

Original Paper

The Effect of Utilizing Hologram Technology on Developing EFL Communication Skills and Attitudes towards English among Middle School Students

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Abstract

The research investigated the effect of utilizing hologram technology on developing EFL communication skills and the attitudes towards English among middle school students. The Quasi-Experimental approach was adopted (pre/post-test design). The sample consisted of (84) middle school students and was divided into two groups: the experimental (N=42) and the control (N=42). The instruments were prepared by the researcher as follows: (1) An EFL Communication Skills Test included (40) items of listening, speaking, reading and writing skills and (2) An Attitude Scale included (20) items in two dimensions (Attitudes towards language learning and Attitudes towards using language in linguistic communication). The findings showed that there were statistically significant differences at the level of significance ($\alpha \leq 0.01$) among the mean scores of the students of the experimental and control groups in favor of the experimental in the post-application of an EFL Communication Skills test and the Attitude Scale. It was concluded that there is a positive effect of utilizing hologram technology in teaching English communication skills. Therefore, it is recommended to train EFL teachers on using hologram technology inside their classrooms.

Keywords

attitude, communication, English, hologram

1. Introduction

English has become as an international communication language that has made teaching and learning it extremely important. Hence, the Kingdom of Saudi Arabia has directed various educational systems and institutions to seek strategies for developing personal, social and functional communication skills,

taking into account technology in English language teaching.

Labinska et al. (2020, 220) pointed that the main goal of teaching communication skills was to make use of those skills in all areas of students' lives. However, English differs at the levels of communication skills as it focuses on the level of development and measurement of communication skills among students as basic skills. Hence, English language teaching and learning programs emphasizes the development of EFL communication skills.

EFL Communication skills are described as a students' ability to comprehend the audio or read a text and interact with it, and to put forward their ideas to communicate with others easily. Therefore, it is related to a students' skills in listening and reading, as well as oral and written expressive abilities. These skills require diversifying teaching and learning strategies, and adopting the strategies offered by learning techniques that enhance opportunities for interaction between students within educational situations (Helwa, 2019, 2).

Language gains its place from its purpose in developing communication skills, by looking at English as an integrated whole in four main skills: listening, speaking, reading and writing. For example, listening is a cornerstone for developing student's abilities in oral communication skills, reading and writing skills. Thus, emphasis should also be placed on developing communication skills as one of the required skills in the digital age (Al-Dosari & Al-Ruwaili, 2018, 591).

Marquina et al. (2021, 29) indicated that the digital world with its characteristics, tools and digital methods were built on communication skills. With the spread of digital tools, learning and communicating in English has become a necessity. This is reflected in the need to develop teaching strategies, in line with the needs of students and the characteristics of the digital world.

Several studies have shown the importance of utilizing technological applications in teaching EFL communication skills. A study by Alanazi et al. (2019, 28) indicated that technology provides opportunities to integrate visual image and sound with movement, which promotes the development of linguistic communication skills, especially listening skills. It also contributes to simulate many abstract situations that are difficult to address with traditional teaching strategies.

Hologram is based on the practical application of three-dimensional imaging, known as holographic imaging. This is an image of things as the eye sees them in three dimensions, with the same required viewing angle. The most important feature of hologram lies in the interactive feature that it provides – the third dimension. This enhances interactive learning environments, characterised by a degree of flexibility in providing learning without being restricted to a specific time or place, and also allowing the design of scientific content in an interactive form (Abdel Hadi, 2017, 64).

According to Al-Shaalan and Al-Turki (2020, 443), hologram is one of the modern technologies which contributes to strengthen education programs, enhance attitudes as a pictorial educational mediator, and working to motivate and stimulate students mentally and intellectually. This increases levels of motivation and attention in schools, improving cognitive learning skills.

Vatansever and Demiryurek (2019, 124) and Byeon et al. (2019, 77) used hologram for constructing mental images about the concepts contained in the content among students and reducing misconceptions. Additionally, Go et al. (2020, 1) showed how digital hologram promoted deep learning based on the correct understanding of scientific content. Kim et al. (2018, 1) confirmed that holograms eliminated traditional miniature photography, using real images within interactive scientific content, and real situations.

Positively, Radwan and Jagadi (2020, 133) indicated the effectiveness of utilizing hologram in teaching and learning literacy skills. Additionally, Al-Khatahtbeh and Al-Omari's study (2021, 358) used hologram in designing educational units, and developing reflective thinking skills among middle school students. Finally, Al-Tuwairqi's study (2020, 23) proved that the hologram can be used to design digital stories in a more attractive way.

