were respectively .90 and .91 for both tests.

The two evaluation checklists were also piloted using 20 students including 10 control group students and 10 experimental participants. A jury of three senior English teachers determined the internal and external validity of the two checklists including the clarity, suitability and applicability of both checklists. The reliability coefficients of both checklists were computed as the Cronbach's Alpha coefficients were respectively .88 for the evaluation checklist of the control group and .90 for that assigned for the experimental group.

Lesson Plan

This section introduces a model of lesson plan of using digital learning-based instruction for teaching reading comprehension to experimental students. The lesson plan was designed according the

guidelines derived from Noordan and Yunus (2022b), Nami and Asadnia (2024) and Zuo and Ives (2024).

Table 2: Model plan of digital learning-based instruction for reading comprehension skills

Lesson: Reading Comprehension

Textbook: Curtis, S. & Hart, C. (2023). *English-New Hello, Student's Book, Secondary One, Term 1*

Title: Ola and Lina giving their opinion, P. 47

Objectives: by the end of the lesson experimental student will be able to:

- Determine exact meaning of multiple meaning words
- Recognize synonyms and antonyms
- Acquire different derivational forms of words
- Comprehend different patterns of sentence structure
- Understand different grammar rules (using the modal verbs, the present simple tense, subject-verb agreement, definite and indefinite articles, comparative adjectives)
- Integrate textual ideas with the background knowledge
- Analyze, evaluate and synthesize textual information
- deduce new information
- Comprehend the meaning of the whole text

Before Reading:

Brainstorming: the experimental participants were about:

- How to make question to ask about other people's opinions?
- What are the expressions that can be used to express opinion?
- How to agree or disagree with the opinions of others.

While Reading:

The experimental students watched Youtube videos about:

- Determining the meaning of the word "experience"
- Formation of words like "conversation", "unhappy", "laughing", etc.
- Expressions used to express opinions
- Similar situations of opinion expression
- Agreement and disagreement with the opinions of others.
- Making questions to ask about other people's opinions.
- Using definite and indefinite articles.
- Forming comparative adjectives

After finishing the first part of the reading test, the experimental students were asked to do some online exercises on:

- Expression of opinions
- Definite and indefinite articles
- Asking about opinions of others
- Word puzzle of multiple meaning words

Student completed the reading text

Post Reading:

The experiment students were asked to:

- Evaluate opinions expresses in the reading text
- Deduce new information from the reading text
- Practice expressions of their opinions of different topics
- Paraphrase the reading text using their own words
- Do multiple choice exercises on the reading text.

Data Analysis

There are three reasons for using the inferential statistics in the quantitative analysis. The first reason was to compare the participants' reading comprehension skills in the pretest. The second reason was to determine the improvement of both groups' reading comprehension skills in the posttest. The first and second reasons were attained through the use of the paired samples t-test. The third reason was to identify the potential statistically significant difference between both groups' reading comprehension skills in the pretest and posttest. The third reason was attained by using the independent samples t-test.

Table 3 indicates the poor reading comprehension skills of both groups in the pretest.

Table 3: Descriptive Statistics of participants' reading comprehension skills in the Pretest and Posttest

	N	Min.	Max.	M	SD
Control pretest	30	12.00	16.00	1.1301	2.21031
Control posttest	30	17.00	23.00	11.7342	8.38140
Experimental pretest	30	12.00	17.00	1.1291	2.10022
Experimental posttest	30	19.00	29.00	23.9244	5.20537
Valid N (listwise)	30				

Table 4 shows that the improvement of both groups' reading comprehension skills varied greatly in both tests. The posttest reading comprehension skills of both groups varied significantly from those of the pretest. However, the experimental group's posttest reading comprehension skills were statistically significant at .000 that is statistically has higher value compared to .005. The experimental group's posttest reading comprehension had been highly developed compared to that of the control group. In other words, the use of digital learning-based instruction had led to higher development of the experiment group's

posttest reading comprehension skills. In contrast, the development of control group's posttest reading comprehension skills resulted from the use of regular method was greatly lower than that of the experimental group.

