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The Effectiveness of Using SCRATCH Applications in Developing Sixth Graders' English Vocabulary, Its Retention, and Self-Efficacy

فاعلية استخدام تطبيقات سكراتش في تطوير مفردات اللغة الإنجليزية واستبقائها وفعالية الذات لدى طلبة الصف السادس

Muhammed Khamees Ihmaid

Supervised by

Awad Suliman Keshta

Prof. of English Teching Methods

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اقـــرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

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نتيجة الحكم على أطروحة ماجستير

بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ **محمد خميس ابراهيم احميد** لنيل درجة الماجستير في **كلية *التربية*/ قسم مناهج وطرق تدريس** وموضوعها:

فاعلية استخدام تطبيقات سكراتش في تطوير مفردات اللغة الإنجليزية واستبقائها وفعالية الذات لدى طلبة الصف السادس

The Effectiveness of Using SCRATCH Applications in Developing Sixth Graders' English Vocabulary, its retention, and self-efficacy

وبعد المناقشة العلنية التي تمت اليوم الاثنين 15 ذو القعدة 1438هـ، الموافق 2017/08/07م الساعة الحادية عشر صباحاً في قاعة مبنى القدس، اجتمعت لجنة الحكم على الأطروحة والمكونة من:

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واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق،،،

نائب الرئيس لشئون البحث العلمي والدراسات العليا

أ.د. عبدالرؤوف علي المناعمة

Abstract

The Effectiveness of Using SCRATCH Applications in Developing Sixth Graders' English Vocabulary, its Retention, and Self-efficacy

Study Aim: This study aims to investigate the effectiveness of using **SC**RATCH applications in developing sixth graders' English vocabulary, its retention, and self-efficacy.

Study Approach: To achieve this aim, the researcher adopted the experimental approach and recruited a sample of (44) EFL male learners studying at Bilal Ben Rabah Elementary School for boys (A) in the middle area of Gaza Strip.

Study Sample: The researcher chose two out of four classes in the school and purposively assigned one class as the experimental group consisting of (22) students and the other as the control group consisting of (22) students. The traditional method was used in teaching vocabulary to the control group, while the scratch applications were used with the experimental one in the second term of the school year (2016-2017).

Study Tools: As a main tool for the study, the researcher used an achievement test of four questions designed and validated to be used as pre- and post test. The test was applied in the beginning to ensure the equivalence of the two groups' achievement levels and then it was applied as a posttest to detect any discrepancies attributable to using Scratch Applictions. In addition, the researcher used the same test to measure the vocabulary retention after using scratch applications then a self-efficacy scale to investigate the level of self-efficacy beliefs to the students gained towards learning English in general and vocabulary in particular.

Study Main Findings: The findings of the study revealed that there were significant differences in learning English vocabulary between the experimental and control groups in favor of the experimental group, and this was attributed to using scratch applications.

Study Most Important Recommendations: Based upon the previous findings, the study recommends the suitability of using Scratch applications in teaching and learning English vocabulary to bring about better results in students' achievement. Also, the researcher suggests that further research should be carried out on the effectiveness of using Scratch applications on teaching different English language approaches as well as other school subjects such as science.

الملخص باللغة العربية

العنوان: فاعلية استخدام تطبيقات سكراتش في تطوير مفردات اللغة الإنجليزية واستبقائها وفعالية الذات لدى طلبة الصف السادس

هدف الدراسة: هدفت هذه الدراسة إلى التعرف على أثر استخدام تطبيقات سكراتش في تطوير مفردات اللغة الإنجليزية واستبقائها وفعالية الذات لدى طلبة الصف السادس.

منهج الدراسة: ومن أجل تحقيق هدف الدراسة، استخدم الباحث المنهج التجريبي.

عينة الدراسة: طبقت الدراسة على عينة ممثلة مكونة من (44) طالب من مدرسة بلال بن رباح الأساسية (أ) في وسط قطاع غزة. اختار الباحث صفين من 4 صفوف في المدرسة وعين أحدهمابطريقة عشوائية كمجموعة ضابطة مكونة من (22) طالباً والأُخرى كمجموعة تجريبية مكونة أيضًا من (22) طالباً أيضاً. استخدم الباحث الطريقة التقليدية في تدريس المجموعة الضابطة بينما استخدم **تطبيقات سكراتش** في تدريس المجموعة التجريبية وذلك في الفصل الدراسي الثاني من العام الدراسي (2016 – 2017م).

أدوات الدراسة: ومن أجل جمع البيانات صمم الباحث اختباراً تحصيلياً مكونًا من 4 فقرات، ومن ثم قام بالتحقق من صدق الاختبار وثباته، وقد استخدم الباحث الاختبار التحصيلي كاختبار قبلي للتحقق من مدى تكافؤ المجموعتين وكاختبار بعدي لقياس أي فروق ذات دلالة إحصائية بين المجموعتين. كما استخدم الباحث نفس الاختبار لقياس استبقاء المفردات بعد فترة أسبوعين من الاختبار البعدي، ثم إستخدم الباحث مقياس فعالية الذات لبحث مستوى الدلالة التي تحققت نحو تعلم اللغة الإنجليزية ومفرداتها.

أهم نتائج الدراسة: خلصت الدارسة الى وجود فروق ذات دلالة إحصائية في تنمية مهارة تعلم المفردات الإنجليزية بين المجموعتين التجريبية والضابطة وذلك لصالح التجريبية تُعزى لاستخدام **تطبيقات سكراتش.**

أهم توصيات الدراسة: في ضوء النتائج أوصت الدراسة بضرورة توظيف **تطبيقات سكراتش** في تعلم اللغة الإنجليزية لتحقيق نتائج أفضل في تحصيل الطلاب، واقترح الباحث ايضاً ضرورة إجراء المزيد من الدراسات للتعرف علي أثر **تطبيقات سكراتش** على مهارات أخرى من اللغة الإنجليزية والمواد الدراسية مثل العلوم.

"وَقُل رَّبِّ زِدْنِي عِلْمًا"

[طه:114]

Dedication

I would like to dedicate my work to

The sake of Allah, my Creator and my Master;

Mohammed (peace and prayers be upon him), the Messenger of Allah and the seal of his Prophets;

My homeland Palestine, the warmest womb;

The Islamic University, my intellectual refuge;

All the great people in my life;

All the martyrs and detainees, who sacrifice every day for Palestine's liberation;

My great parents, who encourage and support me all the time;

My dearest brothers and sisters;

My teachers, doctors, and professors who offered me their endless guidance till I accomplished this great mission;

All my friends and colleagues who gave me a hand many times and in many ways; and to all those whom I owe in my journey to success.

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All praise is paid to Allah for enabling me to complete this study and peace and blessings of Allah be upon the last prophet Mohammed, the first and greatest teacher.

All praise to Allah for enabling me to undertake this research. As Prophet Mohammed (peace be upon him) said, "He who is thankless to people is thankless to God." Therefore, I am truly grateful to all the people who supported me while conducting this study. I sincerely thank all those ones who stood by me and dedicated their time and effort to assist me to accomplish this work.

My deep appreciation goes to my supervisor, Prof. Awad S .Keshta, who guided me all the way throughout my graduate research. I thank him for his patience, generosity, and useful instruction. His meaningful feedback was crucial for the accomplishment of this research. Therefore, I appreciate his help, and strong understanding, which enabled me to take my journey in research work.

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My final and most heartfelt acknowledgement must go to my family, especially my parents, my brothers and sisters, whose prayers, love, affection and supplications guided, helped and stimulated me to complete this work.

Muhammed Khamees Ihmaid

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List of Abbreviations

No.	Abbreviation	Denotation
1	EFL	English as Foreign Language
2	ELT	English Language Teaching
3	ESL	English as Second Language
4	SPSS	Statistical Package for the Social Science
5	MOE	Ministry of Education
6	IUG	Islamic University of Gaza
7	L1	First language
8	L2	Second language
9	MOEHE	Ministry of Education and Higher Education
10	EV3	Evolution of third generation

Chapter 1
Introduction

Chapter 1:
Study Background

1.1 Introduction

Internationally, English is the most commonly used language in business, education and research. Known as EFL, English is now the global common tongue that brings one closer to everything and everyone around the world. Improving the learners' reading, listening and speaking skills in the countries where English is officially the second language is crucial. Therefore, researchers are increasingly focusing on developing the most effective methods that can enhance the students' chances of actual practice in order to improve their achievement and overall attainment.

Considering the recent prominence of the English language at the international level, Arab counties are giving it priority in their school curricula so as to enable their new generations to be in touch with the developments that take place in all sectors of education, commerce, and politics around the globe. According to Keshta (2000), almost every school and university in the Arab region teaches the English language next to the Arabic language. Recently, the Palestinian Authority has inaugurated a project of teaching English starting at the first elementary class. The objective of the project is to enable our students to grasp the language at a young age to facilitate their contact with the language later on. In Palestinian schools, English is considered one of the main subjects (Al-Sofi, 2008). However, (Harmer, 2001) pointed out that despite students were taught Eglish at an early age at Palestinian schools, their achievement in the language was obviously low.

Although people are increasingly intersted in learning new laguages in general, the process of teaching and learning itself seems to have always failed to achieve its best (Karal, 2000). This issue is extensively addressed in reseach, where theories have been articulated, and studies have been conducted, all trying to come up with new efficient ways of teaching foreign languages. Still, learning a language is difficult, and sometimes even disappointing (Lewis & Hill, 1995).

Performance, according to Kara (2009), is also affected by the learners' conceptions and ideas regarding what they learn. Hence, students' unfavorable image towards the English language and its basic skills may have a role in their low achievement. Students who are optimistic about learning a language may –indeed- develop positive attitudes towards it. This, in turn, will encourage them to find the best learning methods, and willingly give the time, effort and research necessary for effective learning. On the other hand, pessimistic conceptions towards language learning may cause class anxiety and low performance (Victori& Lockhart, 1995). As such, learners' attitudes are arguably a main factor of language learning outcomes.

Solving this dilemma of ineffective language learning requires expending tremendous time and effrort at all levels (Deesri, 2002). Teachers need to change the prevalent notion that teaching should be strict, direct and void of any joy or laughter (Kim, 1995, P35). Instead, they should focus on creating an amusing environement, where students can practice the language they learn (Kara, 1992). They should provide the students with a positive and happy learning experience to help them do their best and achieve the best they can while having fun and enjoying themselves.

While receptive vocabulary is the words that students recognize upon reading or hearing, expressive vocabulary refers to the words students actually use in their speaking or writing. Joshi (2005) stresses on the students' need of space and convenient climate for practicing the words they learn, rather than the mere focus on teaching them more words. It is the teachers' responsibility to bridge the gap between the two concepts through offering the students the chance to use their receptive vocabulary. This should reinforce their vocabulary, which will help them to further expand it and retain the words they learn for very long and use them when needed.

Learning foreign language vocabulary might be problematic for students. Understanding the meaning of the words in different contexts is one thing, but effective learning also includes knowing the correct spelling and pronunciation of the words. Choosing the best learning strategy is also an obstacle that faces young learners; should they strictly memorize more words and their corresponding meanings, or practice the words in

convenient contexts? It is the teachers' responsibility to guide their students throughout the learning process and provide them with the appropriate strategies and instructions.

At a time where all aspects of life are changing at a rapid space to cope with the scientific and technological developments, education needs to be improved as well. The teacher plays a major role in making the educational experience successful and fruitful for the student. Teachers are not only instructors who carry the knowledge they know in buckets and pour it into the children's heads; they should rather involve the students in the process and be their guide as well as their friend. A teacher should be a skilled builder of their characters, trainer for their bodies and developer of their intellects (Bourai, 1991).

In teaching a foreign language, such as English, the teacher is responsible for finding the most suitable methods and techniques that can help students grasp the foreign language and make utmost use of their learning process. The classroom environment should be tailored to suit the young learners' abilities, interests and preferences. It should be full of purposeful joy and amusement to attract their attention and give them enough space to practice the English language while having fun and training their imagination (Cakir, 2004). One of the modern techniques that may bring students closer to the ongoing developments and new life requirements is applying technology in the process of language teaching, such as using Scratch applications.

Computers have been widely used in the educational process around the world. Their effectiveness has been an increasingly interesting topic for researchers, who seek to provide the students with the ultimate learning experience. In order for the learning atmosphere to be convenient for the children, it needs to be constantly enthusiastic and vivid. The learning- teaching environment should provide these young students with abundant stimulating elements. Computers do offer such rich environment (Arslan, 2006). According to Donmus (2010), the spreading employment of computers in the educational process notifies us that students may actually benefit from computer programs in learning. It also boosts self-efficacy to the learners and learning process itself.

Many authors (e.g. Colby, 2008; Moberly, 2008; Owston, 2009) are convinced that computer programs can provide high self-efficacy scale and a better learning experience than the old methods, as they can offer the students an environment that matches their interests and attracts their attentiveness. Harb (2007) believes that using computers aims at enabling the students to practice the language they learn. "Computer programs are a good way for practicing language as they provide a model of what learners will use the language for in real life" (Zdybiewska, 1994: p.6). Computer programs, with their features and interactive nature, can strongly motivate students towards learning. They can provide a positive experience to learners at all ages even when the lesson is boring or difficult (Hong, 2002).

Abo Oda (2010) maintained that the problem in students' achievement in the English language is partly attributable to the old techniques employed by teachers. The language instructed to students in a strict rigid fashion without relating it to their surroundings and without motivating some interaction and involvement will frustrate them and hold them back. The researcher, who has been teaching EFL in governmental schools for three terms (6^{th} grade in particular), argues that there are several factors causing the problem. However, most teachers believe that coming up with new original methods can provide a great chance for improving learners' English language skills.

Therefore, the rsearcher is aiming to introduce a new technique comprising several computer programs that will provide the students with a rich interactive environment to reinforce their vocabulary learning experience. Scratch applications can be designed to provide activities that reinforce the school curriculum, which will help both students and teachers and imrove the educational process. The current study aims at investigating the effectiveness of applying Scratch Applications in teaching English vocabulary to sixth graders.

1.2 Statement of the Problem

Throughout the researcher's experience in the field of teaching the English language, he has noticed that students faced great difficulties in vocabulary learning and retention and showed an aversion to English. These problems –the researcher believes may be attributed

to teachers' application of traditional techniques that might hinder students' learning and retention of the English vocabulary. Thus, the researcher feels that there is an urgent need to use new strategies (such as SCRATCH applications) to solve the problems faced by students in developing and retaining vocabulary and self-efficacy, which may positively affect their achievement in English in the future.

1.3 Main Question:

The study problem can be stated in the following major question:
What is the effectiveness of using SCRATCH applications in developing sixth graders' English vocabulary, its retention and self-efficacy?

1.4 Research Sub–questions

The research is directed to answer the subquestions below, so as to meet the objective of the study:

1- What is the nature of Scratch applications intended to be used in teaching vocabulary to sixth graders?
2- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in learning English vocabulary in the pre- posttest?
3- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in learning English vocabulary in the post-test?
4- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in learning English vocabulary in the post-delayed test?
5- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in English self-efficacy scale in the pre- posttest?
6- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in self-efficacy scale in the post-test?
7- Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in English self-efficacy scale in the post-delayed test?

1.5 Research Hypotheses

The research tests the following Hypotheses:

1- There are no significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in learning English vocabulary in the pre- posttest.
2- There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in learning English vocabulary in the post-test.
3- There are no significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in learning English vocabulary in the post-delayed test.
4- There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in English self-efficacy scale in the pre- posttest.
5- There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in self-efficacy scale in the post-test.
6- There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group in English self-efficacy scale in the post-delayed test.

1.6 Purpose of the Study

The overall objective of this study is to improve sixth grade students' English language vocabulary learning through using Scratch applications. Thus, the study aims at:

1- Examining the impact of using Scratch on the 6th graders' improvement of learning vocabulary at government schools in the Middle Area of Gaza strip.
2- Exploring how effective Scratch program is in developing teaching vocabulary among sixth graders in the Middle Area of Gaza strip.
3- Providing recommendations that may contribute to the improvement of teaching and learning vocabulary by Scratch program.

1.7 Significance of the Research

The researcher believes that this study is particularly significant due to the recent introduction of computer programs (Scratch) to the educational process. No other studies have been carried out on this program for teaching the English language in Palestine. Therefore, this study may be of great importance to:

1- Teachers:

The study sheds the light on a new technological application in the teaching process. Teachers may find this new technique very useful, modern, and untraditional for teaching English vocabulary to elementary school students.

2- Decision makers:

The study will hopefullay motivate decision makers to implement Scratch Applications in teaching English vocabulary as well as other English skills and school subjects.

3- School Principals:

The study may convince school principals to encourage teachers to implement new technological techniques in the teaching process. This will surely take effort to update school laboratories and provide sufficient computers and necessary equipment.

4 - Supervisors:

This study may inspire supervisors to train teachers on using Scratch applications in teaching English vocabulary and other materials.

5- Students:

Introducing Scratch Applications to students may encourage them to use it for learning English in general and English vocabulary in particular.

1.8 Limitations of the Research

1. This study will be applied on sixth grade male students enrolled in the academic year 2016-2017 at Belal ben Rabah Boys' School and exclude female learners.

2. The study will be limited to teaching the English language textbook "English for Palestine 6", vocabulary lessons, in units (3 and 4) only.

1.9 Definitions of Terms

- **Effectiveness**: The change in the learners' English vocabulary level that may result from implementing Scratch applications. It is operationally defined as the scores a student gets on the post vocabulary test.
- **SCRATCH:** A graphical programming language designed to gather codes and contains no errors. Each pattern has a different function, shape, and colour to ease editing, developing, and implementing. Users produce animations, stories, interactive games, and multimedia; which means providing a chance to improve the skill of imagination, planning, and designing. (Abonab'a, 2013) It is operationally defined as an educational teaching program where the teacher designs English vocabulary lessons/exercises in order to help students memorize these words and retain them.
- **Sixth graders: T**he pupils who are enrolled at the 6th grade at the basic schools in the Gaza Strip and West Bank who are seeking learning and acquiring English language. They are between 10 and 11years old.
- **Vocabulary:** Vocabulary is one of the language system components that is important to be learnt. It plays an important role in the four language skills. By mastering vocabulary, students will be able to produce many sentences either in spoken or written texts. Roger (2006), as cited in Aisyah (2002), defines vocabulary more widely as an alphabetical list of words often defined or translated. Saputra (2007) gives a comprehensive definition of vocabulary and describes it as all the words that are used in a language, have meanings and consist of some parts like verbs, idioms, pronunciation.

- **Retention:** Richards and Schmitt (2002, p.457) define retention as "the ability to recall or remember words after interval of time".It is operationally defined as the time learners can keep maintaining vocabulary for the long-term memory.
- **Self-efficacy**: Self-efficacy refers to an individual's belief in his or her capacity to exhibit behaviors necessary to produce specific performance attainments (Bandura, 1997). It is operationally defined as the level learners feel more comfortable and valuable where they can be capable to deal with various circumstances.

Chapter 2

Theoritical Background

Chapter 2
Literature Review

This chapter presents the literature review pertaining to the study variables: Scratch, Vocabulary and self-efficacy. The second section of this chapter presents the previous studies followed by commentary on each domain of the previous studies.