Based on the importance of developing communication skills on one hand, and seeking to utilize technologies, such as hologram, on the other hand, the current research investigated the impact of hologram on developing communication skills among middle school students.

A. Problem tackled in Literature

Reviewing literature concerned the low level of communication, Alanazi et al. (2019, 25) showed that the decline in communication skills can be attributed to the teaching strategies, leading to low levels of motivation among students to learn these skills. Labinska et al. (2020, 220) confirmed the existence of many difficulties that students face in communication skills, most of which are attributed to traditional teaching practices and activities. Movement and attractiveness are ingredients which contribute to enhance the educational situation, develop these skills, and motivating them to communicate in multiple topics.

Despite the continuous increase in the number of students' learning English globally, most of them face difficulties in communication. This is a result of lack of mastery in language skills in a functional way that links teaching and learning activities with the student's life. Among the reasons of this lack is the linguistic anxiety among students, especially during real situations that require them to develop communication skills (Top ı & Bařbay, 2020, 1185)

Naheed (94, 2015) called for moving from traditional programs and strategies for teaching and learning English to functional strategies that connect the student with the digital age and skills, integrating technical tools into educational content with activities addressed by both teacher and student. This necessitates training English language teachers in communicative/interactive methods and strategies.

This was confirmed by the results of the studies of (Marquina et al., 2021; Wieczorek et al., 2021; Al-Shehri & Al Hassan, 2020; Chow & Chui, 2018; Awashriyeh, 2015; and Zoghbi, 2013) which showed low levels of motivation, lack of participation in class and low levels of attention. These practices affect students' skills in learning, which in turn affects communication skills.

On the same regard, Patterson et al. (2020, 279-280) showed that there were low levels of students' communication skills. The teacher bears the burden of diversifying teaching strategies and designing

creative activities in language skills, with a need to link training in these skills and attitudes towards them. Positive attitudes towards learning English ensure continuity, perseverance and motivation, while developing communication skills.

Simacek et al. (2018, 519) pointed that mastering communication skills depended on using visual tools and approaches in language learning, especially in new linguistic concepts and vocabulary, diversifying examples, with a focus on functional examples. It focused on designing practical exercises and activities to train students on communication skills.

Due to the researcher's field experience, an interview with (14) teachers and (3) supervisors, middle school students had low levels in communication skills. This lack might be related to teaching strategies. Teaching practices focused on auditory methods in presenting linguistic vocabulary, rather than teaching English as an integrated whole in its receptive skills (listening and reading) and productive skills (speaking and writing). These practices negatively impacted students' motivation, making negative attitudes towards learning English.

B. Research Problem & Questions

Research problem is determined by the low levels of middle school students' EFL communication skills, and negative attitudes towards learning English. It can be stated in the following four research questions:

- I. *“How can hologram technology be used for developing EFL communication skills among middle school students?”*
- II. *“What is the effect of utilizing hologram technology on the development of EFL communication skills among middle school students?”*
- III. *“What is the effect of Utilizing hologram technology on the development of attitudes towards English as a foreign language among middle school students”?*
- V. *“What is the correlation between the levels of middle school students in EFL communication skills and their scores in attitudes towards it?”*

C. Aims of the Research

The research aimed at investigating:

- I. The impact of utilizing hologram technology on developing EFL communication skills, and attitudes towards English among middle school students.
- II. The correlation between the scores of middle school students in communication skills and their scores in attitudes towards English.

D. Significance of the Research

The significance of the research was as follows:

- I. It may benefit middle school researchers, teachers and supervisors in constructing a theoretical and applied background for utilizing hologram in teaching and learning English.
- II. The planners of professional development programs for teachers may incorporate hologram into training programs and workshops to activate visual learning at the intermediate stage.

E. Delimitations of the Research

- *Objective Delimitations:* the research is delimited to develop EFL communication skills: (listening, speaking, reading, writing).
- *Human Delimitations:* *The research is associated with a sample of middle school students in the first intermediate grade. It includes two groups: an experimental and a control group.*
- *Time Delimitations:* *The research was applied in the first semester of the academic year 1442/1443 AH.*
- *Spatial Delimitations:* *The experiment was applied in the middle schools in Madina El Monawara, Saudi Arabia. Two schools were chosen; one for the experimental, and the second for the control group.*

F. Terminology

- **EFL Communication Skills:**

EFL Communication skills were student's abilities to interact directly or indirectly and transfer knowledge and ideas, through English language skills, including listening, speaking, reading and writing (Taha et al., 2011, 707).

