

إقرار

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The Impact of Smart and Non-Smart Styles of VAKT Approach on 4th Graders' English Spelling

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**The Impact of Smart and Non-Smart Styles of VAKT Approach
on 4th Graders' English Spelling**

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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 الباحثة/ إيمان محمود علي بعنوشة لنيل درجة الماجستير في كلية التربية/ قسم مناهج وطرق تدريس وموضوعها:

أثر الأساليب الذكية وغير الذكية لطريقة VAKT على التهجئة باللغة الإنجليزية لدى

تلامذة الصف الرابع الأساسي

The impact of smart and non smart styles of VAKT approach on 4th graders' English spelling

وبعد المناقشة العلنية التي تمت اليوم الأربعاء 22 محرم 1437هـ، الموافق 2015/11/04م الساعة

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واللجنة إذ تمنحها هذه الدرجة فإنها توصيها بتقوى الله وألزام طاعته وأن تسخر علمها في خدمة دينها ووطنها.

والله ولي التوفيق ،،،

نائب الرئيس لشئون البحث العلمي والدراسات العليا

أ.د. عبدالرؤوف علي المناعمة

بسم الله الرحمن الرحيم

" كما أرسلنا فيكم رسولا منكم يتلو عليكم آياتنا ويزكيكم
ويعلمكم الكتاب و الحكمة ويعلمكم ما لم تكونوا تعلمون "
سورة البقرة (الآية 151)

In the name of Allah, the most gracious, the most merciful.

Say,

*"Just as We have sent among you a messenger from yourselves reciting to you Our verses and
purifying you and teaching you the Book and wisdom and teaching you that which you did not
know."*

Surat Al-Baqarah (Verse 151)

Dedication

I would like to dedicate my work to:

The soul of my dear father-in-law "Hassan Tammous",

And the soul of my dear aunt "Fawzeia Ba'lousha",
who will live in my heart and memory forever.

My parents, from whom I have acquired virtue and
hard work, and who are the source of my strength.

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To whoever taught me a word.

Abstract

The Impact of Smart and Non-Smart Styles of VAKT Approach on 4th graders' English Spelling

The study aimed at investigating the impact of smart and non-smart styles of VAKT approach on 4th graders' English spelling. To achieve the aim of the study, the researcher adopted the experimental approach, three-group design. The researcher selected a sample of (96) fourth graders from Al-Shejaeia elementary Co-ed "B" school. The participants were distributed at the beginning of the year into three equivalent groups; two experimental groups and a control one, each of which consisted of (32) students.

The researcher prepared two tools to collect data: Content analysis and a spelling test to measure the equivalence of the groups and to find if there were any significant differences among the three groups. The data of the study were analyzed using one way ANOVA. Scheffe Post Hoc test matrix was used to identify the direction of differences among the fields and T-Test paired sample was used to measure the mean scores of the experimental groups' results of the pre- and post-tests. Effect size technique was used to measure the effect size of smart and non-smart styles of VAKT approach on the experimental groups.

The findings of the study revealed that there were statistically significant differences at (0.01) among the three groups at the level of spelling between the 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group, and there were statistically significant differences between 1st experimental group and control group in favor of the 1st experimental group.

The results also showed that there were statistically significant differences between the mean scores of the pretest and posttest results at ($\alpha = 0.05$) in English spelling in favor of the post-test for the 1st experimental group. There were also statistically significant differences between the mean scores of the pretest and posttest at ($\alpha = 0.05$) in English spelling in favor of the post-test for the 2nd experimental group.

Moreover, the results of the effect size indicated the large effect size of the smart style of VAKT Approach on 4th graders' English Spelling in the Total degree of English spelling. Another finding related to the effect size indicated the large effect size of the non-smart style of VAKT Approach on 4th graders' English spelling in the total degree of the English spelling test.

In the light of those results, the researcher recommended the necessity of using the smart and non-smart styles of VAKT approach in teaching young learners English spelling. The researcher also suggested that further research should be conducted to explore the effect of the use of smart and non-smart styles of VAKT approach on teaching other skills or other school subjects and students' attitude towards this approach.

ملخص الدراسة

أثر الأساليب الذكية و غير الذكية لطريقة VAKT على التهجئة باللغة الانجليزية لدى تلامذة الصف الرابع الأساسي

هدفت الدراسة إلى الكشف عن أثر الأساليب الذكية و غير الذكية لطريقة VAKT على التهجئة باللغة الانجليزية لدى تلامذة الصف الرابع الأساسي، و من أجل تحقيق أهداف الدراسة، استخدمت الباحثة المنهج التجريبي، واختارت الباحثة عينة مكونة من (96) طالبة من طالبات الصف الرابع الأساسي من مدرسة الشجاعة الابتدائية المشتركة "ب"، ووزعت طالبات العينة منذ بداية العام الدراسي على 3 مجموعات؛ مجموعتان تجريبيتان و الثالثة ضابطة بواقع (32) طالبة في كل مجموعة.

ولقد قامت الباحثة بإعداد أداتان للحصول على البيانات اللازمة للدراسة: حيث قامت بتحليل محتوى الوحدات المستهدفة و قامت بإعداد اختبار في التهجئة لقياس تكافؤ المجموعات و للتحقق من وجود فروق ذات دلالة إحصائية بين المجموعات الثلاث.

هذا وقد تم تحليل البيانات و معالجتها إحصائياً باستخدام تحليل التباين الأحادي، واختبار (ت) للعينات المرتبطة لقياس فرق الدرجات بين الاختبار البعدي والقبلي للمجموعات التجريبية، و تم استخدام تقنية حجم الأثر لقياس مدى تأثير طريقة التدريس بالأساليب الذكية و غير الذكية لطريقة VAKT على المجموعات التجريبية.

أظهرت نتائج الدراسة وجود فروق ذات دلالة إحصائية عند (0.01) بين المجموعات الثلاث في التهجئة: بين المجموعة التجريبية الثانية و المجموعة الأولى و الضابطة لصالح المجموعة التجريبية الثانية، وبين المجموعة التجريبية الأولى و المجموعة الضابطة لصالح المجموعة التجريبية الأولى.

وأشارت نتائج الدراسة أيضاً إلى وجود فروق ذات دلالة إحصائية عند (0.05) بين الاختبار القبلي و البعدي في التهجئة للمجموعة التجريبية الأولى لصالح الاختبار البعدي، وهناك أيضاً فروق ذات دلالة إحصائية عند (0.05) بين الاختبار القبلي و البعدي في التهجئة للمجموعة التجريبية الثانية لصالح الاختبار البعدي.

و بالنسبة للنتائج المتعلقة بحجم الأثر فقد أثبتت النتائج وجود أثر فعال وكبير لاستخدام الأساليب الذكية و غير الذكية لطريقة VAKT في تدريس التهجئة باللغة الانجليزية لطالبات الصف الرابع الأساسي.

و في ضوء هذه النتائج؛ فقد أوصت الباحثة بأهمية استخدام الأساليب الذكية و غير الذكية لطريقة VAKT في تدريس التهجئة باللغة الانجليزية للمتعلمين الصغار واقترحت الباحثة إجراء المزيد من الدراسات للبحث في أثر الأساليب الذكية و غير الذكية لطريقة VAKT على تدريس مهارات أخرى أو مواد دراسية أخرى عدا اللغة الانجليزية و دراسة اتجاهات الطلبة نحو هذه الطريقة.

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List of abbreviations

Abbrev.	Denotation
IUG	Islamic University of Gaza
UNRWA	United Nations Relief and Work Agency
ESL	English as a Second Language.
MI	Multiple Intelligences.
etc,	"et cetera" that means in Latin "and other things"
CSCL	Computer-Supported Collaborative Learning
CSILE	Computer Supported Intentional Learning Environment
EFL	English as a Foreign Language.
Apps.	Applications
MTARSH	Multisensory Teaching Approach for Reading, Spelling, and Handwriting
ANOVA	Analysis of Variance
SPSS	Statistical Package for the Social Sciences
IEP	Individualized Education Program
SGD	Speech-Generating Devices
ASD	Autism Spectrum Disorder
DD	Developmental Disabilities
ESOL	English for Speakers of Other Languages
CCC	Copy, Cover, and Compare
AT	Assistive Technology

Chapter I

Study Background

Chapter I

Study Background

1.1 Introduction

This chapter states the study background and problem, as well as the study questions, hypotheses, purpose, significance, justification, originality, limitations, definition of variables and the operational definition of terms.

1.2 Study background:

English is thought to be one of the most important languages in the world. There are many reasons why English is so important. One of the reasons is that English is spoken as the first language in many countries. Even in countries where English is not the native language, people use it for business and tourism. English is used for these purposes in most countries. English is considered the business language. English is the official language of the United Nations. English is also the official language of airlines and airports. All airline pilots that fly to other countries must be able to speak English.

So as McKay (2002: 1) points out:

The teaching and learning of an international language must be based on an entirely different set of assumptions than the teaching and learning of any other second or foreign language.

Therefore, teaching English is a challenge for both teachers and students, especially in the Gaza Strip, because of wars, occupation, poverty and many other social and economic reasons. So, students face many difficulties in grammar, reading, spelling...etc.

This study sheds light on spelling deficiencies because the ability to spell words correctly is a skill that is necessary for success in school and adult life. Further, the students with spelling difficulties need to be identified early and receive proper instruction in order to catch up with their peers.

Spelling plays an important role in our life, for example, looking up words in dictionary, filling up any applications, recognizing the right choice from the possibilities presented by a spell checker and writing notes or anything. "In fact, the National Commission on writing for America's Families, Schools and Colleges (2005) reported that 80 percent of the time an employment application is doomed if it is poorly written or poorly spelled" (Moats, 2005: 6).

But what about spell check? Some educators have argued that spelling instruction is unnecessary. It is true that spell checkers work reasonably well for those of us who can spell reasonably well, but rudimentary spelling skills are insufficient to use a spell checker. Spell checkers do not catch all errors. Students who are very poor spellers do not produce the close approximations of target words necessary for the spell checkers to suggest the right word. Montgomery, Karlan, and Coutinho (2001) study reported that spell checkers usually catch just 30 to 80 percent of misspelling overall and that spell checkers identified the target word from the misspelling of students with learning disabilities only 53 percent of the time.