2.1 Scratch Programme

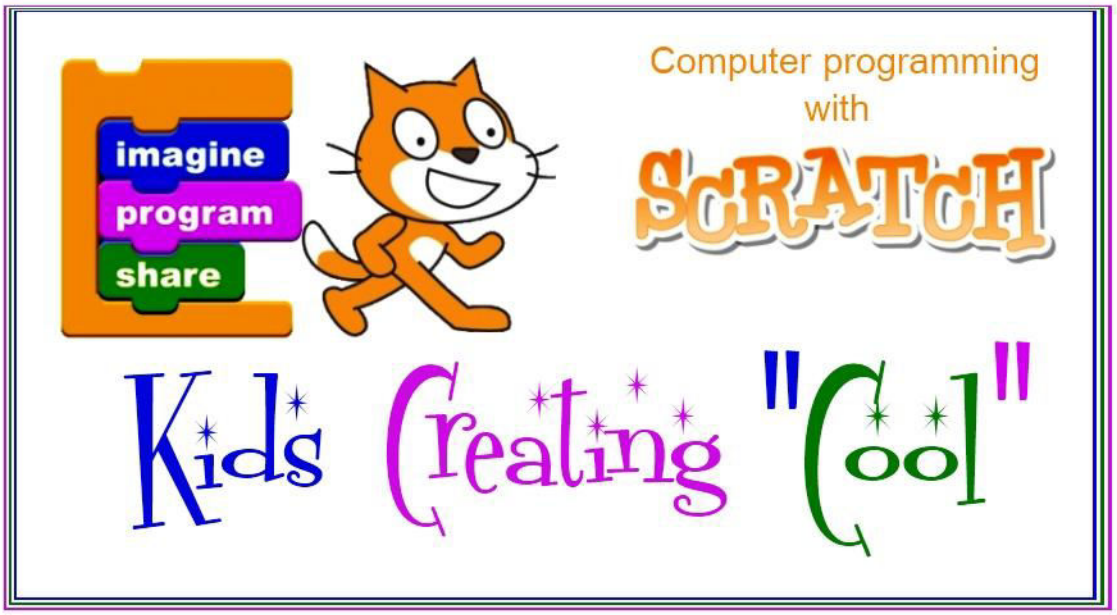


Figure (2.1): Scratch Face

In the process of teaching, teachers ought to be very innovative in order to keep up with the new developments appearing in the field of Education. Teachers should delve into the new strategies and technologies that largely assist their students to be more skillful and gifted. Scratch is one of the important programmes in the field of education through media applications. Such step can make students more innovative.

Students can develop their abilities if they have the opportunity to do so. The educational process can be student-centered when it offers the chance for each learner to do the activities based on his/her pace and interests. Students should have the opportunity to be

provided with situations for cognitive management, problem-solving and skills training (Office for National Education Standards and Quality Assessment, 2006).

There are many useful dimensions for Scratch programme that could be easily used by students to develop their abilities. Maloney et al. (2004) added that when students worked independently on expressive Scratch projects, such as animated stories, games, and collaborative art; they would improve technological facility and problem solving skills. Students can use Scratch symmetrical and measurement concepts like organizing and measuring angle and length.

Ford (2008) confirmed that Scratch programme is one of the educational programming languages (EPL) which is adopted to enhance creativity and problem-solving methods to learners. Problem-solving methods could be simply grasped by programming language based on numerous blocks.

Figure (2.2) Images of Sample Games

2.2 Scratch Emergence

Brennan, (2012) noted that Massachusetts Institute of Technology produced Scratch programme in which learners have the ability to write object-oriented programs.

Scratch first emerged in (2007) and has been developed until it reached Scratch 2.0. The people who are registered in Scratch programme are about (4636281) users and the projects that were registered in Scratch programme were (7164612) projects (Obri, 2014).

The distribution of Scratch users according to their Age

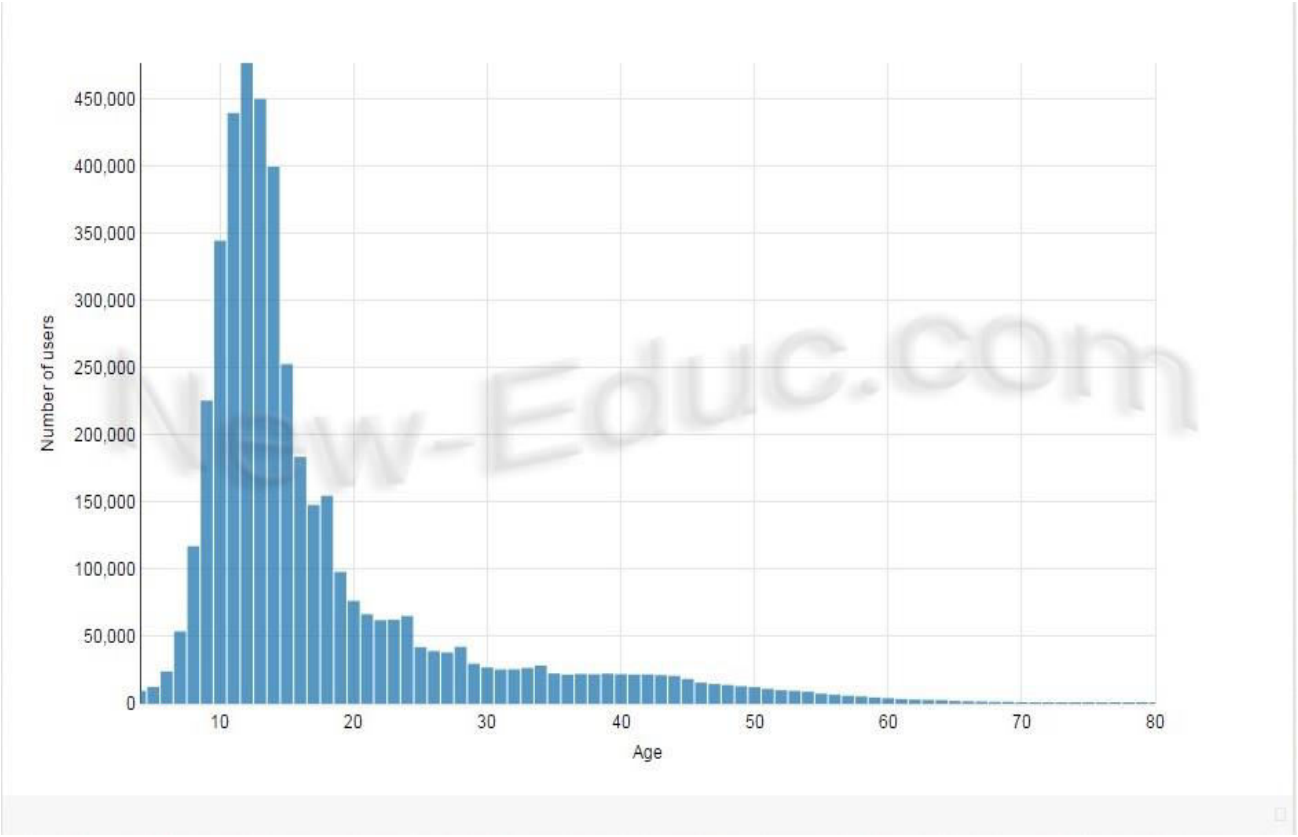


Figure (2.3): The distribution of Scratch users according to their Age

As the chart shows, the number of Scratchers has raised rapidly until it reached more than (450,000) users. Most of the users are between 10 and 15 years old. This means that the population of Scratch is the young learners - and this indicates that Scratch is appropriate for elementary graders. This totally conforms to the current study which aims to find the effectiveness of using Scratch applications in developing sixth graders' English vocabulary, its retention, and self-efficacy. The sample of the study is 6^{th} graders and this means that

children will enjoy it. Scratch official online page (https://scratch.mit.edu/) now contains various works for different users, videos, information for parents and full details about Scratch.

According to Scratch official online page, Scratch is used now in (150) different countries and it is available to users in more than (40) languages, including English and Arabic. The website adds that Scratch is suitable now for all graders, from elementary school to college. Scratch is used in many fields such as computer sciences, math, social studies and languages, Sharples, et al. (2014, p 26) stated in 2008 that there was a conference convened by hundreds of researchers, developers and educators. It was the first annual Scratch Conference. On that conference, there was no attention to the young people who participated in making up the Scratch Community. After that date, users of Scratch began gathering each year to celebrate their programming projects. In 2014, there were more than (250) Scratch Day events convened in (56) countries. In those events, Scratchers conducted sessions to discuss their programs, and online galleries.

Figure (2.4): A Scratch Day project shared online by Crazy Nimbus.

Many of the 1320 comments refer to reuse of the software, or to understanding how this short program works, adopted from: Sharples, et al. (2014, p. 26)

2.3 Definition of Scratch

Scratch is a completely multimedia environment. It allows students to use a diversity of files to help them in their learning. Peppler&Kafai, (2006) affirmed that Scratch was considered one of the media-rich digital environments, which facilitated a structure block mastery to design audio, graphic and video.

Scratch is aimed at programming language education and designed by Lifelong Kindergarten, MIT Media Lab. The name, Scratch, derives from the music turntable technique of scratching, which means that we can program freely using blocks by just combining elements (Young, 2007). Scratch has many advantages and it is a framework based on Piaget's constructivism. This means that it could be programmed by a drag and drop of blocks, similar to putting the pieces of a puzzle together (Buckleitner, 2007).

Obari, (2014) said that Scratch was a simple and easy programming environment. It was originally invented for kids. Scratch was developed by Life Long Kindergarten Group in Multi-Media Institute in Massachusetts in America. Scratch programming allows children to develop their skills and create their own games and stories. It is a free and open programme.

Sharples et al. (2014, p. 26) defined Scratch as "a free programming language, designed for children who are learning to program. The Scratch website brings together a user community that shares and builds on the stories, games and animations created by others around the world."

According to Gülbahar&Kalelioğlu (2014, p 34), Scratch is a software programme that can be applied to program games, short stories and animals' pictures. It can share all the creations with others in the online community. Hence, Scratch aids learners to creatively and systematically think, and work two-way. All these aspects are highly recommended to be amongst the 21st century students. Scratch was developed at the MIT Media Lab and is free of charge. Lamb and Johnson (2011, p 64) commented on Scratch by saying that "In

computer software, scratching refers to reusable pieces of code that can easily be combined, shared, and adapted. Students can create stories, games, art, music, animations, and much more". When students use Scratch, they can make projects by using downloaded or web-based software, and then uploading their projects to the Scratch online site to be shared.

2.4 How to Use Scratch

It is easy to begin with scratch. Lero, (2014, p9) clarified the steps of starting Scratch, "Once the offline editor is installed, start it and click on Tips, Getting Started. The Scratch Project Editor is described under Tips, Getting Started, and Map of Project Editor. Click on this to view the details of the Project Editor. Next, start the Step-by-Step introduction. Step through each of the 13 steps in the Step-by-Step introduction. This Step-by-Step guide introduces fundamental programming concepts and allows participants become familiar with the Scratch programming environment."

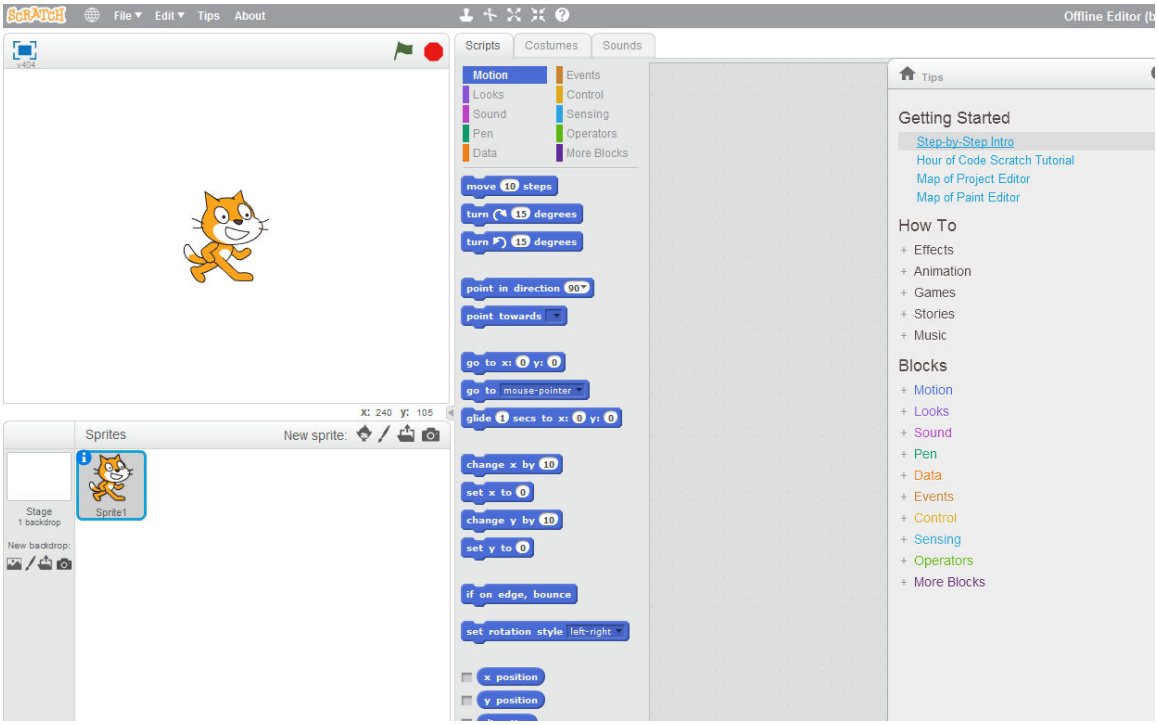
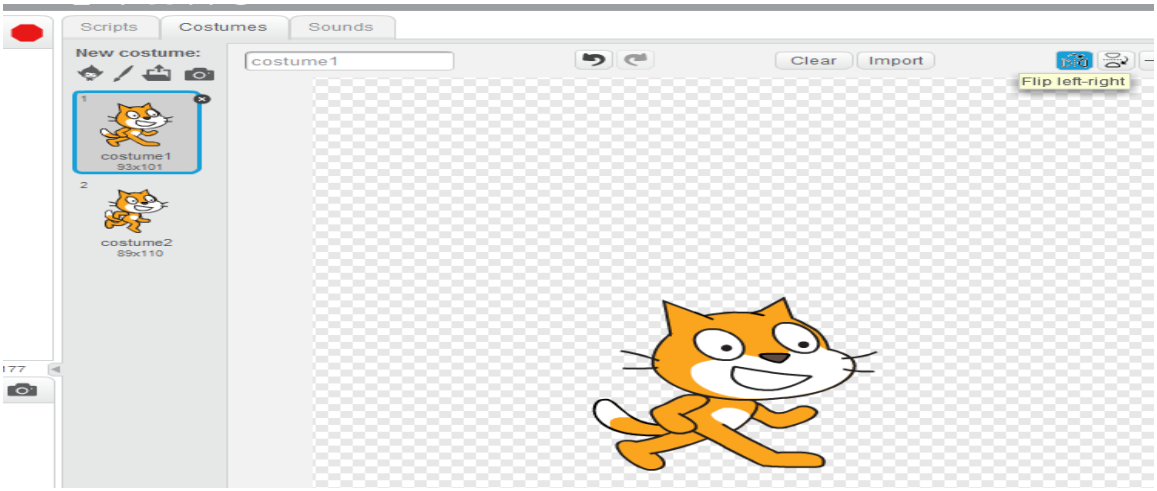


Figure (2.5):How to start with Scratch

2.5 Communicating in Scratch

Scratch uses Broadcast to contact between different parts of programme and spirits. Broadcast is a beneficial tool to take control of the stream of the program. It is designed to send messages from one spirit to another. It is like radio signal. The following are the steps of how we can communicate using Scratch.

1. Choose two spirits from the spirits folder.
2. Code each spirit to face the other. (see the photo)



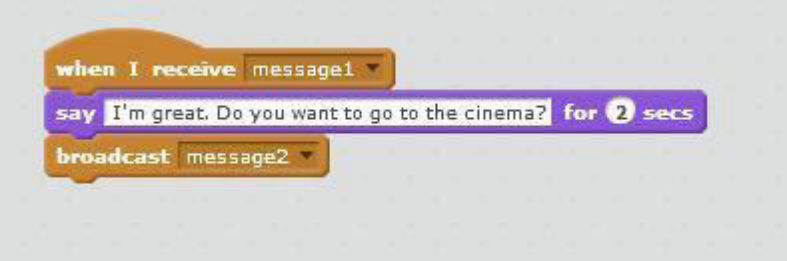
3. Name your spirits and make sure that the spirits are highlighted in blue. See the photo below

4. Use the purple Looks Palette. (See the photo)

5. Sending a signal indicates that the first spirit has finished speaking in order to make the second spirit speak.
6. Click on the Events Palette.
7. Pull out the "broadcast" block. Click on the black dropdown arrow. Select message (1) or make a dissimilar name of your choice to name the message.
8. Broadcast your work on the code. Please, do not make it appear on the stage.

9. Program your second spirit.
10. Click on the second spirit in the Spirit Area.
11. Drag "When I receive message 1" block from the Control Palette or use the dropdown arrow to choose the name of your broadcast message. You can then answer and ask something else.

12. Add a second broadcast to this piece of code.



13. Continue this way until the conversation is complete, Lero, (2014, pp 19-21).

2.6 Scratch Programme in Learning

The use of programming in education is not a modern trendency; back in the 1960s, Seymour Papert created the logo programming language. He allowed young learners to use computers to make their music, games and drawings (Papert& Solomon, 1971). Yet in the recent years, new visual programmes such as: Scratch, Alic and Kodu have enhanced the attentiveness of the educational process. Those programmes aimed to improve learning products and motivation among students (Resnick, 2013).

European Schoolnet Report (2014) announced that many governments all over the world were trying to incorporate computer programming as an integral part of their educational system. The report affirmed that there were already nine European countries implementing that idea. Those countries were Denmark, England, Poland, Ireland, Greece, Estonia, Bulgaria, Cyprus and Portugal.

There are many endeavors in order to effectively make computer programs and games easy for learners' use in different grades and ages. In this regard, many computer programs have been developed to suit students' levels and attention. Scratch is one of those programmes that were invented to address students' levels and education aims. Scratch can easily attract students' attention to the lesson being explained (Papatga&Ersoy, 2016, p. 126).

Scratch has many benefits in the learning process. First, it enhances collaborative work. In this respect, Lewis (2011) conducted a study in order to use Scratch in designing learning environments. The study aimed to assess students when they worked in programming in pairs. The study showed that using Scratch supported collaborative and pair learning.

Scratch is a way for creating entertainment among learners. Lee (2011) made a study in which he concluded that learners could get many benefits from Scratch such as entertainment and becoming creative workers involved in interdisciplinary curriculum materials. He commented on Scratch efficacy that it unleashed students' imagination in their tasks to produce more meaningful activities.