Linguistic communication was the process of sending and receiving components of a message (verbal or non-verbal), based on the partnership between the sender (speaker) and the receiver (listener), to achieve interaction in the transfer of experiences and ideas (Al-Tuwairqi, 2020, 28).

Communication skills were the abilities of the middle school student to develop listening, speaking, reading and writing in interaction, to transfer knowledge and exchange experiences with others inside and outside the classroom.

- **Attitudes Towards English:**

Klosa (2017, 10) defined attitudes towards English as the psychological state that directed and motivated the students towards psychological and academic integration within educational situations with enjoyment and positivity. The student's emotional state was inferred by Al-Zahrani (2012, 21) as a set of indicators, including positive participation in the educational situation, levels of motivation, thinking patterns, opinions about language learning, and other indicators that may affect, negatively or positively, the academic and psychological aspects of the student.

Hence, attitudes towards learning English were the status of the student in the middle school in terms of emotionally expressing an opinion about language learning, which can be inferred from measuring his/her opinion about the content of the courses, teaching strategies, the teacher, and about the importance of learning English.

- **Hologram Technology:**

Al-Shaalan and Al-Turki (2020, 446) defined it as a three-dimensional technical application in imaging or using laser beams to build a near-real image at the same time of objects or individuals, which can be transferred easily.

Muhammad (2020, 153) defined it as a technical application utilized in the visual representation of the

scientific material, allowing students to see the elements of the scientific content and interact with it by hand in the void, without any other educational media.

Hologram can be defined procedurally as: a technology based on visual representations of the course in the first intermediate grade to stimulate students' positivity and interaction with the content, participate in asking questions and discussion, reading through visual texts, and productive writing, to develop EFL communication skills.

2. Theoretical Background

The aim of this section is to shed the light on the hologram, its applications, characteristics as an independent variable, and communication skills as a dependent variable.

A. Communication Skills

Communication skills are pivotal in a student's life for personal, social, academic and future career levels. Seif (2020, 1093) assured that the purpose of language teaching is to communicate. Linguistic communication is determined by a set of skills related to language arts: listening, speaking, reading and writing. These skills range in levels from the first level in acquiring and using them in educational situations, to the functional level which is related to their use in daily life, to the creative level.

Communication is the process of exchanging ideas, and experiences, with the mutual interaction between the parties of communication. The success of this process depends on teaching practices, and the use of strategies that emphasise the student's positivity in connection to the nature of the English as a structure, and connection with the four skills, which require more simulation and repetition, and the embodiment of life situations (Naheed, 2015, 94),

Communication is a process in which the student uses his linguistic knowledge to express his opinion, exchange ideas and experiences with others, and make positive responses and trends among others through the linguistic messages they exchange (Al-Dosari & Al-Ruwaili, 2018, 595).

Linguistic communication is the goal of language teaching and learning, which requires the integration of the four skills into an integrated whole (listening, speaking, reading and writing), as good listening is a condition for understanding and auditory perception, as well as a condition for speaking and reading skills. Reading and speaking skills are a necessary condition for developing writing skills (Ali, 2016, 278).

Most studies such as (Seraoui, 2016, 243; Lagus & Miranda, 2021, 3; Nikolaeva et al., 2019, 225; Al-Tuwairqi's, 2020, 28) classified communication skills into receptive skills (listening and reading) and productive skills (speaking and writing). While Helwa (2019, 4) divided them into personal and interpretive skills.

Through a review of studies including Al-Dosari and Al-Ruwaili (2018) and Ali (2019), a list of communication skills was prepared as shown Table 1:

Table 1. List of EFL Communication Skills

Main Skills	Sub-Skills
Listening	Auditory discrimination
	Connecting ideas
	Identification of the main thought
	Evaluating the audio text
	Making inferences
Speaking	Basic skills in pronunciation
	Making the text coherently
	Intellectual sequential in the text
	Linguistic and grammatical accuracy
	Functional vocabulary
	Personal skills (speech/excitement/body language)

B. Hologram Technology

The word ‘hologram’ consists of two syllables: ‘holo’, which refers to a total, integrated or complex perception and ‘gram’, which refers to a document or record. So ‘hologram’ means a complete record in the linguistic sense.

