A Mobile Learning Environment based on Using Interactive Infographics in Developing Listening Comprehension Skills of English Language among the Students of the Egyptian Japanese Schools

BY

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Abstract

The present study aims to design and identify the effect of a mobile learning environment based on using interactive infographics on developing listening comprehension skills of English language among the students of the Egyptian Japanese schools. The study adopted the descriptive and semi-experimental approach. It was applied in the first semester of the academic year 2020/2021 to a sample of (76) students of the Egyptian Japanese school who study all courses in English. The sample was randomly divided into two groups: a control group consisting of (38) students, and an experimental group consisting of (38) students.

Introduction

Currently, all life areas involve various forms of progress. The global educational systems have attempted to develop educational environments and strategies to prepare a generation that keeps pace with the scientific, technical, technological and cognitive developments.

Teaching foreign languages is substantial in contemporary life. English is the language of the age as well as the first and most common worldwide. Moreover, it is the language of science, scientific researches and modern technology. All countries teach it in their schools and universities. Furthermore, many countries have made teaching English their strategic goal, not as a foreign language, but as an indispensable global language (Al-Ja'eed, 1422).

Teaching English is a controversial issue at the global, Arab and local levels. It also represents a fundamental of the educational system, especially at the Egyptian Japanese schools. Undoubtedly, the Ministry of Education has prioritized teaching English language by providing laboratories, writing books and technological devices. In addition, it has arranged training courses and workshops for the teachers and called for the development of its curricula; Despite the strenuous efforts made by the Ministry of Education, the outcomes of teaching English have not been promising (Al-Shammari, 2012).

Most graduates find it difficult to use English language in their life situations. In addition, few persons tend to learn it because teachers adopt traditional strategies that are inconsistent with the learners' attitudes (Al-Awad, 2001; Al-Zuhairi, 2008; Al-Hamoud, 2009; Al-Salami, 2015). Employing modern technology in teaching English is the optimal solution (Al-Zuhairi, 2008; Al-Sayegh, 2012; Shyamlee & Phil, 2012; Al-Anzi, 2013; Al-Salami, 2014).

Some conferences recommended adopting e-learning and blended learning in teaching, giving concern to a mobile learning environment, publishing and managing educational materials by learners, and using modern programs and technological applications that facilitate teaching English. The most prominent ones are the Conference of Education Technologies and E-learning that was held in the United Arab Emirates (2016), The Conference of Teaching English in the 21st Century: New Perspectives (2014), The International Conference of Language Literature and Culture (2012), the International Conference of Education

Technology and the International Conference of Language Medias and Culture (2015).

Learning environments are among the technological tools that can be employed to achieve the goals of education. Learning process requires a proactive stage of development called non-systemic learning, i.e. learning in an environment where learners learn flexibly according to their needs, tendencies and attitudes (Saleh et al., 2012).

In light of the constant global trends, mobile environments, such as smartphones and tablets, and related applications, are important for learners regardless of their cultural, educational, economic and social levels. Technology has caused remarkable changes in the communication methods adopted by both the teacher and the learner and created a challenge for the teachers represented in their ability to identify how to activate it in teaching and learning process (Drigas & Pappas, 2015).

Mansour (2015) recommended enriching digital content and building knowledge using social networking sites. The Seventh Scientific Conference of the Arab Society for Educational Technology (2011) also recommended employing technological innovations in the educational field and avoiding their stereotypical application as well as directing future studies and research towards interactive learning environments in light of technological changes, which are consistent with the development of information and communication technologies. Abdulaziz (2013) also recommended developing education based on e-learning environments within plans for designing educational situations and activating information and communication technology.

These changes have resulted in the emergence of several patterns and methods of teaching and learning that match the technological revolution that necessitates investing these capabilities to meet the learner's needs using multi-source techniques, such as infographics technology that has various designs. It is the latest technology that is widely used in light of the increasing knowledge, which changes the way of thinking towards complex data and information as well as provides a new form for collecting and presenting information. This form facilitates understanding and disseminating information and helps those in charge of the educational process present curricula in a new and interesting method. This necessitates finding a new method to integrate technology into the educational process and the academic curricula (Shaltout, 2014).

Infographics play a prominent role in the educational process, so Mansour (2015) recommended proposing new methods for using infographics technology in education due to its effectiveness in accelerating learning time and its retention in long-term memory. Al-Quds Open University seminar on "how to employ infographics in the educational process" in 2013, Al-Jeriwi (2014) and Islamoglu et al. (2015) recommended presenting training courses and workshops for faculty members and students to employ it in designing lessons and lectures, as an important source of learning. Matrix (2014), Yeldirim (2016), Awad Allah (2015), Hassan (2016) and Al-Duhaim (2016) asserted that using infographics in the educational process positively affected students as well as maximized their motivation, achievement and interest in educational courses. Curricula have focused on listening because it is the foundation of learning. Teaching English language aims to develop the four skills of language; each skill is important in itself and for the other skills.

Furthermore, language performance is based on listening skill due to its great importance in life and communication skills. It is essential for linguistic development, thinking and comprehension. In addition, it helps the student acquire verbal wealth and vocabulary, learn sentence patterns, receive ideas and concepts, and acquire other language skills: speaking, reading, and writing (Al-Ahmadi, 2015).

Listening comprehension connects between listening and speaking as well as listening, reading and writing. Listening skill cultivates other skills (Al-Anzi, 2013). UNESCO report stated that one obtains 98% of information through listening and vision. Statistical studies showed that student spends (45%) of his/her time listening daily, while other statistics raised it to (52%) (Hijab, 1999).

Since teaching English is a mental process, it is necessary when teaching it to employ everything that develops all skills and activates the roles of the senses to create cause effective education. These needs can be fulfilled through adopting a mobile learning environment based on interactive infographics in developing listening comprehension skills among the students of the Egyptian Japanese schools.

Statement of the Problem and Questions

Despite the importance of listening and understanding what the students listen to, they lack the skills needed to comprehend what they listen to, get ideas of the texts, summarize the audio text, and answer

some relevant questions in the audible text. To assert this, the researcher conducted an electronic survey with close-ended and open-ended questions to a sample of (73) teachers of English language at public schools. The survey aimed to prove if there was weakness in listening and comprehension skill among learners of English language from their point of view. The results demonstrated that (93%) of participants asserted weakness of listening and comprehension skills among most students.

Concerning the results of the open-ended question, (89%) agreed that there was disinterest in teaching listening comprehension skills; (82%) suffered from lack of material facilities as well as computers and English language teaching programs at the laboratories that were badly equipped; (23%) suffered from the insufficient time of the class, which weakens practicing language skills, especially listening skill; and (16%) asserted teachers' disinterest in developing the skill level, as they focus on listening to an audio text rather than realizing and comprehending meaning. Moreover, teachers claim that the following reasons weaken listening and comprehension skill among most students:

- Poor training of students to listening skill.
- Poor interaction between students and teachers in the classroom or lecture.
- Poor curricula neglect listening comprehension skills and prioritize reading, writing and teaching grammar.
- Poor qualification of teachers and faculty members as well as disinterest in using modern teaching strategies that develop students' listening comprehension skills.
- Teachers and faculty members disregard using modern educational technology and advanced techniques as well as their self-development through attending relevant courses that provide them with new teaching skills of English language, especially listening comprehension.

Accordingly, questions have been raised on how to develop listening comprehension skills among the students of the Egyptian Japanese students who study their courses in English. Thus, it is necessary to adopt modern methods and strategies to teach learners listening skill optimally. Based on these results, the recommendations of the previous conferences and studies, the results of the pilot study, and the researcher's sense of conducting this study that benefits the field of

English language teaching, in general, and developing its skills, especially listening and comprehension; the problem of the present study is defined in the following major question:

What is the effectiveness of a mobile learning environment based on using interactive infographics in developing listening comprehension skills of English language among the students of the Egyptian Japanese schools?

It is subdivided into the following minor ones:

1. What are the skills substantial for listening comprehension among the students who study their courses in English in the Egyptian Japanese schools?

2. What is the proposal for a mobile learning environment based on using interactive infographics in developing listening comprehension skills of English language among the students of the Egyptian Japanese schools?

3. What is the effect of a mobile learning environment based on using interactive infographics on developing listening comprehension skills among the students who study their courses in English in the Egyptian Japanese schools?