Scratch enhances students' problem solving strategies. Shin and Park (2014) confirmed that Scratch was an interactive tool to develop students' problem-solving activities. In a study titled "A Study on the Effect affecting Problem Solving Ability of Primary Students through the Scratch Programming.", they proved that Scratch confirmed and expressed students' thinking – especially for primary students. In the same vein, Calder (2010) made a study to prove the efficacy of Scratch to develop problem solving in math. He argued that Scratch played an integral role in enhancing students in problem-solving skills and in making students engage actively in motivating programming environment.

Obri, (2014) mentioned that there were many beneficial uses for Scratch in the learning process. He said that

1. Scratch's importance was derived from the way it reduced the difficulty of the programming language,
2. It offered learners the opportunities to be innovative and creative,
3. It helped learners to design their own projects and apply them on the ground.
4. It prepared learners in the secondary learning stage to understand the language of programming, especially Object Oriented Programming.
5. It assisted students to learn programming core concepts such as frequency and conditions.
6. It enhanced students' fundamental skills such as analysis, cooperation and lifelong learning.

Calao et al. (2015) affirmed that Scratch was a useful tool to develop students' learning. They added that the research literature confirmed the usefulness of Scratch when used in many subjects such as English, Science, Mathematics and writing. Genç and Karakuş

(2011) stated that a great number of Scratch users reported that it was simple, pleasurable and appropriate to be used in classrooms.

2.7 Scratch and Self-efficacy

Abo Oda (2010) maintained that Scratch increases learners' self-efficacy. Learners in Palestine are rarely exposed to software programs in their schools due to the electricity cuts and the lack of devices that promote such type of learning. Their self-efficacy is expected to increase if they are exposed to new methods, especially software programs.

Since Scratch is a new and interactive programme for learning, self-efficacy was investigated among its users. Self-efficacy is one's internal belief that he/she will succeed in the required activity or task and this belief determines the persons' willingness to conduct a specific behavior. Those behaviors will be there until the end of the task, which will surely reflect the performance and the outcomes (Kotaman, 2008).

Scratch has different effects on the self-efficacy of teachers and students. That is to say, scratch develops self-efficacy among its users. In this respect, Korkmaz (2016) made a study titled "The Effects of Scratch-Based Game Activities on Students' Attitudes, Self-Efficacy and Academic Achievement". One of the study aims was to investigate the effect of Scratch on self-efficacy. The study proved that there was an effect created by Scratch programme on students' self-efficacy. The study revealed that the score of the self-efficacy was (62.6%) and such percentage -according to the study standards- was positive.

To indicate that Scratch is also effective on teachers' self-efficacy, there is another study conducted by Yukselturk&Altiok (2016) titled as "An investigation of the effects of programming with Scratch on the pre-service IT teachers' self-efficacy perceptions and attitudes towards computer programming". In that study, the researchers aimed to investigate Scratch's impact on teachers' self-efficacy. The study showed that Scratch had an effect on self-efficacy among teachers.

In the same field, the researcher believed that Scratch affected students' self-efficacy since it was an interactive environment that changed learners' reviews about the content and the way vocabulary was introduced to them in English classes.

2.2 English Vocabulary

In this section, the researcher will elaborate on vocabulary definition, types, benefits in language, teaching, nature of acquisition, strategies and testing.

2.2.1 Vocabulary Definition

Vocabulary can be defined related to many views by researchers in the English Language. The researcher will explain vocabulary in the following definitions.

First, the study reviewes the definition of 'vocabulary' in famous dictionaries as follows:

1. Oxford dictionary (2002) defines 'vocabulary' as, "the container of words used in a specific language or in a particular scope."

2. Merriam - Webster Online Dictionary (2010) presents three definitions for 'vocabulary': first, "a list or set of words or phrases usually alphabetically set up and explained or defined." The second definition is that vocabulary is "A group or stock of words used by a language, collection, separate, or work or in a field of knowledge. The third definition is that "A set of terms or puzzles obtainable to be used."
3. The Longman Dictionary (1995) defines it as, "All the words that people know, learn or use".
4. Oxford Advanced learner's Dictionary of Current English (2002) defines 'vocabulary' as" The words that people know or use, the words that are used when talking about a particular subject or a group of words with the clarification of their implications in context or a book to learn a foreign language".
5. Oxford Dictionary (2013) defines 'vocabulary' as "the form of words used in a specific language."
6. American Heritage Dictionary (2012) defines 'vocabulary' as "All the words of the language, which is the group of words used, understood by, or in the knowledge of a particular person or a group".

Secondly, some of the definitions by famous researchers are presented below:

1. Saputra (2007) says that 'vocabulary' is words used in a specific language and have meaning. It includes; idioms, verbs, pronunciation and nouns.

2. Argueles (2008) (as cited in El Kurd (2014, p. 17) states that 'vocabulary' is the words used in novels and stories that children know and understand.
3. Graddol et al. (1987: p93) claimes that 'vocabulary' could be words or symbols.
4. Nordquist (2013) states that the definition of 'vocabulary' is the words of a language used by a specific people.
5. To sum up, it can be said that Nash and Snowling (2006, p1) defines 'vocabulary' simply as the consciousness of words and their implications.

In the light of the above mentioned definitions, the researcher adds to the preceding definitions that'vocabulary' is the words used by people and understood by every person in the same language. If any word does not have a meaning, it would not be considered as vocabulary. Vocabulary cannot be defined as a random gathering of letters. No, it must have a shape (denotation) and a meaning (connotation).

2.2.2 Types of Vocabulary

Vocabulary types depend mainly on and pertain to many discplines such as semantics, methodology and language teaching. The researcher is going to discuss the types of vocabulary as follows:

2.2.2.1 Intentional and Incidental Vocabulary

Intentional vocabulary is the way of learning vocabulary through some helpers such as teachers who assist learners to find the meaning of the word, dictionaries which give learners full detailed information about a certain word or any other source that helps learners know about the meaning of the word. Incidental vocabulary is a way of learning that helps students know and learn vocabulary without direct assistance from anybody. It is something like an unintended process to learn vocabulary. In this case, vocabulary is learnt randomly and unconsciously (Bakheet, 2016, p 19).

2.2.2.2 Communicative Vocabulary

Communicative vocabulary is the words related to receptive and productive processes of vocabulary. Receptive vocabulary means that learners understand the words when they read or hear them, but they do not use them productively. On the other hand, productive vocabulary includes the words elicited by learners and used in speaking and writing. This means that learners use this type of vocabulary in the productivity stage (Bang and Ngoc, 2002, p.36 cited in Wafi, 2013, p 27).

2.2.2.3 Instructional Vocabulary

Instructional vocabulary is divided into two sections; active vocabulary and passive vocabulary. Active vocabulary includes the words that students understand, say and use properly. Students know these words and use them actively in contexts of speaking or writing. On the other hand, passive vocabulary is the words students can grasp when they read or see, but unfortunately, they do not use them in relevant contexts. These words are used passively because they are used in one direction. Although students know the word, they do not use it (Doff 1998, p 147).

2.2.2.4 Semantic Vocabulary

Semantic vocabulary refers to the words divided into notional words and functional words. Notional words are the words separately understood; that is if they are presented to the students, they will understand them. These include nouns, adverbs, pronouns, numerals, adjectives and verbs. On the other hand, functional words are the words used to make a coherence or cohesion in the text and these constitute grammatical issues such as: articles, prepositions, conjunctions and interjections. To add, functional words are very important to show the meaning of the sentences (Milton 2009, p 227).

2.2.3 Benefits of Vocabulary in Language

Vocabulary is an alienable part of the language and the learning process, especially in learning a foreign language such as English or any other language. Vocabulary is interrelated to other four main skills of English language: listening, speaking, reading and writing. Thus, the incapability to use vocabulary means failure in learning the four skills of the English language. If students lack vocabulary, they will not be able to communicate.

Students will not be able to understand English conversations or English documents if they fail to collect and understand a considerable number of words. In this respect, Wei (2007) note that vocabulary is a very important section in teaching English as a foreign language. Vocabulary studies are conducted to find suitable ways of better vocabulary learning. Learners' inadequate vocabulary causes them to encounter difficulty when they want to receive or produce information. In addition, (Folse, 2008) points out that English language learners are invited to have permanent understanding of vocabulary to better develop their cognizance of a foreign language. Vocabulary ought to be taught throughout every activity and exercise.

Rivers, (1981, p28) adds, "Vocabulary cannot be taught. It can be presented, explained, included in all kinds of activities, but it must be learnt by individuals."

Learning vocabulary is one of the basic stages in learning any language. Contact and communication depend on words that are meaningful to the receivers' ears. Lin (2002) said that learning vocabulary is considered the first step to master any language. He stated that the four skills of English; listening, speaking, reading and writing will be immediately affected by the amount of vocabulary the learners have. Wilkins (2002, p13) stated that communication could take place without grammar, but it cannot without vocabulary. This is a very important opinion that indicated the importance of vocabulary in any language. In the same respect, Laufer (1997) stated that vocabulary is the key point and the vein of learning any language. All these opinions confirm the high importance of learning vocabulary.

Some researchers wrote about the mistakes that learners made in writing and speaking. Davies and Pearse, (2000, p 59) establish that vocabulary mistakes and errors make misperception and confusion in the communication process and make it tough and more problematic to be done properly. They added that mistaken choice of words leads to incorrect understanding that hampers the message to arrive and thus communication would not take place. Bromley (2002, p7) suggests that there are a number of benefits for learning vocabulary as follows:

1. Vocabulary establishes 80% of any test produced by learners.

2. Vocabulary raises students' attainment.

3. Vocabulary helps to reinforce learners' writing.

4. Since vocabulary is a tool for analyzing and evaluating materials, it constitutes thinking.

Wikins (1972) adds that vocabulary is a powerful conveyer of meaning such as the case among beginner users of the language who always communicate without using grammar. They succeed only when they use vocabulary -and not grammar-, which functions to produce good and sound English. He adds that vocabulary has more importance than grammar and communication could occur without using grammar.

To sum up the benefits of vocabulary, the researcher introduces some new benefits for vocabulary in the English language:

1. Vocabulary simplifies the communication process since it is the core of any communicative context.
2. Vocabulary makes reading texts easier and helps students understand comprehensions easily.
3. Vocabulary facilitates listeningand makes the words pronunciations familiar.
4. Vocabulary aids in the process of writing which is totally dependent on vocabulary.
5. Vocabulary facilities translation.

Vocabulary eases the whole process of learning English. The more vocabulary the learner knows, the more he/she masters different points and skills in the language.

2.2.4 Teaching Vocabulary

Vocabulary teaching is one of the most indispensible parts of language teaching. Vocabulary teaching supports the four main skills of English language. Teachers have stopped teaching vocabulary through the process of memorization or translation. They now use more professional techniques to teach vocabulary to students more effectively.El Farrah, (2014, p 9) indicates that it is believed that vocabulary is learnt arbitrarily (as is the case in most schools). He adds that teaching vocabulary to students is one of the most difficult procedures encountering teachers in the class. The process of teaching vocabulary

is not as simple as many people think. It has procedures, methods and techniques, which ought to be implemented in the class.

The awareness to teach vocabulary is one of the most significant topics that are raised in language teaching in the late 20th century. The reason for this interest in teaching vocabulary is the emergence of lexicographical research (Zimmerman, 1997). In the same respect, Barcroft, (2004) reports that teaching vocabulary appeared to be one of the main issues investigated by language teaching and applied linguistics studies.

El Farrah, (2014, p 10) explains that there are two chief styles for teaching vocabulary that provoked argument among vocabulary scholars. The first trend is direct instruction of vocabulary. Direct and explicit instruction of vocabulary means that teachers are aware of students' needs and the words that are suitable for learners to know and learn. Once the teacher defines the vocabulary that students need to know, he\she tries to grow fluency among learners with the previously learnt words. Teachers will present direct learning to students through certain procedures. The second trend is teaching vocabulary incidentally. This means developing vocabulary through other skills such as listening, speaking, reading and writing.

Some argumentations developed among the proponents of the two opinions about their validity. Nation (2002) defends the direct and explicit method of teaching vocabulary. He expresses that teaching vocabulary systematically is better than teaching it randomly. He does not agree to teach vocabulary indirectly through the four skills of English. He says that vocabulary ought to be taught in separate courses. Many different views have tried to come in the middle of the two points. He adds that students ought to learn how to learn and know vocabulary through contexts when they encounter them.

To add more controversial opinions to the previous points of view, many researchers and academics, such as Nation (2001, p232) and Twaddell (1973), affirms that learning vocabulary through texts is a very active method towards better understating of vocabulary. They add that teachers giving direct meanings of words out of their context would be considered an infertile process. They also argue that teachers had to pay attention to the plurality of words. In this regard, Craik and Tulving (1975) assert that guessing a word

from the context leads to better retention of vocabulary since it would be kept in learners' minds for a longer period of time.

Thornbury (2002, p 22) supposes that educators should inspire students to learn vocabulary and teach them how to better learn it through various methods. In the same vein, Bromely (2002, p 11) proposes different pieces of advice for teaching vocabulary efficiently as follows:

1. Words should not be taught separately and ought to be taught in connection to other words. Teaching collocations is better.
2. Words may be presented to students reflecting the outer world through using realia.
3. Teachers ought to motivate students to learn vocabulary and show them the importance of learning it.
4. Teachers have to effectively let learners involve in the vocabulary learning process. Learners should be strongly involved in activities.
5. Learnt words should be discussed among students in order to become familiar to them.

In addition to the previous suggestions, Marzan (2004) explains that there are six steps that might enhance the vocabulary teaching process as follows:

- Explaining words with pictures.
- Asking learners to use the new learnt word in a meaningful sentence.
- Asking students to draw a picture of the new word.
- Teachers make students participate in activities that enhance learning the new vocabulary.
- Asking learners to discuss the new learnt vocabulary with their classmates.
- Using games to activate the new words.

The researcher adds that there are a lot of procedures that may be used in class to familiarize students with new words. Familiarizing students with new words depends on

many factors such as: the difficulty of words, students' level, and sources offered to the teacher and the suitability of the procedure.

2.2.5 The Nature of Vocabulary Acquisition

One of the features that vocabulary has is the incremental nature of vocabulary knowledge. Schmitt (2002) asserts that the nature of vocabulary is gradual since the process of learning vocabulary begins from single word. He adds that no one could learn full sentence without knowing and learning separate words first. Learners first know the direct meaning of the word and then search for other meanings of the same words in other contexts.

Melka, (2001) adds that there is another aspect of vocabulary pertaining to the way of its use – receptive and productive. Vocabulary is distinguished by acquisition. This means that some people understand and use different words. This is divided into two kinds of the process itself. Some vocabularies are used in speaking and writing (productive), while others are understood by learners but not used in speaking or writing.

One of the most important features of vocabulary is retention. (Cohen as cited in Craik, 2002) declares that vocabulary items could be forgotten more easily than grammatical items. Schmitt (2002, 130) adds that vocabulary is fragile because of its individuality. Words are learnt separately while they should be learnt in sentences or in collocations. He adds that words ought to be learnt along with their pronunciation, spelling, relation to other words and polysemy of meanings.

2.2.6 Strategies of Learning Vocabulary

Teachers may largely facilitate the process of teaching vocabulary to students if they simply follow the right methods and techniques taking into their consideration the students' level. In this regard, Renatha (2009, p 45) states that learners do better when their teachers implemented appropriate strategies for teaching them vocabulary. She adds that suitable strategies helped students keep the words in their minds (words –retention).

There are many strategies for teaching vocabulary; Brummitt –Yale (2009, p127) indicates that there were implicit and explicit strategies for teaching vocabulary as follows:

2.2.6.1 Implicit Vocabulary

The implicit vocabulary teaching strategy means teaching vocabulary indirectly to students using the following strategies.

1. Incidental Learning.
2. Context drills.

Through these drills, students may understand and know vocabulary without a systematic way; they may learn vocabulary unintentionally.

2.2.6.2Explicit Vocabulary:

Explicit vocabulary is a technique of teaching vocabulary clearly and directly to students. Explicit vocabulary comprises some of the following strategies:

1. Word Maps;
2. Pre-teaching Vocabulary Words;
3. Key-Word Method;
4. Repeated Exposure to Vocabulary;

There are many methods and strategies for teaching vocabulary. The researcher preferred mentioning some of the strategies whose validity was proved through conducting studies in Palestinian schools. The researcher will briefly mention these studies;

1. **Keyword Strategy**

Laham (2016, p. 9) defines keyword strategy as "a mnemonic method for teaching new English vocabulary by relating it to a familiar English vocabulary which represents the keyword, and then associating the new English vocabulary with the keyword via an interacting visual image". Laham investigates the effect of Keyword strategy on developing 8th Palestinian graders' vocabulary. The study shows the effectiveness of keyword strategy

in developing English language vocabulary. The researcher also advises teachers to use keyword strategy.

2. **Puzzles**

Puzzles strategy was investigated by Al Faleet, (2013, p 8), who defined puzzles as " a confusing situation which requires a solution and this includes riddles, crosswords, anagram, pictures puzzles, spot the differences, missing parts of the picture, adding parts of the picture and guessing games." The study aimed to develop Palestinian 10th graders' vocabulary by using the puzzles strategy. El Faleet's study proved the effectiveness and importance of puzzles in teaching vocabulary.

3. **Contextual Analysis**

Contextual analysis is to deduce the meaning of unfamiliar vocabulary by examining the words around it in the text. This strategy could be taught for learners by using generic organizers and certain types of context clues (Wafi, 2013, p 35).

4. **Memorization**

It seems that memorization is an old strategy for teaching vocabulary, but it is an effective one. Many opinions that memorization is a useful strategy for learning vocabulary. However, it is appropriate strategy for learning a considerable number of vocabularies (Sagarra and Alba, 2006).

There are many other strategies for learning vocabulary such as: multiple exposures to vocabulary in several contexts, wordlist, dictionary use and morphemic analysis of the word.

2.2.7 Testing Vocabulary

Testing vocabulary is a good method for teachers to know if their students grasp vocabulary. Teachers usually design a part of every overall skill test (formative or summative tests). Read (2002, p304) explaines that vocabulary, grammar and reading are the most common parts of an objective test.

Schmitt (2000, p 164) notes that tests are a method of motivating students to present their progress after learning words. He adds that vocabulary tests were used for placement, diagnosis or proficiency. The vocabulary includes in the test ought to be of high level in order to offer the chance for testing talented students or high-level achievers.

Dictation is used by teachers if they want to check students' spelling and writing. If a teacher wants to examine the lexical knowledge, he\she can make a cloze test or guided writing test (Nation, 2001, p213)

There are a certain number of criteria that ought to be considered when building a vocabulary test. According to Nation (2001, p 344), reliability, validity, backwash and practicality should be taken into any teacher's consideration.

There are many ways of examining vocabulary such as multiple choices, cloze test, word formation, matching, odd one out, sentence completion, definitions, translation, writing, reading, oral testing, associations, placement, synonyms and antonyms, transformation, subtitling, and rearrangement (El Faleet, 2013, pp 28-23).

