



Using a Digital Storytelling-Based Electronic Program to develop primary stage pupils' EFL reading comprehension skills

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Abstract

The present study aimed to identify the effect of using a digital storytelling-based electronic program to develop reading comprehension skills of Pupils with Learning Difficulties. The study adopted a quasi-experimental pre-post design with two groups. Each group consisted of 30 pupils. The experimental group was taught through using the digital storytelling-based electronic program, whereas the control one was taught through the traditional method. The researchers prepared a reading comprehension skills test as an instrument to collect data. The results showed that the pupils of the experimental group achieved better results than those of the control one. The results revealed the effectiveness of the Digital Storytelling-Based Electronic Program in developing primary-fifth pupils' reading comprehension skills.

Keywords: Digital Storytelling; Reading Comprehension Skills; Pupils with Learning Difficulties.

1. Introduction

Technology has introduced new and diverse forms of educational materials that surpass traditional methods, especially in presenting curriculum-related events. Activities utilizing students' personal experiences are designed to integrate with new ideas. Among these innovations is the focus on digital stories to develop reading comprehension skills and increase academic achievement among students [27]. The significance of stories in students' lives necessitates our attention, as they attract both adults and children with their literary elements, captivating attention and expanding imagination [10]. The research paper contributes significantly to the field of education by focusing on enhancing reading comprehension skills among students with learning difficulties through the use of digital storytelling-based electronic programs. By adopting a quasi-experimental prepost design with two groups, the study demonstrates the effectiveness of digital storytelling in improving the reading comprehension skills of primary-fifth pupils. This highlights the potential of digital storytelling as an engaging and interactive tool for educators to utilize in teaching reading comprehension, ultimately leading to academic success for students with learning difficulties. Moreover, the paper emphasizes the importance of recognizing digital storytelling as an effective educational strategy, particularly for students facing challenges in reading comprehension skills. By addressing the gap in educational literature regarding electronic programs based on digital storytelling for students with learning difficulties, the research provides valuable insights and practical implications for educators and policymakers in the field of special education and education technology.

The field of educational technology has witnessed a rapid development in the field of research and e-learning in general. This has significantly impacted the educational process and teaching methods to keep pace with progress, cognitive explosions, and educational innovations. The utilization of the latest teaching methods, strategies, and electronic multimedia tools, including digital stories, has played a crucial role in various e-learning environments.

These digital stories, in particular, have been widely used to effectively develop the skills of learners, enhancing differentiation through technology [39]. Technological advancements have facilitated the presence of digital stories in the form of designed and programmed computer sessions with specific and organized steps. These sessions include a variety of information, skills, techniques, and diverse activities, all within a defined timeframe. The primary aim is to achieve educational objectives and new behaviors that assist learners in overcoming reading comprehension difficulties, ultimately leading to academic success [33].

Reading comprehension is not an easy process. Reading comprehension is a complex process. It is like doing a puzzle which a reader needs to recognize the smallest items in a text like words, phrases and sentences to grasp the direct and indirect meaning of the text, evaluate the text and produce new information. A reader needs to understand what is read. Attiyah [8] mentions that the reading comprehension means that a reader should be able to find out what is between the lines, understanding the meaning of unfamiliar words, summarize what is read, identify the opinion of the writer of the text, identify the main idea of the text and infer evidence and arguments through the interaction between the reader and the text. Snow [37, 38] describes reading comprehension as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. There are three elements of comprehension: the reader who is doing the comprehending; the text that is to be comprehended; and the activity through which comprehension can be realized.” Thus, reading comprehension is a process that includes higher-order thinking skills and mental functions.

Jad [25], Alflet and Azyat [5], Papatga and Ersoy [34] mention the reasons why reading comprehension skills are important for learners. Jad states how important reading comprehension is in preparing learners to adapt to what is happening around them and internalize new information in whole fields. In particular, its importance lies in how it affects and improves the learning process. In addition, it makes the readable text a part of the learner's knowledge. Alflet and Azyat show that enhancing reading comprehension is a supreme objective for teaching reading and literary texts because it is one of the main dominant factors in mastering the language arts and dealing with other knowledge sources. Papatga and Ersoy assure that reading comprehension skills are useful for learners to utilize in both their academic and entire lives. Therefore, training learners to acquire reading comprehension skills is a necessity because it is the way through which success can be attained.