Objectives

The present study aims to identify the skills substantial for listening comprehension among the students who study their courses in English in the Egyptian Japanese schools as well as design and identify the effect of mobile learning environment based on using interactive infographics on developing listening comprehension skills of English language among the students of the Egyptian Japanese schools

Significance

Significance of the present study stems from the modernity of interactive infographics concept, scarcity of local and Arabic studies that addressed it- to the researcher's knowledge- its association to teaching English language, in particular, and the need to develop listening comprehension skill among learners, especially with the increasing adoption of the Internet as well as digital technology and applications in education.

- The present study helps the officials in the Ministry of Education develop plans, upgrade teaching methods, and give concern to integrating advanced technologies in education programs in line with the vision of the Egyptian Ministry of Education 2030. Al-Khathami (2016) recommended that the concerned authorities should benefit from

producing, managing and providing the content using communication applications on a smartphone. The study also draws the attention of those concerned with education to the necessity of developing methods and skills of teaching English and skills using advanced educational technology.

-        It provides planners, designers and developers of English language curricula with modern teaching methods that present effective skills.

-        It helps students who learn English overcome poor listening and comprehension skills. Scientific research asserted that English language skills are poor in the Arab Republic of Egypt and some Arab countries, especially listening skill (Al-Mutawa, 2008; Majali, 2008; Al-Tuwairchi, 2009; Al-Qarni, 2011)

-        It helps faculty members, teachers and supervisors overcome the difficulties concerning how to develop listening and comprehension skills among students by introducing modern teaching methods and techniques that match the present technology. Furthermore, it presents new diverse methods that help teachers and supervisors when guiding and training their teachers.

-        It enriches the literature and opens new horizons for researchers to conduct further beneficial educational studies in the field of teaching English and linking it to educational technology. In addition, results and suggestions encourage the researchers to conduct new researches that enrich libraries and promote the educational process in line with the requirements of the current and future era.

Accordingly, the study has an interrelated scientific and applied significance because it provides an electronic method in a mobile learning environment using smart devices that learners extensively use and reinforces teaching listening and comprehension skills in the Egyptian Japanese schools that teach in English.

Definition of Terms

Mobile Learning Environment: It is procedurally defined as an interactive interconnected virtual environment that exceeds the limits of time and place. It also adopts the Internet, where interactive infographics are presented synchronously or asynchronously using Telegram application via mobile smart devices that students (i.e. the experimental group) use to develop their listening comprehension skills.

Interactive infographics: They are procedurally defined as mobile infographics that involve data, information, facts and concepts interacting with presentation through pressing keys or moving parts to create interaction among the students who learn courses in English language in the Egyptian Japanese schools and help them comprehend the audio text.

Listening comprehension: It is procedurally defined as a mental process related to the students' ability to receive audio information and the mind's comprehension of the meaning to acquire knowledge in the course of English language teaching methods as well as use the skills of recall, comprehension, interaction, analysis and cohesion that help integrate and activate previous experiences in their life situations.

Limits

- The study was conducted in the Egyptian Japanese schools in Tahta, Sohag Governorate.

- The study was applied in the first semester of 2020-2021.

- The study was applied to the students of the Egyptian Japanese schools who study their courses in English.

- The study was applied to the content of English language course.

- The content was designed using interactive infographics presented in a mobile learning environment via Telegram application.

Theoretical Framework and Review of the Literature

First: Mobile Learning environments

Al-Mutairi and Obeikan (2015) report the interest in employing technological innovations in the educational field, developing mobile educational environments, taking care of capturing students' attention and interest through mobile learning environments and using portable digital and devices, laptops and personal computers provided that they are all equipped with different communication technology, either wired or wireless, that matches the changing circumstances of learning process (Al-Sherbiny, 2016).

Mobile learning has provided more freedom because it occurs inside and outside the educational affiliation, requires light devices with diverse screen sizes, and helps learn flexibly at anytime and anywhere (Arafat, 2010; Drigas & Pappas, 2015; Yurdugül & Menzi Çetin, 2015; Male & Pattinson, 2011; Corbeil, 2010; Michael & Aditya, 2008). This reinforces the role of mobile learning technologies as an active learning environment that helps learners achieve cooperation, share ideas,

exchange knowledge and work freely with each other or with their teachers

According to Harriman (2011), a mobile learning environment is an environment where the learner benefits from mobile devices and their applications that are connected to the Internet, such as personal digital assistants (PDAs), mobile phones, laptops as well as other mobile devices and information technologies that are adopted in teaching and learning.

Al-Sherbiny (2016) states that mobile learning comprises several new applications of teaching and learning techniques and adds a two-aspect value to the educational process: cognitive aspect represented in mastering reading and writing skills as well as research skills, and educational aspect represented in changing behavior, acquiring life skills and developing learner's motivation.

The European Committee for Mobile Learning Projects in Britain, Italy and Sweden focused on identifying the effect of adopting mobile technologies on the performance of learners, teachers as well as designers of curricula and educational programs (Abdelsalam & Al-Tanawi, 2016).

   Several studies addressed mobile e-learning environments and employing modern technologies in learning English language and its skills or other sciences. Abdelaziz (2013) aimed to design e-learning environment based on computer simulation and identify its impact on developing some office work skills. The sample consisted of (62) students at commercial secondary schools. The results showed statistically significant differences in the acquisition of the skills of operating, using and maintaining office equipment in favor of the experimental group. Moreover, there was a statistically significant improvement in learning in favor of the experimental group compared to the control group.

Al-Harbi (2016) identified the impact of language learning using Twitter on developing writing and reading skills and improving motivation in the environments of learning English as a foreign language in the Kingdom of Saudi Arabia. The researcher adopted the semi-experimental approach and applied the study to a sample of (60) students who were randomly distributed to experimental and control groups to study reading and writing course for eight weeks. The results demonstrated high motivation among the students who studied using Twitter. The study recommended

adopting this approach in teaching reading and writing skills of English language.

Al-Zakari (2016) aimed to design a mobile learning environment to learn English as a foreign language and apply it to some secondary school students in the Kingdom of Saudi Arabia. The researcher adopted the semi-experimental approach. The sample comprised (57) 3rd-grade secondary stage students in Riyadh. The results illustrated a statistically significant effect on learning English language vocabulary among the students who used the electronic design. Moreover, there was a statistically significant effect in favor of those who learned vocabulary in a mobile learning environment. The study recommended employing a mobile learning environment in learning English vocabulary.

Al-Khathami (2016) recommended conducting adequate studies on how to activate using communication applications via smartphones to obtain and learn information as well as reinforcing the adoption of social networking applications on smartphones to obtain information.

Currently, we can use several applications to build mobile direct learning environments that support learning activities, data exchange and file transfer; help learn the content at anytime and anywhere; achieve real and beneficial interaction through the integration between the teacher and the learner or learners with each other; flexibly develop learners' skills via broadcasting lectures and discussions; help create a small library of lessons; provide video clips on smartphone applications and help create groups via digital application networks to exchange the content in the form of photos, videos, and documents (Al-Hammar et al., 2016).

Furthermore, applications of mobile learning environments are simple, popular, attractive, and free as well as can be easily installed (Church & de Oliveira, 2013; O'Hara et al., 2014). The most prominent applications of mobile instant messaging are WhatsApp, Line, Telegram, Twitter, Google voice, Tango, Skype, Facebook Messenger, Plus and other applications that allow users to simultaneously send text messages to individuals or groups of friends, share media such as photos, videos and audio files as well as define their location.

Despite the popularity of the aforementioned mobile instant messaging applications, Telegram team stated in August 2015 that (900) million use Telegram application monthly to exchange more than (10) billion messages per month. Although WhatsApp is the most popular instant

messaging application, Telegram provides its users with several features that WhatsApp and other applications lack, such as:

1.   Access to messages using different devices: It enables users to send messages using different devices, via the web, mobile phone or tablet. Moreover, it is available for iPhone, iPad, Android, Mac, Windows, and Windows Phone devices, and Linux or on the web.

2.   Sending large files unlimitedly: WhatsApp allows you to send only images; video, audio and (PDF) files as well as office documents. However, Telegram allows sending an unlimited number of images, videos and compressed files (Zip), audio files (mp3), and text files (doc) up to 1.5 GB per file. Other applications lack these features, so Telegram excels them.