2.3 Self-Efficacy

People's way of thinking and functioning is served by someone's sense of control. They will be more dedicated to their resolution if they fully believe that they can solve problems. In this regard, self-efficacy is connected to personal control, agency and action. Thus, people can enjoy their life if they believe that they can do more things with self-determination. Self-efficacy affects the way people think, act and feel. It is connected with stress, worry and weakness (Schwarzer, 2014).

Some of the educationalists see that learners' abilities ought to be trained in the right direction because they have positive effects on individuals and society. Ones' self-efficacy is connected to the individual motivation towards learning, (Hellat& El Zoughbi). One of the most important theories concerned with self-beliefs is the Cognitive Theory of the Self-Efficacy which was generated from the Social Learning Theory by Bandura. He theorized that self-beliefs affected learners' actual achievement (Bandura, 2015).

Self-efficacy is one of the most important concepts in amending human behavior. In this respect, El Megdadi& Abu Zaytoon (2010) points out that self-efficacy development is the key for learners' learning and training to control themselves to reduce anxiety and develop their ability to defend their rights and face problems. They confirm that self-efficacy improved the way of positive communication with others and that helped students not to be trapped in the same circumstances. They argue that the need for developing self-efficacy is a must in the light of the changes in this life. Additionally, the social acceptance of one learner is highly impacted by his/her academic achievement.

The researcher Hasona (2009, p 124) explaines that self-efficacy is the perceived operational ability which did not connect to what individuals had; but connected to individuals' faith that they could do their work whatsoever the sources offered. Persons are not asked about their degree of abilities, but they are asked about the degree of confidence in implementing the required tasks in the light of the situation changes. He added that teachers' behaviors were based on their beliefs on self-efficacy in teaching.

2.3.1 First: Self-Efficacy Definition

One of the concepts that are much related to human achievements in all fields is self-efficacy. The concept first appeared in an article published by Bandura, (1997) and titled "Self-Efficacy toward a Unifying Theory of Behavioral Change". In that article, Bandura reveales that self-efficacy helps in defining the behavior of insisting and preserving among individuals. Bandura asserted that self-efficacy was a knowledgeable mediator of individual anticipations towards his/her self-efficacy. It is the tool for deciding the nature of the behavior that individuals do (Bandura, 1997, p 191).

The researcher will explain in detail what self means and what efficacy means to elaborate more about self-efficacy definition. According to Cambridge Online Dictionary (2017), "Self" means "the set of someone's characteristics, such as personality and ability that are not physical and make that person different from other people". The same source defines "efficacy" as "the ability, especially of a medicine or a method of achieving something, to produce the intended result".

In a similar vein, the researcher will present some definitions of self-efficacy that were derived from related previous studies and books.

1. One of the most famous definitions of self-efficacy is the definition of Bandura (1986, p. 126). He defines self-efficacy as all the abilities that an individual thinks he/she owns that enable him/her to practice the self-control over abilities, ideas, acts and feelings. This control is connects to social and environmental determinants.

2. Some definitions connect self-efficacy with self-satisfaction and consider self-efficacy to be a motivator for enthusiasm, which is full of great powers that stimulate people to achieve**.** In this regard, Pajares, (1999, p.220) states that self-efficacy is the person's belief in his/her self-abilities and confidence. It is what a person has that allows him/her to attain a level of satisfaction or balance in his/her life.
3. Murphy, (1997, p.2) describs self-efficacy as the general anticipations that the person have and constituted based on previous experiences that affected success expectations in the new situations. In other words, the general self-efficacy is the self-efficacy for executing a certain task.
4. Gist &Mitchel, (1992) defines self-efficacy as the decisions of individuals' self-efficacy on their abilities to achieve a certain task. Self-efficacy also covers the decisions of change that are connected to self-efficacy during one's acquisition of information and conduction of experiments. Self-efficacy is the factors that directly motivate one's behavior.
5. Bandura, (1997) affirms that self-efficacy is the person's belief regarding the definition of his/her motivation level which would be reflected by the efforts he\she exerted in their works and the time in which they dedicated to face challenges. Self-efficacy gets higher when people increase the level of their motivation and this helps them to overcome difficulties.
6. Haseeb, (2001) connects the definition of self-efficacy with the exam of general efficacy. He defined self-efficacy as the sense in which people felt about self-efficacy. It is the ability to control the events and the environment around you. It is also obtaining a high grade of the General Self-Efficacy Exam.

7. Akhtar (2008) says, “Self-efficacy, or confidence as commonly known, is one of the most enabling psychology models to have been adopted into positive psychology. It is the optimistic self-belief in our competence or chances of successfully accomplishing a task and producing a favorable outcome.”
8. Some researchers defin self-efficacy from an educational point of view. Qattawi&Jamos, (2015, p 149) defines it as the ability of learners to understand their academic status to learn and positively participate in the educational situations and transfer the effect of learning into life. They added that self-efficacy meant that learners should understand their social status. Learners ought to control the feelings, ideas, actions, incidents and situations that affect their life. Self-efficacy means the ability of learner to face the environmental challenges, make decisions and set prospective aims.

In the end, the researcher can add to the previous definitions that self-efficacy is the change occurring in one’s self after witnessing a time of development or undergoing a remedial treatment that restored or enhanced him/her with self-efficacy. One feels satisfied and confident if he/she practices something that raises capacity and enhances attitude. In this study, the researcher investigates the relationship between Scratch programme and many variables including Self-Efficacy to see if there is an effect of Scratch programme on developing self-efficacy among 6th graders.

2.3.2 Sources of Self-Efficacy

Bandura, (1997) states that “Persons’ beliefs about their efficacy can be explained and enhanced in four key ways: mastery experiences, modeling, social persuasion and judgments of their physiological stats.”

To confirm the aforementioned, Ellwan, (2009, p14) points out that there are four sources of self-efficacy through which people could execute different tasks. These sources are: mastery experience, vicarious experiences, verbal personation and physiological Arousal.

2.3.2.1 Mastery Experience

The performance achievements depend on one’s previous experience about his\her performance and success which creates a feeling of self-efficacy. Robert, (2004, p 21) says

that there are many names for mastery experience; also called enactive mastery, performance attainment or enactive attainment. He added that mastery efficacy was one of the most significant sources of self-efficacy. Smith (2002) argued that there were two reasons for creating mastery learning. The first reason is that mastery learning is founded on practices and experiences that are personal and direct. The second reason is people's exertions and proficiency.

Robert, (2004, p21) reveals that there are many effects for mastery experience on the learning process through direct experience. He explained that direct experience helped in self-efficacy and he mentioned an example about a study conducted to show the effect of mastery experience in attaining self-efficacy among mathematics students. After the results of the study, he commented that mastery experience was based on assumptions and not investigation and refuted Bandura's notion, which was an assumption not an investigation.

There were two opinions for the relation between mastery experiences and self-efficacy. The first opinion agrees that there is a relation between mastery experiences and self-efficacy and the second one refuted that there was any. It is believed that powerful mastery experience enhances strong self-efficacy while failure in mastery experience decreases self-efficacy (Bandura, 1986). Some researchers, including Dawes et al. (2000), conduct a study to identify the impact of mastery experiences on self-efficacy in Middle School Technology, but concluded no significant findings connecting mastery experiences to self-efficacy.

2.3.2.2 Vicarious Experiences

A vicarious experience is the second most active way to develop self-efficacy. According to Bandura (1997), vicarious experience is also known as modeling. In modeling, people judge their own behaviors and abilities when they compare them with others' abilities and behaviors. Similarly, Wood & Bandura, (1989, p 364) stated, "Proficient models build self-beliefs of capability by conveying to observer effective strategies for managing different situation."

Gorrell and Capron (1990) conduct a study titled "Cognitive Modeling and Self-Efficacy: Effects on Pre-Service Teachers' Learning of Teaching Strategies" to investigate the effect

of cognitive modeling and self-efficacy among pre-service teachers. They discovere that cognitive modeling had really impacted self-efficacy and that modeling controlled the process of thought before behavior occurred. They also discovered that verbal persuasion and vicarious experiences raised self-efficacy among pre-service teachers.

Individual experiences are defines by individuals' previous experiences and anticipations. McCown, Driscoll &Roop, (1996, p 269) mention that some researchers called vicarious experiences as learning by model and observation of others. Vicarious experiences are the indirect experiences acquired by an individual. Students who observe successful models may use these observations to evaluate their personal effectiveness.

2.3.2.3 Verbal Persuasion

It is the third source of self-efficacy. Verbal persuasion is decided by one's persuasion of others' experiences verbally. McCown, Driscoll &Roop, (1996, p 269) states that verbal persuasion refers to the encouragement operations and support by others in the social environment (teachers, parents and peers). Learners could be verbally persuaded of their abilities to succeed in certain tasks. Verbal persuasion can be internal and called the positive talk with self. Bandura, (1986) says that there was another name for verbal persuasion which is "Social Persuasion". He declares that social persuasion was a way to raise people's belief in their efficacy. Wise and Trunnell (2001) tell that verbal persuasion was the most appropriate effective method when it followed a performance achievement. Wood & Bandura, (1997, p365) affirm that if somebody received realistic encouragement, he/she would exert great effort to be effective. This will help him\her more than just leaving oneself for self-doubts.

2.3.2.4 Physiological Arousal

This is the fourth and last source of self-efficacy. Bandura calls it "the internal sources" that would decide if one can achieve his/her aim. They add that there are several factors affecting self-efficacy such as the perceived ability of the model, the difficulty of the task, the effort exerts and the assistances a person may need for performance (Driscoll &Roop, 1996, p 269).

Robert, (2004, p27) says that physiological arousal was the individuals' decisions regarding their physiological states. According to him, Physiological arousal is also called affective arousal and sometimes emotional arousal. Conger and Kanungo state that, " emotional arousal states that result from stress, fear, anxiety, depression, and so forth, both on and off the job, can lower self-efficacy expectations. Individuals are more likely to feel competent when they are not experiencing strong aversive arousal. Empowerment techniques and strategies that provide emotional support for subordinated and that create a supportive and trusting group for subordinates and that create a supportive and trusting group atmosphere can be more effective in strengthening self-efficacy beliefs."

2.3.3 Elements of Self-Efficacy

Ellwan, (2009, p 16) reports that self-efficacy is something raw and could not be noticed except by some elements that would show whether a person have high or low levels of self-efficacy. Ellwan assures that there were three elements: Self-confidence, self-assurance and mental toughness.

2.3.3.1 Self-Confidence

Vocabulary Online Dictionary defines self-confidence as "To be self-confident is to be secure in yourself and your abilities. When you are giving a presentation or a speech, it helps to be self-confident - or at least to pretend that you are".

Assad, (1997, p5) considers self-confidence to be an image for the internal character of a person; one who is confident always welcomes criticism. He explains that if the criticism was positive, the person criticizes would build new progress and take new steps based on that criticism. If the criticism is negative, the person would not deal with it out of conviction in his\her confidence.

Self-confidence is one of the key components for each person in the society. It is necessary for success in social and family contact. Self-efficacy is the positive point we see about ourselves. It makes us achieve our aims without being under someone's influence. Self-confidence makes people accept life as it is (Ellwan, 2009, p 16).

El Rashed, as cited in Ellwan, (2009, pp 16-17), states that confident people have (8) qualities. Confident people have the priority to live successfully, respect and appreciate themselves, do not get affected by others' falls, have full competency of their ideas, have a wide view of life, are fully aware of things around them, do not fear to take responsibility and have clear objectives.

El Noaime (2002, p34) asserts that there are many factors forming self-confidences. She comments that when children are born, they have many opportunities to develop themselves if the correct factors are available to them. She explains that inheritance, parenting styles and self-education were the most important factors in constituting a self-confident individual.

2.3.3.2 Self-Affirmation

Self-affirmation is one of the most important concepts that have been investigated. This concept first appeared by Salter (1994), who called self-affirmation, as consultant behavior. The self-affirmation concept was widely spread by Wolpe (1998) to express self and its reassurance. She confirmed that self-affirmation was the spontaneous response by a person to others, responding to questions and acts. (El Qatan, 1986, p 73).

According to Baumeister (1997), self-affirmation theory suggests that people have an essential enthusiasm to keep self-integrity, an observation of themselves as decent, moral, and able to guess and control significant results. In fact, in all cultures and historical eras, there are publicly shared conceptions of how to be a person of self-integrity. Having self-integrity means that one observes oneself as living up to a culturally specified conception of goodness, asset, and activity. The self-affirmation theory inspects how people sustain self-integrity when this perception of the self is endangered.

Sherman, & Cohen, (2006, p 186) affirm that self-affirmation is connected to self-integrity and that self-integrity was in the center of self-affirmation theory. They illustrat that self-affirmation is the performance that showed one's competence. People who are under stress might have self-affirmation to achieve high levels of success. They say that self-affirmation might take forms such as winning in a competition or doing a great job. Self-affirmation

could be fed through visiting friends, doing voluntary work, participating in charity work or attending a religious event or ceremony.

2.3.3.3 Mental Toughness

Mental toughness is a set of personal traits that work as protection against tough life and constitute a belief or tendency among persons that they can use their potential power. Mental toughness helps people understand the tough life logically, and makes them face it positively (Kobasa, 1997, p67)

Maddi,(2004) states that Kopasa is the first one to pave the way for the emergence of mental toughness. Meddia noticed that some people could achieve their goals even when they were exposed to high levels of pressure and depression. Meddia added that specialists ought to focus on the people who look forward to developing themselves since they already had the motivation to be developed.

In this context, there are some features that are found in people who have mental toughness. Lambert, et al. (2003) mentioned three qualities as follows:

1. They can socialize in their life and communicate with the society.
2. They have a principal that change is something challenging.
3. They have the ability to control and affect the course of their life.

Abbas, (2010, p174) states that Lan have said that every person have a level of mental toughness and that level would increase or decrease pursuant to the situation or the attitude and the time he\she lives in. The differences among people in mental toughness may refer to students' ways of learning. Mental toughness affects one's health and it is a personal source and not a personal characteristic.

In a study conduct by Hannah &Morresse (1978), they conclude that mental toughness could facilitate the process of evaluation and perception and lead to the right action in different situations. This could be achieved through different ways such as:

1. Mental toughness amends the perception of events and reduces their negative effects.

2. Mental toughness leads to flexible fronting styles that change when the situation changes.
3. Mental toughness increases the ability to support socially as a fronting style.
4. Mental health directs people to follow a regular healthy system and do sport.

2.3.4 Importance of Self-Efficacy

The importance of self-efficacy begins to depend on the capability of humans. El Sayed, (2001, p 165) affirms that self-efficacy have a fundamental role in fronting work pressures and making decisions. He mentions that self-efficacy is very important to exist among the high officials who would take the right resolutions for the country.

Self-efficacy is very significant for people, as it helps them face difficulties. It is very important in the field of education. Some researchers studied the impact of self-efficacy in education. Al-Alwan&Mahasneh, (2011, p 411) confirms in a study titled "Reading Self-Efficacy and Its Relation to the Use of Reading Strategies among a Sample of Hashemite University Students" that there is a strong and positive relationship between self-efficacy and reading abilities through using reading strategies. The positive effect of self-efficacy was that students with high levels of self-efficacy achieved more progress in reading and reading strategies. The researchers state that students who have high levels of self-efficacy tended to use more strategies to help them in reading.

Not only does self-efficacy affect reading, it also affects motivation. Bandura,(1997) states that the perceived self-efficacy affects motivation. Self-motivation is defined as the efforts that any person should exert to achieve his\her goals in life. He states that people with high levels of self-efficacy expect to have high levels of achievement and do skillful tasks. Abu Hasoona, (1999) states that self-efficacy workes as cognitive mirrors to judge peoples' actions and decisions. Self-efficacy is very effective in fronting challenges and making resolutions.

Abu El Ula, (2006, p27) claims that self-efficacy affected peoples' future plans. He adds that people who have high levels of self-efficacy made successful plans that encouraged them to be very successful in their life. He adds that people with lower levels of self-efficacy always had negative plans.

Krueger & Dickson,(1993) states that self-efficacious people have the ability to perform their tasks properly. These have a sense of preservation and diligence. In addition, Self-efficacy helps students in choosing the activities that are suitable for their success. Learners will not choose the activities that are difficult for them and that they are not expected to succeed in (Bandura, 1997).

Qutami, (2000) mentions that self-efficacy helps people solve problems properly. Consequently, people with self-efficacy have also a high level of analytical thinking. On the researchers, Zahran (2003) confirms that self-efficacy began to appear among children when they start differentiating the factors that affect their senses. Children begin to feel confident when they practice and succeed in things. Self-efficacy is promoted among children when they succeed and make progress.

2.3.5 Dimensions of Self-Efficacy

El Badi (2014, p48) explains that there are three dimensions for self-efficacy. She states that Bandura have argued that the three dimensions for self-efficacy are magnitude, generality and strength. The researcher will explain each one of them in detail.

2.3.5.1Magnitude

This dimension can be defined through the difficulty of the situation. It will be clear when tasks are arranged from easiness to difficulty. This dimension is also called the level of task difficulty. Self-efficacy decreases when learners have low level of experience and skills and thus, students find difficulty in fronting.

2.3.5.2 Generality

Generality means the ability of a student to generalize the similar attitudes. It also means the transference of self-efficacy from one similar situation to another. The degree of generality is different from one person to another.

Schwarzer,(1999) mentions that some people's self-efficacy is more effective in one field than another. He means that some people have general self-efficacy, but they have lower level of self-efficacy in certain fields.

2.3.5.3 Strength

Bandura interprets strength as the levels of self-efficacy among individuals in the failed situations. It creates a source of depression. It will not exist among the people who have high levels of self-efficacy as they can easily go out of the weakness points (Bandura, 1997, pp 84-85).

2.3.6 Factors Affecting Self-Efficacy

Self-efficacy is very significant in one's life. There are many factors that can promote or reduce it. According to the educational literature reviewed by the researcher, there were three factors affecting self-efficacy. They will be explained in detail below:

2.3.6.1 Personal Effects

People's perception of their effective efficacy depends on four personal factors:

1. **The Acquainted Knowledge**

There is a borderline between knowledge as it is in life and the knowledge owned by people who organize it according to their psychology. Once somebody gets knowledge; he/she organizes it according to its content or in a hierarchal building. People store such information and knowledge to suit their experiences and to properly use them in different ways of life (Zimmerman, 1989).

2. **Metacognitive Process**

The Metacognitive process affects people's decisions and way of self-organizing. They divide their aims by type, level of difficulty and need. The metacognitive process makes people plan, supervise and evaluate ideas and take the right decisions. In the light of that, right self-efficacy is owned (Hamadnaand El Sherdaqa, 2014, p 189).

3. **Targets**

Bandura, (1997) states that learners with a strong sense of self-efficacy tend to be more effective in achieving difficult self-aims. Their aims are accurate, clear and realistic and in harmony with self-anticipations. People who also have a high level of self-efficacy have a strong sense of challenge to reach their aims. These people are more able to face difficulties and problems. Self- efficacy constitutes a degree of self-satisfaction and self-efficacy.

4. **Self-effects**

Self-effects are people's internal factors that directly affect their behavior during performing some works and tasks. These effects may lead to a difficulty in self-regulation and a kind of depression in the future. These factors include anxiety, difficulty in defining the personal aims, level of motivation, pessimism and optimism processes (Zimmerman, 1989).