Most EFL learners face many difficulties that prevent them from comprehending readable texts. Some specialists have discussed some problems for learners in reading comprehension. For example, Lynch [30] discusses that most learners have some reading comprehension difficulties, such as the inability of learners to give a summary of the readable text in which they focus on just a small part of the entire story; the learners' inability to describe what a character is thinking and; their inability to draw a connection between the events in the story and the events in real life; and their ability to describe what happened in the story but not why it happened. Meanwhile, Al-Jarrah and Ismail [6] summarize some reading comprehension difficulties for most learners, such as environmental, instructional, and biological sources; the lack of vocabulary knowledge; the complexity of the text; and the inability to comprehend complex sentences. They also add that the difficulties in reading comprehension for some learners can involve coordinating conjunctions, prepositional phrases, participial phrases, and nominalizations because they make the text more complex and difficult to understand.

In a similar vein, Abu Abeeleh [1] summarizes the factors that affect negatively many learners' reading comprehension: the complexity of a text which may lead to ambiguity and incomprehensibility of the text; the environmental conditions, such as unsafe places, which may influence negatively the ability to read and understand a text; the anxiety which may affect the learners' reading comprehension negatively; exams, classwork or homework situations may prevent learners from the enjoyment of reading and understanding the material; and the material monotonous and the lack of both interest and motivation affect negatively the learners' reading comprehension. Furthermore, Hollowell [24] finds that medical problems may influence negatively the learners' reading comprehension, such as attention deficit disorder (ADD), speech problems and hearing impairments. Besides, Gilakjani & Sabouri [17, 18] add that understanding the meaning of the text is negatively impacted by decoding and word recognition.

Additionally, Hidayati [23] divides factors that influence the understanding of a text for several learners into external and internal factors. The internal elements include physics, intellectual and psychological problems; the lack of learner's concentration; the inability to understanding a sentence and text; the lack of learner's prior knowledge; and the learner's inability to use reading types such as skimming, scanning, intensive reading and extensive reading. Whereas the external factors involve surroundings, such as the parents' unconsciousness of their children and school environments, such as the limited English books, magazines and newspapers. Finally, the researchers concluded that the difficulties in comprehending a reading text could be attributed to the pupil's poor experience in reading comprehension sub-skills.

Reading comprehension for learners with learning difficulties is defined as the activities undertaken by students to develop various reading comprehension skills, including literal, inferential, evaluative, critical, and creative skills. This is achieved through recognizing symbols and words, understanding the relationships between them, and comprehending meanings and connotations of written symbols.

Reading comprehension enables students to perform various cognitive processes, including analysis, judgment, and inference, their thinking skills develop, surpassing their cognitive age in comparison to peers in the same grade. Thus, their talents emerge, their horizons expand, and their innovations become apparent. Human advancement and culture are no longer solely dependent on the quantity of what is read but also on the reading and the investment in the material read [11].

Students with learning difficulties constitute a significant segment of the school community, influencing and being influenced by it. Neglecting them can lead to various obstacles affecting their integration and interaction with their society.

Digital storytelling derives its importance in the educational process from its ability to improve students' comprehension. It provides learners with the opportunity to analyze and interpret story events, engages multiple senses, facilitates easy information transfer, adds fun and entertainment to the learning process, and cultivates critical thinking, dialogue, analysis, and reading fluency skills [21]. Learners with learning difficulties often struggle to understand written text, attempting to create meaning from what they read [15]. Proper supervision by teachers and continuous monitoring of students' reading development are essential for understanding the material [19].

Digital storytelling is an educational product that merges literary art and technology by combining sound, images, storytelling techniques, video, animations, and text. Its purpose is to achieve specific educational goals through an engaging environment and an interactive creative experience. This enriches students with numerous concepts that contribute to enhancing their language proficiency, comprehension abilities, and a thorough understanding of written or read content [2].

Digital stories, as an educational approach, come with several advantages. They stimulate learners' motivation towards learning, facilitate knowledge acquisition, promote interaction between the learner and the narrative content, strengthen memory retention, and enhance comprehension skills. Additionally, digital storytelling helps learners retain and apply what they have learned in new and similar learning situations [16]. Digital storytelling skills are an engaging means that encourages students' active participation with digitally illustrated and narrated content. The dynamic and integrated development of digital storytelling events is considered a fun way to enhance literacy skills [14].

Empowering students to use digital storytelling and employing control options such as speed, sound, and visually displayed text contribute to creating an exciting, engaging, and effective learning environment [9]. That stimulates active participation according to individual needs and differences, especially for learners with reading difficulties, leading to increased motivation for reading and acquisition of vocabulary. This, in turn, improves reading comprehension skills among learners with learning difficulties [41].