3.   Speed and security: Telegram relies on worldwide servers to ensure speed and security. The company that develops the application stated that it is safer than other instant messaging applications, such as WhatsApp and Line due to the company's reliance on a special protocol (i.e. MTProto), which relies on algorithms that ensure fast and confidential message delivery. Telegram asserts that it protects users' messages from intrusion, marketers and advertising companies, which provides privacy for the user.

4.   Telegram is always free: Unlike WhatsApp provides its users with the possibility of instant messaging with friends for free without showing any ads for one year only, and then it provides its services for $ 1. Telegram is always available for free to its users without the need to pay anything at any time.

5.   Encrypt Chats: Telegram users can start secret chats with friends and all messages are encrypted end-to-end; no third party will be able to read messages other than the sender and the recipient only, even telegram. When you delete any secret conversation, the conversation will be deleted automatically on the other party, and users can activate an option in secret conversations to delete messages automatically less than a minute after sending them.

6.   Channels: The telegram allows you to broadcast messages or content to a large audience. In addition, users of the application can create a private channel to broadcast content with a special link and a private picture, and then others can subscribe to it. When you post any message or new content they will get an alert. Channels are divided into two types: the first is special; the person who created it adds users or

sending them an invitation link to join. As for the other channels, they are public channels that are distinguished by the fact that any user can join them without needing to know his phone number, through a special link. One of the most significant features that distinguish the channels of different types is their availability for the user who joins them and the ability to view the contents of the channel since its starting as soon as he\she joined it (Telegram, 2016).

Because of the benefits and characteristics of the telegram, the researcher aims to employ the Telegram application in this study based on its characteristics and the availability of making a channel with an unlimited group of members, may reach (1000) users. As well, it provides protection for data, encryption of information, safety, confidentiality, and privacy for its users. All of these advantages are consistent with the premises of mobile learning environments and their characteristics and what internationally agreed of e-learning quality standards that emphasize the safe use of technology.

The interest in expanding the use of mobile learning environments in learning; is due to its effective role in improving the educational process, and keeping pace with the developments of the current era. Currently, serious attempts are being made to keep pace with these technological developments and employ them in educational fields in all their forms, such as applications and computer programs and others. Moreover, there are some local and international experiences have received support, and have proven their effectiveness in this field through the diversity and renewal of the studies, experiments and field studies and, that monitor and investigate the impact and effectiveness of learning across mobile environments. The following is a presentation of some of the local, Arab and international experiences in this field as cited in Shawish (2010, p.33)

- *Abu Dhabi and Bahrain experience (in the Arab World)*, Clayt's higher technology experience in Abu Dhabi in 2009 applied a mobile learning model. It was applied to (16,000) students in the Higher College of Technology all over the city and allowed students to deal with the course through a live presentation of lectures, discussion of the lesson, and interaction with it electronically through a mobile learning environment that has all its advantages. In addition, Bahrain started a mobile learning project in 2008. It aimed at developing interactive educational content, that can be downloaded from a mobile phone and

providing   SMS   services   to   request   specificinformation.
• *The Experience of the University of Birmingham in Britain and the University of Pretoria, South Africa in 2005 (internationally)*. A research team at the University of Birmingham applied a 10-months mobile learning environment to master's students in science, where students were provided with materials, learning topics and reports. In addition, the University of Pretoria, South Africa, had experience in using SMS in education, especially for those who have difficulty obtaining learning opportunities due to the constant relocation and permanent geographical conditions.

Second: Infographic

The infographic technology appeared with its various designs to give a new interactive visual form that displays the information or transmits it in attractive images to the learners. The infographic designs are very important because they help the educational process in presenting the curriculum in a new and interesting way; therefore, it is necessary to search for a new way to apply this technology in the service of the educational process and to integrate it in the academic courses (Shaltout, 2014, p. 6).

Yildirim (2016) aimed to find out the significance and place of using infographic as educational material from the learners' point of view. This is a case study, that applied to (64) students from Ataturk University. The results of the study showed that the learners preferred the use of infographics in the learning process rather than the use of regular texts. The results indicated that the infographic ranked the second after the video as the best educational materials used in the learning process from the learners' point of view.

Islamoglu, H., et.al. (2015), aimed at identifying the educational role of infographic. The study is based on analyzing the related studies of using infographic in learning. The findings of the study showed that there was a need for applied methods that enable the teacher to use the infographic during the educational process. In addition, there was a need for effective educational classification of the infographic that focuses on skills and cognitive processes rather than on designing and production elements with establishing a theoretical framework for this topic. The study recommended conducting research on the effectiveness of infographic in specific educational contexts.

To sum up, presenting the educational content and integrating it together to students by using infographics may contribute to luring learners and achieving the objectives of the current study to develop listening understanding following the results of the two previous studies by making the most of the benefits by providing interactive infographics, which allows the learner to receive the amount of information s/he needs to fulfill this curriculum.

There are several definitions of the infographic. Shaltout 2016, defines it as "the art of transforming complex data, information, and concepts into images and drawings that can be understood clearly and with suspense, this method is characterized by presenting complex and difficult information in a smooth, easy and clear manner" (p. 6).

He states that the infographic is divided into two types, and each type has characteristics and programs for its implementation, as follows:
- *The first type* is "the static infographic". It is a static advertisement that is printed, distributed or published on Internet pages. The static infographic content explains some information on a specific topic chosen by the owner of the infographic.
- *The second type* is Animated Infographic, which consists of two parts:
A) Shooting a normal video with data and explanations placed on it in an animated graphic that shows some facts and concepts on the video itself, and unfortunately, this type is slightly in use.
B) Section Two: It is about designing data, explanations and information in a fully mobile form. This type requires a lot of creativity and the choice of expressive movements that help in bringing it out interestingly, as well as having a complete scenario for the final output of this type, and this is the most used type now.

Darwish and Al-Dakhni 2015, aimed at presenting a pattern of (static, mobile) infographic through the web and knowing their impact on learning outcomes. The study used the quasi-experimental approach based on the experimental design, pre and post, and was applied to a sample of (30) children with autism, where the first group studied according to the static infographic pattern, and the second studied according to the animated infographic pattern. the study recommended making use of the infographic technology in both fixed and mobile modes by presenting it in the cognitive structure of the content of the

courses to the class students, and conducting more similar research and application on different educational stages.

Using infographics is as significant as using images and visual information in the teaching and learning processes. In addition, studies proved that the brain's processing of pictorial information as an infographic technique is less complex than its processing of raw texts. Thus, one of the most important reasons that make the brain process photographed information faster by about (6000) times rather than the string data is that the brain deals with the image simultaneously, while it deals with the text in a sequential linear way (Smiciklas, 2012, p.7).

For a clear, distinctive and interactive infographic design. Dai 2014, mentioned that it is necessary to choose the idea and start with an appropriate topic, also to be visually convincing i.e. the psychology of colors and the selection of appropriate color systems to improve the target's memory and content retrieval rate, and clarify the message with clear organizational structures to classify data in an organized structure to produce a funnier Infographic, more understandable and more persuasive, with precise identified signals with those to take a specific action after reviewing the infographic, for example, downloading and registering application and other procedures. The study emphasized that the designer should have a set of inter-skills from multiple scientific disciplines, such as visual design, and has technical and artistic research skills.

McCartney (2013), summarized the advantages of using infographics in the educational process as follows:
- Delivering the complex information in a smooth and simple way.
- addressing the mind with the appropriate preference for visual information, vision, and visual representation.
- Helping the learner to form an overall view of the provided information and knowing the relationships among them, which provide the integration of knowledge within the same field.
- Linking knowledge in different fields.
- Directing the teacher and the learner to focus on comprehension and awareness rather than on the memorization process.
- The low cost of using the Infographic compared to other educational methods.
- It provides an element of thrill and fun in the educational process.

Moreover, what distinguishes the use of infographics in the educational process is that it can be used mostly in natural and human science. In addition, it can be used with all student segments, and also with groups of learning difficulties, as Hassan's, 2016 study, which resulted in showing differences in student achievement compared to the group that had been taught.

The advantages and the characteristics of the infographic greatly contribute to the process of delivering the educational content presented to students in this study. it helps them to understand the methods of activating modern teaching strategies in the English language, with providing a full explanation of each strategy, and focus on The most prominent ideas and the most important fundamentals that distinguish each strategy from others and presenting them in an interactive visual format, which helps the participants to understand and perceive the meanings and relationships among the types of strategies and to differentiate them more easily, with interactive integrating the audio texts.