2.3.6.2 Behavioral Effects:

Bandura (1997) confirms that when people display a behavior, they went through three stages; self-observation, evaluation and self-reaction. The researcher will explain all the three previous stages according Bandura.

1. **Self-Observation**

Self-observation is the regular observation of self. It means that people support themselves with information about their level of progress towards achieving targets. The observation process is affected by self-processes such as self-efficacy, the composition of the aim and the planner of knowledge. There are two processes that result from self-observation: verbal transfer of news and quantitative statement of actions and reactions.

2. **Self-Judgment**

Self-judgment means the response of people that have regular comparison for their performances with the targeted aims and the aims that are planned to be achieved.

3. **Self-Reaction**

This stage contains three stages of reactions: behavioral self-reaction, personal self-reaction and environmental self-reaction.

2.3.6.3 Environmental Effects

Bandura (1997) offers some environmental factors affecting self-efficacy through modeling and different photos. There are many qualities of modeling that affect self-efficacy:

1. **Identification:**

Identification is based on certain factors such as gender, age, educational level and natural variables.

2. **Differentiation in Modeling:**

Differentiation in modeling means presenting various models of skill rather than presenting one model. Presenting more models raises the level of self-efficacy. People ought to take into their consideration the previous factors in order to avoid the weakness in self-efficacy.

Part Two

2.4 Previous Studies

2.4.1 Introduction

This section reviews the previous studies and articles pertaining to the study main variables: Scratch, vocabulary and self-efficacy. The previous studies were classified under three main sections. The first section is previous Studies on scratch. It includes (9) studies explaining the effect of Scratch in Education. The second section is on vocabulary including (11) studies related to the effectiveness of various strategies for better vocabulary achievement. The third section tackles self-efficacy and encompasses (8) studies. The total is (28) previous studies closely related to the study variables. The researcher did his best to select the most recent studies. The following previous studies were summarized based on date, title, adopted approach, sample, procedures and outcomes. They are presented from the most recent to the oldest.

2.4.2 Previous Studies Related to Scratch

Korkmaz (2016):

The study aimed at exploring the effect of Scratch and Lego Mindstorm EV3 programming activities on academic achievement in computer programming, problem solving and mathematical thinking skills among Turkish students. The researcher used the quasi-experimental approach. The sample of the study consisted of (75) students divided into two experimental groups and one control group. The study used a pre-posttest as the study tool. The sample was divided into three groups. The first experimental group was taught using Scratch games, the second experimental group was taught Lego Mind storms Ev3-based design activities and the control group was taught using editor-based teaching activities. The study concluded that Scratch activities were more effective in developing mathematical thinking among students than Ev3-based design activities and traditional methods of teaching.

Korkmaz, (2016):

The purpose of this study was to examine the effects of Scratch-based game activities on students' attitudes towards computer programming, self-efficacy beliefs and levels of academic achievement. The study adopted the quasi-experimental approach. The study used pre-posttest as the study tool. The study was conducted on (49) students who studied at the Faculty of Engineering in Turkey. Scratch-based game activities had no effects on students' attitudes and self-efficacy perceptions.

Papatga&Ersoy (2016):

The study examined the effectiveness of using Scratch programme in developing reading comprehension skills among 4th graders. The study used the quasi-experimental approach on one group comprising (8) Turkish students. The experiment lasted for (15) weeks using various methods to develop reading comprehension skills. The study results showed that Scratch programme was really effective in improving reading comprehension skills.

Calao et al. (2015):

The study aimed at developing Mathematical thinking by using Scratch among 6th graders. In order to achieve the study aims, the researchers adopted the quasi-experimental approach using a sample of (42) students from Candelaria Hacienda school in Colombia. The sample was categorized into (24) in the experimental group and (18) students in the control group. The study used a pre-posttest. The study results showed an increase in understanding mathematical processes among students in the experimental group taught by Scratch.

Gülbahar&Kalelioğlu (2014):

Gülbahar&Kalelioğlu (2014) conducted a descriptive and experimental study so as to invistigate the effect of teaching programming using Scratch on problem-solving skills. The sample of the study consisted of (49) fifth graders (22) girls and (27) boys. The study used two tools. The first was a pre-posttest (quantitative mode) and the second was observation of students (qualitative mode). The study continued for (5) weeks; (1) class every meeting. The study results showed that there was no effect of Scratch programme on developing

self-confidence among students. The study also showed that Scratch programme was very funny to use.

Park & Shin (2014):

The study aimed at investigating the effect of using Scratch programming in math on problem solving ability of primary students. The study adopted the experimental approach using one sample as the experimental group consisting of (46) students in Korea. The study used a test of (34) questions for measuring the problem-solving skill. The study results showed that there was a positive effect on divergent thinking, decision making and planning ability. Scratch programme was effective in helping students to solve problems.

Kobsiripat (2014):

The study aimed at defining the effects of media on promoting Scratch Programming capabilities and the creativity of elementary school students. The study adopted the experimental approach. The study sample consisted of one group consisting of (60) students. The study used pre-posttest. The experimental group was taught using lessons designed according to Scratch programming media. The results of the study showed that Scratch programme could be used in the educational process. The study also showed that Scratch programme was effective in enhancing creativity among elementary learners.

Shin et al. (2013):

The study aimed to investigate the effect of information-technology gifted programs on friendship using scratch programming language and clutter. The researchers adopted the experimental approach on a sample of (20) elementary gifted students enrolled in Gifted Education Programme in Korea. The sample was divided into (11) boys and (9) girls. The study showed that Scratch programming language had an effect on developing friendship among students.

Ferrer-Mico et al. (2012):

The study aimed at discovering the effect of Scratch programming on students' understanding of their learning process in math. The sample of the study was chosen from

the British School in Barcelona, Spain. The sample consisted of (41) students who were divided into two groups; (19) beginner students and (22) advanced students. The study used a focus group which was interviewed to get the data of the study. The two groups received (4) math classes and one class using Scratch programming. The study concluded that there was some development among students towards math.

2.4.3 Commentary on the first domain: Studies related to Scratch:

The researcher reached the following comments:

- Scratch is a software programme that is very suitable for young learners. It offers them an attractive environment.
- Scratch largely contributes to problem solving activities.
- Scratch could be used in different subjects. This gives the current study the strength to use Scratch in developing 6th graders English vocabulary, its retention, and self-efficacy.
- Some of the studies proved the suitability of Scratch in improving self-efficacy among learners such as Korkmaz, (2016).
- The researcher got many benefits on how to make a study using Scratch programme. The previous studies of Scratch were various in using different learning applications in which it led to positive outcomes.

2.4.4 Previous Studies Related to Vocabulary

Laham Study (2016):

The study explored the effect of using keyword-based instructions on developing 8th graders' English vocabulary and retention. The study used the experimental approach. The sample of the study was purposively selected and it involved (78) students distributed into (38) students in the experimental group taught using key-word instruction and (40) students in the control group. The study used two tools; pre-posttest and delayed test which were prepared to collect data. The study showed that the keyword strategy was effective in developing 8th graders' English vocabulary. The study recommended using keyword strategy to teach English vocabulary.

Bakheet (2016):

The study investigated the effect of using a website on 10th graders' English vocabulary, retention and reading skills. The study used the experimental approach. The sample was purposively selected which consisted of (84) students who were divided into two equal groups: the experimental group and the control group. The experimental group was taught through the website while the control group was taught using the conventional method. The researcher used three tools to collect the study data: a checklist for teachers to define the most important (5) reading comprehension skills and a reading comprehension test and vocabulary pre-post and retention test. The study showed that using a website was effective on 10th graders' English vocabulary, retention and reading skills. The study urged English language teachers to use websites in teaching vocabulary.

Abdel Rahim (2016):

The study aimed to explore the effectiveness of KWL strategy on Palestinian 11th graders' reading comprehension, vocabulary and its retention and attitudes towards English. The researcher used the experimental approach with a study sample of (64) students purposively selected. There were (32) students in the experimental group and (32) students in the control group. The researcher used (5) instruments to achieve the study objectives: a checklist for teachers to select the most significant reading comprehension skills, a reading comprehension pre-posttest, a vocabulary pre-posttest, a delayed vocabulary test, and a pre-post attitude scale towards the English language. The study revealed that KWL strategy was effective in developing reading comprehension vocabulary and its retention and attitudes towards English. The study recommended English language teachers to use KWL strategy.

Chen & Wang (2015):

The study explored the effectiveness of using iPad App in Taiwanese classrooms to assist learners to obtain English vocabulary. The study adopted the experimental approach. The study sample was (74) students in a private university, (36) of which were in the

experimental group and (38) in the control group. The study outcomes revealed that the students who used iPad got higher marks than the students taught by the traditional method. The study also concluded that using theiPad in teaching made students more motivated. The study recommended making interviews with more teachers to take their opinions about the use of iPad application.

El Kurd (2014):

The study investigated the effect of computerized educational songs on developing Palestinian 3rd graders' achievement in English vocabulary and structures and improving their motivation towards learning English. The study used the experimental approach in order to achieve its obectives. The researcher purposively chose (80) students; (40) in the control group and (40) in the experimental group. Thirteen songs were computerized to teach the experimental group while the students of the control group were taught using the traditional method. The researcher prepared four tools: a vocabulary achievement test, a structure achievement test, a questionnaire and an observation card. The study outcomes showed that computerized educational songs were effective in developing Palestinian 3rd graders' achievement in English vocabulary and motivation towards learning English. The study recommended using computerized educational songs in teaching English vocabulary.

El Farrah (2014):

The study examined the effectiveness of using smart boards in developing 10th graders' vocabulary achievement, retention and attitudes towards English. To achieve the study purpose, the study adopted the experimental approach by using two groups, (44) students in the control group and (41) students in the experimental group. In order to collect data, the study used the following: an achievement test (pre-post & delayed), an attitude scale (pre & post) and a teacher's guide. The experiment lasted for (5) weeks. The study found that the smart board strategy was effective in developing 10th graders' vocabulary achievement, retention and attitudes towards English. The study recommended that teachers should be trained on using smart boards.

El Faleet (2013):

The study investigated the effectiveness of using puzzles in developing 10th graders vocabulary achievement, retention and attitudes towards English. The researcher adopted the experimental approach on (80) students; (40) in the experimental group and (40) in the control group. The experiment continued for (6) weeks. The researcher used the following tools to collect the study data: an achievement test (Pre, Post & delayed), an attitude scale (pre & post) and a teacher's guide. The study showed that the students in the experimental group who used puzzles in learning achieved better than the students in the control group. The study recommended using puzzles in teaching the English language.

Wafi (2013):

The study investigated the effect of animated pictures programme on learning English vocabulary among 5th graders in Gaza by using the quasi-experimental approach. The sample of the study was randomly selected and consisted of (64) students; (32) students in the experimental group and (32) in the control group. The experimental group was taught using the animated pictures while the control group was taught in the traditional method. The study tool was a pre-posttest. The study revealed that the animated pictures strategy was effective in teaching English vocabulary for 5th graders. The study recommended using animated pictures in teaching vocabulary.

BaniAbdelrahman (2013):

The study objective was to investigate the effect of semantic mapping as a teaching strategy for EFL learners at Al Imam Mohammed ibn Saud Islamic University. The study sample was randomly selected and consisted of (50) students; (25) in the experimental group and (25) in the control group. The study used a quasi-experimental approach. The experimental group studied the lexical items by semantic mapping strategy while the control group studied lexical items using the traditional method. The study tool was a pre-posttest. The study outcomes showed the effectiveness of semantic mapping as a teaching strategy for EFL learners at Al Imam Mohammed Ibin Saud Islamic University. The study recommended teachers to use semantic mapping in teaching vocabulary.

Sotoudehnama&Soleimanifard (2013):

The study investigated the effect of teaching vocabulary through synonym, semantically unrelated, and hyponym sets based on Higa's (1963) proposed continuum. The researcher adopted the experimental approach. The study sample consisted of (120) Iranian intermediate EFL learners classified into two levels; high and low achievers based on their PET (2003) scores. Four tests were used in this study, two of which were set before the experiment and the other tests were given to the learners afterwards. The results of the study showed that the learners from the synonym sets group gained better ST vocabulary achievement and that quantitatively hyponym, semantically unrelated, and synonymous sets were the most effective methods.

Nilforoushan (2012):

The study examined the effect of semantic mapping on teaching vocabulary and the awareness of two affective scopes, assessment and potency dimensions. The sample of the study consisted of (30) EFL students divided into one experimental group of (30) students and one control group of (30) students. Two tools were used in this study: a vocabulary achievement test and a test of awareness of evaluation and potency dimensions. The outcomes showed the effectiveness of semantic mapping in teaching vocabulary.

2.4.5 Commentary on the Second Domain: Studies Related to Vocabulary

The researcher made the following comments:

1. Teaching vocabulary could be executed by presenting numerous new methods. This gives Scratch programme a green light to be used as a new strategy to measure the vocabulary achievement among learners.

2. Most of the previous studies used the experimental approach to teach vocabulary, and which conforms with the study approach.
3. The previous studies provided the researcher with good insights on how to use diverse activities and strategies to test vocabulary.
4. The previous studies helped the researcher make a suitable guide for teaching vocabulary.

2.4.6 Previous Studies Related to Self-Efficacy

Jumana&Meera (2015):

The study investigated the relationship between self-efficacy and academic performance in English of secondary school. The study used (520) secondary stage students as the study sample who were divided by gender (male-female), environment (urban-rural) and type of school management (governmental -aided). The researcher used, as instrumentation, a Scale of self-efficacy which included (48) items and an academic performance test of language which consisted of (42) items. The study showed that there was a significant difference in the academic performance in English and self-efficacy between rural and urban students. Significant differences were found based on gender or type of management.

Qattawi& Abu Jamos (2015):

The study aimed at exploring the service-learning in developing self-efficacy of 10^{th} graders in Jordan in National and Civil education subjects. The study adopted the quasi-experimental approach on a sample of (121) students. They were purposively selected and divided into two groups: (64) students in the experimental group which was taught by service-learning and (57) students in the control group. The study results showed the effectiveness of self-learning on developing self-efficacy among 10^{th} graders in Jordan in National and Civil education subjects. The results revealed differences attributable to gender since female students showed more self-efficacy.

El Qisi (2014):

The study aimed at exploring the personality traits and their relationship with the self-efficacy of social workers in Oman's schools. The study sample consisted of (75) male and (125) female social workers from different schools in Oman. A scale of self-efficacy was prepared by the researcher to be distributed to the study sample. The study results showed that the level of self-efficacy among social workers was as low as (68%). The study also showed that there were no differences attributed to gender in terms of self-efficacy.

Shkullaku (2013):

The study discovered gender differences in self-efficacy and academic performance among Albanian students in two universities in Tirana city, Albania. The data of the study was gathered from a sample of (180) students (102 females and 78 males). They were selected from first, second and third levels. The sample and the two universities were chosen randomly. A questionnaire was used to measure self-efficacy and the (GPA) of the first semester to measure the academic performance of the sample. The study showed that there was a significant difference between males and females in self-efficacy. There was no difference between males and females in academic performance. Also, a significant relationship was found between the students' self-efficacy and their academic performance.

Medion&Mawlood (2014):

The study aimed at identifying the level of self-efficacy and academic adjustment among middle school students in Algeria. The sample of the study consisted of (798) students of the two genders. The researchers used two tools to achieve the study aims: a self-efficacy scale consisting of (10) items and a scale of academic adjustment containing (36) items. The study found that there was a positive relation between self-efficacy and academic adjustment. The study also found a higher level of self-efficacy associated with female students.

Hamarna&Sherdaqa (2013):

The study aimed at investigating self-efficacy among students with hearing impairment at Yarmouk University. The study variables were the level of hearing impairment and gender. The study purposely selected a sample of (56) students divided into (28) males and (28) females. The study outcomes revealed that the degree of self-efficacy among students at Yarmouk University with hearing impairment was mediocre. The study also concluded that there were no differences attributed to gender.

Hasona (2009):

The researcher investigated self-efficacy among elementary pre-service science teachers. The researcher used a sample of (194) elementary science pre-service teachers from the Islamic University of Gaza. The researcher distributed a scale of self-efficacy as the study tool. The results showed that the sample of the study had a mediocre level of self-efficacy. The study also showed that female pre-service teachers had an advanced level of self-efficacy compared to male pre-service teachers.

ElWan (2009):

The study aimed at exploring the effect of a suggested programme on raising self-efficacy among the physically disabled people in the Gaza Strip. The researcher adopted the experimental approach on (18) physically disabled people belonging to an association in Rafah City. The researcher used a suggested programme (counseling) and a questionnaire to measure self-efficacy. The study proved that there were significant differences attributed to the counseling suggested programme.

Commentary on the Third Domain: Studies Related to Self-Efficacy

The researcher made the following comments:

- Self-efficacy is raised among learners after they experience a new learning strategy that affects their performance.
- Self-efficacy may also rise among teachers, as proven by Hasona, (2009) study.
- People gain self-efficacy after an experiment. This means that this study is right to use the experimental approach using Scratch to raise the level of self-efficacy.

One of the studies that investigated self-efficacy, JumanaMeera (2015), indicated that students' self-efficacy improved and they became more confident after learning the English language. This proves that the English language is not difficult and can, indeed, increase the level of self-efficacy among learners.

Chapter 3

Methodology

Chapter 3
Methodology

3.1. Introduction

This chapter covers the procedures followed throughout the study. It introduces a complete description of the study methodology in terms of its population, sample, instrumentation, pilot study and research design. Moreover, it introduces the statistical treatment of the methods used to answer the research questions, and the hypotheses.

3.2. Type of Research Design

The researcher will adopt the qusi-experimental approach. Two groups will be assigned as the participants of the study; the experimental group, and the control group.

Acquiring Vocabulary will be taught via Scratch Applications to the experimental group, whereas the traditional methods will be used with the control group.

3.3. Sample

The sample of the study consists of (44) students has been chosen purposively from **Belal ben Rabah Boys' School** and equally divided into two groups; an experimental group of (22) students and a control group of (22) students.

Both groups were all in the 6th grade aged nearly 10-11 years old. They were equivalent in their general achievement in accordance with the statistical treatment of their results in the first term exam of the scholastic year 2016-2017 and so, naturally, all classes were equivalent in their achievement as they were distributed according to their achievement in equivalent classes by the school administration beforehand. A pre-test was used to check the equivalence of achievement between the two groups.

3.4. The Variables

The study included the following variables:

A- The independent variables represented in

1- SCRATCH Applications
2- The traditional method.

B- The dependent variable represented in

1- Vocabulary, its retention, and self-efficacy.

3.5 Instrumentation

The researcher used two different instruments to achieve the aims of the study:

1. A- pre-posttest: used by the researcher to measure the vocabulary achievement.
2. B- Retention test: used by the researcher to measure the retention of Vocabulary achievement.

Both pre-posttest and retention test are the same.

2-self-efficacy scale to assess the students' self-efficacy beliefs regards to learning English, enjoying learning English, teacher-teaching style, and learning English using Scratch applications.

3.6 Vocabulary Achievement Test

The Vocabulary achievement test was prepared by the researcher to measure the students' achievement in acquiring the vocabulary of two units.