Thomas, Cristina, Margaret, Robert, and Judith [40] point out that children with learning difficulties face numerous academic challenges that contribute to hindering the learning process. Reading problems are the root cause, leading to issues in behavioral and social aspects, especially in the early stages of learning.

According to Ceylan [12], storytelling activities play a crucial role in early education, promoting reading skills and readiness for learning in primary stages. These activities aim to develop senses, abilities, inclinations, and skills in children through role-playing rather than formal teaching. Mastiani et al. [31] emphasize that digital storytelling significantly impacts linguistic aspects of students' lives, allowing them to express and explore their surroundings through role-playing.

A study by Chi, and Kim [13] suggests that reading skills are linked to individual cognitive growth, which is closely related to the development of social abilities. Failure in reading comprehension presents psychological, educational, social, and economic problems, leading to various educational challenges, including social withdrawal and, in some cases, aggressive behavior.

Adigüzel and Kumkale [3] found a positive impact of digital stories, considering them as visual and auditory tools that help students analyze texts, understand events and characters better, improving their ability to use words in different contexts and boosting their confidence in learning.

The research aims to investigate the role of digital storytelling in enhancing reading comprehension skills among students with learning difficulties. Additionally, it highlights gender differences in the development of reading comprehension skills after exposure to electronically processed narrative content. The significance of the study lies in recognizing digital storytelling as an effective educational tool for students facing challenges in reading comprehension skills. Digital storytelling stimulates students' motivation to acquire new vocabulary and comprehend events and topics, thereby enhancing attention and interaction, ultimately improving reading comprehension skills.

The practical importance of the research is evident in:

Most students with learning difficulties face challenges in reading, leading teachers to view short stories as an effective means to enhance reading comprehension. Positive learning experiences through alternative teaching methods provide students with opportunities to express their thoughts and opinions, promoting readiness and reading comprehension, which, in turn, develops various reading skills for students with lower reading levels [26].

The elementary stage is critical for a child's personality formation, academic growth, and human behavior development. It is the initial educational stage significantly influencing their personality. Digital stories, with their audio, visual, motion, and writing elements, play a crucial role in the comprehensive growth of students with learning difficulties. Through their use in education, these stories contribute to the development of students' skills, behavioral habits, abilities, and social relationships. The elementary stage is vital for the early intervention that is easier and more effective than later stages [43]. The current research addresses a gap in educational literature that lacks exploration of electronic programs based on digital storytelling for developing reading comprehension skills in students with learning difficulties. Previous studies focused on variables related to ordinary students, neglecting those with learning difficulties.

2. Context of the study

The researchers observed the primary stage pupils' poor performance in reading. That weakness was evident in the inability of pupils to guess the meaning of unfamiliar words and identify the reference of a pronoun in a text, their inability to suggest a title for a text, their inability to identify the main ideas, etc. That can be due to the teachers' adoption of traditional teaching methods in teaching reading. The researchers held informal meetings with 24 of primary stage teachers to check out the existence of this problem. Most of them mentioned that their pupils had difficulties in reading comprehension in general. Most of their difficulties were in understanding what a reading text means; determining the main idea; guessing the meaning unfamiliar words; and in answering questions based on texts.

Several authors such as Khalifa [28], Zahran [44], Nada [32], Hammad, [22], Ahmed [4] recommended using different modern methods to develop reading comprehension skills for primary stage pupils and called for avoiding traditional methods of teaching reading.

To empirically validate the existence of the problem, the researchers conducted a pilot study where 20 primary-fifth pupils. Based on their scores, the pupils were found very weak at several reading comprehension skills which are mentioned in the delimitations of the present study. The researchers thought that the effect of using a digital storytelling-based electronic program hopefully would develop the acquisition of the reading comprehension skills of the fifth year primary stage pupils with Learning Difficulties.

Reading comprehension:

Woolley [42] defines reading comprehension as “the process of making meaning from a text. The goal, therefore, is to gain an overall understanding of what is described in the text rather than to obtain meaning from isolated words or sentences. In understanding reading text information, pupils develop mental models or representations of the meaning of the text ideas during the reading process.”