Noh (2015) aimed to use infographics as a tool to facilitate learning. The study used the experimental method. A sample of (99) learners from the Faculty of Arts and Design of Technology Mara University were chosen randomly. the study revealed that the related advantages with the infographic, such as the use of images and icons, good design, attractive colors, short texts, and graphics can encourage learners to understand better with any amount of information. The study recommended that it is necessary to enhance the infographic, as one of the tools that can be relied upon, to overcome learners' problems, and it should also be used as a tool to transform complex data into an understandable visual display.

Kos & Sims (2014) aimed to know the effectiveness of using the static infographic technique in writing articles for non-English speakers as opposed to other traditional methods. Intermediate level students were selected as a sample of the study all over 5 weeks. The study indicated that infographic as an educational modern technology was better than learning by the traditional ways in learning essay writing skills for non-English speaking students, especially in topics related to creativity and visual imagination, as the infographic had an important role in maintaining the pupils' interest and attracting attention while studying those topics.

Concerning the success of educational technologies in many studies concerned with learning and emphasizing the positivity of the learner and defining the role of the teacher as the facilitator, supervisor, and guide of the educational process, modern studies have focused on strategies based on modern technology. Infographic technology is one of the technologies that provide an active and interactive learning environment. It has proven its effectiveness in teaching various subjects, and this has been emphasized by many previous studies that have been reviewed. Although, the previous studies did not address the impact of mobile environments using interactive infographics in general and the skill of aural comprehension in particular - as far as the researcher knows.

Third: Listening comprehension

Listening is one of the four language skills. It comes in the first rank, followed by speaking, reading, and writing. Listening is focused on collecting ideas through ears that translate the heard word. Some scholars believe that listening is a type of reading, because it is a mean of understanding and language communication between the speaker and the listener. Thus, if the silent reading is the reading by eye and aloud reading is the reading by eyes and tongue, then listening is a reading with the ear accompanied by mental processes that take place in both readings (Al-Bishri, 1999), as cited in Al-Maliki (2013, 44).

Listening comprehension is a mental skill with great importance that helps the learner to build his mental capabilities by engaging in educational activities that integrate new learning and are based on the learner's previous knowledge. It is the main influence on the personality of the learner, his thought, his future, and through it his culture is built. The level of the learner is determined in his ability to understand what he listens to, analyzing it, and interpret the information and data it carries, as well as determine the extent of interaction with the audio material. Therefore, listening understanding is the basis of the linguistic development for learner. It helps him to build his intelligence in general and his linguistic intelligence in particular. The interest in teaching the skills of listening comprehension is f the first stage of education, and it helps learner to simulate the correct pronunciation of vocabulary, acquire high-end linguistic models, master its rules and structures, understand the audio material, and express one freely (Al-Juhani, 2015, p. 189).

It is worth noting here, that it is necessary to pay attention to listening skill for students in general, because it represents the link between other

language skills. Thus, the way to achieve proficiency in reading, speaking, and writing is to develop students' listening skills in the same line with the general objectives of teaching English in the vision of the Egyptian Ministry of Education 2030.

The definitions that dealt with the concept of listening comprehension varied. Al-Maliki (2013) indicated that listening comprehension is: "The student's ability to distinguish and understand what he is listening to with the aim of learning and with the aim of providing him with the etiquette and skills of listening in real- life situations (p.98)."

In addition, Al-Shrairi, (2004) dealt with the concept of listening comprehension as: "A set of mental processes that students undertake to reach the required learning through conscious listening to the received messages, such as the skill of listening comprehension verbatim, interpretative, deductive, inferential, and critical (p.255)."

Listening skills include the following elements:

Listening discrimination: sounds differ from each other in terms of their level, intensity, and pitch of tone in which they appear. The individual's ability gradually develops the feeling and distinction of these sounds, through his different experiences in his daily life (Stankeviciene, 2007)

Listening memory and listening sequence:

This memory is one of the skills that enable the individual to remember a series of thoughts and events, and it is important for the development of his language (Ameen & Barakat, 2012, p.155-156).

Al-Naqaa, and El-Eid (2009) defines the basic skills of listening comprehension, represents in defining the general idea of the audiobook text, remembering some of the information contained in the audiovisual text, distinguishing between the main and secondary ideas in the audiovisual text, realizing the objectives of the audiovisual text, drawing some correct conclusions from the audio text, arranging The ideas contained in the audiobook, the judgment of the audiobook in light of past experiences, and the ability to summarize the audible text.

While Abu Almagd (2015) dealt with listening comprehension skill, and divided them into:

A) - Basic Listening Skills: guessing the meanings of words by listening to audio texts.

B) - Higher comprehension listening skills: Listening to direct and indirect details of audio lectures.

Table (1)
Educators' division of listening skills into four main sections that were mentioned (Ziyad, 2010) as follows

Skill	First: Understanding skills and accuracy consists of:	Skill	Second: Comprehension skills consist of:
Element	1- Willingness to listen with understanding.	Element	1- The ability to summarize the audible.
	2- The ability to confine the mind and focus it on what it hears.		2- Distinguish between truth and fiction from what is said.
	3- Realizing the general idea around which the conversation is talking about.		3- The ability to perceive the relationships among the presented ideas.
	4- Realizing the basic ideas of conversation.		4- The ability to classify the ideas presented to the speaker
	5- Using contextual audio signals for understanding.		
	6- Understanding the partial ideas that make up each main idea.		
	7. The ability to follow verbal instructions and understand what is meant by them.		
skill	Third: Remembering consists of:	Skill	Fourth: Taste and criticism, consists of:
Element	1 - The ability to know the new in the audio.	Element	1- Listening well and interacting with the speaker.
	2- Linking the new acquired with previous experiences		2- The ability to share the speaker emotionally.
	3- Realizing the relationship between hearing from previous ideas and experiences.		3- The ability to distinguish strengths and weakness points.
	4- The ability to choose the right ideas to keep in memory.		4- Judgment in light of previous experiences and their acceptance or rejection.
			5- Realizing the importance of ideas and their suitability for implementation
			6- The ability to predict what the conversation will end up with

Through the previous presentation of the listening comprehension skills and their levels that were useful in preparing the tools of a list of appropriate listening comprehension skills in the current study, it should be noted that developing these skills requires the participation of the effort of both the teacher and the students together to achieve the desired goals. In addition, teachers must fulfill their roles represented in the appropriate selection of the educational material to be heard, providing an appropriate learning environment concerning the students 'levels and abilities, and stimulating the students' hearing with the need to integrate modern technology to teach them the etiquette and skills of listening.

Rubin (1980, p. 45) indicates that the focus on listening and its skills as a basic technique into the teaching of language skills resulting in improving the level of general language performance and oral performance in particular. The student could success in his study according to his superiority in listening skills. In addition, if the student identifies his listening style, s/he can evaluate himself or herself in listening, and in other language skills.

Many studies tackle listening comprehension from different aspects. Al-Maliki (2013), aimed to identify the effect of an interactive video program on developing listening comprehension skills in English among first- intermediate grade students in Altaa'f governorate, where the descriptive approach and the experimental approach were used to achieve the objectives of the study. The sample of the study consisted of (60) students selected randomly and divided into two (control and experimental groups). The results revealed the effectiveness and the impact of the interactive video program used in developing the listening comprehension skill of intermediate first grade students. The study recommended using the interactive video program in teaching English to develop listening comprehension skills, in addition to developing other language skills, such as reading and writing among middle school students. Also, working on developing software and computer programs that contribute to the development of English language skills, especially comprehension.

Mariouma Al-Enezi (2013) pointed out that there are some difficulties may appear in learning listening skill within identifying the difficulties related to learning listening and comprehension skill, which are encountered in the English language department, Faculty of Education for Girls in Arar. The descriptive and analytical approach was employed.

A sample of (96) female students were chosen. The findings revealed that the students face difficulties related to the techniques used by the teacher in teaching, difficulties related to the audio text, difficulties related to listening activities, difficulties related to the listener, difficulties related to the surrounding environment of the listener, and difficulties related to the emotional and psychological side of the listener. The study recommended the necessity of providing an appropriate environment for students by the teacher and emphasizing the importance of using modern educational aids, such as computers and videos. In addition, providing teachers with the latest strategies and techniques used in teaching.