3.6.1 The aim of the Vocabulary Achievement Test

The test was one of the study instruments which aimed at measuring the effectiveness of using Scratch Applications in Developing Sixth Graders' English Vocabulary and its retention.

3.6.2 The sources of designing Vocabulary Achievement Test

The researcher referred to many resources in designing the test. In addition to his own experience, he depended on English for Palestine 6 textbook to construct the domain of vocabulary test. Furthermore, the researcher consulted English supervisors and experienced teachers.

3.6.3 Items of the Test

The test has four domains: **listening**, which consists of two parts circling the word the learner hears and numbering the word the learner hears; **matching**, which consists of 10 words to match each with the proper picture; **filling in the gap** (space) according to their photos; and **re-writing** the gamble words.

3.7 The Pilot Study

The test was applied on a random sample of (30) students from **Belal ben Rabah Boys' School**, who have the same characteristics of the study sample. The results were recorded and statistically analyzed to assess the validity and reliability of the test as well as the time needed. The items of the test were modified in the light of the statistical results.

3.8 The Validity of the Test

Al Agha (1996, p.118) states that "a valid test is the test that measures what it is designed to measure". The study used the referee validity and the internal consistency validity.

3.8.1 The Referee Validity

The test was introduced to a jury of specialists in English language and methodology in Gaza universities, Ministry of Education and experienced supervisors (see Appendix 5).

3.8.2 The Internal Consistency Validity

Al Agha (1996: 121) asserts that the internal consistency validity indicates the correlation of the score of each item with the total average of the test. It also indicates the correlation of the average of each domain with the total average. This validity was calculated using Pearson Formula. Table (3.1) shows the correlation coefficient of every item of the writing achievement test.

Table (3.1): Correlation coefficient of every item of the Vocabulary test

No.		Pearson Correlation		No.	Pearson Correlation
1	listening	0.763**	Matching	1	0.761**
2		0.599**		2	0.590**
3		0.801**		3	0.777**
4		0.570**		4	0.779**
5		0.424*		5	0.892**
6		0.413*		6	0.920**
7		0.627**		7	0.640**
8		0.452*		8	0.789**
9		0.430*		9	0.870**
10		0.521**		10	0.854**
1	Filling gap	0.419*	re-writing	1	0.786**
2		0.472**		2	0.786**
3		0.528**		3	0.477**
4		0.720**		4	0.820**
5		0.443*		5	0.691**
6		0.423*			
7		0.721**			
8		0.774**			

*r table value at df (28) and sig. level (0.05) = 0.361

**r table value at df (28) and sig. level (0.01) = 0.463

The table shows that correlations of the test items were significant at (0.05) and 0.01), which indicates that there was a consistency between the items. This proves that the test was highly valid for the study.

Table (3.2): Pearson Correlation coefficient for every skill in the Vocabulary test

Skill	Pearson Correlation	Sig. level
Listening	0.733**	sig. at 0.01
Matching	0.928**	sig. at 0.01
Filling in the gap	0.645**	sig. at 0.01
Re-writing	0.740**	sig. at 0.01

*r table value at df (28) and sig. level (0.05) = 0.361

**r table value at df (28) and sig. level (0.01) = 0.463

As shown in table (3.2), there is a correlation between the scopes and the total score and each scope with the other scopes at sig. level (0.01). This shows a high internal consistency of the vocabulary test which reinforces the validity of the test.

3.9 Reliability of the Test

The test is regarded reliable when it gives the same results in case of applying it again for the same purpose in the same conditions (Al-Agha, 1996,p120). The reliability of the test measured by the Spilt- half technique.

3.9.1 Split-Half Method

The reliability of the test was measured by KR20 and the Spilt- half techniques. Table (3.4) shows (KR20) and the Split-half coefficients of the vocabulary achievement test.

Table (3.3): (KR20) and Spli- half coefficients of the Vocabulary test domains

Scope	No. of items	KR20	Split half coefficients of the test domains
Listening	10	0.706	0.731
Match	10	0.932	0.873
Filling Gap	8	0.685	0.683
Re-writing	5	0.744	0.881
Total	33	0.910	0.810

The results show that the Spilt-half coefficient is (0.810) and KR20 is (0.910) indicating that the reliability of the test is high and strong.

3.10 Difficulty Coefficient of the Test

Difficulty coefficient is measured in the pilot study by finding out the percentage of the wrong answers made by the students to each item (Abu Nahia, 1994:308). The coefficient of difficulty of each item was calculated according to the following formula for the pilot study which was conducted on (30) students:

$$\text{Difficulty Coefficient} = \frac{\text{No. of students who gave wrong answers}}{\text{the total number of students}} \times 100$$

Table (3.4): Difficulty coefficient for each item of the Vocabulary test

No.	Difficulty coefficient	No.	Difficulty coefficient
1	0.63	18	0.63
2	0.50	19	0.56
3	0.63	20	0.50
4	0.75	21	0.69
5	0.69	22	0.63
6	0.63	23	0.56
7	0.38	24	0.25
8	0.50	25	0.31
9	0.38	26	0.38
10	0.25	27	0.63
11	0.50	28	0.56
12	0.44	29	0.25
13	0.31	30	0.31
14	0.63	31	0.44
15	0.38	32	0.38
16	0.63	33	0.31
17	0.50		
Total difficulty coefficient		**0.49**	

Table (3.4) shows that the difficulty coefficient lies between (0.25) and (0.75) with a total average of (0.49). This indicates that each item is acceptable or in the normal limit of difficulty.

3.11 Discrimination Coefficient

It refers to the ability of the test to differentiate between high and low achievers. The discrimination coefficient was calculated according to the following formula:

$$\textbf{Discrimination Coefficient} = \frac{\text{No. of students who gave the correct answer from the high achievers}}{\text{Total no. of high achievers}} - \frac{\text{No. of students who gave the correct answer from the low achievers}}{\text{Total no. of low achievers}}$$

Table (3.5) shows the discrimination coefficient for each item of the test:

Table (3.5): Discrimination coefficient for each item of the Vocabulary test

No.	Discrimination coefficient	No.	Discrimination coefficient
1	0.75	**18**	0.75
2	0.50	**19**	0.63
3	0.75	**20**	0.75
4	0.50	**21**	0.38
5	0.63	**22**	0.75
6	0.75	**23**	0.63
7	0.75	**24**	0.50
8	0.75	**25**	0.63
9	0.25	**26**	0.75
10	0.50	**27**	0.75
11	0.50	**28**	0.63
12	0.63	**29**	0.50
13	0.63	**30**	0.38
14	0.75	**31**	0.63
15	0.75	**32**	0.75
16	0.75	**33**	0.63
17	0.75		
Total Discrimination coefficient			**0.63**

Table(3.5) shows that the discrimination coefficient wobbles in the range (0.25 – 0.75) with a total average of (0.63). This means that each item is acceptable or in the normal limit of discrimination in the point of view of the assessment and evaluation specialist.

3.12 Self-Efficacy Scale

The **self-efficacy scale** was used to determine the students' self-efficacy. The scale composed of four domains, involving thirty-nine items as shown in Table (3.6) below. The resrearche adopted an Arabic version of the self-efficacy scale and distributed it to students while conducting the results. The **self-efficacy scale** items were constructed by the researcher taking into account the opinions of supervisors and experts of the English language.

Table (3.6): The self-efficacy scale

Domains	No. of items
Self–efficacy towards learning English	10
Self–efficacy towards enjoy learning English	10
Self–efficacy towards English teacher and methodology	10
Self–efficacy towards learning English vocabulary	9
TOTAL	39

3.13 The Validity of the Self-Efficacy Scale

In order to measure the validity of the **self-efficacy** scale, the researcher used the referee validity. The **self-efficacy** scale was introduced to experienced supervisors (Appendix3) and the items of the attitude scale were adjusted according to their recommendations.

3.13.1 The Validity of the Self-Efficacy Scale

According to table (3.7), the coefficient correlation of each item within its scope is significant at levels (0.01) and (0.05).Table (3.8) shows the correlation coefficient of each scope with the whole attitude scale. According to the following tables, it can be concluded that the attitude scale is highly consistent and valid as a tool for the study.

Table (3.7): Correlation coefficient of self-efficacy scale domains

Domains	Items	Pearson correlation	domains	Items	Pearson correlation	domains	Items	Pearson correlation	domains	Items	Pearson correlation
Self–efficacy towards learning English	1	0.565**	Self–efficacy towards enjoy learning English	11	0.560**	Self–efficacy towards English teacher and methodology	21	0.566**	Self–efficacy towards learning English vocabulary	31	0.402*
	2	0.541**		12	0.478**		22	0.699**		32	0.419*
	3	0.404*		13	0.743**		23	0.750**		33	0.799**
	4	0.762**		14	0.574**		24	0.413*		34	0.415*
	5	0.483**		15	0.452*		25	0.497**		35	0.578**
	6	0.592**		16	0.785**		26	0.496**		36	0.478**
	7	0.560**		17	0.405*		27	0.598**		37	0.593**
	8	0.638**		18	0.633**		28	0.624**		38	0.437*
	9	0.372*		19	0.471**		29	0.545**		39	0.707**
	10	0.476**		20	0.479**		30	0.540**			

r table value at df (28) and sig. level (0.05) = 0.361

r table value at df (28) and sig. level (0.01) = 0.463

Table (3.8): Correlation coefficient of each scope with the whole self-efficacy scale

Domains	Pearson correlation	Sig. level
Self–efficacy towards learning English	0.650**	sig. at 0.01
Self–efficacy towards enjoy learning English	0.814**	sig. at 0.01
Self–efficacy towards English teacher and methodology	0.503**	sig. at 0.01
Self–efficacy towards learning English vocabulary	0.701**	sig. at 0.01

r table value at df (28) and sig. level (0.05) = 0.361

r table value at df (28) and sig. level (0.01) = 0.463

3.13.2 Reliability of the Self-Efficacy Scale

The self-efficacy scale is reliable when it gives the same results if it is reapplied in the same conditions. The reliability of the scale was measured by Alpha cronbach and the Spilt- half techniques.

According to tables (3.10) and (3.11), the scale proved reliable. Alpha cronbach coefficient is (0.720) and the Spilt- half coefficient is (0.680).

Table (3.9): Alpha cronbach Coefficients for the self-efficacy scale Domains

SCOPE	TOTAL	Alpha Cronbach coefficient
Self-efficacy towards learning English	10	0.597
Self-efficacy towards enjoying learning English	10	0.670
Self-efficacy towards English teacher and methodology	10	0.531
Self-efficacy towards learning English vocabulary	9	0.601
Total	39	0.720

Table (3.10): Reliability coefficient by Spilt –half Technique

SCOPE	TOTAL	BEFORE	AFTER
Self-efficacy towards learning English	10	0.682	0.811
Self-efficacy towards enjoying learning English	10	0.618	0.764
Self-efficacy towards English teacher and methodology	10	0.680	0.810
Self-efficacy towards learning English vocabulary	9	0.597	0.624
Total	39	0.679	0.680

3.14 Controlling the Variables

The researcher tried to control some variables that might affect the results of the research to ensure valid results and avoid any possible external interference. Mackey and Gass (2005, p128) emphasized that "it would be important that each group of students be relatively homogeneous. Were they not homogeneous, one cannot be sure about the source of the results".

3.14.1. General English Achievement Variable

T-test is used to measure the statistical differences between the groups due to their English vocabulary achievement. The subjects' results in the first term test of the school year (2016-2017) are recorded and analyzed as shown in Table (3.11) below.

Table (3.11): T-test results of controlling the English achievement variable

Domains	group	N	Mean	Std. Deviation	t	Sig. value	sig. level
English achievement	experimental	22	18.318	11.073	-0.419	0.677	not sig.
	control	22	19.727	11.230			

"t" table value at (42) d f. at (0.05) sig. level equal 2.02

"t" table value at (42) d f. at (0.01) sig. level equal 2.70

Table (3.11) shows that there were no statistical differences at (0.05) between the experimental and the control subjects due to the English vocabulary achievement test**.**

3.14.2. Controlling the Vocabulary Variable

To make sure that the sample subjects are equivalent in their previous English language achievement, the researcher applied a pre vocabulary test. The results of the subjects were recorded and statistically analyzed using T-test. Table (3.12) shows the mean and the standard deviation of each group in the pre-writing achievement test. The analysis results indicate that there are no statistically significant differences between the experimental and the control groups at (0.05) level.

Table (3.12): t.test results of controlling test variable

Scope	Group	N	Mean	Std. Deviation	t	Sig. value	sig. level
Listening	experimental	22	1.364	0.902	0.511	0.612	not sig.
	Control	22	1.227	0.869			
Matching	experimental	22	4.727	3.104	1.134	0.263	not sig.
	Control	22	3.591	3.528			
Filling Gap	experimental	22	1.636	1.840	1.572	0.123	not sig.
	Control	22	0.909	1.151			
Re-writing	experimental	22	0.864	1.207	0.967	0.339	not sig.
	Control	22	0.545	0.963			
SUM	experimental	22	8.591	4.807	1.589	0.120	not sig.
	Control	22	6.273	4.872			

"t" table value at (42) d f. at (0.05) sig. level equal 2.02

"t" table value at (42) d f. at (0.01) sig. level equal 2.70

3.14.3 The Age Variable

The researcher recorded the students' ages from the school files for the scholastic year (2016-2017) and made sure that they were all of the same age ranging between [10-11] years old, indicating that both the experimental and the control groups were equivalent in the age variable.

3.15 Procedures of the Study

To accomplish the objectives and to validate the hypotheses of the study, the following steps were followed:

1- Reviewing and revising the researches and previous studies conducted on the use of SCRATCH Applications in Developing Sixth Graders' English Vocabulary, its retention, and self-efficacy particularly to benefit from their recommendations, results, instrumentation and sampling.
2- Modifying, Analyzing and deciding the content of the study (two units).
3- Designing the formula of the achievement test.
4- Designing the formula of the self-efficacy scale.
5- Designing the process of vocabulary learning approach based on a computer program (Scratch applications).
6- Consulting experts and specialists in English language and methodology and refereeing the validity and the reliability of the study tools.
7- Obtaining permission from the Islamic University of Gaza and The Ministry of Higher Education to carry out the study.
8- Applying the pre- test on both the control and the experimental groups.
9- Applying the program, which is concerned at teaching vocabulary through Scratch computer applications on the experimental group and using the traditional way with the control group
10- Applying the posttest on the experimental group and the control group.
11- Applying the post self-efficacy scale on the experimental group.
12- Applying the vocabulary retention test on the experimental group.
13- Presenting recommendations and suggestions in the light of the study findings.

3.17 Statistical Analysis Procedures

The data was collected and computed using Statistical Package for Social Sciences (SPSS). The following statistical techniques were used:

1. T. Test Independent Samples: to control the intervening variables and to measure the statistical differences between the two groups due to the study variables.
2. Spearman Correlation: to determine the internal consistency validity of the test.
3. Pearson Correlation Coefficient: to identify the correlation between the items of the test and the scale.
4. Split-half and Alpha Cronbach techniques: to test the reliability of the scale items.
5. Eta square: to assess the effect size.

3.18 Summary

This chapter shows the procedures of designing and applying the instruments, the subjects and the statistical analysis that the researcher adopted in analyzing the results of the pre- post-test and the pre- post self-efficacy scale. The next chapter presents the data analysis and results on the study hypotheses.

Chapter 4
Data Analysis

Chapter 4

Data Analysis and Results

4.1. Introduction

The study aimed at investigating **The Effectiveness of Using SCRATCH Applications in Developing Sixth Graders' English Vocabulary, its retention, and self-efficacy.**

This chapter handles the procedures and the findings of the study regarding the research questions. The researcher used a variety of statistical tests using the statistical program (SPSS) to analyze the collected data. Tables were also used to present these data with analysis and interpretation.

4.2. Data Analysis

4.2.1. Answering the first question

The first question was formulated as follows:

What is the nature of Scratch applications intended to be used in teaching vocabulary to sixth graders?

Scratch is a graphical programming language that you can use for free. By simply dragging and dropping coloured blocks, you can create interactive stories, games, animation, music, art, and presentations. You can even upload your creations to the Internet to share them with Scratch programmers from around the world. Scratch is designed for play, self-directed learning, and design.

From left to right, in the upper left area of the screen, there is a *stage area*, featuring the results (i.e., animations, turtle graphics, etc., everything either in small or normal size, full-screen also available) and all sprites thumbnails are listed in the bottom area. The stage uses x and y coordinates, with 0,0 being the stage center. The stage is 480 pixels wide, and 360 pixels tall, x:240 being the far right, x:-240 being the far left, y:180 being the top, and y:-180 being the bottom.

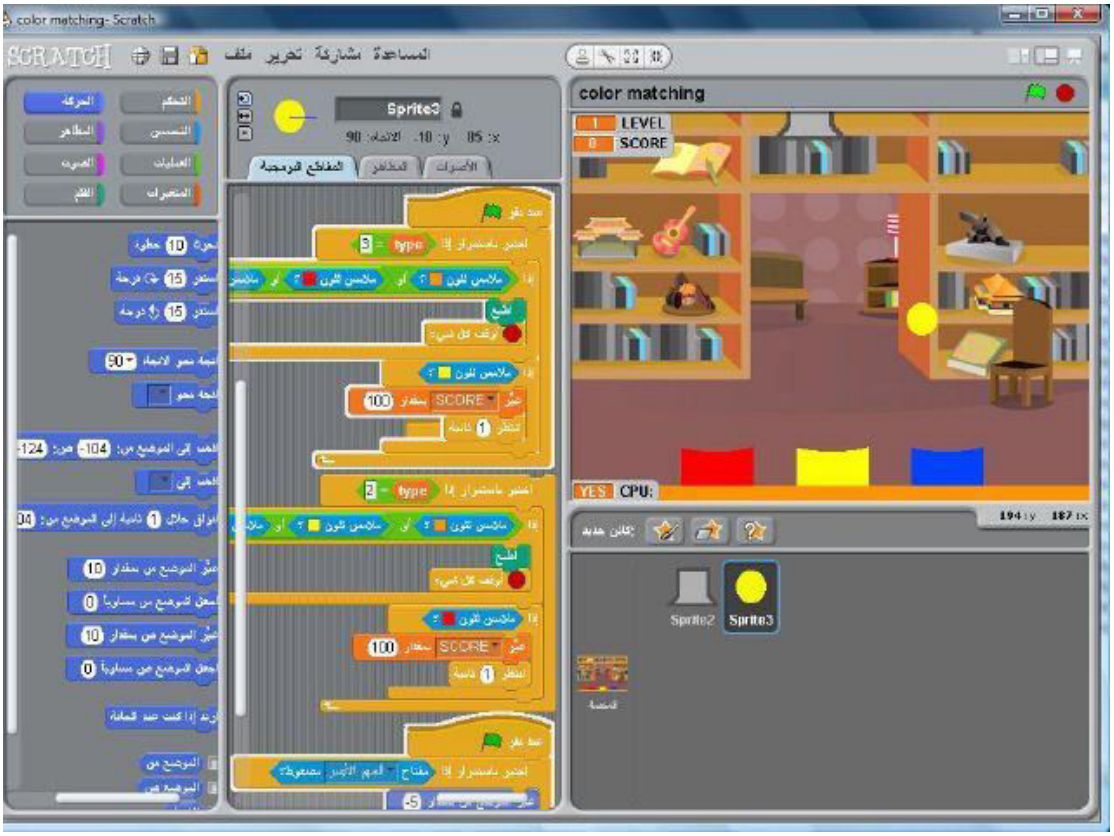


Figure (4.1): Category of Sprite and Blocks

With a sprite selected in the bottom-left area of the screen, blocks of commands can be applied to it by dragging them from the Blocks Palette onto the right area of the screen, containing all the scripts associated with the selected sprite. Under the Scripts tab, all available blocks are listed and categorized as the Motion, Looks, Sound, Pen, Data, Events, Control, Sensing, Operators, and More blocks as shown in

the table below. Each can also be individually tested under different conditions and parameters via double-click.