Operationally, the researchers defines reading comprehension as a process in which primary-one pupils read with comprehension and this is reflected in some skills: guessing the meaning of the new words and their opposite; identifying the reference of the pronouns; recognizing the explicit information in a text; identifying the main ideas in a text; giving an opinion; predicting the next events in a story; inferring the learned lesson from a story; suggesting alternative ends for a story; suggesting a different title for a text; summarizing the text and

understanding the emotional aspect of the characters in a story. It is measured by using a reading comprehension performance test for these skills.

3. Methodology

The Methodology diagram in figure 1 provides a detailed visual representation of the interactions and processes involved in a digital storytelling-based program designed to enhance reading comprehension skills among primary-stage pupils with learning difficulties. Here’s a breakdown of the components and flow within the diagram:

- Participants Involved: The diagram includes three main participants: the pupils, the teachers, and the digital story-based program. The pupils are the primary participants who engage directly with the program. Teachers play a crucial role in administering assessments and overseeing the educational process, while the digital story-based program serves as the medium through which educational content is delivered.
- Pre-test and Post-test Assessments: The process begins with teachers administering a pre-test to assess the pupils' initial reading comprehension skills. This initial evaluation helps in tailoring the program to meet the specific needs of the pupils. At the end of the program, a post-test is conducted to evaluate the improvements in pupils' reading comprehension skills, providing a measure of the program’s effectiveness.
- Program Interaction: Pupils participate in the digital storytelling-based program where they are provided with instructions and feedback. The program is interactive, involving multiple sessions where pupils engage with various story elements. During these sessions, the program continually assesses the pupils' understanding and skills, providing immediate feedback to help them improve.
- Repetitive Learning Loop: The diagram highlights a loop of engagement with story elements, signifying the repetitive nature of the interactions within each session. This loop is crucial for reinforcing learning and ensuring that pupils have multiple opportunities to absorb and apply the concepts taught.
- Outcome Note: A note in the diagram indicates the expected outcome of the educational process—gains in reading comprehension skills. This note emphasizes the program’s objective to enhance the pupils' ability to understand and interpret text, which is a fundamental component of reading comprehension.

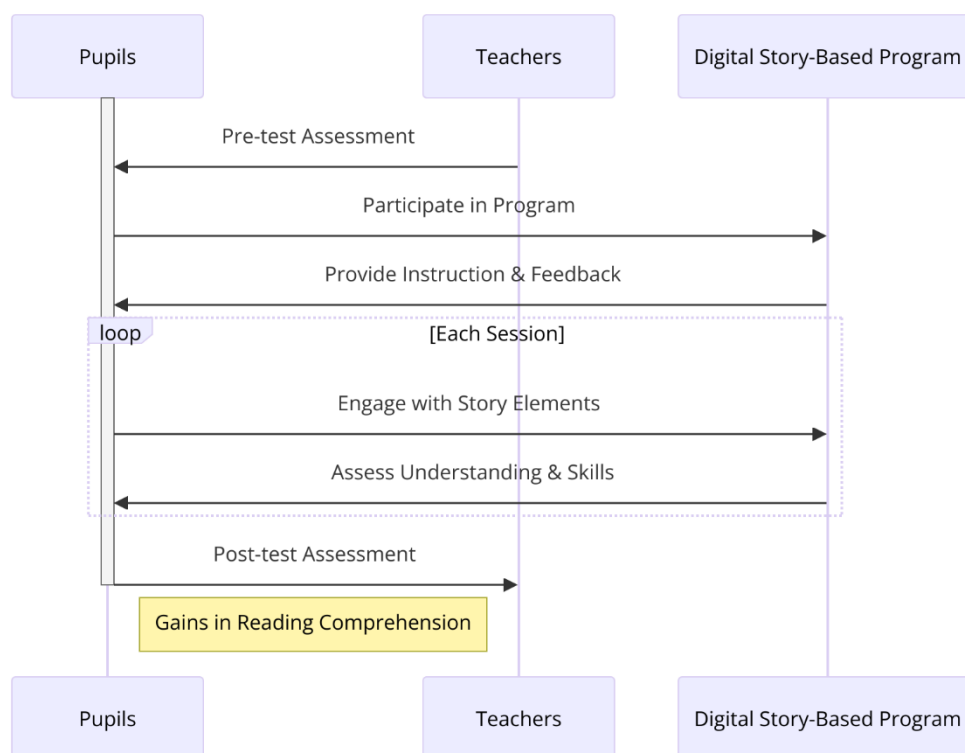


Figure 1: Study framework

3.1 Statement of the Problem

The research problem can be stated as follows:

Primary-fifth pupils at primary school are very weak at reading comprehension. Therefore, the researchers think that using a Digital Storytelling-Based Electronic Program would hopefully help those pupils develop their reading comprehension skills.