Methodology

The current study used the descriptive approach to build a list of listening comprehension skills in English language. The study also used the quasi-experimental approach applying to two sections of the students of the Egyptian Japanese School in Tahta, Sohag Governorate. One of them was chosen to represent the experimental group, and the other as the control group. By pre- tested of the tools to. The experimental group is exposed to the experimental variable, which is a mobile learning environment based on the use of interactive infographics in developing the listening comprehension skills of the students of the Egyptian Japanese School in Tahta/ Sohag. and the experimental variable was blocked from the control group. Afterword, post- tested of the tools. Thus, the difference in the responses of the two groups on the pre and post scale is resulting from being affected by the experimental variable.

Population & Sampling

The population of the study consists of all students of the Egyptian Japanese School in Tahta, Sohag Governorate, who study their courses in English for the academic year (2020/2021). Their total number is (224) students (according to the obtained statistics). It consisted of two randomly selected sections; (38) students of them represented the experimental group, and (38) students represent the control group. The experimental group was studied using a mobile learning environment based on the use of interactive infographics in developing the listening comprehension skills of the students of the Egyptian Japanese School in Tahta, Sohag Governorate, while the control group studied in the usual way.

Tools

The current study requires a specification of the effectiveness of a mobile learning environment based on the use of interactive infographics in developing listening comprehension skills. The researcher used two tools for the study:

• A cognitive achievement test: it aims to measure the cognitive achievement at the level (analysis, synthesis, evaluation) of topics taught in English.

• Note card: aims to measure the skill aspect of listening comprehension.

Procedures

First: making a mobile learning environment based on the use of interactive infographics for the English language course among students of the Egyptian Japanese School in Tahta, Sohag Governorate, as follows:

1. Determining the content elements of the English language course for students of the Egyptian Japanese School, whose topics were determined according to the course description approved by the Egyptian Ministry of Education, which included four sub-units: Effective Teaching of the English Language Teacher, Teaching English Language Skills, Strategies Teaching and assessment of the English language, employing modern technologies in teaching English.

The validity of the observation card for the listening comprehension:

Validity of Reviewers

The validity of the card is estimated by the apparent validity, i.e. the general appearance of the card in terms of the type of vocabulary, how it is formulated, its clarity, and the clarity of its instructions and their accuracy. To achieve this, the card was presented to a group of reviewers to ensure the accuracy of the instructions, the integrity and the clarity of the procedures of the card's vocabulary, and make any changes if requires. The reviewers' modifications were limited to the arrangement of the sub-skills in the card, and the reformulation of some linguistic vocabulary for this skill. No skills were removed from or added to the card. The reviewers agreed that the note card includes all aspects to be observed and measured, which focused on the listening comprehension skills included in the curriculum.

The validity of the internal consistency:

To verify the internal validity of the listening comprehension skills of the observation card, the researcher applied the research tool to an pilot

sample consisting of (20) students who were not chosen from the basic sample of the research. The "Pearson" correlation coefficient was calculated by the score of each sentence and the total score of the questionnaire, using (SPSS) program. The results came as shown in the following tables:

Table (2)
The items' internal consistency in the list of listening comprehension skills (n = 20)

Dimension	Item No.	Correlation coefficient	Statistical significance	Item No.	Correlation coefficient	Statistical significance
First: understanding and listening comprehension	1	0.558	0.01	2	0.482	0.05
	3	0.545	0.05	4	0.593	0.01
	5	0.605	0.01	6	0.719	0.01
	7	0.893	0.01	8	0.609	0.01
	9	0.856	0.01	-	-	-
Second: Vocabulary	1	0.486	0.05	2	0.593	0.01
	3	0.458	0.05	4	0.501	0.01
Third: Grammar	1	0.743	0.01	2	0.456	0.05
	3	0.744	0.01	-	-	-
Fourth: Phonetics	1	0.464	0.05	2	0.674	0.01
	3	0.643	0.01	4	0.613	0.01

(The tabular value of the correlation coefficient (t) at the significance level 0.05 = 0.444 and at the significance level 0.01 = 0.561)

Table (2) shows that all the items of the observation card are statistically significant with the total score at the significance levels (0.01) & (0.05), and this indicates that all the vocabulary of the observation card have internal consistency.

Table (3)
Internal consistency of the listening comprehension skills dimensions (n = 20)

Sub-dimension	Correlation coefficient of the questionnaire's total score	Statistical significance
First: understanding and listening comprehension	0.783	0.05
Second: Vocabulary	0.837	0.01
Third: Grammar	0.698	0.05
Fourth: Phonetics	0.794	0.01

(The tabular value of the correlation coefficient (t) at the significance level 0.05 = 0.444 and at the significance level 0.01 = 0.561)

Table (3) shows that all the dimensions of the observation card are statistically significant with the total score at the significance levels (0.01). This indicates that all the dimensions of the observation card have internal consistency.

Observation card stability for listening comprehension skills: Stability means "to what degree does the test give close reading positions every time it is used on the same group" (Al-Assaf, 2003, 236), and the researcher verified the stability of the observation card through:

1-   Stability by Cronbach Alpha method: it was used to calculate the stability coefficients for the axes and for the total score of the listening comprehension skill, on the data collected from the pilot sample, and the results were as follow:

Table (4):
Stability coefficient for the dimensions of the list of listening comprehension skills

Sub dimensions	Sub skills No.	Cronbach's alpha Coefficient reliability
First: understanding and listening comprehension	9	0.849
Second: Vocabulary	4	0.913
Third: Grammar	3	0. 798
Fourth: Phonetics	5	0.862
General reliability coefficient	**20**	**0.926**

The previous table shows that the reliability coefficients for the dimensions of the observation card of the listening comprehension skills ranged between (0.798) and (0.913), and the general reliability coefficients were (0.926). This indicates that the observation card of the listening comprehension skills has a high degree of reliability and can be relied upon in Field application.

2-Reliability based on the reviewers' agreement:
The researcher with the help of a colleague has evaluated (7) students from the pilot sample of the listening comprehension skills' observation card. Each observer recorded his observations in light of the skills list indicators. The coefficient of agreement between the observers was
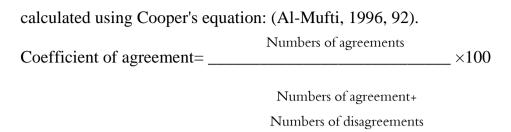
calculated using Cooper's equation: (Al-Mufti, 1996, 92).

Numbers of agreements

Coefficient of agreement= _____ ×100

Numbers of agreement+

Numbers of disagreements

Table (5)
The stability of the list of listening comprehension skills results by the method of the reviewers'' agreement (n = 7)

Observation card dimensions	Agreement No.	Disagreement No.	Agreement coefficient
First: understanding and listening comprehension	58	5	92.06%
Second: Vocabulary	26	2	92.85%
Third: Grammar	20	1	95.24%
Fourth: Phonetics	25	3	89.28%
Total marks	**129**	**11**	**92.14%**

The results of Table (5) indicate that the coefficients of agreement for the observation card axes of the listening comprehension skills ranged between (89.28% - 95.24%). These values confirm that the skills list axes enjoy a high degree of stability, as the general stability coefficient of the list as a whole is (92.14%). It is a value that indicates that the list of listening comprehension skills enjoys a high degree of stability and therefore its suitability for field application.

Third: Designing the achievement test for the English language course:

1-Determining the objective of the achievement test :

The test aims to measure the level of achievement at the level of (analysis - application - evaluation) for the English language students at the Egyptian Japanese School in Tahta, Sohag Governorate, in the English language course after they study the course using a mobile learning environment based on the use of interactive infographics.

2-   Determining the type of items of the achievement test: the researcher examined the different types of tests and measurements, and reviewed previous studies and researches. He concluded that the most appropriate type is the objective test. This is because it is more accurate and effective. Answering objective questions requires that students choose the correct answer from several alternatives, mark it, or complete

a sentence or phrase. The questions should be clear. The researcher used: completion questions, pairing, and multiple choices.

3-   *Formulating and preparing the items of the achievement test in its initial form:* the achievement test in its initial form included 35 items.

4-   *Establishing the grading system:* The grading system was set up in the achievement test, where only one score is given in the case of the correct answer to the item and (zero) in the case of the wrong answer, where the total score for the test was (35).