A hologram is a technology based on laser light waves. This three-dimensional imaging, or display screens are among the developmental stages in e-learning applications, which began with the idea of simulating reality with models that can be integrated into the educational situation. The idea evolved through the development of the zSpace model on which it was built. Hologram facilitates the construction of interactive 3D educational environments.

Hologram can also be used in imaging, information storage, designing three-dimensional models, and in audio-visual presentations, as well as providing a huge library of images for places that are difficult to photograph according to traditional methods (Abdel Hadi, 2017, 74).

Ibrahim et al. (2021, 11) defined it as a visual treatment based on holographic imaging within an interactive learning environment designed to integrate components of hologram, which works to reconstruct or install three-dimensional images that simulate the real reality in a high-quality way. Without changing the dimensions, by using laser beams and electronic digital imaging, this interactive environment allowed the student to interact with the educational experience, making the educational material more attractive and interesting, and increasing the learning stimuli within this educational environment.

Vatansever and Demiryurek (2019, 124) and Radwan and Jagadi (2020, 135) utilized hologram in teaching abstract concepts, especially in the fields of anatomy and biology, which depended on the student’s ability to imagine. It allows building a three-dimensional image or transferring a real event

that builds a mental image among students. It also stems from the need to diversify learning methods to take into account the disparity among students. Hologram among sounds, images, movement, effects and texts, and real learning stems from the transfer of experiences as they are in their real environment.

C. Advantages of Hologram in Teaching English

The studies of Al-Shaalan and Al-Turki (2020, 447), Muhammad (2020, 153), Al-Jalma (2021, 198), and Issa (2021, 1423) demonstrated the effectiveness of using hologram in developing reflective thinking, science fiction, visual and higher thinking skills. It also promotes the development of personal and social skills: self-confidence, self-learning, flexible learning, communication, dialogue and discussion skills, in addition to improving teachers' practices in processing and presenting the scientific content.

Al-Subhia (2011, 3) utilized hologram in the production of visual learning aids through real videos and three-dimensional images, which enhance processing educational experiences, simplify the presentation of concepts and skills, and ensure a high level of attractiveness to process lessons. This leads to high levels of motivation and participation among students. Hologram allows vision from all directions and directs the student to assimilate the details of the presented stories or experiences. Through 3D images, it can also be used by linking with social media and within traditional classrooms. Ibrahim et al. (2021, 13) confirmed that hologram promotes the growth of interactive skills, including discussion and dialogue, positive participation in educational situations, and provides a great opportunity for simulation, which is linked to train students in mental and performance skills. These features contribute greatly to building positive attitudes towards learning environments.

D. Hologram Applications in Education

Muhammad (2020) showed that hologram stems from the principles of many learning theories. It agrees with realistic learning theory which confirms that learning takes place in an educational environment that enhances interactions. It is consistent with the theory of social constructivism, which confirms that learning takes place in an active and attractive educational environment. It is also consistent with the theory of brain-based learning in providing learning for each student according to his abilities, with the need to provide appropriate conditions, bearing in mind that improving learning levels among students depends on improving connections (Neuroticism), which depends on the student's positivity and activity within the educational situation. It is also consistent with the nature of human memory, which builds mental patterns around visual images and retrieve them with a greater degree of speed and accuracy than is the case with traditional learning methods.

It can be concluded that hologram can be helpful at the intermediate stage as it:

- Presents some real societal situations to develop oral communication skills among students.
- Shows some 3D illustrated stories, motivating students to read and comprehend the text.
- Presents audio and visual stories to develop listening skills and auditory perception skills.
- Transitions from traditional to blended learning without being restricted to place or time.

3. Method

A. Research Method

The method relied on the descriptive approach to analyse literature and previous studies on hologram (independent variable) to develop communication skills (dependent variable). The quasi-experimental approach was adopted. The researcher administered the dual design of the experimental and control groups (before and after), while the two groups were exposed to the application of a pre-test for measuring communication skills to verify the equivalence of the two groups, followed by teaching the experimental group using the hologram, while the control group was taught by the usual method. At the end of the experiment, the two groups are exposed to the post-application of the test to measure the effect of the independent variable.

To answer the research questions, a test of EFL communication skills was developed as a tool to measure listening, speaking, reading and writing of first-grade intermediate students. A teaching guide was prepared as the first module in the first intermediate class in the first semester (entitled *Who Are You?*). The content of the test was related to the four language skills in the content of the first unit (entitled *Who Are You?*), as detailed in Table 2.