3.2 Question of the study

The present study was to answer the following main question:

What is the effect of using a Digital Storytelling-Based Electronic program in developing primary-fifth pupils' EFL reading comprehension skills? This question can be divided into sub-questions:

- I. Are there statistically significant differences in the mean scores of reading comprehension skills between the experimental and control groups after implementing the electronic program?
- II. Are there statistically significant differences in the pre-test and post-test measurements of reading comprehension skills among students in the experimental group?

3.3 Aim of the study

The present study aimed to:

Identify the effect of using a Digital Storytelling-Based Electronic Program in developing primary-fifth pupils' EFL reading comprehension skills.

3.4 Hypothesis of the study

The following hypothesis was suggested:

There would be statistically significant differences at level of 0.05 between the mean scores of experimental group and control group in reading comprehension skills post-test, in favor of experimental group.

3.5 Significance of the study

The present study is expected to be significant for:

The pupils:

- I. Primary-fifth pupils with learning difficulties are expected to benefit from the suggested Digital Storytelling-Based Electronic Program;
- II. The Digital Storytelling-Based Electronic Program is supposed to strengthen and foster their positive attitudes towards reading comprehension in particular and learning English as a foreign language generally through involving them in electronic learning activities.
- III. The Digital Storytelling-Based Electronic Program is supposed to develop a meaningful learning environment.

The teachers:

- IV. *Teachers will be provided* with a new strategy (i.e. the Storytelling) in teaching reading comprehension.
- V. The Digital Storytelling-Based Electronic Program is supposed to encourage primary stage *teachers* to have training sessions on improving the pupils' reading comprehension skills avoiding the traditional method of teaching.

Course designers:

- VI. *Course designers* are supposed to include certain electronic activities based on using the storytelling in reading instruction.

For researchers:

- VII. *Researchers* can make use of electronic Storytelling for doing more and more research in that respect.

3.6 Delimitations of the study

The present study was delimited to the following:

- I. A group of 60 primary-fifth pupils.
- II. Administration was done during the first semester of the school year 2023/2024.
- III. The reading comprehension sub-skills which were suitable and necessary for primary-Fifth pupils with learning difficulties were delimited to: answering certain questions based on a digital short story; stating reasons for specific events in a short story; mentioning the main idea of a short story; guessing the meaning of unfamiliar words in digital short story; giving synonyms and antonyms of words; identifying the reference of pronouns; identifying the reference of demonstratives; and suggesting a title for a digital short story.

3.7 Research Design

The researchers adopted a quasi-experimental design. The focus is on measuring the reading comprehension skills of students with learning difficulties in their natural state without any influence. Subsequently, the experimental intervention, represented by the electronic program based on digital storytelling, is applied. This is done to verify the effectiveness of the utilized electronic program in enhancing the reading comprehension skills of the participants, Table (1).

Table 1: Experimental Design for the Research

Pre-Application of Tools	Group	Treatment	Post-Application of Tools
Cognitive Achievement Test for Reading Comprehension Skills	Experimental Group	Digital Story-Based Learning Environment	Cognitive Achievement Test for Reading Comprehension Skills
	Control Group	Traditional Learning Environment	

3.8 Participants

The current research sample consists of a total of 60 male and female elementary school students enrolled in learning difficulties programs. They were divided into two groups, an experimental group (30 students) and a control group (30 students). The study was conducted during the first semester of the academic year 2023-2024. The final sample was randomly selected, excluding any cases with other types of disabilities, Table (2).

Table 2: Program Sessions

Session NO.	Program Axes	Session Objectives	Procedural Objectives	Techniques
1	Preparing students and applying the pre-test for the Reading Comprehension Skills Assessment			Dialogue and reinforcement
2-3	Direct Comprehension Skills	Determining the meaning of the word	<ul style="list-style-type: none"> To enable the student to recognize the meanings of words and apply them in daily life situations. To help the student distinguish between different meanings of words. 	Reinforcement Modeling Simulation Feedback Dialogue and discussion Homework
4-5		Identifying the antonyms of words	<ul style="list-style-type: none"> To have the student know the antonym of words. To have the student differentiate between a word and its antonym. 	
6-7		Identifying the singular and plural	<ul style="list-style-type: none"> To have the student know the singular and plural forms. To have the student differentiate between the singular and plural forms. 	
8-9	Inferential Comprehension Skills	Choosing the appropriate title	<ul style="list-style-type: none"> To enable the student to recognize the appropriate title for the story. To enable the student to distinguish between the appropriate and 	