Moats (2005: 6) assures that spelling instruction may be old fashioned, but its importance has not diminished with computerized spell checkers and there is no reason to believe that it will diminish in the foreseeable future. In line with this argument, Crystal (2012) conforms that One day spelling checkers will be more sophisticated, taking the context of the word into account; but for now they can let us down badly. One day there will be even better labour-saving spelling devices. We will speak into a machine and it will spell the words for us, or type them for us. Devices of this kind already exist, using voice-to-text software, but they are far from perfect. They do not like broad regional accents. They do not like fast speakers. They do not like background noise. They especially do not like proper names. Eventually these problems will be solved, but not for another generation or so.

Moreover, the current educational environment, with large class sizes and many curricular demands, results in the need for spelling interventions that are both effective and efficient (Garcia, 2012). Spelling probably is the biggest difficulty for non native speakers, since the relation between English spelling and pronunciation does not follow the alphabetic principles consistently, especially for Arab students because in their mother tongue (Arabic Language), there is correspondence between

what is pronounced and what is written but in English there is a lack of that correspondence and there are different and overlapping spelling patterns. This means in English language you can find that one letter can give different sounds and one sound can be represented by different letters. For such reasons, English spelling and pronunciation are difficult even for native speakers to master.

Also, teachers need to know how to teach spelling in the elementary years because it is the most beneficial time to provide young students with knowledge and opportunities to strengthen the relationship between reading and writing skills (Bloodgood, 1991). The classroom is the scene because there are important links between what and how children are taught, and what they learn. The activities that happen in classrooms create a kind of environment for learning and, as such, offer different kinds of opportunities for language learning. Part of the teaching skill is to identify the particular opportunities of a task or activity, and then to develop them into learning experiences for the children (Camerson, 2001: 20).

In a similar vein, Schlagal (2001) believes that memory is not a sufficient tool to make spelling meaningful and lasting. Memorizing words each week and completing drills may allow some students to be successful on tests, but most students will forget the spelling of these words after Friday. It seems as though this teaching method tests the student's ability to memorize rather than their ability to spell.

Obaied (2013: 75-76) states that teachers know that students learn in different ways. In order for instruction to reach all students, teaching methods must relate to each child's own learning preference style. But we stray into a minefield if we try to classify learners into fixed visual (What we see), Auditory (What we hear), kinesthetic-tactile (What we feel), stereo types and teach them accordingly. Most children can learn through all channels and if they are taught through all channels; they will have maximized learning because what they do not get from their main channel, they may get from another. Thus, the most effective instructional method for teaching all children is multi sensory instruction.

Also, knowing that no one method of learning is appropriate for all children, teachers have to vary in their techniques in the same teaching period. By doing so, they focus on every student's unique strengths. Out of this idea, the researcher looked

for an approach which could deal with the different learning styles employing the multi sensory instruction and which could be suitable to teach spelling. After a long searching process, she chose "the VAKT Approach."

(VAKT) Approach is an old approach, and in today's developed world, use of the new technology makes the learning process more convenient, reliable and productive. The researcher thinks that using new technological tools side by side with other tools and activities which incorporate (VAKT) Approach should meet the needs of each child in the classroom and could bring significant benefit to teachers and students alike, as the Chinese proverb says: "Tell me, and I will forget. Show me, and I will remember. Involve me, and I will learn". The researcher thinks that smart devices are effective as a learning tool since they address all the channels (Visual, auditory and kinesthetic- tactile). Moreover, they are more attractive and amusing for children. Out of this idea, this study could be a new addition to the English language education and it will be a step forward to a better spelling which leads to a better reading and writing. It is aimed to determine the impact of smart and non smart styles of VAKT approach on 4th graders' English spelling in Gaza schools. This study is also needed to identify the most effective techniques that aid in the acquisition of spelling and that deliver meaningful improvements in an efficient manner.

Several studies have revealed that (VAKT) Approach can render positive outcomes and high retention rates of learning. As means of combating spelling difficulties and thereby also of combating reading difficulties. Moreover, in the researcher's best knowledge; there have not been any studies that examined (VAKT) Approach and its effects on spelling in Gaza schools. It is suggested that the visual-auditory-kinesthetic-tactile (VAKT) approach be used in learning to spell. Originally designed by Grace Fernald, (1943), the method provides multimedia exposure through sight, hearing, and touching. The six steps to be followed in using the VAKT method are (1) inspect the whole word to be learned, (2) pronounce or enunciate the whole word, (3) write the whole word while pronouncing each syllable, (4) dot the "i's" and cross the "t's" in the left to right sequence, (5) pronounce each syllable and underline it, and (6) pronounce the whole word again (Taschow, 1970).

Reports of the use of the VAKT method seem to indicate that it is a valuable means of learning to spell and that its value might well transfer to other reading skills

(Taschow, 1970:10). When the three channels, visual, Auditory and kinesthetic-tactile, are used, memory and learning are enhanced; thus links are consistently made between the visual, auditory and kinesthetic-tactile channels in learning to read and spell. Teachers who use this approach teach children to link the sounds of the letters with the written symbols. Children also link the sound and symbol with how it feels to form the letter or letters. Teachers and their students rely on all three channels for learning rather than focusing on a "sight-word" or memory method, "tracing method" or "phonetic method" alone.

The above mentioned viewpoints and discussions support developing spelling teaching and highlight the importance of spelling. As a result, the idea of this study came into existence..

1.3 Need for the study:

Teaching spelling traditionally has become boring and insufficient for today's world of technology and development. Students need to be exposed to other approaches which may enhance their learning and increase their abilities in spelling. It was proofed that using technology has good effects on all fields, especially on education. So, educators should be aware of the impact of using smart applications on improving students' skills and enhancing their competencies. Student's live technology in all walks of their lives and when they come to school they get separated of that technology. So, there is a huge gap between real life nowadays and the traditional ways of teaching at schools. Therefore, to fill this gap up, this study produced some smart applications on smart devices to find out their impact on spelling improvement and to be as a reference for all educators.

On the other hand, some educators are not convinced of the benefits of technology in education, but they believe in teaching students using multi-sensory approaches like VAKT Approach, so this study gives educational research the opportunity to check out if VAKT Approach, smart applications based on VAKT approach or traditional methods have the most impact on improving students' English spelling.

1.4 Statement of the problem:

The researcher has been teaching at UNRWA schools for about 9 years. She used many techniques to improve student's spelling skills, but she found that these techniques are not good enough for students who feel bored while reading from their books or from the blackboard. As a result, the students perform poorly and receive low scores in spelling tests. Also, the researcher has found out that students are interested in multimedia and smart devices that hook their attention so much. Also, students like to be involved in the teaching process by moving, touching and doing; hence why do not we use what they love to make them learn better? Thus with the sense of responsibility, the researcher thought to conduct this study to identify the impact of smart and non-smart styles of VAKT Approach on developing 4th graders' English spelling.

1.5 Study Main Question:

The study problem is stated in the following main question:

What is the impact of smart and non-smart styles of VAKT approach on 4th graders' English Spelling?

1.6 Study sub-questions:

To achieve the purpose of this study, the study addressed the following sub-questions:

1. What are the words that 4th graders should be able to spell?
2. Are there statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling posttest for the three groups due to the teaching approach?
3. Are there statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling pretest and the posttest for 1st experimental group?
4. Are there statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling pretest and the posttest for 2nd experimental group?

1.7 Research Hypotheses:

1. There are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling posttest for the three groups due to the teaching approach.
2. There are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling pretest and the posttest for 1st experimental group.
3. There are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the spelling pretest and the posttest for 2nd experimental group.

1.8 Purpose of the study:

This study aimed to:

1. Examine the impact of smart and non smart styles of VAKT Approach on spelling.
2. Contribute to improve the process of teaching English in general and teaching spelling to 4th grade in particular.
3. Identify the best approach in teaching English spelling to 4th graders.
4. Identify the words that are appropriate for 4th grade and students have to be able to spell them.

1.9 Significance of the study:

The implications of this study can be exploited by:

- Curriculum designers and decision makers.
- English language supervisors.
- English language teachers.
- Parents

1.10 Limitations of the study:

The study was conducted within the following limitations:

1. This study was confined to 4th graders in the Gaza Strip aged between 9 and 10.
2. This study focused on spelling and developing spelling by VAKT approach using smart and non-smart applications of VAKT Approach.
3. This study was limited to English language learning.
4. This study was conducted within the academic year (2014-2015) / Second semester in Gaza district.

1.11 Definitions of Terms:

Impact: Measure of the effects (consequences) of one thing's or entity's action or influence upon another.

VAKT Approach: (visual, auditory and kinesthetic-tactile) is a multi-sensory program that features tracing, hearing, writing and seeing (Hallahan, Kauffman, & Lloyd, 1985).

Smart Style of VAKT Approach: The use of technological applications based on VAKT approach to address the three channels (visual, auditory and kinesthetic-tactile)

Non-smart style of VAKT Approach: The researcher defines the **non-smart style of VAKT Approach** as a multi-sensory program which employs sounds, pictures, body movements, drawing, tracing and writing to serve the operation of spelling vocabulary.

Spelling in English is the art or study of orthography, which means forming words with letters in an accepted order.

4th Graders: All students who are about 9 or 10 years old and studying at UNRWA schools.

1.12 What is original about the study?

A massive number of previous studies investigated the effectiveness of teaching spelling strategies and methods as dependent or independent variables without specifying the target strategies or the relations among them. The majority of programs that address spelling instruction are targeted at children who have learning difficulties (Wanzek, et al., 2006) and at younger children. What is missing are whole-class programs that meet the requirements of older students by targeting morphological and orthographic distinctions.