Table 2. Specifications of the Communication Skills Test

The Lessons	Percentage	Communication Skills				Total
		Listening	Speaking	Reading	Writing	
Where are you from?	20%	2	2	2	2	8
He's a chef	20%	2	2	2	2	8
Day and Night	20%	2	2	2	2	8
Get Sporty	20%	2	2	2	2	8
I'm a student	20%	2	2	2	2	8
Total	100%	10	10	10	10	40

The items of the test were formulated, including objective questions in multiple-choice style (10) items to measure listening and (10) items to measure reading. It also included (10) items in pairing style to measure speaking, the arrangement pattern to form sentences (4) items, the pattern of completion with one or two words (4) items, and the pattern of questions to discover errors in writing sentences (2) items to measure writing. The criteria for correction and grade estimation were determined, as one mark was assigned to each question (zero or one). The test was also presented to (10) specialists in curriculum and Instruction to judge it in the light of the extent to which the items were related to the objective of the measurement, with scientific and linguistic accuracy. Their observations were taken into account.

B. Measuring Validity and Reliability of the Test

The stability of the test was calculated using test-retest method, under the same conditions, and the

reliability of the test was measured on Cronbach's alpha coefficients. Table 3 showed that the correlation coefficients showed a positive correlation, as most of the values of the Pearson correlation coefficient came with a large degree, which was statistically significant at the level of significance (0.01).

Table 3. Pearson Correlation Coefficient between Each Item and Total Score

Correlation Coefficient	N						
Writing		Reading		Speaking		Listening	
0.806**	1	0.676**	1	0.843**	1	0.773**	1
0.833**	2	0.705**	2	0.822**	2	0.709**	2
0.817**	3	0.716**	3	0.738**	3	0.834**	3
0.799**	4	0.737**	4	0.874**	4	0.816**	4
0.725**	5	0.752**	5	0.807**	5	0.724**	5
0.763**	6	0.781**	6	0.856**	6	0.779**	6
0.717**	7	0.690**	7	0.740**	7	0.684**	7
0.844**	8	0.708**	8	0.738**	8	0.765**	8
0.861**	9	0.734**	9	0.766**	9	0.718**	9
0.703**	10	0.769**	10	0.808**	10	0.855**	10

** Significant at 0.01 level

Table 3 indicated the consistency of the test items with an acceptable degree, confirming the validity of the test and a correlation with the goal of measurement represented in the EFL communication skills test.

The stability of the test was also calculated, which means that the tool gives the same results when reapplied under the same conditions, and the reliability of the test was measured on Cronbach's alpha coefficients for its suitability for the application. The results were as in Table 4.

Table 4. Cronbach's Alpha Coefficients to Measure Stability of Test

Cronbach's Alpha Coefficient Value	Number of Items	Communication Skills	N
0.846	10	Listening	1
0.873	10	Speaking	2
0.809	10	Reading	3
0.827	10	Writing	4
0.923	40	Total marks	

It is clear from Table 4 that Cronbach's alpha coefficients were large, and these values indicated a high degree of internal consistency and reliability of the items of EFL communication skills test, which means test reliability and its applicability to the field.

C. Psychometric Properties of Test Vocabulary

Difficulty coefficients were also calculated, where the students of the exploratory sample were arranged according to the test scores as a whole (descending); (27%) were identified from the higher category, (27%) from the lower category, including (10) students in each category. The difficulty coefficient was calculated from the law: Difficulty coefficient = (the sum of the students who answered the item in the upper and lower categories) divided by (the sum of the students of the two categories).

The values of the test vocabulary difficulty coefficients were confined between the two values (0.32-0.71), which were acceptable values in studying the difficulty/ease of the test vocabulary. In the lower category, the number of students in one of the two groups was divided, and its values for the test vocabulary in the current study were limited to (0.31 -0.49). These values indicated the test's validity for use in field application procedures. In light of this, the test was put into its final form.

D. Attitude Scale Towards English

The attitude scale aimed at determining the level of first-grade students' attitudes towards the English language. The scale was linked to two main dimensions: students' attitudes towards learning English, and students' attitudes towards utilizing hologram to develop communication skills as shown in Table 5.