			inappropriate titles for the story.
10-11		Character Recognition	<ul style="list-style-type: none"> To enable the student to identify the characters. To enable the student to distinguish between the characters.
12-13	Critical Comprehension Skills	Distinguishing between what is relevant and what is not relevant	<ul style="list-style-type: none"> To enable the student to know what is relevant and what is irrelevant to the story when reading it. To enable the student to differentiate between what is relevant and what is irrelevant when reading a story.
14-15		Distinguishing between the correct and incorrect opinion	<ul style="list-style-type: none"> To enable the student to recognize the correct opinion and the incorrect opinion. To enable the student to distinguish between the correct and incorrect opinions.
16	The concluding session and application of the post-measurement of the Reading Comprehension Skills scale		
The total number of sessions is (16) sessions, held three times a week, with each session lasting (45) minutes			

3.9 Variables of the Study

The variables of the study were:

- I. The independent variable: A Digital Storytelling-Based Electronic Program.
- II. The dependent variable: Reading comprehension skills.

3.10 The program

The program was based on Digital Storytelling, which is a combination of some short electronic stories. It was designed by the researchers to develop primary-fifth pupils’ reading comprehension. The program includes two units of six lessons each. It includes both the Teacher’s Guide and the Pupil’s Book. The objectives, the stages of teaching, the activities and evaluation techniques are included. It also includes the roles of both a teacher and pupils. The program includes some short online stories. Some of them have been written with known and unknown authors such as King Solomon’s Mines [20].

3.11 Research Tools

Two tool were designed to achieve the research objectives and answer the relevant questions.

3.11.1 A Reading Comprehension Skills Test for students with Learning Difficulties

A reading comprehension skills test was developed for individuals with learning difficulties to determine the level of their reading comprehension skills. To assess the scale's reliability, internal consistency among its items was calculated on a sample of 65 elementary school students. The correlation coefficients between the scale items ranged from 0.700 to 0.824. The reliability of the scale was confirmed using Cronbach's alpha coefficient, which reached 0.843. These results indicate that the scale exhibits a suitable level of validity and reliability.

The test is broken down into four main parts that include 38 items to assess 14 reading comprehension sub-skills. It includes randomly selected 3 short narrative texts that were appropriate for primary-fifth pupils. The researchers prepared a table of specifications for the reading comprehension test that shows the distribution of test questions based on the reading comprehension sub-skills.

Scoring the test:

Regarding Scoring the Test, three raters, who were the researchers and two English teachers, were included in the scoring process. They used a key answer to the test, which was prepared by the researchers. The key answer includes the determined score of each item and rubrics of questions. The test involves 38 items. The researchers assigned 4 marks for each item of multiple choice questions, true or false questions and short answer questions. The item of the summarizing question was determined 24 marks. The researchers assigned 8 marks for each item of perdition questions. It was assigned 20 marks for the question "Finish the given short story within four sentences". In addition, 4 marks were identified for rearrangement questions. Thus, the reading comprehension test total score is 196 marks.

Instructions of the test:

Furthermore, the test included some instructions, which were written in simple English to be suitable for primary-fifth pupils' linguistic backgrounds and easy to comprehend. They involved details regarding the test objectives; its elements, the time allocated for answering, its overall score, and the scores assigned to each item.

Validity of the test:

To examine the validity of the reading comprehension test, it was submitted to 9 jury members specialized in TEFL and technology to test the following items:

- I. Reflection of the test items to the aim of the study.
- II. Clarity of the test items.
- III. Relevance of the test items to the desired reading comprehension sub-skills.
- IV. Suitability of the test items to the linguistic background of primary-fifth pupils.

The previous table illustrated that the entire correlation coefficients between each item of the test and the total score were significant at the level of (0.01), where the values of the correlation coefficients ranged between (0.635-0.912). That proved that the quality of the test had appropriate item-to-item internal consistency.

Reliability of the test:

To calculate the reliability of the test, the researchers used the following methods:

The researchers calculated the reliability of the test through using the Alpha-Cronbach equation. The value of the reliability coefficient is 0.776 (See Table 3). This high value confirms the stability of the test.

The test-retest method also was utilized to calculate the test reliability after administering it to 20 primary-fifth pupils, with a two-week interval between the first administration and the second one. The researchers calculated the Pearson correlation coefficient between the pupils' scores in the first administration and their scores in the second administration of the test as a whole. Table 3 clarifies the reliability coefficients of the test.