Table 4: Results of the paired samples t-test

Group	M	SD	N	df	t-value	Sig.
Control pretest	1.1301	2.21031	30	29	6.165	.005
Control posttest	11.7342	8.38140	30	29		
Experimental pretest	1.1291	2.10022	30	29	19.847	.000
Experimental posttest	23.9244	5.20537	30	29		

Furthermore, the determination of effectiveness related to both the digital learning-based instruction and the regular method was attained by using the independent samples t-test. Table 5 indicates higher effectiveness related to the employment of digital learning-based instruction inside the experimental group's FL reading classrooms compared to the regular method applied to the control group. The experimental group obtained largely higher gained mean score (22.79) compared to that of the control group (10.56). Meanwhile, the control group had higher standard deviation (6.17) compared to that of the experimental group (3.10) in an indication of the control groups' higher variance in their reading comprehension skills compared to the experimental group. Therefore, the digital learning-based instruction had remarkably higher effectiveness vis-à-vis the regular method in developing the experimental group's reading comprehension skills. The finding agrees with those reported by Noordan and Yunus (2022b), Rahman et al. (2023), Nami and Asadnia (2024), Zuo and Ives (2024) who emphasized the necessity of using digital tools for the improvement of EFL learners' reading comprehension skills. On the contrary, the finding opposed those reported by Potot et al. (2023) and Saro et al. (2024) that associated improvement of reading comprehension skills to the use of regular methods. The finding accepts the first null hypothesis about similar pretest performance in reading comprehension skills while rejecting the other three null hypotheses about the posttest performance, significant differences between control and experimental students' performance and the effectiveness of digital learning-based instruction and regular method.

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Table 5: Results of the independent samples t-test

Group	N	Gained M	SD	df	t-value	Sig.
Control	30	10.59	6.17	29	13.682	.000
Experimental	30	22.79	3.10	29		

Evaluation Checklists

Tables 6 and 7 indicate the total frequency of using digital learning-based instruction and the regular method for teaching reading comprehension skills to the experimental and control groups. The experimental students had higher frequency of the Always and Often assessments of reading comprehension skills (162) and (157) compared to the control group (49) and (59). In addition, the control group had higher Rarely and Never assessments of the reading comprehension skills (125) and (97) vis-à-vis the experimental students (9) and (2). The finding emphasizes the effectiveness of using digital learning-based instruction compared to the regular method for teaching reading comprehension skills to first year secondary school students.

Table 6: Evaluation Checklist for Experimental Students

No.	Reading comprehension skills	Always	Often	Rarely	Never
1	DLBS helped students to determine exact meaning of multiple meaning words	15	13	2	-
2	It supported students' recognition of synonyms and antonyms	12	17	1	
3	It reinforced students' learning of different derivational forms of words	14	14	1	1
4	It improved students' comprehension of different patterns of sentence structure	16	13	1	-
5	It enhanced students' understanding of different grammar rules	15	14	1	-
6	It trained students to integrate textual ideas with the background knowledge	12	16	1	1
7	It enabled students to analyze, evaluate and synthesize textual information	17	12	1	

8	It trained students to deduce new information	15	14	1	
9	It trained students to understand the meaning of the whole text	16	14		
10	It reinforces students' self-confidence	15	15		
11	It provides enjoyable learning experience	15	15		
Total frequency		162	157	9	2

Table 7: Evaluation Checklist for Control Students

No.	Reading comprehension skills	Always	Often	Rarely	Never
1	RM helped students to determine exact meaning of multiple meaning words	3	2	12	13
2	It supported students' recognition of synonyms and antonyms	4	6	14	6
3	It reinforced students' learning of different derivational forms of words	7	11	6	6
4	It improved students' comprehension of different patterns of sentence structure	5	8	7	10
5	It enhanced students' understanding of different grammar rules	6	4	12	8
6	It trained students to integrate textual ideas with the background knowledge	8	4	12	6
7	It enabled students to analyze, evaluate and synthesize textual information	2	4	14	10
8	It trained students to deduce new information	5	6	13	6
9	It trained students to understand the meaning of the whole text	4	4	12	10

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10	It reinforces students' self-confidence	2	4	13	11
11	It provides enjoyable learning experience	3	6	10	11
Total frequency		49	59	125	97

Discussion of the Results

The pretest showed low level of reading comprehension skills of both groups as the minimum and maximum scores were (12-16) for the control group and (12-17) for the experimental group. Indeed, all participants had problems with identifying the exact meaning of the tested reading comprehension text as a whole. Table 8 provides examples of the pretest errors.