Table 5. Description of Content of the Attitudes Scale for the English Language

Total Number of Statements	Negative Statements	Positive Statements	Scale Dimensions	N
11	3, 5, 7, 11	1, 2, 4, 6, 8, 9, 10	Attitudes towards learning English	1
11	14, 16, 18, 21	12, 13, 15, 17, 19, 20, 22	Attitudes towards language communication	2
22	8	14	Total Attitudes Scale	

The items of the scale were formulated and a triple Likert scale was adopted (strongly agree = 5, agree = 4, agree moderate = 3, disagree = 2, strongly disagree = 1) for the positive items; vice versa while assessing the scores for the negative items. The scale was presented to the jury so they determine the extent to which it is related to the two main dimensions, and its relation to measure attitudes towards the English language in general.

E. Measuring Validity and Reliability of the Attitude Scale

The validity of the scale was measured using consistency validity, by calculating the correlation coefficient between the score of each individual item and the total score of the scale as shown in Table 6.

Table 6. The Values of the Correlation Coefficients

Correlation Coefficient	N	Correlation Coefficient	N	Correlation Coefficient	N	Correlation Coefficient	N
0.858**	17	Second Dimension		0.833**	6	First Dimension	
0.769**	18	12	0.686**	0.819**	7	0.813**	1
0.649**	19	13	0.722**	0.885**	8	0.774**	2
0.728**	20	14	0.874**	0.766**	9	0.682**	3
0.773**	21	15	0.811**	0.743**	10	0.758**	4
0.806**	22	16	0.802**	0.805**	11	0.791**	5

** Significant at 0.01 level

Table 6 showed that the values of the Pearson correlation coefficients between the score of each item and the total score on the scale were positive. This indicated a high degree of items consistency in measuring what was set to be measured.

The reliability of the scale was calculated using Cronbach's alpha coefficient, and the following Table 7 showed these values.

Table 7. Cronbach's Alpha Coefficients Measuring Reliability of Attitude Scale

Cronbach's Coefficient	Alpha	Total Number of Statements	Scale Dimensions	N
0.806		11	Attitudes towards language learning	1
0.874		11	Attitudes towards language communication	2
0.901		22	Total Trend Scale	

Table 7 showed that the values of Cronbach's alpha coefficients came to a large degree in general and at the level of each scale's dimensions, which indicated the reliability of the scale's items using test re-test method. Therefore, the scale of attitudes towards the English language was put into a final form applicable and reliable.

F. Teaching Guide

This section provides the answer to the first research question: *How can hologram technology be used for developing EFL communication skills?*

Teaching guide was prepared for teachers in the first semester for the first intermediate grade. The unit was linked to a set of general and procedural objectives, in addition to defining a set of educational methods, as outlined in Table 8.

Table 8. Objectives of First Unit of Teaching Guide

Who Are You? Objective of Module (1)	The Lesson
To greet people	
To introduce yourself and others	
To ask for and give basic personal information	Where are you from?
To say where you're from	He's a chef
To tell the time	Day and night
To talk about school subjects and what you're good at	Get sporty
To talk about your favourite sports and athletes	I'm a student
To present your family and the jobs they do	
To write about yourself	
The Techniques	The Skills
Listen to vocabulary and repeat.	
Listen to the dialogues	Listening
Listen and read	
Talk in pairs	
Talk using: the verb be	Speaking
Talk using: who, what	
Read the dialogues	
Read again and match	
Listen and read	Reading
Read again and answer the questions	
Write the time	
Complete with the words	Writing
Write a few sentences about	

To determine teaching model according to hologram, many studies were reviewed for utilizing hologram for developing EFL communication skills. This included studies by Al-Jalma (2021); Al-Lihyani and Al-Otaibi (2020); Go et al. (2020); Vatansever and Demiryurek (2019); Salem and Farhoud (2018); Kim et al. (2018); and Abdel Hadi (2017). Thus, it was possible to determine that the stages of teaching, according to the hologram technology, were as follows:

Stage 1: Orientation: presenting the idea of hologram with an introduction, then an illustrated short story or an illustrated conversation was presented between two or more parties. This stage aimed to increase the levels of attention and mental activation of the students, while training them in the skill of listening with visual learning at the same time. At the end of the narrative presentation, the teacher discussed new vocabulary and the central idea in the audio and visual text with the students.

Stage 2: Visual Learning, in which a teacher presented a readable text, where the process of reading the text (visual and audible) was simulated. Students were trained to read the text well, taking into account reading skills (proper pronunciation). At this stage, the teacher made a discussion with students, to develop reading comprehension skills through reading the text.