Moreover, there have been many studies where the authors suggest that their method of teaching children is effective. However, very few studies examine the individual learning strategies and cognitive development of both children experiencing difficulty and children experiencing no difficulty, and compare the effectiveness of different teaching methods. There are fewer studies of spelling than reading. For these reasons, this research is innovative.

Many researchers investigated the impact of VAKT approach, but no one ever investigated a smart style of VAKT approach before. The present study investigated the impact of smart and non-smart styles of VAKT approach on 4th graders' English spelling in Gaza. Strategies were specified, and the level of the development of each strategy was investigated separately. Then, they were compared with each other. Finally, this study is - to the best knowledge of the researcher -the first of its kind in the Gaza Strip and in the world and it tested a spelling program that can be used in a typical classroom and offers a different approach to developing students' senses.

Chapter II

Literature Review

Chapter II

Literature Review

This chapter consists of two sections: theoretical framework and previous studies

Section A: Theoretical framework

Since the purpose of this study is to explore the impact of smart and non-smart styles of VAKT Approach on fourth graders' English spelling, the theoretical framework guiding this study consists of four main parts: the first part discusses spelling, the second part discusses technology and education, the third part discusses different theories of teaching spelling, and the fourth part discusses the smart and non-smart styles of VAKT approach.

Part One: Spelling

This part discusses spelling; its definition; its relationships with other skills; the sources of inefficient spelling; its importance; the difference between spelling, orthography and dictation; and methods of spelling assessment.

2.1 What is spelling?

The term spelling has various definitions. Kress (2000:1) defines it as "knowing how to write words correctly". Tainturier and Rapp (2002: 263) say that the term "spelling" is used to refer in a general sense to the expression of orthographic knowledge regardless of the modality of output. Weeks, Brooks, & Everatt, (2002) say that " Spelling is to a large degree a phonological translation task". Also, Sebba (2007:10) defines spelling as "writing of words of a language according to the norms or conventions of that language". In his turn, Nordquist (2010) describes spelling in written language as the choice and arrangement of letters that form words. According to Reed (2012:7), spelling is "producing the correct orthographic representation of a written word.",Davenport, et al.(2009:1) define spelling as " A crucial component of successfully expressing oneself in written communication." Spelling can be operationally defined as the art or study of orthography, which means forming words with letters in an accepted order.

Spelling is also one curriculum area in which neither creativity nor divergent thinking is encouraged; only one pattern of arrangement of letter is accepted as correct; there is no compromise or leeway. Proficiency of spelling is needed in all subjects in the school curriculum. Though the child may know the answer to a question properly, yet due to poor spelling, he/she may not be able to convey a clear meaning. Since the problem of making mistakes in spelling pervades of all areas of school curriculum, due to errors he/she may not be able to communicate what he/she wants to most of the time in the school. Hence, remedying spelling errors for overall improvement is very important. Juel's (1991) opinion supports that when he says that difficulties with spelling can divert attention from other important processes in writing.

2.1.1 Relationship between spelling and reading:

Research has shown that learning to spell and learning to read rely on much of the same underlying knowledge - such as the relationships between letters and sounds - and, not surprisingly, that spelling instruction can be designed to help children better understand that key knowledge, resulting in better reading (Moats, 2005).

In alphabetic languages such as English, progress in acquiring reading and spelling proficiency normally depends upon a firm understanding of the correspondence between the individual sounds of spoken words and the graphemes used to represent them. While the reading and spelling ability rely on the same basic principles, mastery of English spelling presents a greater challenge than learning to read (Holmes & Carruthers, 1998).

Recht, et al. (1990) suggest that almost every child who has reading difficulties has similar or even greater problem with spelling. Spelling ability is a powerful characteristic to differentiate dyslexic children from normal learners (Deshler, et al., 1982; Cronin, 1994).

According to the abovementioned, there is a strong relationship between spelling and reading. In addition, there is sufficient ground to assert that many students in elementary and secondary classrooms show deficiencies in various degrees in the art of spelling. Concomitantly, most of these inefficient spellers are also plagued by a variety of reading deficiencies (Taschow, 1970: 2).

The ability to spell is an achievement no less deserving of well-directed study than the ability to read. Yet, spelling and reading are not quite opposite sides of a

coin. Though each is party to a common code, the two skills are not identical (Shankweiler & Lundquist, 1993. p.135).

As Reed (2012) states teaching reading and spelling together gives students more opportunities to practice applying common patterns. However, researchers caution that poor spelling ability does not necessarily mean that students are poor readers: good readers can typically decode more words than they can spell or encode (Berninger, et al., 2002). Moats (2005: 12) assures that "Clearly, we should not assume that progress in reading will necessarily result in progress in spelling."

2.1.2 Relationship between spelling and writing:

The ability to communicate is a necessary skill in any class or career. One of the most common ways we communicate is through writing. When we write, we are sending a message to the readers. We want that message to be clear, and we want the readers to feel connected to our topic and to us. If spelling errors are present in our writing, the readers will be distracted and may miss our message.

Our writing creates an impression with the readers. We want the readers to feel that you have taken the time to review, proofread, and edit your work before submitting it or sending it to them. This is true in essays, but also in emails or messages that we may send. If we fail to do so, we may leave the readers with the impression that we simply do not care.

Research also bears out a strong relationship between spelling and writing: Writers who must think too hard about how to spell use up valuable cognitive resources needed for higher level aspects of composition. Even more than reading, writing is a mental juggling act that depends on automatic deployment of basic skills such as handwriting, spelling, grammar, and punctuation so that the writer can keep track of such concerns as topic, organization, word choice, and audience needs. Poor spellers may restrict what they write to words they can spell, with inevitable loss of verbal power, or they may lose track of their thoughts when they get stuck trying to spell a word (Moats, 2005).

Lenski and Verbruggen (2010) assure that spelling, like handwriting, is a transcription skill that helps students to write with fluency. During a writing workshop in her classroom, Bowden found that when students stopped writing in order to ask for help with spelling or to look up a word in the dictionary, the flow of the students' thinking was interrupted and they would often have difficulty picking up

their train of thought. For foreign language learners who need to use the bulk of their cognitive resources to organize and express their ideas, fluent spelling is an important part of fluent writing.

Children should be relaxed about spelling; if not, it will inhibit their writing. They will be less willing to write out their assignments. When you listen to a struggler spell or read something that he/she has written, it is impossible not to notice that their choice of words may be poor or limited. This is very unfortunate because writing is something that we do throughout our lifetimes. Bad spelling also gives others a bad impression about you. No matter what you say, if the spelling is poor, the reader will notice this before anything else. Punctuation errors often go unnoticed, but everyone notices spelling errors.

As the child gets older and progresses through various grades, he/she will have to write reports and papers. Instructors at all grade levels, including the university level, will grade harshly on poor spelling. This will invariably affect the child's grade and possibly determine his/her future success in life.

Accurate spelling is important in academic writing and you will lose marks if your writing has spelling errors. It is important to realise that you cannot always rely on your computer; you should refer to a dictionary as well. We are all guilty of making spelling errors. Perhaps, it is that we are rushing through our work. Or, it could be that we do not take the time or know what to look for when proofreading our writing. However, it is important that we take the time to look for spelling errors in our writing.

Writing, spelling, and reading reinforce each other. Spelling helps a child see the patterns in language and understand how words are really put together. By learning spelling, children realize that the English language follows rules, which makes it easier for them to understand those rules when reading or writing. "Successful writers have proficient skills in three areas: handwriting, spelling and composition" (Simmons & Carpenter, 2010: 5).

2.1.3 Relationship between spelling and listening:

Listening is the basic bricks and mortar of language acquisition. Listening comprehension is the primary channel of learning a language. Yet, of the four dominant macro-skills (listening, speaking, reading and writing), listening is often difficult and inaccessible for second and foreign language learners due to its implicit

process. The secondary skill, speaking, proceeds listening cognitively. Aural/oral skills precede the graphic skills, such as reading and writing, as they form the circle of language learning process. However, despite the significant relationship with other language skills, listening comprehension is treated lightly in the applied linguistics research. Half of our daily conversation and three quarters of classroom interaction are virtually devoted to listening comprehension. Additionally, listening is the first phase in teaching oral spelling; since students listen to the pronunciation of words from the teacher and then they could spell them orally or in writing. By listening, students can distinguish between different sounds and can produce them correctly.

2.1.4 Relationship between spelling and speaking:

Although, spelling has a powerful relationship with other English skills, spelling has no effect on pupils' speaking and vice versa. Some pupils have a good speaking ability; however, their spelling is not good enough. The fact that pupils who have inefficient speaking abilities does not mean they are not able to spell words correctly. In this vein, Groff (1979) asserts that "speech therapy to correct the problems children have in articulating speech sounds is not likely to have much effect on their power to spell".

2.1.5 Relationship between spelling and intelligence:

There is not any correlation between spelling and intelligence. At this juncture, Horobin (2013: 8) assures that "Spelling is not a reliable index of intelligence. . . Many intelligent people struggle with English spelling, while others will find it comparatively easy to master. Learning to spell correctly requires remembering numerous unusual and peculiar spelling forms. Some people are just better at this form of rote learning than others. . . . ", which means spelling has nothing to do with intelligence, and pupils with low or medium average of intelligence can learn spelling.

2.1.6 Relationship between spelling and encoding:

Decoding means translating written words into the sounds and meanings of spoken words (often silently). Encoding, or spelling, is the reverse process. The skills used in encoding are usually developed alongside decoding skills and reflect similar learning. In order to become good decoders and spellers, learners need to first develop

some basic understandings about print and how it relates to spoken English. In particular, learners must have developed phonological awareness and phonemic awareness (Henry, 2010).