5-   *Preparing the specification table:* The specification table is defined as a table with two dimensions, one of which represents: the unit content (the topics), and the other represents the learning outcomes (objectives) associated with this content. Determining the initial specifications of the test required the formulation of the expected procedural goals after using a mobile learning environment based on the use of interactive infographics. These procedural goals were designed by the researcher to develop the cognitive aspects of the students of the Egyptian Japanese School in Tahta, Sohag Governorate, at the levels (analysis - application - evaluation) in the English language course.

Table (6)
Summary of the Table of Specifications

Topic	Items No.			Total
	Analysis	Creation	Evaluation	5
1- Effective teaching of the English language teacher	2	2	1	
2- Teaching English Language skills	3	2	2	7
3-Teaching and evaluation strategies for the English language	3	3	3	9
4- Employing modern technologies in teaching English	2	3	2	7
Total (35)	**13**	**12**	**10**	**35**

The validity of the achievement test: It means the validity of the test in measuring what was designed to be measured (Abdul Hamid, 2002, 36). The researcher verified the validity of the test in the following ways:

1- Face Validity of the achievement test: The validity of the test is that the test is correct to measure what it was designed to measure. To

estimate the validity of the test, the face validity method was used (the validity of the reviewers), by presenting the achievement test in its initial form to a group of experts and reviewers in the field. This aimed at identifying the following: the extent to which the items are related to the objectives and their adequacy, the accuracy of the linguistic formulation of each item, the suitability of the suggested alternatives for each question, the scientific accuracy of the terms used in the test, the clarity of the test instructions, and the appropriateness of the grading system.

The reviewers recommended the researcher to modify the linguistic wording of some test items to become clearer, and to modify the alternatives for some items. After taking into account the modifications recommended by the reviewers, the researcher obtained the final version of the achievement test. The number of the test items reached (35). Thus, the test became valid for application to the sample of the study.

The validity of the internal consistency:

In order to verify the internal validity of the achievement test, the researcher applied the research tool to an pilot sample consisting of (20) students who were not chosen from the basic sample of the research. The "Pearson" correlation coefficient was calculated by the score of each sentence and the total score of the questionnaire, using (SPSS) program. The results came as shown in the following tables:

Table (7)
The internal consistency of the achievement test items
(n = 20)

Axes	Item No.	Correlation coefficient	Statistical significance	Item No.	Correlation coefficient	Statistical significance
First Axes: Analysis Level	1	0.502	0.05	2	0.517	0.05
	3	0.475	0.05	4	0.506	0.05
	5	0.537	0.05	6	0.563	0.05
	7	0.517	0.05	8	0.594	0.01
	9	0.533	0.05	10	0.475	0.05
	11	0.664	0.01	12	0.538	0.05
	13	0.564	0.01	-	-	-
Second Axes: Creation Level	1	0.568	0.01	2	0.665	0.01
	3	0.563	0.01	4	0.538	0.05
	5	0.497	0.05	6	0.572	0.01
	7	0.620	0.01	8	0.452	0.05
	9	0.519	0.05	10	0.497	0.05
	11	0.534	0.05	12	0.540	0.05
Third Axes: Evaluation Level	1	0.458	0.05	2	0617	0.01
	3	0.517	0.05	4	0.727	0.01
	5	0.594	0.01	6	0.577	0.01
	7	0.727	0.01	8	0.727	0.01
	9	0.634	0.05	10	0.542	0.05

(The tabular value of the correlation coefficient (t) at the significance level 0.05 = 0.444 and at the significance level 0.01 = 0.561)

Table (7) shows that all the items of the achievement test are statistically significant with the total score at the significance levels (0.01) & (0.15). This indicates that all the items of the achievement test have internal consistency.

Table (8)
The internal consistency of the achievement test axes
(n = 20)

Axes of the Achievement test	Correlation coefficient of the test's total score	Statistical significance
First Axes: Analysis Level	0.944	0.01
Second Axes: Creation Level	0.943	0.01
Third Axes: Evaluation Level	0.929	0.01

(The tabular value of the correlation coefficient (t) at the significance level 0.05 = 0.444 and at the significance level 0.01 = 0.561)

Table (8) shows that all the axes of the achievement test are statistically significant with the total score at the significance levels (0.01). This indicates that all these axes have internal consistency.

Test Reliability: It means that the test gives the same results if it is used more than one time under similar conditions. (Jaber Abdel Hamid and Ahmed Kazem, 1996, 276). The stability of the achievement test was verified through the following:

1-   Stability by Alpha Cronbach's method: The "Alpha-Cronbach's" coefficient was used to calculate the stability coefficients for the axes and for the total score of the achievement test, based on the data collected from the pilot sample, and the results were as shown in the following table.

Table (9)
Stability coefficient of achievement test axes

Axes of the Achievements test	Items No.	Cronbach's alpha Stability Coefficient
First Axes: Analysis Level	13	0.907
Second Axes: Creation Level	12	0.815
Third Axes: Evaluation Level	10	0.779
General Stability coefficient	35	0.882

Table (9) shows that the stability coefficients of the achievement test axes ranged between (0.779) and (0.907) and the general stability coefficient reached (0.882). This indicates that the achievement test has a high degree of stability and can be relied upon in field practice.

2-   Stability by the split-half method: the researcher divided the test items into two halves; odd items versus even items. Then Pearson's correlation coefficient was used to calculate the correlation between the scores of the two halves. The length was corrected using the Spearman and Brown equation, and the results came as the following table shows:

Table (10)
Results of the stability of the achievement test using the split-half method
(n = 20)

Axes of the Achievements test	Items No.	Stability Coefficient
First Axes: Analysis Level	13	0.916
Second Axes: Creation Level	12	0.875
Third Axes: Evaluation Level	10	0.769
Total Marks of the Test	35	0.892

Table (10) shows that the stability coefficients of the achievement test axes using the "half-splitting" method ranged between (0.769-0.916). This indicates that all the achievement test axes have a high degree of stability, and the general stability coefficient of the test as a whole is (0.892). It is a value that confirms that the test has a high degree of reliability.

Calculating the degree of ease and difficulty of the achievement test items:

1- Difficulty coefficient: The difficulty coefficient expresses "the ratio between the number of wrong answers for an item and the sum of the number of right and wrong answers for the same item." (Melhem, 2011) and was calculated by the equation:

Difficulty coefficient= $\dfrac{\textit{No. of students who gave wrong answers}}{\textit{No. of students who tried to answer}}$

Discrimination coefficient: It expresses "the item's ability to distinguish between an excellent student and a weak student in answering the test" (Zaytoun, 2003), and the researcher calculated the discrimination coefficient for each item according to the following covariance equation: (Al-Kinani, Issa, 1995, 146).

Discrimination coefficient $= \sqrt{\text{coefficient of ease} \times \text{coefficient of difficulty}}$

Where: coefficient of ease = 1- coefficient of difficulty. (Al-Sayyid, 2005). The following table shows the values of the difficulty and discrimination coefficients for the items of the achievement test as follows.

Table (11)
Results of the difficulty and discrimination coefficients for the achievement test
(n = 20)

Table (11) shows that:

Axes	Item No.	Difficulty coefficient	Discrimination coefficient	Item No.	Difficulty coefficient	Discrimination coefficient
First Axes: Analysis Level	1	0.40	0.49	2	0.30	0.46
	3	0.35	0.48	4	0.35	0.48
	5	0.25	0.43	6	0.40	0.49
	7	0.30	0.46	8	0.45	0.50
	9	0.40	0.49	10	0.35	0.48
	11	0.35	0.48	12	0.35	0.48
	13	0.45	0.50	-	-	-
Second Axes: Creation Level	1	0.50	0.50	2	0.25	0.43
	3	0.40	0.49	4	0.45	0.50
	5	0.30	0.46	6	0.25	0.43
	7	0.40	0.49	8	0.40	0.49
	9	0.40	0.49	10	0.30	0.46
	11	0.25	0.43	12	0.35	0.48
	1	0.25	0.43	2	0.25	0.43
Third Axes: Evaluation Level	3	0.50	0.50	4	0.35	0.48
	5	0.30	0.46	6	0.40	0.49
	7	0.35	0.48	8	0.35	0.48
	9	0.55	0.50	10	0.40	0.49

-      Difficulty coefficients for the achievement test items ranged between (0.25-0.55), and therefore all test items were accepted as they were at a reasonable level of difficulty, as determined by specialists in the field of measurement and evaluation. (Al Kubaisi, 2007).