The coefficient correlations between the scores of the same items in both administrations range between (0,724 - 0.993). These values are significant at the level of (0.01). The total Pearson correlation coefficient value is 0,975, which is significant at the level of 0.01. Thus, that shows that the test is extremely trustworthy and can be relied upon in the present study.

3.11.2 The electronic program Based on Storytelling Skills

Table (2) clarifies that we have developed a program aimed at enhancing reading comprehension skills for elementary school students with learning difficulties.

The program is designed as an interactive digital story program for teaching reading, structured into four stages:

- I. Preparation and Planning Stage:
 - Defining the overall and specific objectives of the program.
 - Identifying the characteristics of the students.
 - Specifying the reading skills to be addressed.
 - Determining the content of the stories to be included.
 - Identifying the situations to be presented on the program screens.
- II. Design and Scenario Preparation Stage:
 - Considering the characteristics of interactive storytelling.
 - Defining the learning model.
 - Designing the screens.
 - Preparing the final image of the scenario.

- III. Implementation Stage:
 - Executing the program on the computer.
 - Collecting and producing multimedia elements.
 - Specifying interaction patterns between students and the program.
 - Reaching the final version of the program.
- IV. Application Stage:
 - Applying the program to the research sample.

4. Results

The first research question states: Is there a statistically significant difference between the mean scores of the experimental and control groups in reading comprehension skills after implementing the electronic program?

Table 3: The Difference between the Means of scores of the Experimental and Control Groups on the Reading Comprehension Skills Test

Group	Number	Mean	Standard Deviation	t-Value	p-Value
Control	30	10.26	1.3	39.44	0.0001
Experimental	30	23.3	1.2		

Table (3) displays the results of the independent samples t-test, indicating a statistically significant difference between the mean scores of the control and experimental groups on the Reading Comprehension Skills Test (t=39.44, p<0.0001).

The obtained p-value, which is less than 0.01, indicates a statistically significant difference between the mean scores of the control and experimental groups in reading comprehension skills after the application of the electronic program. The results favor the experimental group, with a higher mean of 23.3. This implies that the digital story-based electronic program has had a statistically significant positive effect on improving reading comprehension skills for the experimental group compared to the control group.

The second research question states: Is there a statistically significant difference between the pre-test and post-test scores in reading comprehension skills for the experimental group students?

Table 4: The difference between the means of responses of the experimental group on the reading comprehension skills scale

Application	Number	Mean	Standard Deviation	t-Value	p-Value
Pre-test	30	10.2	1.4	56.1	0.0001
Post-test		23.8	1.3		

Table (4) presents the results of a paired-sample t-test conducted to measure the significance of the difference between the mean scores of the pre-test and post-test for students in the experimental group. The analysis revealed a statistically significant difference (p < 0.0001), indicating that there was a substantial improvement in the reading comprehension skills of the experimental group after the application of the electronic program. The mean score increased from 10.2 in the pre-test to 23.8 in the post-test, reflecting the positive impact of the digital storytelling program on students' reading comprehension abilities.

The researchers calculated the reliability coefficient using the Alpha-Cronbach equation, yielding a high value of 0.776, indicating a stable and consistent measure of the skills being assessed. Additionally, the test-retest method was utilized to evaluate reliability, with the Pearson correlation coefficient between initial and subsequent test scores reaching 0.975, signifying strong reliability of the assessment tool.

Statistical testing played a crucial role in determining the effectiveness of the digital program. A paired-sample t-test was conducted to compare the mean scores of the experimental group before and after the program implementation. The analysis revealed a statistically significant difference (p < 0.0001) between the pre-test and post-test scores, indicating a substantial improvement in reading comprehension skills following the intervention. Specifically, the mean score for the experimental group increased significantly from 10.2 in the pre-test to 23.8 in the post-test, highlighting the positive impact of the digital storytelling program on enhancing students' reading comprehension abilities.

Moreover, the experimental design of the study involved a sample of 60 elementary school students, with half assigned to the experimental group and the other half to the control group. The research was conducted during the first semester of the academic year 2023-2024, providing a structured framework for evaluating the effectiveness of the digital storytelling-based electronic program on reading comprehension skills among students with learning difficulties. These statistical analyses offer quantitative evidence supporting the efficacy of the digital program in fostering reading comprehension skills in primary-fifth pupils, emphasizing the importance of innovative educational approaches in enhancing learning outcomes.