2.1.7 Phonological awareness:

Phonological awareness is an awareness of the different levels in the sound system of speech. In order to learn to read or spell words, learners need to be aware that the words they hear in spoken language are made up of small segments of sound and that these sounds can be represented in print. Phonological awareness is the awareness that words can be separated in three ways and at three levels, by syllables, by onsets and rimes, and by phonemes. Syllable awareness is awareness that words can be divided into syllables. A learner who has phonological awareness at the syllable level will know that the word 'mat' has one syllable, that 'rabbit' has two syllables and that 'hospital' has three syllables. Onset-rime awareness is phonological awareness within the syllable level. At this level, the learner knows that, in the word 'mat', the 'm' is the onset (the initial consonant/s of a syllable) and the 'at' is the rime unit of the syllable (the vowel and any consonants that follow it). The third level of separating words is by phonemes (or phonemic awareness). Phonemic awareness is knowing that 'mat' has three phonemes (/m/ /æ/ /t/) (Henry, 2010).

2.1.8 Phonemic awareness

Phonemic awareness is the most advanced level of phonological awareness. Phonemic awareness means awareness of the sounds or phonemes in spoken words and the ability to manipulate the sounds. Phonemes are the smallest sound units that can change the meaning of a word. For example, the difference between 'hit/sit', 'hit/hot' or 'hit/hid' is a difference of only one phoneme (a sound) in each case. The English language includes 42 to 46 phonemes and these phonemes are represented by 26 letters. The 42 to 46 phonemes produce over 500,000 words. Knowing that the word 'mat' has three phonemes (/m/ /æ/ /t/) or that the difference between 'mat' and 'pat' is one phoneme (/p/) are examples of learners having phonemic awareness. Phonemic awareness is very important for learning to read and write English texts. In alphabetic languages such as English, letters or letter clusters represent sounds or phonemes. Readers and writers must develop an awareness that words are made up of phonemes. This awareness does not necessarily come easily because phonemes are an

abstract concept; they are heard, not seen. Learners who lack phonemic awareness find it very hard to understand letter-sound correspondences and this means they have great difficulty in learning to read and write (Chard, Pikulski & Templeton, 2000).

2.1.9 Further prerequisites for learning to decode and spell

Learners also need to know the names of the letters of the alphabet and the sounds the letters represent, and they need to understand the key concepts about print. Without this knowledge, readers will not learn to decode and writers will not learn to spell.

- *The alphabetic principle.* Learners need to know that letters in print represent sounds in speech. This means knowing that speech can be turned into print, that print can be turned into speech and that letters are used to represent sounds in the language. It includes knowledge of the names and shapes of the letters of the alphabet. This knowledge is necessary so that learners can recognize letters by shape as they read and shape letters correctly as they write.
- *Concepts about print.* Learners need to understand how print works in written text. Such concepts include:
 - that text is written and read from left to right with a return sweep to the left of each new line.
 - that print on the left-hand page or column is read before print on the right
 - that written sentences start with capital letters and end with full stops
 - that the spacing between words, sentences, lines of print and paragraphs follow a meaningful pattern. (Clay, 1991)
- *Knowledge of letter-sound correspondence.* When learners understand that the words in speech are composed of small segments of sound and that letters in print can represent these sounds, they can learn the ways in which certain letters represent specific sounds. This is not an easy understanding for all learners, partly because the match between sounds and letters or letter clusters is not always regular. However, this knowledge of the relationship between spoken sounds and the corresponding letters is essential for decoding and writing text.
- *Word analysis.* Learners use their increasing knowledge of the ways in which many words are built up from root words, prefixes and suffixes to help them

work out how to read new words, for example, by recognizing the way the word kind changes when the prefix 'un-' is added.

- *Developing the ability to decode or spell automatically.* Good decoders and spellers quickly develop a store or bank of words they recognize or can write automatically (Ehri, 1998). These words are variously known as high-frequency (words that appear very frequently in written texts), everyday (words that a person may encounter in their everyday life), or familiar (words that a person knows well, often because they have particular relevance for the person). Such categories overlap, but knowing many of these kinds of words is essential for reading and writing.

By accessing this bank of words, readers are able to speed up their processing of print, pausing to decode only those words they do not yet recognize automatically. Similarly, writers are able to speed up their writing, pausing for words they are not yet able to write automatically. At the early stages of reading and writing, the words most likely to be used automatically are short, everyday words (typically of Anglo-Saxon origin), for example, 'he', 'hand', 'bread' and 'dog'. Many readers have difficulty progressing past this stage to automatic recognition of multi-syllabic words (typically of Greek or Latin origin), because they need to apply more complex strategies to decode these words (Chard, Pikulski, & Templeton, 2000).

2.1.10 Write to Communicate: Spelling progression

In addition to the prerequisites listed above, Ehri, (1998) listed some strategies for spelling for learners to be learned and applied as following :

- recalling words from memory
- working out words by using sound-letter relationships
- spelling rules and conventions
- using knowledge of root words and affixes
- writing the word and then checking to see if it looks right
- making analogies to known words or parts of words.

Expert spellers draw on these strategies automatically, using them flexibly to solve particular spelling problems. Learners need to develop expertise in the use of

dictionaries and other tools to check their spelling, including knowing how to select the correct spelling when there are choices. As they develop their expertise, adult learners need access to suitably-leveled dictionaries and spelling aids, including electronic tools.

2.1.11 What are the sources of inefficient spelling?

Inefficient spelling can result from the following:

1. Individual attitude toward spelling:

Some students have a prejudice for spelling; it is difficult and unpredictable. So, they have mental and psychological barriers resulting from their illusions. Those barriers prevent them from learning spelling or trying to memorize words (Salisbury, 2015).

2. Inappropriate methods in teaching spelling:

The teaching of spelling does definitely influence if not to some extent determine the individual's attitude toward spelling. Fernald (1943) refers to student failure to spell as being due to bad habits forced upon the child by the school in the attempt to teach him to spell. In a similar vein, Crystal (2012: 9) declares that "The bridges are especially needed by teachers, who have the unenviable task of introducing their students to the English orthographic world.

3. Brain damages:

Nearly 30% of children have differences in brain wiring associated with language-based learning disabilities. For example, studies showed that, compared to average readers, children with dyslexia tend to have more activity on the right side of the brain when they are reading. This can mean inefficient, slower processing and inefficient and slower reading and writing (Salisbury, 2015).

4. The difficulties inherent in the English language:

At present, nothing can be done to this attribute. As Crystal (2012: 9) says "Nowhere is the old saying 'I cannot see the wood for the trees' more applicable than in the case of spelling. We are dealing with thousands of words whose orthographic character has been shaped by sets of factors that often defy generalizations. We search for rules, and just when we think we have found some, we encounter a host of anomalies, variations and exceptions. How, under these circumstances, do we find a roadmap to take us through the spelling wood?" So, the following question deserves to be answered: Why is English spelling so unpredictable?

The basic patterns of modern English spelling had been established by the fourteenth century. That is a long time ago, and since then pronunciation has changed a lot. Spelling patterns tend to be very stable over long periods of time. When these basic patterns were established, the relationship between spelling and pronunciation was much closer. An example of this would be the letters 'gh' (night, light, cough, through, etc.). In the 14th century these were used to reflect a fricative sound which has since been lost (similar to the fricative in the Arabic pronunciation of Ahmad). It made sense then, but it does not now. (Barber, 1997)

Another reason is that English borrows words from other languages, sometimes along with their pronunciation, leading to words which seem to be following different rules (physics, psychology). Sometimes the pronunciation of the word changes, but not always. As Horobin (2013:14) says, "One of the reasons why English spelling is so unpredictable is because its vocabulary consists of many words derived from other languages, which have been adopted with their original spellings intact. Understanding the origins of these words and the languages they have come from will help with spelling them."

We also tend to keep the shape of the word the same, even if the pronunciation changes when suffixes are added (photograph, photography). This is quite useful, and an illustration of why writing systems do not just have to consider pronunciation. Any reform of English would have to take account of the many different accents of English; there could never be a perfect match between spelling and pronunciation.

There will always be such a discrepancy or mismatch between pronunciation and spelling because English has 20 vowel sounds but just five proper vowel letters. This discrepancy, says linguist Crystal, "underlies the complexity of English spelling", and he adds that "The origins of spelling difficulties in English lie in the fact that there are far more sounds in the language than there are letters, as can be seen from a list of the spoken vowels and consonants that have to be written down" (2012: 18).

2.1.12 Why Is Learning Spelling Words Important? Why does spelling matter?

At some point, a child may even ask, "Why do I have to learn spelling words?" Learning spelling words is important to your child's future. Spelling words

help lay the basic foundation that your child will need throughout his/her education and life.

Spelling is important because it aids in reading. It helps cement the connection that is shared between sounds and letters. Learning high frequency sight words also has been shown to help with both reading and writing. This is why students learn sight words during their early years. Spelling and reading also have a common factor, proficiency with language (Thiel, 2013).

You cannot place your entire future on the line by not being able to spell. Not only is the ability to spell necessary in most occupations, but a person also needs to be able to spell well in order to be able to communicate and take notes and directions. You could be trying to write someone a note that could possibly save his life, but if the person only sees a note filled with misspelled words, then that person may not be able to comprehend what you are saying. It is a stretch, but the message is clear. Spelling is so very important.

Accurate spelling reflects more advanced linguistic knowledge because it requires the integration of phonological, orthographic, and morphological knowledge. For example, we would not expect a student who struggles with reading words to be a precocious speller.

Crystal (2012:12) confirms that "We are all aware that there are some words in the language that we do not know how to spell, and have to look them up before we write them. There are no exceptions. Nobody knows how to spell every word in the language. Even the brilliant spellers who win the prizes in spelling bees get some words wrong."

2.1.13 What is the difference between spelling, orthography and dictation?

The terms "spelling", "orthography" and "dictation" seem to be largely synonymous. In order to answer this question, we have to first investigate the exact meaning of orthography. Corley, et al. (2008: 1) define orthography as "The process whereby words' spelling patterns are committed to memory such that they can be retrieved automatically rather than decoded from grapheme-phoneme correspondences." Orthography is the standardized procedure of a writing system, which includes punctuation, capitalization, word breaks, emphasis, etc. This means that spelling is only a part of orthography (spelling is part of a writing system), but

orthography includes a lot more than just spelling. Dictation, on the other hand, is a method of teaching spelling; so the purpose of dictation is correct spelling.