-      The discrimination coefficients for the achievement test items ranged between (0.43-0.50), and therefore all test items were accepted as they were within a reasonable level of discrimination, as determined by specialists in the field of measurement and evaluation. (Ouda, 2005).

-      Determining the time of the achievement test when it is applied to the basic research sample: The test time was determined by calculating the time taken by each student of the pilot sample to answer the test questions. Then calculating the average response time, through dividing the sum of the answer times for all sample students by the number of the students. The average time for applying the test was (40) minutes.

-      The final form of the achievement test: After confirming the test's validity and stability, and verifying the appropriateness of its items in

terms of the ease and discrimination factors, the test in its final form became valid for application. It included (35) items, and thus the total score for the test is (35) degrees, and the time available to answer is (40) minutes. Then the test became valid to verify the research hypotheses.

Field application:

1-The students were divided into two groups randomly, one of them is a control group, and the other is an experimental group. The number of the students in each group was 38. The researcher explained the purpose of the experiment to the students and the steps that will be taken during it.

2- Verifying the equivalence of the two groups: The equivalence of the experimental and control groups were confirmed by using the T-test for two independent samples. The statistical analysis was conducted using the statistical package for social sciences "SPSS". The results came as shown in Table (12); the results of this table indicate the following:

Table (12)

The significance of the differences between the arithmetic mean scores of the experimental and control groups in the four axes, and the total score for the pre-application of the list of listening comprehension skills

Axis	Group	No	Arithmetic mean	Standard Deviation	T -value	Significance level
1-Listening Comprehension	Experimental	38	11.079	1.514	0.579	Not statistically significant
	Control	38	11.263	1.245		
2-Vocabulary	Experimental	38	4.848	0.935	0.923	Not statistically significant
	Control	38	5.079	1.050		
3-Grammar	Experimental	38	3.605	0.946	0.882	Not statistically significant
	Control	38	3.789	0.875		
4-Phonics	Experimental	38	4.842	0.973	0.469	Not statistically significant
	Control	38	4.947	0.985		
Total	Experimental	38	24.395	2.138	1.404	Not statistically significant
	Control	38	25.079	2.110		

From the previous table, it is clear that all (T) values for the four axes and the total score of the skills list were not statistically significant, This indicates that both the experimental and control groups are equal in the pre-application of the listening comprehension skills, and after making sure that the experimental and control groups are equal in the pre-application of the listening comprehension skills observation card.

3- The students were trained on some of the skills of using mobile e-learning that are found in the proposed program before application, and ensure the availability of a smart phone and internet for the experimental sample.

4- The control group studied through the traditional lecture method which is represented in the presence of the textbook, and presenting the lectures using PowerPoint presentations. The experimental group studied by using a mobile learning environment through the application of Telegram, and the use of interactive infographics in order to develop achievement in the levels of (analysis - application - evaluation), and listening comprehension skills in the English language course.

5- The experiment lasted (6) weeks, and was applied during the first semester (2020/2021).

Results:

The results of answering the first question: What is the effect of a mobile learning environment based on the use of interactive infographics on developing the achievement in the levels of (analysis - application - evaluation) among students of the Egyptian Japanese School in Tahta, Sohag Governorate?

The researcher using the "T" test for two independent groups to identify the significance of differences between the arithmetic mean grades of the two groups experimental and control group in the post application of the test grades. The researcher also calculated the ETA square equation "η^2" value, and the corresponding "D" value and the size of the effect for the differences between the experimental and control groups in the post-application of the achievement test, and the following tables show the results reached by the researcher:

1-1 Level of Analysis:

Table (13):

The results of the "T" test, the ETA square "η^2" value, the corresponding D" value and the amount of the effect for the differences between the experimental and control groups in the post application of the achievement test at the level of analysis.

Group	No.	Artimatic mean	Standard Deviation	Freedome Degree	T Value	Indication	"η^2" value	D Value	Effect Size
Experimental	38	11.053	1.488	74	8.611	0.01	0.494	1.975	Large
Control	38	7.868	1.727						

As indicated in table (13), there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the achievement test at the level of analysis. The differences came in favor of the students of the experimental group.It is noted from the table that the value of the square of ETA "η^2" value was (0.494), which indicates that (49%) of the variance in the degrees of the level of analysis is due to the use of a mobile learning environment based on the use of interactive infographics. The table also shows that the value of "D" was (1.975), a value that confirms that the use of a mobile learning environment based on the use of interactive infographics has a "large" effect on the development of achievement in the level of analysis of English language students at the Egyptian Japanese School in Tahta, Sohag Governorate.

1-2 Creation Level:

Table (14):
The results of the "T" test, the ETA square "η^2" value, the corresponding "D" value and the amount of the effect size for the differences between the experimental and control groups in the post application of the achievement test at the level of synthesis

Group	N o.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	"η^2" value	D Value	Effect Size
Experimental	38	9.737	1.427			0.01	0.353	1.477	
				74	6.473				Large
Control	38	7.605	1.443						

As indicated in table 14, there is a statistically significant difference at the level (0.01) between the arithmetic mean grades of the experimental group and control group in the post application of the tested grades in the creation level. The differences came in favor of the students of the experimental group. It is noted from the table that the value of the square of ETA "η^2" reached (0.353) this indicates that 35% of the variance in the degrees of the level of synthesis is due to the use of a mobile learning environment based on the use of interactive infographics. It is shown that the value of "D" reached (10477), a value that confirms that the use of a mobile learning environment based on interactive infographics has a significant impact on the development of achievement in the level of creation of English language students at the Egyptian Japanese School in Tahta, Sohag Governorate.

1-3 Evaluation Level:
1-4
Table (15):

The results of "T" test, the ETA square "η^2", the corresponding "D" value, and the size of the effect for the differences between the experimental and control groups in the post application of the achievement test at the evaluation level

Group	No.	Arithmetic mean	Standard Deviation	Freedome Degree	T Value	Indication	"η^2" Value	D Value	Effect Size
Experimental	38	8.526	0.951	74	8.168	0.01	0.467	1.872	Large
Control	38	6.079	1.583						

As indicated in table 15, there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the achievement test at the evaluation level. The differences came in favor of the experimental group students, and it is noted from the table that the value of the square of ETA reached(0.467) which indicates that (47%) of the variation in the evaluation level scores is due to the use of a mobile learning environment based on the use of interactive infographics. The table also shows that the value of "D" reached (1.872),which is a value that emphasizes the use of a mobile learning environment based on the use of interactive infographics that has a great impact on the development of achievement in the evaluation level among English language students at the Egyptian Japanese School in Tahta, Sohag.

1-5 Total score of the achievement test:
Table (16):

The results of the "T" test, the ETA square "η^2" value, the value of "D" and the effect of the differences between the experimental and control groups on the post-application of the achievement test as an overall score.

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	"η^2" value	D Value	Effect Size
Experimental	38	29.316	2.243	74	11.657	0.01	0.643	2.682	Large
Control	38	21.553	3.438						

As indicated in table 16, there are statistically significant differences at the level (0.01) between the artimatic mean scores of the experimental

group and the control group in the post application of the achievement test as an overall score. The differences came in favor of the experimental group students reached (0.643),which indicates that (64%) of the variance in the achievement test scores is due to the use of a mobile learning environment based on the use of interactive infographics. Moreover, the table shows that the "D" value reached (2.682), which is a value that confirms that using the environment of Mobile learning based on the use of interactive infographics has a significant impact on the development of achievement as a total score for English language students at the Egyptian Japanese School in Tahta. The researcher refers the previous result to the students' positive attitudes to using the mobile and the Internet in education and the good selection of infographic applications that were used in designing of English language course content, and keenness on the good selection of the infographic elements that support the course so that they are directly linked to achieving the procedural objectives of the course. In addition, this helped in introducing students to how to deal with electronic content for the infographic-supported course and training them on interaction skills and dealing with it before application. In general, the students prefer the photographic information. The proposed course provided that by designing the static and moving infographic that supported visual thinking, and made it easier for students to acquire information .Also, the continuous communication of the researcher with the students via e-mail to solve any problem facing them during the application (technical or educational), which was reflected on the success of the application.