Category	Notes	Category	Notes
Motion	Moves sprites and changes angles and change X and Y values	Events	Contains event handlers placed on the top of each group of blocks
Looks	Controls the visuals of the sprite; attach speech or thought bubble, change of background, enlarge or shrink, transparency, shade	Control	Conditional if-else statement, "forever", "repeat", and "stop"
Sound	Plays audio files and programmable sequences	Sensing	Sprites can interact with the surroundings the user has created and can import from PicoBoard or Lego WeDo
Pen	Draw on the portrait by controlling pen width, color, and shade. Allows for turtle graphics.	Operators	Mathematical operators, random number generator, and-or statement that compares sprite positions
Data	Variable and List usage and assignment	More Blocks	Custom procedures (blocks) and external devices control

Table (4.1) Sprtie and blocks

4.2.2 Answering the second question

The second question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- post test) in learning English **vocabulary**?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- post test) in learning English **vocabulary.**

To examine the hypothesis, means and standard deviations of the experimental groups' results on the pre-post test were computed. Independent Samples T-test was

used to measure the significance of the differences. Table (4.3) describes those results.

Table (4.2)

T.Test paired sample results of the differences between the pre-test and the post test of the experimental group in English vocabulary achievement

scope	group	N	Mean	Std. Deviation	T	Sig. value	sig. level
Listening	Pre test	22	1.364	0.902	17.363	0.000	sig. at 0.01
	post test	22	8.727	1.882			
Match	Pre test	22	4.727	3.104	4.125	0.000	sig. at 0.01
	post test	22	8.364	2.498			
Finish	Pre test	22	1.636	1.840	9.919	0.000	sig. at 0.01
	post test	22	7.000	1.543			
re-write	Pre test	22	0.864	1.207	9.009	0.000	sig. at 0.01
	post test	22	5.545	1.625			
Total degree	Pre test	22	8.591	4.807	10.936	0.000	sig. at 0.01
	post test	22	29.636	6.723			

"t" table value at (21) d f. at (0.05) sig. level equal 2.08

"t" table value at (21) d f. at (0.01) sig. level equal 2.83

Table (4.3) shows that the T. computed value is larger than T. table value in the test, which means that there are significant differences at ($\alpha \leq 0.01$) in the total average score of the post-test of the experimental group in favor of the post test. The mean of the post-test reached (29.636), whereas the mean of pre-test was (8.591). This means that there are statistically significant differences between the pre and post application of the experimental group in favor of the post test. This means that using scratch computer applications is very effective in the achievement of sixth graders' learning English vocabulary.

Table (4.3)

The effect size of scratch applications in the pre-post test of the experimental group

Scope	t value	η^2	d	Effect volume
Listening	17.363	0.935	7.578	Large
Match	4.125	0.448	1.800	Large
Finish	9.919	0.824	4.329	Large
re-write	9.009	0.794	3.932	Large
TOTAL	10.936	0.851	4.773	Large

Table (4.4) shows that the effect size of scratch computer applications is large on students' English vocabulary achievement. This means that the effect of scratch computer applications is significant.

4.2.3 Answering the third question

The third question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in learning English **vocabulary** in the post-test?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in learning English **vocabulary** in the post-test

To examine the hypothesis, means and standard deviations of the experimental groups' results on the pre-post test were computed. Independent Samples T-test was used to measure the significance of the differences. Table (4.5) describes those results.

Table (4.4)

T.test independent sample results of differences between the experimental and the control group in the post learning vocabulary test

Scope	group	N	Mean	Std. Deviation	t	Sig. value	sig. level
listening	experimental	22	8.727	1.882	6.287	0.000	sig. at 0.01
	control	22	5.000	2.047			
Match	experimental	22	8.364	2.498	4.538	0.000	sig. at 0.01
	control	22	4.000	3.754			
Finish	experimental	22	7.000	1.543	8.270	0.000	sig. at 0.01
	control	22	2.591	1.968			
re-write	experimental	22	5.545	1.625	10.808	0.000	sig. at 0.01
	control	22	0.727	1.316			
SUM	experimental	22	29.636	6.723	8.341	0.000	sig. at 0.01
	control	22	12.318	7.047			

"t" table value at (42) d f. at (0.05) sig. level equal 2.02

"t" table value at (42) d f. at (0.01) sig. level equal 2.70

As shown in table (4.5), the T. computed value is larger than T. table value in the test, which means that there are significant differences at ($\alpha \leq 0.01$) in the total mean score of the post-test between the experimental and control group in favor of the experimental group. The mean of the post-test in the experimental group reached (29.636), whereas the mean of the control group was (12.318). This result indicates that using **SCRATCH applications** is more effective than the traditional method in developing the students' **vocabulary** skills.

To show the extent to which **SCRATCH applications affect** the experimental group's achievement in the **vocabulary** skills, the study applied the "Effect Size" technique (Affana, 2000, p. 42). The researcher computed "$^2\eta$" using the following formula:

$$\eta^2 = \frac{t^2}{t^2 + df}$$

And the "d" value using the following formula:

$$D = \frac{2t}{\sqrt{df}}$$

Table (4.5)

The Table References to Determine the Level of Effect Size (²η) and (d)

Test	Effect volume		
	Small	**Medium**	**Large**
η^2	0.01	0.06	0.14
D	0.2	0.5	0.8

The results of "²η" and "d" values found in Table (4.6) indicate a large effect size of using **SCRATCH applications** in the post-test Table (4.6) shows the effect size of SCRATCH applications of the vocabulary learning test is large.

Table (4.6)

The Effect Size of SCRATCH applications on the experimental group Post-Test

Table (4.6) shows that the effect size of **SCRATCH applications** is large on

Skill	t value	η^2	D	Effect volume
Listening	6.287	0.485	1.940	Large
Matching	4.538	0.329	1.401	Large
Filling Gap	8.270	0.620	2.552	Large
Re-writing	10.808	0.736	3.335	Large
Total	8.341	0.624	2.574	large

students' **vocabulary** items. This means that the effect of **SCRATCH** is significant.

This large effect may be due to the activities and techniques which are used in the **SCRATCH applications** to develop students' **vocabulary** items.

4.2.4 Answering the forth Question

The forth question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in learning English **vocabulary**?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in learning English **vocabulary**

To investigate the hypothesis, the means and standard deviations of the experimental group's results were computed. T.Test Paired Sample was used to measure the significance of differences.

Table (4.7)

T.test paired sample results of the differences in the total mean score between the post-test and the delayed test of the experimental group

Scope	Group	N	Mean	Std. Deviation	t	Sig. value	sig. level
Listening	Post test	22	8.727	1.882	-1.000	0.329	not sig.
	Delayed test	22	8.773	1.798			
Matching	Post test	22	8.364	2.498	-1.312	0.204	not sig.
	Delayed test	22	8.591	2.108			
Filling Gap	Post test	22	7.000	1.543	-0.439	0.665	not sig.
	Delayed test	22	7.045	1.397			
Re-writing	Post test	22	5.545	1.625	-1.821	0.083	not sig.
	Delayed test	22	5.682	1.393			
SUM	Post test	22	29.636	6.723	-1.702	0.104	not sig.
	Delayed test	22	30.000	6.102			

"t" table value at (21) d f. at (0.05) sig. level equal 2.08

"t" table value at (21) d f. at (0.01) sig. level equal 2.83

Table (4.8) shows that the T. Computed value is less than T. Table value in the delayed vocabulary retention test. This means that there are no statistically significant differences at ($\alpha \leq 0.05$) in the total average score between the post vocabulary test and the delayed vocabulary retention test of the experimental group. The mean of the post vocabulary test was (29.636), while the mean of the delayed vocabulary retention test was (30.300). This result indicates the long-term effect of using **SCRATCH applications** on the vocabulary retention of the experimental group.

4.2.5 Answering to the fifth Question

The fifth question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- post test) in English **self-efficacy scale**?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- post test) in English **self-efficacy scale.**

To investigate the fourth hypothesis, the means and standard deviations of the experimental group results were computed. T. Test Paired Sample was used to measure the significance of the differences.

Table (4.8)

T.Test paired sample results of the differences between the pre-post test of the experimental group in self-efficacy scale

scope	group	N	Mean	Std. Deviation	t	Sig. value	sig. level
Self-efficacy towards learning English	Pre test	22	32.364	4.696	71.589	0.000	sig. at 0.01
	post test	22	39.500	4.480			
Self-efficacy towards enjoy learning English	Pre test	22	36.591	4.563	155.000	0.000	sig. at 0.01
	post test	22	43.636	4.541			
Self-efficacy towards English teacher and methodology	Pre test	22	30.682	5.295	86.965	0.000	sig. at 0.01
	post test	22	37.636	5.368			
Self-efficacy towards learning English vocabulary	Pre test	22	30.364	4.865	57.424	0.000	sig. at 0.01
	post test	22	37.409	4.758			
Total degree	Pre test	22	130.000	13.119	125.564	0.000	sig. at 0.01
	post test	22	158.182	12.934			

"t" table value at (21) d f. at (0.05) sig. level equal 2.08

"t" table value at (21) d f. at (0.01) sig. level equal 2.8

Table (4.9)

The effect size of scratch applications in the pre- post test of the experimental group

Scope	t value	η^2	d	Effect volume
Self-efficacy towards learning English	71.589	0.996	31.244	Large
Self-efficacy towards enjoy learning English	155.000	0.999	67.648	Large
Self-efficacy towards English teacher and methodology	86.965	0.997	37.955	Large
Self-efficacy towards learning English vocabulary	57.424	0.994	25.062	Large
Total	125.564	0.999	54.801	Large

Table (4.10) shows that the effect size of scratch applications is large on students' self-efficacy. This means that the effect of scratch applications is significant.

4.2.6 Answering to the sixth Question

The sixth question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in **self-efficacy scale** in the post-test?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in **self-efficacy scale** in the post-test**.**

To examine the hypothesis, means and standard deviations of both groups' results on the post-test were computed. Independent Samples T-test was used to measure the significance of the differences. Table (4.11) describes those results.

Table (4.10)

T.test independent sample results of differences between the experimental and the control group in the post self-efficacy scale

Scope	group	N	Mean	Std. Deviation	t	Sig. value	sig. level
Self-efficacy towards learning English	experimental	22	39.500	4.480	4.483	0.000	sig. at 0.01
	control	22	33.409	4.532			
Self-efficacy towards enjoy learning English	experimental	22	43.636	4.541	4.553	0.000	sig. at 0.01
	control	22	37.318	4.664			
Self-efficacy towards English teacher and methodology	experimental	22	37.636	5.368	3.754	0.001	sig. at 0.01
	control	22	31.500	5.475			
Self-efficacy towards learning English vocabulary	experimental	22	37.409	4.758	4.388	0.000	sig. at 0.01
	control	22	31.182	4.656			
SUM	experimental	22	158.182	12.934	6.276	0.000	sig. at 0.01
	control	22	133.409	13.247			

"t" table value at (42) d f. at (0.05) sig. level equal 2.02

"t" table value at (42) d f. at (0.01) sig. level equal 2.70

As shown in table (4.10) the T. computed value is larger than T. table value in the test, which means that there are significant differences at ($\alpha \leq 0.01$) in the total mean score of the post-test between the experimental and control group in favor of the experimental group. The mean of the post-test in the experimental group reached (158.182), whereas the mean of the control group was (133.409). This result indicates that using **scratch applications** is more effective than the traditional method in developing the students' **self-efficacy scale.**

Table (4.11) shows the effect size of **scratch applications** in **self-efficacy scale**.

Table (4.11)

The Effect Size of scratch applications on the Experimental/control group Post-Test

Skill	t value	η^2	d	Effect volume
Self-efficacy towards learning English	4.483	0.324	1.384	Large
Self-efficacy towards enjoy learning English	4.553	0.330	1.405	Large
Self-efficacy towards English teacher and methodology	3.754	0.251	1.158	Large
Self-efficacy towards learning English vocabulary	4.388	0.314	1.354	Large
Total	6.276	0.484	1.937	large

Table (4.11) shows that the effect size of **scratch applications** is large on students' self-efficacy scale. This means that the effect of **scratch applications** is significant. This large affect may be due to the activities and techniques which are used in the **scratch applications** to develop students' self-efficacy scale.

4.2.7 Answering to the seventh Question

The seventh question was formulated as follows:

Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in English **self-efficacy scale**?

To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in English **self-efficacy scale.**

To investigate the eighth hypothesis, the means and standard deviations of the experimental group results were computed. T. Test Paired Sample was used to measure the significance of differences.

Table (4.12)

T.Test paired sample results of the differences between the post-delayed test of the experimental group in self-efficacy

scope	group	N	Mean	Std. Deviation	t	Sig. value	sig. level
Self-efficacy towards learning English	Post test	22	39.500	4.480	1.865	0.076	not sig.
	Delayed test	22	39.955	4.359			
Self-efficacy towards enjoy learning English	Post test	22	43.636	4.541	1.116	0.277	not sig.
	Delayed test	22	44.000	4.106			
Self-efficacy towards English teacher and methodology	Post test	22	37.636	5.368	1.821	0.083	not sig.
	Delayed test	22	37.773	5.246			
Self-efficacy towards learning English vocabulary	Post test	22	37.409	4.758	0.568	0.576	not sig.
	Delayed test	22	37.455	4.798			
SUM	Post test	22	158.182	12.934	1.914	0.069	not sig.
	Delayed test	22	158.818	12.172			

"t" table value at (21) d f. at (0.05) sig. level equal 2.08

"t" table value at (21) d f. at (0.01) sig. level equal 2.83

Table (4.12) shows that the T. computed value is less than T. table value in the delayed self-efficacy scale. That means there are no statistically significant differences at ($\alpha \leq 0.05$) in the total mean score between the post-delayed self-efficacy scale of the experimental group. The mean of the self-efficacy scale was (158.182), while the mean score of the delayed self-efficacy scale was (158.818). This result indicates the long-term effect of using scratch applications on the self-efficacy scale of the experimental group.

Chapter 5

Discussion of Findings, Conclusions & Recommendations

Chapter 5

Discussion of Findings, Conclusions and Recommendations

This chapter presents the results of the study. It discusses and interprets conclusions are induced in the light of the study findings and the implications suggested by the researcher. It also provides suggestions and recommendations for further research. Such recommendations are expected to be beneficial for course designers, supervisors, sixth grade teachers of English, students and educators. They may help improve teaching the English language in general and English vocabulary in particular.

5.1 Study Findings

The findings of this study outlined in the previous chapter were as follows:

1. There are statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- posttest) in learning English vocabulary?
2. There are statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in learning English vocabulary in the post-test?
3. There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in learning English vocabulary?
4. There are statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (pre- posttest) in English self-efficacy scale?
5. There are statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the control group and those of the experimental one in self-efficacy scale in the post-test?
6. There are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental group (post-delayed test) in English self-efficacy scale?

5.2 Discussion of the Study Findings

The experiment is designed to determine if the students would develop their vocabulary learning and positively change their self-efficacy beliefs towards English as a result of the use of Scratch applications. All subjects of the experimental group showed an improvement in their performance on the achievement post-test. Furthermore, the experimental group also showed a clear positive maintaining of the English language and vocabulary on the retention test and after applying the self-efficacy scale. Such positive result was very obvious through students' responses to the different domains of the test. This means that using Scratch applications in teaching vocabulary is very effective and lies at the center of the learning–teaching process.

5.2.1 Discussion of the First Hypothesis Findings

The findings of the first hypothesis which tested the absence of any statistically significant differences between the mean scores of the experimental group (pre-post test) in English learning vocabulary, showed that there were statistically significant differences at ($\alpha \leq 0.05$) level between the mean scores of the experimental group, in pre and post teaching vocabulary by using Scratch computer applications in favor of the post test of experimental group.

There was also a significant difference between the means of pre-pose experimental group in favor of the posttest of the experimental group since the mean of the pre test of the experimental group was (8.591) whereas that of posttest of the experimental group was (29.636). In addition, the researcher found that the effect size of the strategy was significantly large.

These findings were only attributable to the "Scratch applications. It can be concluded that the students in the posttest of the experimental group improved their achievement in vocabulary learning at the end of the study compared with the themsleves in the pre test. It was also found that the use of scratch applications positively influenced the post-experimental group students' achievement in the vocabulary learning due to the use of Scratch applications.

These findings could be attributed to the nature of Scratch computer applications which provides a sequence of instructions placing students at the center of their previous experiences and emphasizing collaborative learning that helps students develop their higher order learning and imaginative skills. The researcher and the teacher found that the students of the experimental group liked learning cooperatively and were able to learn the vocabulary much faster and more easily.

The classroom of the post-experimental group had an active and positive atmosphere, which helped students show more interest, participation and engagement. The pre-experimental group, on the other hand, showed less interest and frequently showed signs of boredom during the class and perhaps wished the lesson to end, especially because vocabulary learning, to many students, may be considered a tough and hard subject needing more concentration and deeper understanding. Actually, Scratch computer applications created a relaxed learning atmosphere, which directly and positively affected students' achievement in vocabulary learning as the findings of the first hypothesis indicate, in which the researcher is totally agree with these results.

5.2.2 Discussion of the Second Hypothesis Findings

The findings of the second hypothesis, which tested the absence of any statistically significant differences between the mean scores of the control group and those of the experimental one in English learning vocabulary, showed that there were statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the experimental group, who were taught vocabulary using Scratch computer applications, and those of their counterparts in the control one, who were taught vocabulary using the traditional method, in favor of the experimental group.

There was also a significant difference between the means of both groups in favor of the experimental group as the mean of the experimental group was (29.636), whereas that of the control group was (12.318). In addition, the researcher found that the effect size of the strategy was significantly large.

These findings of the study were only attributable to the "Scratch applications", since all other variables such as age; general achievement and achievement in English

were controlled before the experiment. It can be concluded that the students in the experimental group improved their achievement in vocabulary learning at the end of the study compared with the students in the control group. It was also found that the use of this strategy positively influenced the experimental group subjects' achievement in the vocabulary learning due to the use of Scratch applications.

These findings could be attributed to the nature of Scratch computer applications which provides a sequence of instructions placing students at the center of their previous experiences and emphasizing collaborative learning that helps students develop their higher order thinking skills. The researcher and the teacher found that the students of the experimental group liked learning cooperatively and were able to learn the vocabulary much faster and more easily than their counterparts in the control group.