2.1.14 Methods of spelling assessment

Assessment of students' spelling provides an indication of their progress over time and of the effectiveness of the spelling instruction they receive. Westwood (2008: 74) states that information on students' spelling skills and strategies can be obtained by using any of the following assessment procedures:

- tests
- observation
- analysis of work samples
- individual interview and discussion with a student
- formal and informal testing.

Spelling tests are the most common type of assessment that most of us know from school. The teacher assigned a set of words, and at the end of the week or in a specified day the words were dictated, usually in sentences for context. We would write the words, hopefully with the correct spelling. This kind of assessment is still useful for checking students' mastery of spelling words. And there are a few variations on the traditional spelling test that teachers could try. First, instead of dictating the words, show the students a picture that illustrates the meaning of the word and have them write the word. A second variation would be to give the students a multiple-choice test, with various options for spelling the word, to see whether they can recognize the correct spelling (Brown, 2004). This alternative might be especially useful when a word has several different spellings, each with a different meaning, such as *there*, *their*, and *they're*, or *two*, *to*, and *too*, in which case the teacher could assess word meaning as well as spelling (Lenski & Verbruggen, 2010).

Ongoing assessment to guide instruction is usually termed 'formative' to differentiate it from 'summative' assessment that occurs much less frequently to evaluate students' learning at the end of a course of study or unit of work. Summative assessment is based on the stated learning objectives for that course (Westwood, 2008: 73).

In spelling, the whole word is either correct or incorrect; no partial correctness is acceptable at all. And that point was considered through the teaching process of the

experiment and through the tests of the current study. Finally, assessment must lead to action in terms of effective teaching and intervention.

Part Two: Different theories for teaching spelling

In this part, the following titles are discussed: theories for spelling instruction; multi-sensory approach and different learning styles.

2.3 Theories for spelling instruction:

Historically, spelling has received much less attention in literature as compared with listening, speaking, reading and writing instruction. In fact, spelling problems in students may be more severe than listening, speaking, reading and writing problems and may have proved more difficult to remediate.

Spelling was to be addressed as an integral part of the writing process. It was firmly believed that students would become proficient spellers in a ‘natural’ way if they simply had the opportunity to write every day about meaningful topics and received corrective feedback from their teachers.

The notion of ‘natural learning’ is attractive, but Graham (2000) has argued strongly that this approach, if used alone, is inadequate for effective spelling development. Some study results appear to support this view, particularly since a study in (2004) showed an improvement in spelling standards when whole-language teaching gave way in the late 1990s to a more balanced approach that embodied some explicit teaching (Westwood & Bissaker, 2005).

The importance of explicit teaching of spelling in schools is strongly reinforced in the renewed *Primary Framework* (DES, 2006: 5) in which spelling is identified as one of the 12 key strands of learning. There is an emphasis now on daily ‘word study’ and spelling within the ‘literacy hour’; and the teaching of phonic knowledge (which underpins basic spelling ability) has become respectable again.

Virtually all of these studies provide evidence that learning to spell is not a ‘natural’ process but rather a complex task involving many different perceptual, cognitive and linguistic skills (Westwood, 2008: 7).

There are many methods of teaching spelling. Beginning with the word lists, some teachers choose words from traditional spelling books, while others use high-frequency words from students' writing. Some teachers use a traditional visual-auditory approach to teaching words, while others use a multi-sensory approach that

emphasizes the use of kinesthetic and tactile modalities. Teachers also vary in the amount of time they devote to the teaching of spelling. Some teachers spend more time teaching the rules of spelling, while others devote more of their classroom time to writing (Murphy, 1997: 16).

One group of researchers, including Gillingham, Stillman, Hanna, Hodges and many others, have the belief that the English language is "primarily regular". Spelling is seen as learning a variety of rules that apply to the spelling of the 44 speech sounds (Seda, 1989). Another camp of researchers, including Hillerich, Horn, Groff, Graves, and many others, have an "irregular view" of spelling. They believe that the English language is "highly inconsistent and does not possess a one-to-one grapheme-phoneme relationship" (Seda, 1989).

There is support for using a high-frequency word list as opposed to one based on spelling patterns. Using spelling patterns can help students predict the spelling of unknown words. Hillerich (1977) suggests that teachers do not need spelling books, but rather a good word list. The list should be pretested with immediate correction by the student. Horn, (1947), Fitzsimmons and Loomer (1978), and Ganchow (1983) indicate that the pretest with immediate self-correction accounts for ninety-five percent of learning in a spelling program. McNeish, et al. (1992) and Wirtz et al. (1996) conducted similar studies to investigate the effectiveness of self-correction but with a different audience for each study. Their results were close; they found that more words were learned during the self-correction condition than the traditional condition.

Stetson (1984) classifies methods of instruction into three groups which he calls "sub-skills", "holistic", and "eclectic". The "sub-skill" method emphasizes the learning of spelling rules and exceptions. Drill in phonics is a popular activity. The "holistic" method emphasizes the learning of words in their whole form (the exact opposite of the "sub-skill" method). High-frequency words are selected. Instruction involves visual, auditory, and kinesthetic imagery. Finally, Stetson describes an "eclectic" approach as one that includes an equal number of activities from each of the other methods.

Storie and Williams (1988: 126) state that "... teachers should provide for a systematic teaching of spelling, but along with this, attention should be given to spelling in connection with the whole school program". Students should use the spelling skills they have learned in meaningful situations. The authors suggest

involving children in an active writing program in all areas of the curriculum. This helps children develop a need to spell correctly, not just memorize words on a list.

Graham and Freeman (1986) used a multisensory study strategy to help those with learning problems recall correct spellings. The group using this study method was better able to recall correct spellings than those who chose their own study method.

In a study done by Murphy (1990), a multi-sensory technique was used to teach spelling to a 10-year old special education student. In this study, the student traced target words with the index finger of the dominant right hand, and wrote target words in sentences dictated by the teacher. Tactile, auditory, and kinesthetic methods were emphasized in this study. Results indicated that the tracing and dictation methods were effective for this particular student. Other benefits that were not measured included improvement in the accuracy of spelling high-frequency words and improvement in handwriting. It was noted, however, that the subjects' spelling performance never reached the average of the students in the regular classroom.

Blau and Loveless (1982) suggest that the visual modality (part of VAKT) is part of the problem, not the solution, so they suggest a technique called "Hemispheric-Routing-TAK-v" with the emphasis on the tactile modality. And in their study, they blindfolded the subjects to cut off the use of the visual modality. Subjects scanned the letters of unknown words with the fingers of one hand rather than eyes. Results showed improvement in immediate recall when the left hand was used, but not in delayed recall. Also, the authors pointed out that the results should be considered exploratory due to the small size of the sample.

A multi-sensory approach cannot only be used with learning disabled students, but also has benefits for non-learning disabled students as well. In a four year study done by Vickery, Reynolds, and Cochran (1987), a mastery learning program called MTARSH (Multi-sensory Teaching Approach for Reading, Spelling, and Handwriting) was implemented. Subjects were remedial and non-remedial students in grades three through six. Reading and spelling instruction included phoneme-grapheme correspondences, pronunciations, and spelling rules. Techniques of synthesizing phonics and memorizing whole words were used. Multi-sensory techniques based on those developed by Fernald (1943) were used to memorize irregular words. Also, letters and letter clusters were taught using multi-sensory steps recommended by Gillingham and Stillman (1956). Scores on CAT tests indicated that

there was an improvement over baseline scores for both remedial and non-remedial students after instruction by the MTARSH Program. These trends, however, were not as pronounced in the fourth grade scores.

Although there is plenty of research on spelling, the question remains, How do teachers actually teach spelling? Many teachers are dependent on textbooks for spelling instruction, but do teachers use the methods supported by research? In other words, is there a gap between research and practice in the classroom?

Fitzsimmons and Loomer (1977) conducted a study to see if teachers' instructional procedures were consistent with research findings. When they surveyed 1,289 teachers teaching grade two through six, they found that teachers often did not use the procedures supported by research. It was also found that many teachers agreed with supported procedures, but did not use them.

Furthermore, a similar study done by Stetson (1985) indicated that a great number of teachers believed in using procedures that are the exact opposite of those in research findings. Stetson points out that many teachers believe strongly in textbook methods although they may not be supported by research.

In an exploratory study conducted by Gill and Scharer (1996), the researchers found that many teachers were dissatisfied with their current spelling programs. The authors used a survey and individual interviews with teachers to gain insight into teachers' questions about spelling. They also held small group discussion sessions during in service sessions and instructed teachers in a more developmental approach. Teachers varied in the number of changes they made to their programs, but teachers indicated their need for continued support in the area of spelling.

Reed (2012) wrote about *Whole-word spelling instruction* which is divided into two types:

1. **Thematic lists:** Using the vocabulary words from basal readers or supplementary texts creates lists of words arranged by theme, topic, or curricular unit. Students learn how to pronounce the words, read them, and define them in context at the same time they are learning to spell the words. Although aligning spelling instruction with a thematic unit might provide a meaningful context for students, learning all aspects of a word at once might be too cognitively challenging for others. In addition, choosing spelling words based on the vocabulary students are learning does not necessarily produce a list that reinforces a common phonemic or morphemic structure. Rather, combining spelling and vocabulary instruction

suggests that memorizing words is the primary means of learning to spell and, hence, instruction is implicit: students are not taught how to learn and remember the spellings of the words, other than to memorize them.

2. **Leveled or self-selected lists.** Starting in the 1930s, leveled spelling lists were offered as a more organized alternative to thematic lists (Schlagal, 2002). These lists are based on word frequency counts, so younger children are given shorter words that appear in speech and print very often, and older students are given successively more complex and less frequently occurring words. The lists may be formal, such as the Dolch (1936) sight word lists, or they may be generated from errors students make in their own writing (Templeton, 2003). Generally, instruction for leveled and/or self-selected lists has been implicit. However, some approaches successfully teach students a learning strategy, such as study-copy-cover-compare, for increasing their accuracy in spelling memorized words. A well-organized and leveled spelling list allows students to sort words into contrasting categories such as the *-oi* and *-oy* patterns. Teachers can draw students' attention to the apparent patterns and help students articulate the observed rule that *-oi* comes in the middle of a word or syllable, and *-oy* at the end of a word or syllable. Because many irregular words are highly useful to students, whole-word memorization can never be completely avoided.