The results of the current study agree with those of the previous studies regarding the development of mobile education in the cognitive achievement of various subjects such as (Al-Zahrani and Ahmed 2013) in the achievement of chemical scientific concepts, (Kinsara 2016) in the concepts of educational technology, and Al-Ghamdi (2012 AD) in the achievement of the educational software course. This study differs with the previous studies in dealing with the achievement test for the three cognitive categories of the Bloom: Remember Understand and Apply. The studies of (Al-Otaibi and Zidan 2013), (Seo and Choi 2014), and (Dashtestani 2016) are in language acquisition.

The results of answering the second question: "What are the necessary skills for the students of the English language course for listening comprehension at the Egyptian Japanese School in Tahta?. In

order to answer this question, the researcher prepared a list of listening comprehension skills in its initial form, which included 22 items distributed& understanding into four sub-axes.   The first is comprehension and listening comprehension (9 items), the second is language vocabulary (5 items), the third is grammar (4 items) and the fourth is sounds (4 items). Then the researcher presented the list to a group of reviewers.

The reviewers expressed their views on the items of the list in terms of their degree of importance and the degree of connection with the axis to which they belong. Accordingly, one of the items of the second axis (language vocabulary) was deleted, and one of the vocabularies of the third axis (grammar) was deleted due to its lack of relevance to the axis and its low degree of importance. Consequently, the list consisted in its final form of 20 items distributed on four sub-axes, which are explained in Table (18) as follows: The First is listening comprehension (9 items), the second is vocabulary of the language (4 items),the third is grammar (3 items), and the fourth is phonetics(4 items).

The results of answering the third question: "What is the effect of a mobile learning environment based on the use of interactive infographics on developing listening comprehension skills among Egyptian-Japanese school students in Tahta?"

The researcher used the "T" test for two independent groups to identify the significance of the differences between the artimatic mean scores of the experimental and control groups in the post application of the listening comprehension skills observation card. The researcher also calculated the equation of the ETA square "η^2", the corresponding "D" value, and the size of the effect for the differences between the Experimental and control groups in the post application of the listening comprehension skills observation card. The following tables show the researcher's findings:

1-6 Listening comprehension& Understanding skills:

Table (18):

The results of the "T" test ,and the ETA square "²η" with the corresponding "D" value, and the size of the effect for the differences between the experimental and control groups in the post application of the dimension of comprehension, and listening comprehension

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	" η²"	D Value	Effect Size
Experimental	38	25.079	1.440	74	4.973	0.01	0.240	1.125	Large
Control	38	22.605	2.707						

As indicated in table 18, there are statistically significant differences at the level of (0.01) between the artimatic mean scores of the experimental group and the control group in the post application of the dimension of comprehension and listening comprehension, and the differences were in favor of the experimental group. It is noted from the table that the value of ETA amounted to square is (0. 240), which indicates that (24%) of the variance in degrees after comprehension and listening comprehension is due to the use of a mobile learning environment as an observation card on the use of interactive infographics. It appears from the table that the "D" value was (1.115), which is a value that confirms the use of a mobile learning environment as observation card on the use of interactive infographic with a great effect on developing the listening comprehension among English language students in the Egyptian Japanese School in Tahta.

Vocabulary:

Table (19):

The results of the "T" test and the ETA square "η²"with the corresponding "D" value, and the magnitude of the effect for the differences between the experimental and control groups in the post application of the vocabulary dimension.

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	" η²"	D Value	Effect Size
Experimental	38	11.123	0.963	74	1.718	0.01	0.025	0.323	Large
Control	38	10.658	1.400						

As indicated in table (19) that there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the

vocabulary dimension of the language. The differences came in favor of the students of the experimental group. It is noticed from the table that the value of ETA square " η^2" reached (0.025), and it indicates that (0.025%) of the variance in the degrees of the language vocabulary is attributable to the use of a mobile learning environment as an observation card on the use of interactive infographics. It appears from the table that the "D" value reached (0.323). It is a value that confirms that the use of a mobile learning environment as a note card on the use of interactive infographics has a large effect on the development of language vocabulary for English language students at the Egyptian Japanese School in Tahta.

Grammar:

Table (20):
the results of the "T" test, and the ETA square " η^2",with the corresponding of "D" value, and the size of the effect for the differences between the experimental and control groups in the post application of the grammar dimension

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	" η^2"	D Value	Effect Size
Experimental	38	8.447	0.860	74	2.677	0.01	0.076	0.573	Large
Control	38	7.868	1.018						

As indicated in table (20) that there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the grammar dimension. The differences came in favor of the students of the experimental group. It is noticed from the table that the value of ETA square " η^2" reached(0.076), and it indicates that (0.076%) of the variation in scores after grammar scores in the environment of using a mobile learning environment is an observation card on the use of interactive infographics with a medium effect on grammar development among English language students at the Egyptian Japanese School in Tahta

Sounds:

Table (21):
The results of the "T" test, and the ETA square "η²", with the corresponding "d" value, and the magnitude of the effect for the differences between the experimental and control groups in the post application of the counting of sounds.

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	" η²"	D Value	Effect Size
Experimental	38	11.105	1.158	74	5.192	0.01	0.257	1.177	Large
Control	38	9.342	1.744						

As indicated in table (21) that there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the counting of sounds. The differences came in favor of the students of the experimental group. it indicates that (26%) of the variation in the degrees of the sounds is due to the use of a mobile learning environment with an observation card on the use of interactive infographics. It appears from the table that the "D" value was (1.177). which is a value that confirms that that the use of a mobile learning environment as a note card on the use of interactive infographics has a large effect on the development of language vocabulary for English language students at the Egyptian Japanese School in Tahta.

(1-10) Overall score on the listening comprehension skills observation card

Table (22)
The results of the "T" test and the ETA square " η²"and the corresponding "d" value and the size of the effect for the differences between the experimental and control groups in the post application of the listening comprehension skills observation card as an overall score

Group	No.	Arithmetic mean	Standard Deviation	Freedom Degree	T Value	Indication	" η²"	D Value	Effect Size
Experimental	38	55.763	2.583	74	6.354	0.01	0.344	1.449	Large
Control	38	50.474	4.434						

As indicated in table (22) that there are statistically significant differences at the level (0.01) between the arithmetic mean scores of the experimental group and the control group in the post application of the listening comprehension skills observation card as an overall score. The

differences came in favor of the experimental group students. It is noticed from the table that the value of ETA square " η^2 " reached (0.344), which indicates that (34%) of the variation in the scores of the listening comprehension skills observation card as a whole is due to the use of a mobile learning environment as an observation card on the use of interactive infographics. It appears from the table that the "D" value reached (1.449). This value confirms that using a mobile learning environment with an observation card on the use of interactive infographics has a large effect on developing listening comprehension skills as an overall score for English language students at the Egyptian Japanese School in Tahta. The researcher attributes these results to the good design of the interactive infographic elements that were employed within the course activities to develop the skillful aspects of listening comprehension skills, building the practical aspects in the English language course according to the listening comprehension skills observation card, and increasing the number of activities and practical exercises for each skill within the designed course, presenting Feedback on the educational tasks presented to the students in general, especially the practical, during the implementation of the infographic-supported training course.

       The results of the current study agree with those of previous studies regarding in the development of mobile education in the skillful aspects of the English language, such as the study of (Khubyari & Narafshan, 2016) in the skill of reading comprehension, the study of (Najmi, 2015)in directed writing skills, a study of (Wang & Shih 2015) in Learning vocabulary in the English language, and the study of (Al-Ghamdi 2012) which focused on developing educational software design skills. While they differ with the same studies in developing the same skill, which is listening comprehension. The results of previous studies also proved the effectiveness of the infographic in developing various skill aspects, but they differ in the type of skill aspect, such as the study of (Dyjur & Li 2015) in developing skills of the twenty-first century, the study of (Kibar & Akkoyunlu 2015) in employing infographic design as a learning strategy for the purpose of teaching students how to design effective visual messages, and the study of (Al-Jarawi, 2014) in developing the skills of designing electronic mental maps.

Recommendations and Proposals:

• Employing mobile education supported by infographics in designing general education student learning activities in various academic courses.

•Enriching the field of mobile education with more studies and research that support the characteristics that can present using infographics.

• The need to enrich the field of learning English language with more research and studies due to its scarcity.

• Giving courses to Egyptian-Japanese school teachers about interactive infographic design in mobile education systems.

•Re-application of the research, not only at the level of Egyptian-Japanese schools but also all over Egypt, as well as public education schools in Egypt, and showing the impact of mobile learning supported by infographics on the development of other English language skills.

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