Table 8: Examples of the pretest errors

Questions	Errors	Correct answers
The synonym of isolated is a. Remote b. unusual c. close	Unusual	Remote
The synonym of giant is a. Modern b. generous c. huge	Generous	Huge
..... do no harm to environment. a. Ecology b. ecosystem c. eco-tourists	Ecosystem	Eco-tourists
He is an a. Environmentalist b. environment c. environmental	environmental	environmentalist
Keep your children in from bad company. a. Isolate b. isolated c. isolation	Isolate	Isolation
..... does the least harm to environment. a. Eco-tourists b. Ecotourism c. Ecology	Eco-tourists	Eco-tourism
Tourism is When we protect our touristic places.	Crowded	Sustainable

<p>a. Crowded b. sustainable c. noisy</p>		
<p>A person who protects natural things is called</p> <p>a. Conservationist b. conservation c. conserve</p>	Conservation	conservationist
<p>The effect that an action has on something is called</p> <p>a. Impact b. act c. affect</p>	Affect	Impact
<p>"....." means related to the environment.</p> <p>a. Re- b. Ex- c. Eco-</p>	Ex-	Eco-
<p>Things used for making something are called</p> <p>a. Matter b. material c. materials</p>	Matter	Materials
<p>The National Park is for its pink sand.</p> <p>a. Knew b. know c. known</p>	Know	Known
<p>Tourists like to go</p> <p>a. Dive b. diving c. dove</p>	Dive	Diving
<p>The passage handles</p> <p>a. Tourism b. environment c. A&B</p>	Tourism	A&B
<p>Madagascar ecosystem.</p> <p>a. Back b. harm c. backs</p>	Back	Backs

Both groups achieved improvement in their posttest reading comprehension skills. However, the experimental group made largely fewer errors compared to their counterparts of the control group. The

experimental group's posttest supremacy is attributed to the digital learning-based instruction that enabled them through its advantages to comprehend contextualized meaning, distinguish multiple meaning words, differentiate between synonyms and antonyms, understand word derivational rules, and be aware of the correct grammar usages. Owing to the digital learning-based instruction, the experimental students highly realized text-related skills. They managed to relate textual ideas to prior background, deduce new information and comprehend the meaning of the whole passage.

Table 9 indicates the effect size of using the digital learning-based instruction compared to the regular method in teaching reading comprehension skills. Table 7 shows high statistically significant effect size in favour the digital learning-based instruction of the experimental group as Cohen's $D = .9$ and $p < 0.05$.

Table 9: The effect size

Item	Control Group		Experimental Group		T(60)	P	Cohen's d
	M	SD	M	SD			
Maximum proportion	10.59	6.17	22.79	3.10	8.72	.000	0.9

These findings affirm the importance of integrating digital learning-based instruction into the teaching of reading comprehension skills to first year secondary school students. Thus, FL teachers should find ways to adjust their teaching strategies to cope with the use of advanced technology and the employment of digital learning materials. It is the responsibility of school administration to equip classroom with necessary equipment for the facilitation of using digital learning materials inside the English classrooms. The findings are compatible with those reported by Noordan and Yunus (2022b), Rahman et al. (2023), Nami and Asadnia (2024), Zuo and Ives (2024) for asserting the necessity of utilizing digital tools to improvement the EFL learners' reading comprehension skills. The findings are opposed to those reported by Potot et al. (2023) and Saro et al. (2024) that related the improvement of reading comprehension skills to the utilization of regular methods.

Implications

The digital learning-based instruction created dynamic learning environment which sustains collaboration and interaction among experimental students. Compared to the regular method-based print learning materials, digital learning of reading texts provided better opportunities for experimental students' interaction and assessment as

well. It is also an advantage of digital learning of reading texts to provide treatment of comprehension deficits which experimental students encountered while learning reading comprehension skills. Digital learning of reading texts compensated for the experimental students' low performance and improved their understanding of the digital reading content through the increased engagement, participation, interaction, collaboration, and motivation within the classroom parameters.