Stage 3: Linguistic Communication, when real situations were modelled through pictures, digital stories, or infographics. The teacher directed the students to summarise the story, writing a main idea, a comment, or analysing the events, while motivating students during the discussion process to talk about what they found and learnt in the models presented.

Stage 4: Open Communication, when social networking applications were utilized with some applications of hologram technology in images, comics or digital short stories. Students participate together in discussing a set of questions about the story or the readable text through social media, such as a forum private discussion in the experimental group, WhatsApp group, or Telegram group.

G. The Sample

The sample consisted of (84) students of the first intermediate grade assigned into two groups: the first group was the experimental (N=42), and the second group was the control (N=42). The sample was chosen randomly from one school.

H. The Experiment

The objectives of the study were exposed to the sample, and its steps were identified. A teaching guide was presented to the teacher of the experimental group, and the tasks of the teacher and students were clarified in the steps of the teaching model used. The control group was taught using the usual method. Before the experiment, the communication skills test was administered to the sample to determine the extent of the equivalence of the two groups. The results were shown in Table 9.

Table 9. Extent of Equivalence of the Two Independent Groups

Statistical Significance	Degrees of Freedom	Value (T)	Standard Deviation	Arithmetic Mean	Sample	Group	Skills
0.713	82	0.369	0.849	2.905	42	Exp.	Listening
			0.923	2.976	42	Cont.	
0.550	82	0.600	1.094	2.857	42	Exp.	Speaking
			1.088	2.714	42	Cont.	
0.381	82	0.880	1.167	3.619	42	Exp.	Reading
			1.060	3.405	42	Cont.	
0.553	82	0.596	1.564	2.452	42	Exp.	Writing
			1.358	2.643	42	Cont.	
0.859	82	0.178	2.283	11.833	42	Exp.	Total
			2.604	11.738	42	Cont.	

Table 9 and extrapolation of the value of (T) and the levels of significance showed that there were no statistically significant differences at the level of significance (0.01) among the mean scores of the experimental and control groups in the pre-application of EFL communication test in. Attitudinal differences between experimental and control groups were tested with a pre-application of the Attitude Scale in general and each dimension separately. The results were shown in Table 10.

Table 10. Attitudinal Differences between the Two Groups

Statistical Significance	Degrees of Freedom	Value (T)	Standard Deviation	Arithmetic Mean	Sample	Group
0.580	82	0.966	1.858	30.095	42	Exp.
			1.674	30.309	42	Cont.
0.667	82	0.734	1.659	25.690	42	Exp.
			1.380	25.595	42	Cont.
0.830	82	0.503	2.736	55.785	42	Exp.
			2.303	55.904	42	Cont.

Table 10 showed that there were no statistically significant differences at the level of significance (0.01) among the mean scores of the experimental and control groups in the pre-application of the attitude scale in general, and its two dimensions separately. This indicated the equivalence of the two groups towards language learning and language communication.

The experiment was applied, where the experimental group was taught utilizing hologram according to the prepared teaching guide, while the control group was taught according to the usual method. The teachers were followed up during the experiment, and it was noted that there was a high degree of attention and motivation among the students of the experimental group as a result of the use of digital illustrated stories, models, expressive images, sounds, movement and colours. These techniques had a significant impact on the participation of the experimental group in an effective degree.

The experiment was carried out during the first month in the first semester of the academic year 1442/1443 AH. At the end of the experiment, the post-application was administered to test communication skills, monitor grades and prepare for statistical processing of data and presentation of results.

4. Presenting Results & Interpretation

To answer the second question: “*What is the effect of utilizing hologram technology on the development of EFL communication skills among middle school students?*” A post-test was administered to measure the level of communication skills in general, and each skill separately. The value of (T) was calculated for the experimental and control group as presented in Table 11.

Table 11. Results of Communications Skills Post-Test

Skills	Group	Sample	Arithmetic Mean	Standard Deviation	Value (T)	Degrees of Freedom	Statistical Significance
Listening	Exp.	42	8.286	0.834	15.667	82	0.000**
	Cont.	42	5.289	0.918			
Speaking	Exp.	42	8.548	0.632	19.075	82	0.000**
	Cont.	42	5.017	0.997			
Reading	Exp.	42	9.119	0.967	15.516	82	0.000**
	Cont.	42	5.786	1.001			
Writing	Exp.	42	9.357	0.692	19.104	82	0.000**
	Cont.	42	5.283	1.195			
Total Skills	Exp.	42	35.310	1.422	34.593	82	0.000**
	Cont.	42	21.429	2.176			

Table 11 indicated that there were statistically significant differences at the level of significance ($\alpha \leq 0.01$) among the mean scores of the students of the experimental and control groups in the post-application of EFL communication skills in general, and each skill separately, in favor of the experimental group. This indicated the effectiveness of the independent variable in developing the dependent variable.