5. Discussion and conclusion

The results showed a high level of reading comprehension skills among the experimental group pupils. The study concluded that the possession of reading comprehension skills, (including the ability to focus, extract meaning, understand text structure, identify main ideas, distinguish and evaluate important and secondary information, and engage in cognitive processes like analysis, criticism, imagination, and evaluation) contributed to develop the pupils' reading comprehension.

The research suggests that the high level of reading comprehension skills in students was attributed to the effectiveness of the electronically guided program directed towards them. This aligns with studies by Kotluk and Kocakaya [29] and Robin [35], emphasizing the positive impact of digital storytelling programs on learning.

Digital stories provide a sense of fun, adventure, and excitement, motivating students towards the learning process. This finding is supported by studies such as Anilan et al. [7] and Sadik [36], indicating that the use of digital stories in education adds meaning to the learning process.

The research highlights the importance of psychological and academic support provided by teachers and learning difficulties specialists at school. Additionally, the collaboration between families and schools in monitoring students' behavior and meeting their psychological, social, and academic needs plays a crucial role.

The study underscores the significant role of the learning resource center in considering individual differences among students, implementing tailored intervention plans, and employing multiple teaching strategies. Equipping the learning resource center with tools and resources that attract students' attention enhances their academic motivation, contributing to positive attitudes toward the learning process.

The research results also emphasize the role of digital storytelling in developing reading comprehension skills in the research sample. The positive impact is attributed to the experience gained from digital storytelling, enhancing the effectiveness of students with learning difficulties. Positive experiences based on the effectiveness of digital storytelling provide additional motivation and self-efficacy for overcoming academic challenges, fostering perseverance, planning, and effort, reflected in the development of reading comprehension skills.

In conclusion, the study aligns with existing literature, shedding light on the positive impact of digital storytelling on reading comprehension skills among students with learning difficulties. The results emphasize the importance of employing effective teaching strategies concurrently with the use of multimedia for modern educational technology. This underscores the significance of creating stimulating learning environments to enhance students' skills and capabilities.

This study showed the results of the statistical analysis of the collected data, verifying the correctness of the research hypothesis, the discussion of the results in light of the hypothesis and the challenges that the researchers encountered while implementing the program. Based on the results of the study, it is clear that the Digital Storytelling-Based Electronic Program was effective in developing first-year primary pupils' reading comprehension skills. The program was effective in developing the sub-skills of answering specific questions about a short story; stating reasons for specific events in a short story; mentioning the main idea of a short story; guessing the meaning of unfamiliar words in a text; giving synonyms and antonyms of words; identifying the reference of pronouns; identifying the reference of demonstratives; identifying the reference of non-referential items; suggesting a title for a short story; predicting some events in a narrative sequence; drawing a conclusion for a short story; giving an opinion about the characters of a short story; arranging ideas of a short story in logical sequence; and summarizing a short story. The program allowed the experimental group participants to study English in an enjoyable atmosphere, which in turn helped the pupils develop their reading comprehension sub-skills.

6. Challenges

While implementing the experiment, the researchers encountered the following challenges:

- I. The absence of some participants.

- II. Lack of classrooms and whiteboards, so the researchers sometimes used the library that did not contain a whiteboard.
- III. Taking time to organize the desks and benches in the classroom to be suitable for working in groups
- IV. Some participants needed more practice to make presentations.
- V. Some participants did not take it seriously at the beginning of implementation. However, they reacted seriously after teaching the first lesson and their integration into activities.
- VI. The pupils were not able to use dictionaries at the beginning, so the researchers took additional time to train them how to use digital and paper dictionaries.
- VII. At the beginning of the program, the participants used Arabic to answer the question orally, but gradually in the last lessons, they began to speak English.

7. Recommendation

In light of the results of the study, the researchers suggest conducting the following research:

- I. Conducting a descriptive research to identify primary-fifth pupils' perceptions towards the Storytelling in improving reading comprehension skills.
- II. Using the Storytelling to develop first-year primary pupils' presentation skills in English.
- III. Using the jigsaw narrative strategy in developing first-year primary pupils' communication skills.
- IV. Carrying out research to decide the effectiveness of other new types of the Digital Storytelling in developing primary stage pupils' reading comprehension skills.
- V. Carrying out research to decide the effectiveness of other new types of the Digital Storytelling in developing primary stage pupils' reading comprehension skills.

Acknowledgments: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Project No.: GrantA148]

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