The digital learning-based instruction of reading texts sustained the experimental students' self-confidence in their reading ability. It provided enjoyable learning experience for experimental students by reducing their extreme cognitive load which they experienced in fulfilling reading comprehension tasks. Therefore, the design of digital learning-based instruction ensured the realization of effective reading on the part of experimental students as shown in the lesson plan. Thus, it is the role of EFL teachers to provide sufficient training for students on using digital tools for reading comprehension purposes. Teachers should also motivate students to read intentionally covering various aspects of reading comprehension skills.

That is, students should be aware, while the practice of digital learning of reading, of the skills they need to acquire and polish. Teachers can also train students on the optimal use of digital tools in order to explore information. For instance, students can watch and listen to digital youtube related the learning of vocabulary, grammar, sentence structure during the reading comprehension classes. On practicing digital learning-based instruction, EFL teachers should apply teaching strategies that encourage students' engagement. In this regard, teachers should exploit the advantages of visual, audio and aural learning materials provided through the digital learning. For instance, teachers may ask students to do some exercises on an interspersing basis. Observing the learning differences among EFL students, initial selection of simple and short-length digital texts can reduce the students' cognitive load.

Conclusion

The low level of reading comprehension skills indicated by all participants in the pretest highlighted the need for selecting a good strategy by the secondary school English teachers for improving the students' proficiency of reading comprehension skills. The digital learning-based instruction had led to a transformational change in teaching reading comprehension tasks to the experimental students since it contains techniques that appeal for various learning styles of EFL learners such as visual, audio and aural preferences learning styles.

The posttest indicated improvement of the control group and experimental group's reading comprehension skills due to the use of regular method and digital learning-based instruction. However, the latter had highly extreme effectiveness compared to the former method. Therefore, the present study emphasizes the importance of integrating digital learning-based instruction into the teaching of English reading comprehension to first year secondary school students.

Recommendations

The current study recommends the following:

1. EFL Teachers:

Secondary school English teachers should be trained to employ technology in the classrooms.

2. Curriculum Planning:

The digital learning-based instruction is highly recommended for TEFL process in the Egyptian context.

3. Curriculum Design:

Curriculum designers should integrate the digital learning-based instruction into the secondary school English syllabi.

Suggestions for further research:

The present study introduces the following suggestions for further research:

1. The effectiveness of digital learning instruction can be tested at other educational stages such as primary and preparatory schools.
2. Verification of the positive impact of digital learning instruction is also required for teaching other language skills.
3. Investigating the potential modification of secondary school FL curricula planning and design in the light of employing digital learning-based instruction.
4. Examining the effect of using digital learning-based instruction on the Egyptian EFL students' motivations and attitudes towards learning English.
5. Exploring the impact of using digital learning-based instruction on developing the Egyptian EFL teachers.
6. Revisiting the Egyptian EFL student-teachers' training programs to address their equipment of advanced technology utilization in the FL classrooms.

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Appendix A
Reading Comprehension Pretest
30 Marks
Source of the reading comprehension
Curtis and Hart (2023)

Read the following passage and answer the questions below:

"Ecotourism is about providing holidays to places which are often endangered and isolated. The holidays are designed to have a limited impact on the local environment and to educate tourists about conservation.

Egypt is developing ecotourism to protect the environments along the Red Sea. Tourists can stay in hotels built of environmentally friendly materials. When tourists go diving, they are taught how to avoid damaging the fish and keeping the special coral reefs safe.

Madagascar is famous for its ecotourism and wants to protect its ecosystem (the animals and plants in its environment). 80% of the animals and 90% of the plants that live there do not exist anywhere else in the world. Lemurs, for example, only live in Madagascar.

The Galapagos Islands in Ecuador are famous for the unique animals such as the giant turtles which live there. Ecuador makes sure that tourism is sustainable. Only a limited number of people can visit the islands each year, so the animals and their environment are safe.