Children who use multiple strategies such as phonological awareness, orthography, and visual storage decrease their spelling errors compared with those using one strategy in isolation (Frith, 1980).

Multiple intelligences (MI) theory has become very popular as it meets the global trend of making students the center of the educational systems. As learners are the most important element of any educational system, dealing with them should not be random. Their needs, learning styles, strengths and weakness should be addressed and recognized in order to have effective and meaningful learning. MI is a new model of learning that helps students to learn effectively. It can also affect students' behavior in schools as it makes them more involved by recognizing their needs which make them less frustrated and confused (Armstrong, 1994).

In conclusion, correct spelling is not only important on a spelling test, but in all areas of the curriculum. It is not only important to educators, but also to society.

Educators need to be aware of the current research in spelling and put that knowledge to use in the classroom.

2.3.1 Multi-sensory Approach:

Murphy (1997: 4) defines Multi-sensory approach as "An approach using four sensory modalities: visual, auditory, kinesthetic, and tactile. And (Moustafa, 1999: 4) states "In investigating effective strategies to teach diverse learners, multi-sensory approaches and learning styles theory have been found to be effective". Multi-sensory approach is used generically to refer to any learning activity that includes the use of two or more sensory modalities simultaneously to take in or express information (Dalecki, 2007). One of the most approaches that most strongly associated with multi-sensory approach is the Fernald VAKT approach. The idea of this approach came out of the principle of different learning styles.

2.3.2 Different Learning Styles:

Everyone has his/her own learning style. As (Ford, 2005: 1) states "Anyone who thinks there is one right way to teach reading, has never worked with two children" and there are many research studies that prove that the learners have various learning styles such as those of Carbo et al. (1986). The VAKT approach deals with those different styles and tries to cope with the every learner according to his/her own style. The learning styles that VAKT approach deals with are visual, audio and kinesthetic-tactile.

Boyles, N. (1997) describes learners according to their learning style as follows:

2.3.3 Visual Learner

- Often responds with "Just show me!" after hearing an explanation or when presented with new or confusing concepts.
- Often asks for things to be repeated. Overuses, "Huh?"
- Will often look at what other children are doing rather than ask the teacher to repeat the instructions
- May appear distracted when overwhelmed by too much information.

- May have word-finding problems, so uses a lot of hand gestures. Also may make verbal errors.
- Often completes many difficult tasks (change a tire, knit a sweater, weave a basket) but cannot explain in words how it is done.
- Unless directions or assignments are in writing, may have difficulty remembering them.
- Easily recognizes visual images and can distinguish sounds.
- Is aware of spatial relationships such as spacing, margins, directionalities, and sequencing differences.
- Needs to create a mental picture of what is being said, Examples, Pictures, maps, charts, diagrams, modeling, or demonstrations help create the mental images.

2.3.4 Tactile Learner

- Needs to feel, touch, and manipulate objects.
- Twisting, turning, rotating, pouring, and measuring enhance learning.
- Is a tinker or designer
- Benefits from hands-on experiences, such as math manipulatives (counters, coins matrix, geoboards) building materials, and laboratory experiments.

2.3.5 Auditory Learner

- Gains understanding from what is heard.
- Usually very verbal but has illegible handwriting.
- Enjoys using language.
- Can discriminate between similar sounds. .
- May appear distracted as language is being processed.
- May omit or transpose words or letters.
- Spells out loud better than on paper. May test better orally.
- Better retains what he hears in class, as opposed to what he reads.
- Comprehends better when read to or reads aloud.
- Not a detail person. May miss sign changes in math problems or incorrectly read numbers, letters, or words.
- Work appears sloppy or messy. Dislikes worksheets.
- Uses bookmarks, in markers, or fingers to mark place.

- Can be the class hummer or whistler.
- May complain of eyes problems, but eye tests do not indicate a problem.
- Benefits from a tape recorder to play back information.
- Benefits from books on tape.
- Usually benefits from a phonics approach to reading when combined with whole language.

2.3.6 Kinesthetic Learner

- Uses bodily control and movement to express himself.
- Has exceptional fine and gross motor coordination.
- Eye-hand coordination is also well developed.
- Is energetic and physical. Has difficulty sitting for long periods of time.
- Expresses self successfully through dance, sports, gymnastics and martial arts.

Part Three: Technology and Education

This part deals with the relationship between technology and education. Its focus is on the following titles: Technology and its effect on education, cell phones and their advantages and the benefits of technology use for ESL teaching and learning.

2.2 How Does Technology Affect Education?

Technologies that are already widely used in today's smart devices are more than enough to make an impact on our everyday lives. One of the first technological interventions in education was the Computer-Supported Collaborative Learning (CSCL), which was advanced in the 90s (Batson, 1988) out of a small number of projects, including the Computer Supported Intentional Learning Environment (CSILE) project by Scardamalia and Bereiter (1991), which aimed to bring learners together and help them learn collaboratively supported by peers and tutors in ways that were not possible before (Dwyer & Suthers, 2005; Stahl et al., 2006). Today we have a plethora of social media at our fingertips that make this idea happen more easily and quickly as the technology has become much more user- and learner-friendly in ways that no longer require advanced technical expertise ensuring we can all become collaborators.

Stodd (2014: 5) stresses the importance of social learning to survive and thrive with change. For him learning in the social age is social. He reminds us that “It’s no longer about providing materials for people to learn and be tested on like parrots, more about creating spaces and a matrix of resources for people to engage with to create meaning. It is about scaffold social learning environments where we facilitate, nurture and support.”

Opportunities to learn informally have exploded since the arrival of social media and mobile technologies. These technologies disrupt the way we learn and create new opportunities for learning (Beetham & Sharpe, 2013). Furthermore, technology has allowed teachers and students to adopt new behaviors and responsibilities consistent with the realities of a rapid technological society (Kozma & McGhee, 2001).

Mobile devices have begun to be used massively within the e-learning especially with the advent of tablets. The first tablet, which has received a truly global expansion, was the first-generation iPad (of Apple Incorporation), which was officially launched in 2010. This tablet was possible to be intuitively controlled using fingers. It was possible to connect it easily to the Internet and also use a large number of applications that Apple company began offering its users through its online App Store (which has existed since 2008, especially for the download apps and music for mobile phones series iPhone and iPod). iPad underwent very rapid technological developments up to the current 4th generation, which was launched in November 2013 (the so-called. iPad Air). All the mobile devices from Apple use a relatively closed system iOS (for mobile devices released in 2007), which is popular with large numbers of users especially for its simplicity, speed and user friendliness ((Kopecký & Hejsek, 2015: 2).

Applications, or apps, that are available for both smart phones and tablets can be an effective tool for promoting EFL vocabulary development. An app is a software program for a mobile phone or computer operating system. Examples of such apps are provided along with practical recommendations for their use by teachers and students (Nisbet & Austin, 2013).

EFL students must learn to navigate new technologies in order to fully participate in the prevalent technological discourse community (Fox & Fleischer, 2002). To this end, Ball (2011), Larsen-Freeman and Andersen (2011), and others

(e.g. Warschauer & Meskill, 2000) recommend that EFL and ESL teachers incorporate current technology into teaching and learning English (Nisbet & Austin, 2013).

2.2.1 Cell phones and their Advantages

Mobile or cell phones have become a ubiquitous presence in our daily life. Lately, the advent of "smart phones," connected to the Internet, has added a number of general computing capabilities to the basic function of telephony. With these new functions, cell phones become powerful mobile learning devices, sharing many educational applications with computers. Moreover, for a number of reasons, cell phones are even more effective than computers in the new Web 2.0 context of creating, sharing and distributing knowledge (Irina, 2011).

First, cell phones are currently the most accessible electronic device that the majority of teachers and students possess. In less advantaged societies, access to computers at schools, to say nothing of homes, still remains a "digital divide" between poorer and wealthier countries and social strata. At the same time, worldwide mobile phone subscriptions penetrate all economies and reach the bottom of the economic pyramid. Second, with cell phones deeply integrated in their lifestyles, learners display immense familiarity with ever-increasing numbers of applications. Research shows that students surpass their teachers in harnessing the potential of mobile technology to their needs, as for them today cell phones are the technology of choice. Of no less importance is the thorough appropriation of mobile technology by modern students for communication. Such communication, if engaged for educational purposes, can increase the relevance of learning and, thus, heighten students' motivation (Kukulska-Hulme, 2009). The instances of how the cell phones can be used in learning are numerous: from short written assignments, quizzes, surveys, podcasts to blogs, e-books, electronic dictionary, vocabulary games, etc. In short, the incidental learning of various kinds that can take place anywhere and anytime with mobile technologies can effectively support direct language instruction.

Mobile computing devices (smart phones, tablets, etc.) are rapidly becoming the dominant means of communication worldwide and are increasingly being used for scientific investigation. This technology can further our Extension mission by increasing our power for data collection, information dissemination, and informed

decision-making. Mobile computing applications (apps) with relevance for Extension can be divided loosely into three categories, information delivery, collaborative research/participatory sensing, and self-assessment (Drill, 2012).

To conclude, mobile technology has become the tool-of-choice of modern students. Stockwell (2008) predicted that mobile learning would be the way of learning of the next generation. While there are numerous accounts of the beneficial experience of learning with cell phones, the majority of educational institutions still struggle with legitimizing such practices. There are some objective reasons for this resistance, but they are outnumbered by the positive outcomes of mobile learning. Since cell phones have firmly established themselves as students' "friends," schools need to stop treating them as "foes," and teachers need to find effective ways of capitalizing on the rich potential of mobile technologies.

Technology plays a role in this approach of providing students with tools and information that support their problem solving, communication, collaboration, and knowledge creation. It also provides teachers with new tools that can transform instructional roles, curricula, and practices to prepare students to excel in an information-based, technologically-advanced society" (Kozma & McGhee, 2001).