To answer the third question: “*What is the effect of utilizing hologram technology on the development of attitudes towards English among middle school students?*” the value of (T) was calculated for the two independent groups (experimental and control) in the post-application of the Attitude Scale as outlined in Table 12.

Table 12 Results of the Attitude Scale Post- Application

Skills	Group	Sample	Arithmetic Mean	Standard Deviation	Value (T)	Degrees of Freedom	Statistical Significance
Attitudes towards language learning	Exp.	42	49.143	2.159	37.403	82	0.000**
	Cont.	42	32.738	1.848			
Attitudes towards language communication	Exp.	42	48.214	2.504	29.538	82	0.000**
	Cont.	42	32.142	2.474			
Total Skills	Exp.	42	97.357	3.642	46.278	82	0.000**
	Cont.	42	64.881	2.843			

Table 12 showed that there were statistically significant differences at the level of significance ($\alpha \leq 0.01$) among the mean scores of the students of the experimental and control groups in the post-application of the Attitude Scale towards language in general, and its two dimensions separately in favor of the experimental group.

To measure the effect of hologram on the attitudes towards language, the omega square was calculated. Table 12 showed that the omega square was greater than (0.2), which indicated the effectiveness of the independent variable in developing the dependent variable.

To answer the fourth question: “*What is the correlation between the levels of middle school students’ EFL communication and their scores in attitudes towards it?*” The Pearson correlation coefficient was calculated between the total score of communication skills and the total score in the attitude scale in the post-application in favor of the experimental group as indicated in the Table 13.

Table 13. Relationship Between Scores of the Experimental Group in Post-Applications for EFL Communication Skills and Attitudes toward it

Coefficient of Determination	Type and Grade	Pearson Correlation Coefficient	Sample	Relationship Dimensions
0.667	high positive	0.817	42	Linguistic communication and directions

Table 13 outlined that the correlation between the scores of the experimental group in the post-application of communication test and the attitude scale was positive to a large degree (greater than 0.7), which indicated the large correlation between the two dependent variables. To calculate the significance of the correlation, the Coefficient of Determination was calculated. Table 12 showed that the coefficient of determination was (0.667), and this result indicated that 66.7% of the joint variance could be explained with the knowledge of the two variables, while the rest of the percentage (33.3%) was due to other variables.

It can be concluded that there were statistically significant differences at the level of significance ($\alpha \leq 0.01$) among the mean scores of the students in the experimental and control groups in the post-application of communication test in general, and its skills separately, in favor of the experimental group. There were statistically significant differences at the level of significance ($\alpha \leq 0.01$) among the mean scores of the students of the experimental and control groups in the post- application of the attitude scale in general, and its two dimensions separately, in favor of the experimental group.

These results can be attributed to the use of hologram teaching practices, and diversifying its methods, especially visual learning. This enhances students’ motivation, participation, and reflection. These results were assured by Abu Odeh et al. (2020); Al-Tuwairqi (2020); and Zaki (2017). These studies confirmed the effectiveness of hologram as a digital application, for improving visual learning and

reflection.

These results were also confirmed by Khalil and Youssef's study (2020), which showed the effectiveness of hologram as a result of its uniqueness to meet the needs of students, especially in relation to various learning styles. Radwan and Jagadi (2020) showed the effectiveness of hologram for developing language skills. Finally, the results of the study by Issa (2021), Moussa et al. (2019), Abdel Samad (2018) indicated the effectiveness of hologram in improving students' participation and thinking, especially related to meditation and visual thinking skills which develop communication skills.

5. Recommendations & Suggestions

Based on the results of the research, the following recommendations can be presented:

- Training EFL teachers and supervisors to plan and implement teaching communication utilizing hologram.
- Presenting professional development portfolios/programs for using hologram among EFL teachers and supervisors.
- Preparing teachers to develop communication skills in life situations among their students and take consideration of their attitudes towards English.

More suggestions can be summarized for further research as follows:

- Investigating the effectiveness of hologram in developing reflective thinking, and metacognition skills.
- Researching the impact of hologram-based mobile application on developing EFL pronunciation skills.
- Designing a hologram-based program for developing EFL teaching skills among teachers.

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