The Komodo National Park in Indonesia is a popular ecotourism destination. Much of Indonesia's endangered wildlife, including the Komodo dragon, can only be found here. The National Park is also famous for its beach and pink sand."

Choose the correct answer a, b, or c:

1. The synonym of isolated is
a. Remote b. unusual c. close
2. The synonym of giant is
b. Modern b. generous c. huge
3. Isolated is antonymous with
a. Remote b. close c. endanger
4. do no harm to environment.
d. Ecology b. ecosystem c. eco-tourists
5. He is an
d. Environmentalist b. environment c. environmental
6. does the least harm to environment.
d. Eco-tourists b. Ecotourism c. Ecology

7. Keep your children in from bad company.
d. Isolate b. isolated c. isolation
8. Lions are animals, they can attack people.
a. Dangerous b. endangered c. danger
9. Tourism is When we protect our touristic places.
c. Crowded b. sustainable c. noisy
10. A person who protects natural things is called
d. Conservationist b. conservation c. conserve
11. The effect that an action has on something is called
c. Impact b. act c. affect
12. Things used for making something are called
d. Matter b. material c. materials
13. "....." means related to the environment.
a. Re- b. Ex- c. Eco-
14. means special or the only one.
a. Sustainable b. unique c. exotic
15. Eco-tourists visit places.
a. Danger . endangered c. danger
16. Holidays should have a impact on the local environment.
a. Limited b. limit c. great
17. Tourists like to go
d. Dive b. diving c, dove
18. Madagascar ecosystem.
d. Back b. harm c. backs
19. Coral reefs exist in
a. Ecuador b. Madagascar c. Egypt
20. The antonym of unique is
a. Commonly b. common c. uncommon
21. The Red Sea is a for eco-tourists.
a. Destiny b. destination c. design
22. Ecotourism must local environment.
a. To protect b. protected c. protect
23. Development of eco-tourism is in In Egypt.
a. Progressing b. progressive c. progress
24. The National Park is for its pink sand.
c. Knew b, know c. known
25. Conservation is a work.
a. Volunteer b. voluntary c. volunteering
26. Some unique Only exist in Madagascar.
a. Plans b. plants c. plan
27. The Galapagos Islands include Animals.

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- a. Especial b. spicy c. special
28. The best suitable title of the passage could be
- a. Ecosystem b. Ecotourism c. environment
29. The passage is
- a. Interested b. interesting c. interest
30. The passage handles
- d. Tourism b. environment c. A&B

Appendix B
Reading Comprehension Posttest
30 Marks
Source of the reading comprehension
Curtis and Hart (2023)

Read the following passage and answer the questions below:

"Perhaps you think I am going to write about a football star or a famous actor. These are important people, of course. However, I admire professor Magdi Yacoub. For me, he is the best role model. He is a great man for everything he has done for the mankind.

Professor Yacoub was the son of a doctor who had to move to a new town every few years. This helped young Yacoub to adapt to different situations. When his aunt died of a heart problem, he decided that he wanted to a heart surgeon.

He succeeded in achieving his goal. He became a surgeon. He travelled abroad and worked with great heart surgeons in Britain and the USA. That gave him a lot of experience. He was part of the team that did the first heart transplant. Queen Elizabeth II awarded him the title 'Sir' for his great achievements.

When he retired, he returned to Egypt and set up Magdi Yacoub Heart Foundation in Aswan. This foundation helps people with heart problems for free.

In my opinion, Professor Magdi Yacoub is the best example of greatness among people. He does not think of himself. Instead, he thinks how to help the people of his own country. He does not care for money. He only cares for saving people's lives. He gives heart patient the hope to live. I hope we all do our best to follow his footsteps."