2.2.2 Benefits of Technology use for ESL teaching and learning:

As Ball (2011) indicates in his literature review, technology can be beneficial in ESL teaching and learning as follows:

- a. Opportunities for increased learner autonomy and student choice.
- b. Transferability of skills to other areas of life (including work).
- c. Increased student engagement/motivation.
- d. Immediate, precise feed-back.
- e. Ease of tracking progress toward the individual's self-selected goals.

Technology is rapidly changing with today's innovations soon becoming outdated; however, it is clear that teachers and students must begin with current technology and continue to build upon their knowledge as technological advances unfold. Two popular forms of current technology which can be highly beneficial for ESL students are smart phones (such as the *iPhone* by Apple or the android *Samsung Galaxy*) and tablets (such as the Google *Nexus* or Apple's *iPad*). Many students already own or have access to one (or more) of these mobile devices, and those who

do not may find it a worthwhile investment (Nisbet & Austin, 2013). Alyahya and Gall, 2012: 1266) state that there are more than 1.5 million iPads being “used specifically for education and more than 20,000 educational applications have been created”

A key feature of both smart phones and tablets is the availability of *apps*, many of which can be downloaded for free or at a little cost. Simply put, an app is a software program for a mobile phone or computer operating system (American Dialect Society, 2011). Most users of smart phones and tablets quickly learn how to use apps – sometimes even receiving instruction on how to do so at the time of purchase. A second important feature of smart phones and tablets is their portability, which makes it possible for users to access apps while “on the go” or while engaged in a specific learning task. Because of these features, mobile devices can be highly effective tools for use in language teaching and learning. One domain of ESL teaching and learning where the use of mobile devices can be particularly powerful is the area of vocabulary development (Nisbet & Austin, 2013).

There is a compilation of applications that can be of high utility for English teaching and learning. Included are options for both android and iOS-based mobile devices; and all of the apps can be downloaded quickly and easily through popular online stores such as Apple’s *The App Store* or Amazon’s *Appstore for Androids*.

Khoo, et. al. (2015: 3) highlights some key implications of using ipads for teaching young children, teachers and teacher learning. These are as follows:

1. iPads are one of the wide repertoire of digital and mobile technologies available for today’s young children to use to access resources to inform their, and their peers’ learning. Young children are able to use iPads to express, share and communicate their ideas to others in multimodal ways that are appealing and meaningful to them. Young children are able to emulate teacher talk to help peers become aware of, and use, iPads productively within peer group learning.
2. Teachers valuing of children’s interests and funds of knowledge is an important influence on how iPads come to be integrated into their teaching practice and enrich learning.
3. Teacher recognition and understanding of the opportunities iPads offer and their deliberate incorporation of these opportunities can support young children’s learning and exploration.

4. Teachers' modeling and negotiation of guidelines (including limits and social etiquette) for children's use and sharing of iPads, when they are a limited resource, is essential to ensure appropriate and productive use.
5. For teachers to recognize the affordances that iPads offer they need time to explore and experiment with the iPad's different functionalities and possibilities. As teachers grow in confidence and expertise, they can share and reflect on the possibilities for iPad use with colleagues, to the mutual benefit of both groups.

Kopecký and Hejsek (2015) indicated that teachers could use iPads as:

- a) a support tool for preparing lessons (e.g. to prepare a presentation, which is then uploaded via cloud storage to the tablet and then used);
- b) a tool to support the different stages of teaching units (e.g. presenting educational content via tablet and interactive whiteboard/overhead projector);
- c) a tool for their own self education (e.g. they test educational applications, try MOOC courses; learn to use a variety of interactive services/applications, use the tablet in lifelong learning etc.).

2.2.3 VAKT Approach and Technology:

Mainly the VAKT Approach depends on the senses, and it is an old approach, hence; the researcher thought of integrating this approach with technology. Since educational smart applications are designed to suit all the children styles. If you look at any smart application, and look at children while they are playing educational games, you will notice that, children see words and pictures so they employ their visual sense, also when they listen to the words, they focus on auditory sense, but when they move their fingers on the screen and pronounce the words or record the words on the application by their own voice, the kinesthetic sense here is motivated. And of course the smart devices have touch screens which interacts with the touch of the children, so they use the tactile sense.

So, smart applications by their nature go along with VAKT approach, and they can be integrated effectively.

Part four: Smart and Non-smart Styles of VAKT approach

This part focuses on smart and non-smart styles of VAKT approach and steps for teaching them. In addition, this part focuses on the stages of the study and the challenges facing the researcher as well as the teacher's and pupils' roles.

2.4 VAKT Approach:

The multi-sensory method known as VAKT (visual-auditory-kinesthetic-tactile) implies that students learn best when information is presented in different modalities (Mercer & Mercer, 1993). Fernald (1943) developed the VAKT method. This is a multi-sensory technique with a tracing component. Students see the word, say the word, trace it, and then write it. This method has been found to be successful with learning disabled students. Numerous studies using the multi-sensory method proved to be successful. In this vein, Ali (2012: 42) declares "I have experienced some success in teaching sight words using the Visual-Auditory Kinesthetic-Tactile (V-A-K-T)..., which emphasizes memorization through visualization, involves asking the student to say the name of each letter in a word and to trace each letter with his or her finger in the air before covering the word and attempting to spell it on paper. The VAKT method may be used to help students with both the reading and spelling of phonetically irregular words." This approach does not single out a specific learning style for a specific student. A multi-sensory approach is an eclectic approach that teaches all children regardless of their preferred learning style. (Murphy, 1997:19).

2.4.1 Definition of VAKT Approach:

VAKT the acronym standing for visual, auditory and kinesthetic-tactile is a multi-sensory program that features tracing, hearing, writing and seeing (Hallahan, Kauffman, & Lloyd, 1985).

2.4.2 Non-Smart Style of VAKT Approach:

The researcher defines the **non-smart style of VAKT approach** as:

A multi-sensory approach which employs sounds, pictures, body movements, drawing, tracing and writing to serve the process of vocabulary spelling.

2.4.3 Smart Style of VAKT Approach:

The researcher defines smart style of VAKT approach as an approach which uses applications of smart devices in teaching English spelling, and those applications are based on VAKT approach. This means they address the three channels (visual, auditory and kinesthetic- tactile).

2.4.4 Description of the VAKT approach:

It is necessary to point out that the VAKT approach was built in accordance with the criteria of Grace Fernald VAKT Approach (1943). She developed her theory in the University of California to develop a sight vocabulary and improve spelling through the use of seeing, hearing, and feeling words simultaneously. The distinguishing feature of Fernald's approach is tracing and her target population were students who failed to learn to read through other instructional methods or who had difficulty learning phonetically irregular words. Additionally, this approach is recommended for second grade through secondary school students with average or above average intelligence who are either non-readers or poor readers.

The theoretical grounding behind this approach is that not all students learn the same; so they need a remedial reading method that relies on as many of the child's senses as possible to reinforce learning. Therefore, the multi-sensory techniques are frequently used for students with learning disabilities because it engages students at multiple levels.

The VAKT approach promises of providing structure and support for struggling students, providing direct instruction for the students, and depending on students' language development and their interests or experiences.

The researcher of this study called the authentic Fernald VAKT Approach “non-smart style of VAKT Approach”. This Approach follows the steps of Fernald’s Approach which combines visual auditory and kinesthetic tactile senses by using real objects that can be seen, heard, and touched. And the other approach titled “smart style of VAKT Approach” as it is an updated version of the same Fernald’s VAKT Approach. However, the difference is using smart applications on smart devices to go along with the spirit of the age.

Because of the leverages of the iPad's size, powerful speech synthesis abilities and touch screen, iPad applications can offer building words by just touching the letters on the screen, tracing them or writing them by fingers and then pronouncing

the result clearly. Also, it presents clear and good photos, plus the ability to change the sound and to record the pronunciation of the words.

Both styles- smart and non smart – of the VAKT approach promote active and autonomous learning in students, provide them with individualized or differentiated instruction and can be customized to meet the needs of students with different achievement levels, interests, or learning styles.

Instructors know that there is neither "one-technique-for-all" in learning to spell nor a "panacea" method to remediate and ultimately to prevent the common spelling quandary; hence, there are different styles for learners. That quandary can be remediated by using VAKT approach, since the visual learner can learn by his/her favourite way by looking at the picture or the photo of the word. The auditory learner can learn through his/her own way by listening to the pronunciation of the word or sometimes breaking the word into syllables. The kinesthetic-tactile learner can learn with his/ her preferable method by pronouncing the word through moving their throat and lips, tracing the word and writing it through finger movements. Additionally, most of the learners learn by integrating more than one sense. Thus, the VAKT approach allows pupils to study the words through stimulation of one or more of the senses in accordance with their individual needs (Taschow, 1970:6).

The researcher adopted the immediate error correction as stated by Reed (2012: 21) "Immediate correction, better outcomes: Immediate correction of misspellings leads to better outcomes than students writing words without any error correction or providing delayed error correction."

The researcher used those two styles of the same approach to teach English spelling at Al-Shejaeia Elementary Co-ed "B" School for fourth graders in Gaza Governorate. The application lasted for 4 weeks. The researcher followed some steps in teaching both approaches. Each step was understood to the extent that the pupils could transfer each step to the subsequent one, and in the final analysis, each step was applied within the entire technique in pupils' attempt to learn how to spell independently.

2.4.5 Steps for Using the Non-Smart Style of VAKT Approach in teaching spelling in the classroom:

1. Use "mini black boards", black board, flash cards and realia to present the written form of the new vocabulary.

2. Pronounce the whole word.
3. Write the word while pronouncing each syllable.
4. Dot the "i's" and cross the "t's" in the left to right sequence.
5. Pronounce each syllable and underline it.
6. Pronounce the whole word again.
7. Pupils trace the words on worksheets.
8. Pupils spell the words orally.
9. Teacher spells the words orally and pupils listen then write the words on " a small black board"
10. Pupils write the words on cards and make their own dictionary.
11. Teacher and pupils revise the spelling and pronunciation of the words at every teaching period for two weeks. (6 teaching periods for the unit)

Teacher gives pupils a printed version of the English words with pictures and Arabic meaning for words that they are going to be tested in. For more details see the teacher guide Appendix (1).