Furthermore, the researcher realized that there was a clear difference between the atmosphere dominating the classroom of the control group and that of the experimental group. The classroom of the experimental group had an active and positive atmosphere, which helped students show more interest, participation and engagement. The control group, on the other hand, showed less interest and frequently showed signs of boredom during the class and perhaps wished the lesson to end, especially because vocabulary learning, to many students, may be considered a tough and hard subject needing more concentration and deeper understanding. Actually, Scratch computer applications created a relaxed learning atmosphere, which directly and positively affected students' achievement in vocabulary learning.

5.2.3 Discussion of the Third Hypothesis Findings

The findings of the third hypothesis, which tested the absence of any statistically significant differences between the mean scores of the experimental group in learning vocabulary (post test) and their scores on the delayed test, showed that there were no statistically significant differences at ($\alpha \leq 0.05$) level between the scores of the experimental group, after being taught vocabulary using Scratch computer applications and the scores of the same group in the delayed test. This means that the students maintained the learnt vocabulary in their long-term memory.

There was a significant similarity between the means of both results due to the use of the Scratch computer applications; the mean of the experimental group was (29.636), whereas that of the delayed group was (30.000). This makes it crystal clear that Scratch applications achieved no significant results.

These findings can be attributed to the nature of Scratch computer program which provides a sequence of instructions that place students at the center of their prior experiences and emphasize collaborative learning that helps students develop their higher order thinking skills. The researcher found that the students of the experimental group liked learning cooperatively and were able to learn the vocabulary much faster and more easily by exposing them to the interactive Scratch computer applications.

5.2.4 Discussion of the Forth Hypothesis Findings

The findings of the forth hypothesis, which tested the absence of any statistically significant differences between the mean scores of the experimental group (pre-post test) in English self-efficacy scale, showed that there were statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the experimental group, in pre and post self-efficacy scale by using Scratch computer applications, in favor of the post self-efficacy scale of experimental group.

There was also a significant difference between the means of pre-pose experimental group in favor of the post self-efficacy scale of the experimental group as the mean of the pre self-efficacy scale of the experimental group was (130.000), whereas the post self-efficacy scale of the experimental group was (158.182). In addition, the researcher found that the effect size of the strategy was significantly large.

These findings of the study were only attributable to the "Scratch applications. It can be concluded that the students in the post self-efficacy scale of the experimental group improved their self-efficacy scale at the end of the study compared with the themsleves in the pre self-efficacy scale. It was also found that the use of scratch applications positively influenced the post experimental group students' self-efficacy scale in the English learning due to the use of Scratch applications.

5.2.5 Discussion of the Fifth Hypothesis Findings

The findings of the fifth hypothesis, which tested the absence of any statistically significant differences between the mean scores of the control group and those of the experimental one in their self-efficacy beliefs towards English showed that there were statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the experimental group, and those of their counterparts in the control one, in favor of the experimental group.

There was also a significant difference between the means of both groups in favor of the experimental group as the mean of the experimental group was (158.182), whereas that of the control group was (133.409). In addition, the researcher found that the effect size of the strategy was significantly large.

These findings of the study were only attributable to the "Scratch applications", since all other variables such as age; general achievement and achievement in English were controlled before the experiment. It can be concluded that the students in the experimental group improved their self-efficacy at the end of the study compared with the students in the control group. It was also found that the use of this strategy positively influenced the experimental group students' self-efficacy scale due to the use of Scratch applications.

These findings could be attributed to the nature of Scratch computer applications which provides a sequence of instructions placing students at the center of their previous experiences and emphasizing collaborative learning that helps students develop their higher order thinking skills. The researcher and the teacher found that the students of the experimental group liked learning cooperatively and were able to learn the vocabulary much faster and more easily than their counterparts in the control group.

Furthermore, the researcher realized that there was a clear difference between the atmosphere dominating the classroom of the control group and that of the experimental group. The classroom of the experimental group had an active and positive atmosphere, which helped students show more interest, participation and engagement. The control group, on the other hand, showed less interest and

frequently showed signs of boredom during the class and perhaps wished the lesson to end, especially because vocabulary learning, to many students, may be considered a tough and hard subject needing more concentration and deeper understanding. Actually, Scratch computer applications created a relaxed learning atmosphere, which directly and positively affected students' self-efficacy beliefs in learning. The most important issue that the researcher spotted high interest in dealing with these scratch applications and learning process.besides; learners highly appreciate it.

5.2.3 Discussion of the Sixth Hypothesis Findings

The findings of the sixth hypothesis, which tested the absence of any statistically significant differences between the mean scores of the experimental group in self-efficacy scale (post test) and their scores in the delayed test, showed that there were no statistically significant differences at ($a \leq 0.05$) between the scores of the experimental group, after being measured self-efficacy beliefs by using Scratch computer applications and the scores of the same group on the delayed test. This means that the students maintained the same self-efficacy scale in their long-term memory.

There was a significant similarity between the means of both results due to the use of the Scratch computer applications; the mean of the experimental group was (158.182), whereas that of the delayed group was (158.818). This makes it crystal clear that Scratch applications achieved no significant results.

These findings can be attributed to the nature of Scratch computer program which provides a sequence of instructions that place students at the center of their prior experiences and emphasize collaborative learning that helps students develop their higher order thinking skills. The researcher found that the students of the experimental group liked learning cooperatively and were able to learn the vocabulary much faster and more easily by exposing them to the interactive Scratch computer applications.

5.3 Conclusions

Based on the current study findings, the following conclusions were derived:

1) Scratch applications were more effective and had superiority over the traditional methods of teaching the English vocabulary.
2) Scratch applications provided students with a better learning environment, which affected their achievement and performance in learning vocabulary.
3) Scratch applications promoted a learning environment that provided opportunities for exploring and investigating ways for understanding new words.
4) Scratch applications increased students' motivation towards learning and raised the degree of cooperation among students.
5) By applying the Scratch applications and by seeing the acronym of strategy, students felt relaxed, amused and comfortable and this led to easier and better learning and acquisition of the language.
6) Scratch applications increased students' motivation and communication, which provided fluency practice and reduced the dominance of the teacher.
7) Scratch applications strengthened the relationship between the teacher and the students and made the teacher a close friend, which facilitated the process of teaching and learning English vocabulary.
8) Scratch applications allowed the students and teacher-researcher to experience common activities, use and build on prior knowledge and experience, construct meaning, and continually assess their understanding of new words.
9) Scratch applications take into account the individual differences among learners with its various activities and techniques that were suitable for students of different levels of proficiency.

5.4 Recommendations

In the light of the study findings and conclusions, the following recommendations are put forward for the different parties involved in the English language teaching-learning process:

5.4.1 Recommendations to the Ministry of Education

The Ministry of Education is recommended to:

1. Conduct workshops and training programs on Scratch applications aiming at familiarizing teachers with them and using them in teaching the English language.
2. Include the Scratch applications in the Teacher's Guide and distribute it to teachers.
3. Develop and enrich the Teacher's Guide with approaches and techniques that increase and enhance the teaching and learning of the English vocabulary.
4. Computerize the curriculum so as to provide both teachers and students with free access to these Scratch applications by internet or CD's.

5.4.2 Recommendations to Supervisors

Supervisors are recommended to:

1. Develop teachers' abilities to implement cooperative learning methods by organizing in-service training programs, workshops and short courses.
2. Provide teachers with instructional materials that raise their awareness of Scratch computer applications and the importance and necessity of using this application to teach English vocabulary.
3. Hold workshops that aim at familiarizing teachers with Scratch applications.
4. Encourage teachers to exchange experiences and class visits by organizing training and demonstrative lessons.
5. Concentrate on the fact that student-centered activities are not time-wasting activities; rather, they are very important for teaching different aspects of the language.

5.4.3 Recommendations to English Language Teachers

English language teachers are recommended to:

1. Keep being in touch about the latest trends in the field of TEFL and benefit from the findings of the educational research.

2. Change the methods and approaches of teaching from traditional into more interactive ones based on the students' real involvement in the teaching-learning process.
3. Select effective methods and strategies that activate students' motivation, participation and degree of competition and challenge among themselves.
4. Change their role from instructors who dominate the class into educators whose role is to organize, help, guide, coordinate and support the students to communicate and learn the language.
5. Having rapport with their students, aiming to create a relaxed classroom atmosphere and facilitate the teaching-learning process.
6. Consider students' individual differences and learning styles in selecting Scratch applications.

5.4.4 Recommendations for Further Studies

The researcher suggests the following recommendations for further research:

1. Other researchers can conduct evaluative studies based on Scratch applications to examine the extent to which English for Palestine encompasses interactive and communicative activities and exercises.
2. They may also investigate the effectiveness of using Scratch applications on students' attitude towards the English language.
3. Researchers may investigate the effectiveness of using scratch applications on students' motivation for learning English vocabulary.

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Appendixes

Appendix(1): An Invitation to Referee a Self Efficacy Scale

The Islamic University- Gaza

Faculty of Education

Department of Curricula and Methodology

An Invitation to Referee a Self Efficacy Scale

Dear referee /……

The researcher is conducting a study entitled "The Effectiveness of Using SCRATCH Applications in Developing Sixth Graders' English Vocabulary, its retention, and self-efficacy" to obtain a Master Degree in curriculum and instruction.

As the aim of the study is to examine the self efficacy of the students who studied two chapters of English for Palestine textbook six graders using scratch applications, the researcher designed a self efficacy scale consisting of forty two (42) items.

You are kindly invited to examine and referee the attached scale. And I would be so grateful to your comments on its suitability, relevance, linguistic correctness and importance of each procedure.

All your contributions are highly valued. If you have any comments, please write them down in the space below.

……

Thanks for your cooperation

Researcher: Muhammed khamees Ihmaid

Appendix (2): Pre-Post Test

Pre- post Test

Belal ben Rabah Boys' School

Name:…….. Grade /6th

Time : ……..... Mark : ……/35

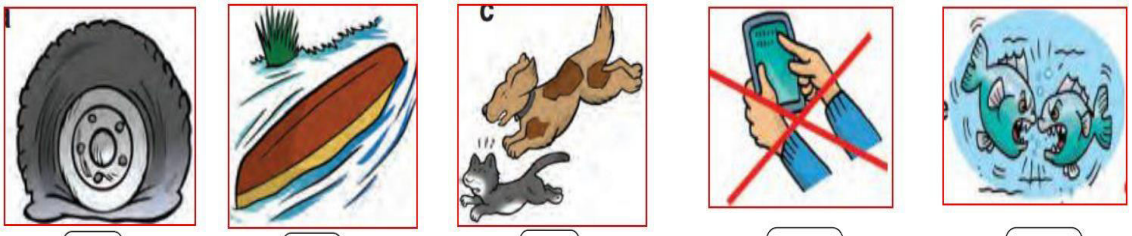
==========

A: Listening:

A – 1 : Listen and circle the word you hear :

a- **Adventure – burst – chase**
b- **Summer – turn over – seventeenth**
c- **Attach – diver – fight**
d- **Funny – mouse – noise**
e- **Other – ox – push**

A – 2 : Listen and number the pictures as you hear them:



B: Match the words with the pictures:

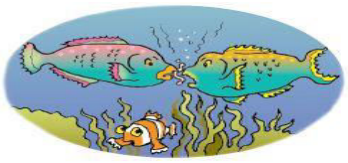
1. diver
2. attack
3. seventeenth
4. twenty first
5. fifteenth
6. noise
7. fight
8. ox
9. mouse
10. thirtieth

C: Finish the following sentences with words from the box below:

together – fighting – chasing – safe – diver – attacked – mouse - when

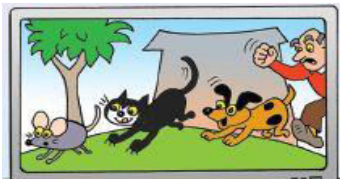
1. The small dog was ……..the big dog …… it crashed into a tree.

2. The green fish were ……and the orange fish was ……..under the plant.



3. The tiger ……..the young ox but the older stayed …….. .

4. The man was chasing the ……, cat and dog and made lots of …….. .



D: Re-write the words in the correct way:

1. siexthten  ……

2. totherge  ……

3. fonthurtee  ……

4. nesoi  ……

5. eiteenghth  ……

Appendix (3)

Scale for Measuring Self Efficacy

#	Items First Domain: Self-efficacy towards learning English	SA	A	N	D	SD
1	I can manage to solve difficult problems if I try hard enough					
2	If someone opposes me, I can find means and ways to convince them.					
3	It is easy for me to stick to my aims and accomplish my goals.					
4	I am confident that I could deal with unexpected situations efficiently.					
5	I can remain calm when facing difficulties relying on my abilities.					
6	When I am confronted with a problem, I can usually find a solution.					
7	I can usually handle whatever comes in my way.					
8	I am certain, I can understand the idea taught in the class					
9	I lose control when I get angry					
10	I can overcome the feeling of worry					
	Second Domain: Self-efficacy towards enjoy learning English					
11	I enjoy solving puzzles, and finding out mystery things					
12	I think Iam an effective and efficient person					
13	I can ask questions in class					
14	I enjoy participating English in the class					
15	I enjoy joining English club at school					
16	I feel happy when I learn English					
17	I feel confident when taking English exams					
18	I feel confident when I make full use of English outside the school					
19	Iam sure I will be able to do well in future English courses					
20	I feel confident enough to suggest ideas in English class					
	The third domain: Self-efficacy towards English teacher and Methodology					
21	I felt I was treated respectfully in class					

22	the teacher expressed lack of confidence in my ability to succeed					
23	I was ignored when I tried to participate in class discussions					
24	I feel opportunities are available to fulfill my goals					
25	There are many skills I can't accomplish					
26	I can get along with my friends outside school					
27	I talk more with my teacher and my colleagues					
28	I can persuade any person in my point of view					
29	I find difficulty in making the right decisions					
30	It's hard to make friendships with my classmates					
The fourth domain: Self-efficacy towards learning English Vocabulary						
31	I can keep up with the required studying					
32	I can understand text of teacher, textbooks, and exams					
33	I can get written activities done on time					
34	I can improve my achievement, and get the grade I want					
35	I can find an effective solution for each problem I face					
36	I am able to organize my activities					
37	Iam sure I can do an excellent job on task assigned in class					
38	I am no longer find difficulty in preparing my lessons					
39	I achieve my goals when trying many times					

Thanks for your cooperation

Appendix (4)

أداة قياس فعالية الذات

#	البند	موافق بشدة	موافق	محايد	معارض	معارض بشدة
	المجال الأول : فعالية الذات نحو تعلم اللغة الإنجليزية					
1	أستطيع حل الأسئلة الصعبة إذا بذلت جهد كافٍ					
2	إذا أحد عارضني أستطيع أن أجد وسيلة لإقناعه					
3	استطيع بسهولة إنجاز وتحقيق أهدافي في الفصل					
4	أثق بقدرتي على التعامل مع المواقف غير المتوقعة بفاعلية					
5	عندما تواجهني مشكلة استطيع ان ابقى هادئاً معتمداً على قدراتي					
6	عندما تواجهني مشكلة أستطيع أن أجد لها حلاً					
7	أستطيع عادة معالجة أي موقف يصادفني في طريقي					
8	متأكد من فهمي للمعلومات والأفكار التى تدرس في الفصل					
9	أفقد السيطرة عندما أتعرض لموقف يغضبني					
10	أستطيع التغلب على المواقف التي تعرضني للقلق					
	المجال الثاني : فعالية الذات نحو الاستمتاع بتعلم اللغة الإنجليزية					
11	أستمتع بحل الألغاز ، واكتشاف الموضوعات الغامضة					
12	أعتقد بأنني شخص فعال ومؤثر					
13	أستطيع طرح أسئلة في الفصل					
14	استمتع بالمشاركة باللغة الانجليزية في الفصل					
15	أستمتع بالانضمام لنادي اللغة الانجليزية بالمدرسة					
16	أشعر بالسعادة عندما أتعلم اللغة الانجليزية					
17	أشعر بالثقة عندما أتقدم للاختبارات الدراسية					
18	أشعر بالثقة عندما أستخدم اللغة الانجليزية خارج الفصل					
19	متأكد بانني سأكون قادرا أن أنجز بشكل أفضل مستقبلياً في المساقات الانجليزية					
20	أشعر بثقة كافية لطرح موضوعات داخل الفصل					
	المجال الثالث : فعالية الذات نحو معلم اللغة الإنجليزية وطريقة تدريسه					
21	يعاملني المدرس بإحترام داخل الفصل					
22	يرى المعلم ضعف ثقة في قدراتي على النجاح					

23	يتم تجاهلي عندما أحاول المشاركة في المشاركات الفصلية					
24	أشعر بتوفر الفرص لتحقيق أهدافي					
25	يوجد مهارات عديدة لا أستطيع تحقيقها					
26	أستطيع التعايش مع أصدقائي خارج المدرسة					
27	أستطيع التحدث أكثر مع معلمي وزملائي داخل الفصل					
28	أستطيع إقناع أي شخص بوجهة نظري					
29	أجد صعوبة في اتخاذ القرار السليم					
30	أجد صعوبة في تكوين صداقات مع زملائي داخل الفصل					
المجال الرابع : فعالية الذات نحو تعلم مفردات اللغة الإنجليزية						
31	أستطيع التغلب على فهم المفرادات الدراسية المنهجية داخل الفصل					
32	أستطيع فهم النص الكتابي للمدرس ، والكتاب المنهجي ، والاختبارات					
33	أستطيع إتمام المهام الكتابية المطلوبة في وقتها					
34	أستطيع تطوير تحصيلي وإحراز درجات أفضل في الاختبارات					
35	أستطيع إيجاد حل فعال لتخمين المعاني الصعبة التي تواجهني					
36	أصبحت قادراً على تنظيم وترتيب واجبتي وأنشطتى					
37	أصبحت واثقا من تقديم أداء ممتاز للأنشطة المطلوبة في الفصل					
38	أصبحت لا أجد صعوبة في حل واجباتي وتحضير الدروس					
39	أستطيع تحقيق أهدافي عندما أحاول عدة مرات					

Appendix (5): Referee committee / List of Referees

No.	Name	Field	Degree	Institution
1)	Prof. Hassan Abo Jarad	English Dept.	Ph.D.	Al – Azhar university-Gaza
2)	Prof. Abdelmoti Alagha	Education Dept.	Ph.D.	IUG
3)	Prof. Ezoo Afana	Education Dept.	Ph.D.	IUG
4)	Dr. Muhamed hamdan	English Dept.	Ph.D.	Gaza-University
5)	Dr. Akram Habeeb	English Dept.	Ph.D.	IUG
6)	Amal Hosni Abu Sharar	Supervisor of English	M.A	MOEHE
7)	Mr.Waleed Al-saqqa	Teacher of English	B.A.	MOEHE
8)	Mr.Wael Abu owda	Teacher of English	B.A.	MOEHE
9)	Mr. Zakria Mdoukh	Teacher of English	B.A.	MOEHE
10)	Mr.Mustafa Abo-taha	Lecturer of English	M.A	Aqsa University-Gaza