Choose the correct answer a, b, or c:

- Perhaps refers to
a. Non-probability b. probability c. certainty
- Star means a
a. Celebrity b. unknown c. strange
- The female form of actor ends with
a. -ed b. -ess c. -ion
- However refers to
a. Agreement b. similarity c. contrast
- The speaker has Way of thinking.
a. Literary b. scientific c. entertaining
- The antonym of admire is
a. Like b. love c. hate

7. Admire means
A, disrespect b. respect c. dislike
8. Magdi Yacoub has great To the mankind.
a. Damage b. contributions c. loss
9. 'This helped young Yacoub' refers to the
a. Son b. father c. both of them
10. The synonym of 'adapt' is
a. Reject b. just c. adjust
11. The father used to places of work.
a. Change b. maintain c. fix
12. Young Yacoub had Experience to deal with different situations.
a. Little b. wide c. fast
13. Young Yacoub wanted to be a heart surgeon because of a family
a. Reason b. season c. call
14. Young Yacoub decided to be a heart surgeon.
a. Interpersonally b. personnel c. personally
15. The word team refers to
a. Footballers b. surgeons c. physicians
16. He had a award.
a. Royal b. common c. fake
17. Britain is situated in
a. Europe b. North America c. Asia
18. The noun of 'retire' is formed by adding
a. -ion b. -ment c. ism
19. Treatment at Magdi Yacoub foundation is
a. Expensive b. costly c. free
20. Magdi Yacoub is doing a Work in Egypt.
a. Cheer b. charity c. cheap
21. 'Set up' means
a. Established b. grew c. managed
22. The best suitable title for the passage is
a. Foundation
b. Celebration
c. The person I admire
23. Magdi Yacoub From his father's job.
a. managed
b. benefited
c. hated

24. His family life His early decisions.
- Effect
 - Effected
 - Affected
25. The word 'greatness' refers to
- Failure
 - Success
 - Disappointment
26. The writer has a Opinion of Magdi Yacoub
- Positive
 - Negative
 - Neutral
27. Magdi Yacoub has self- attitude.
- Deny
 - Denying
 - Denial
28. 'The people of his own country' refers to
- Americans
 - Egyptians
 - British
29. 'Saving' means
- Keeping money
 - Rescuing
 - Holding
30. The last sentence is a valuable
- Advise
 - Advice
 - Vice

Appendix C

Evaluation Checklist for Experimental Students:
The digital learning-based instruction (DLBS)

No.	Reading comprehension skills	Always	Often	Rarely	Never
1	DLBS helped students to determine exact meaning of multiple meaning words				
2	It supported students' recognition of synonyms and antonyms				
3	It reinforced students' learning of different derivational forms of words				
4	It improved students' comprehension of different patterns of sentence structure				
5	It enhanced students' understanding of different grammar rules				
6	It trained students to integrate textual ideas with the background knowledge				
7	It enabled students to analyze, evaluate and synthesize textual information				
8	It trained students to deduce new information				
9	It trained students to understand the meaning of the whole text				
10	It reinforces students' self-confidence				
11	It provides enjoyable learning experience				
Total frequency					

Appendix D
Evaluation Checklist for Control Students:
The Regular Method (TM)

No.	Reading comprehension skills	Always	Often	Rarely	Never
1	RM helped students to determine exact meaning of multiple meaning words				
2	It supported students' recognition of synonyms and antonyms				
3	It reinforced students' learning of different derivational forms of words				
4	It improved students' comprehension of different patterns of sentence structure				
5	It enhanced students' understanding of different grammar rules				
6	It trained students to integrate textual ideas with the background knowledge				
7	It enabled students to analyze, evaluate and synthesize textual information				
8	It trained students to deduce new information				
9	It trained students to understand the meaning of the whole text				
10	It reinforces students' self-confidence				
11	It provides enjoyable learning experience				
Total frequency					

Appendix E

Activities of digital learning-based instruction

<https://youtu.be/5Y00Oe-cODw>

<https://youtu.be/g0a9z6XBUFo>

<https://youtu.be/DSRQuDPkKF4>

https://youtu.be/CEFv0Fs_8k8

<https://youtu.be/JY2V84SsPac>

https://www.youtube.com/watch?v=y_GnX0-MJR8

<https://www.youtube.com/watch?v=QMIQv7yPlkI>

<https://www.youtube.com/watch?v=10auVRva1Jk>

https://www.youtube.com/watch?v=W7BW9gv_OkU

<https://www.youtube.com/watch?v=10auVRva1Jk>