2.4.6 Steps for Using the Smart Style of VAKT Approach in teaching spelling in the classroom:

1. Use "The white board application" to present the written form of the new vocabulary.
2. Pronounce the whole word.
3. Write the word while pronouncing each syllable.
4. Dot the "i's" and cross the "t's" in the left to right sequence.
5. Pronounce each syllable and underline it.
6. pronounce the whole word again
7. Pupils trace the letters and listen to the word on "Little writer application".
Teacher can let students record their pronunciation of the word on the same application by themselves.
8. Pupils spell the words orally.
9. T. spells the words orally and pupils listen then write the words on "The white board application".
10. Pupils write the words on cards and make their own dictionary.
11. Teacher and pupils revise the spelling and pronunciation of the words at every teaching period for two weeks. (6 teaching periods for the unit)

12. Teacher gives pupils a printed version of the words with pictures and Arabic meaning for words that they are going to be tested.

The pupils at all time watch and observe the teacher who is tracing the word with his/her two fingers stiff following again steps one through twelve. After teacher's demonstration of writing (kinesthetic) and then tracing (tactile) the word to be learned, the students then trace the word applying the same steps till they express a desire to write the word on the reverse side of the same cards.

By time and practice, pupils will be trained to use the VAKT approach individually and independently; individually by choosing their own way of learning which suits their needs in learning spelling; independently by knowing the sequence and content of each step of the VAKT approach, so they can apply it whenever and wherever they need it.

It should be known that these approaches are not intended to replace the current traditional approach of teaching spelling in the classroom. They are implemented to enhance the students' spelling abilities giving them new ways to practice and study their spelling words.

2.4.7 Stages of the study:

Duration	Description of the stage	Stages
1 week	Preparing the list of words. Preparing the pre and the post tests. Pilot study Preparing materials needed in implementation.	Preparation stage
4 weeks	Applying the steps of smart style on the 1 st group. Applying the steps of non-smart style on the 2 nd group.	Implementation stage
1 week	Evaluation stage. [Post Test Scoring] Results of Statistical Analysis	Evaluation stage

2.4.8 Preparation stage:

The researcher made a big effort in preparing two lists of words (one for the pretest and the other for the posttest) all taken from 4th grade text book and the students learnt them for the first time. That was the criterion for the choice and inclusion of words in the tests. The researcher also asked another English teacher to make similar lists with the same criterion and the results were almost the same. The English teacher and the researcher chose 60 words for each list. These lists made up the words that the 4th grade student should learn and to be the word lists of the study.

Then the tests were designed and applied on the pilot study. The researcher made sure of the validity and reliability of the test. Also, at this stage the researcher prepared the materials needed for the implementation such as coloured pens, paper, cards, files, mini-black boards, and smart devices.

2.4.9 Challenges:

Time was a great challenge to the researcher because the school time is limited and allocated for formal learning. The researcher did her best to hurry up these preparation procedures to reach the next stage.

2.4.10 The Implementation Stage:

At this stage, the researcher explained the new approaches to the experimental groups and explained the steps that they were going to get through, and then gave them the materials and told them how, when and why to use them.

The researcher started to apply the VAKT Approach with its two styles smart and non-smart on the 1st and 2nd experimental groups respectively. Each word was provided with a clear, colored and attractive picture, accurate and expressive pronunciation and precise directions for writing it. In 4 weeks, the students finished learning the 60 words of the word list and were ready for the posttest.

2.4.11 The teacher's role:

The teacher here is the researcher herself and had a great role in implementation the study through number of roles as the following:

Explicit instruction

The teacher explained to participants when, how and why to use the approach.

Modeling

The teacher modeled or demonstrated how to apply the steps of each approach

Guided practice

The teacher guided and assisted students as they learnt how and when to apply the strategy.

Application

The teacher helped students to practice the approach as much as possible in the regular classes.

Assessing performance:

The teacher helped the students to assess their performance by writing the words correctly and making their own dictionary and to assess how useful the approach was.

2.4.12 Pupils' Role

Active Participants

Pupils were in the core of the teaching-learning process; they are not passive recipients; they interacted with their classmates, teacher, environment and curriculum

Construction

Pupils were responsible for constructing their own knowledge about their learning and apply it in their learning.

Thinking

It is pupils ' job to THINK. When thinking, students should be able to find some prior experience or knowledge to apply this new learning. When doing so, they should mentally prepare themselves to learn more about this new word. Now, this does not always happen, but pupils who want to be actively involved in their education should THINK.

Taking information

Pupils took words, their image, their pronunciation and their ways of writing from the teacher. They also took worksheets, instructions and feedback from the teacher. All of these were steps towards learning to happen.

Task monitoring

The pupil must be a task monitor by checking herself in terms of task study time, noise level, and quality work. She should be responsible for gathering materials needed for an assignment (like Index Cards, Markers, Word files, mini blackboards,

clay, appropriate spelling word list, worksheets, smart applications.), when given directions to where resources can be found and to use materials well and appropriately. She should also put back materials when finished.

Autonomous learning

By time, pupils tried to be Self-learners; they were responsible of their own learning, they know the strategies and techniques as well and they just need a little support from the teacher, but they can lead their learning process.

2.4.13 Challenges

The challenges which the researcher encountered while conducting the study arose mainly from the smart devices. Some of which are as follows: The big challenge was providing students with smart devices; such devices are not cheap nor available in the school, The researcher could manage to bring three smart devices, sometimes four, for students to practice inside the classroom. However, they were not enough and that problem was the cause of losing more precious time. The researcher also tried to ease this problem by using a connection from the smart devices to the monitor Magnifier. It would have been better if every student had had her own device. That would have maximized the time of practice.

2.4.14 Continual Assessment

After two weeks, a short test was given to the students to check whether they achieved progress in the spelling skills and to motivate students to study and keep them on the track.

2.4.15 The Evaluation Stage:

A posttest was administered by the three groups. The results were collected and analyzed statistically. The findings were recorded.

2.5 Summary

In this section of Chapter II, the researcher presented the theoretical framework of the study. It discussed four main parts: spelling, technology and education, different theories for teaching spelling and smart and non-smart styles of VAKT approach. In the part that follows, the previous studies will be outlined.

B) Previous studies

2.6 Introduction

This section of chapter II investigates previous studies relevant to the problem of the current study. These are thirty four studies classified into six sections:

- The first section includes (12) studies concerning the effects of using VAKT and multi-sensory approaches on developing English spelling and other skills.
- The second section includes (3) studies concerning the effects of using smart devices on developing English skills.
- The third section includes (7) studies concerning the effects of using smart devices on developing other language skills and other school subjects.
- The fourth section includes (8) studies concerning the effects of using other approaches on developing English spelling.
- The fifth section includes (1) studies concerning the effects of spelling on personality and intelligence.
- The sixth section includes (3) studies concerning the effects of teaching spelling on developing English skills: listening, speaking, reading and writing.

2.6 .1 Studies concerning the effect of using VAKT and multi-sensory approaches on developing English spelling and other skills:

1. Obaid (2013)

Obaid (2013) investigated the effect of using the Multi Sensory Approach for teaching students with learning disabilities on the sixth grade students' achievement in mathematics at Jordanian public schools. To achieve the purpose of the study a pre/post- test was constructed to measure students' achievement in mathematics. The test consisted of twenty items on mathematics. The sample of the study was (62) students in the experimental group and (55) students in the control group. Those groups were distributed into four purposefully selected sections. The findings of the study indicated that there were statistically significant differences in the post-test between the control and the experimental groups in favor of the experimental group. The researcher recommended the importance of parental involvement on students' achievement.

2. EL-Modalal (2012)

EL-Modalal (2012) investigated A Suggested Programme Based on Multiple Intelligences Theory for Enhancing Palestinian Ninth Graders' Writing Ability. The study aimed at investigating the effectiveness of a suggested programme based on Multiple Intelligences (MI) theory for enhancing ninth graders' English writing ability. The targeted skills were six traits writing approach (ideas, organization, voice, word choice, word fluency and conventions). To achieve this aim, the researcher employed a representative sample of 72 EFL female students studying at Rafah Prep. 'B' girls' School which is run by UNRWA in the Gaza Strip.

The participants were divided into two equivalent groups: a control group, 37 students, and an experimental one, 35 students. Regarding the instrumentation, an achievement test and weekly quizzes, for the purpose of formative evaluation, were administered. The achievement test was used as a pre test to prove groups equivalence. In addition, it was used as a post test to measure any possible differences between the target groups. The collected data were analyzed and treated statistically through the use of SPSS.

The findings indicated that there were statistically significant differences between both groups, in favour the experimental one, in ideas, organization, voice, word choice, word fluency and conventions due to the programme implemented. Moreover, implementing the effect size equation, the researcher revealed that the programme had a large effect size in favour the experimental group. In the light of those findings, the study recommended the necessity of implementing MI theory in teaching English writing to make better outcomes in students' English writing achievement. Also, the researcher suggested that further researches should be conducted on the effects of MI theory on different English skills.

3. Jubran (2011)

Jubran (2011) studied "Using Multi Sensory Approach for Teaching English Skills and its Effects on Students' Achievement at Jordanian Schools". The purpose of her study was to investigate the effects of using Multi Sensory Approach for teaching English language skills on tenth grade students' achievement in English at Jordanian public schools. The subjects were 31 male students and 32 female students

for the experimental group, and 26 male students and 33 female students for the control group.

To achieve the purpose of the study a pre/post-test was constructed to measure students' achievement in English. The test consisted of thirty items. Comparison statistical methods were used (two way ANOVA) analysis of variance to make a comparison between the control and the experimental groups and gender variable.

The findings of the study indicated that there were statistically significant differences in the post- test between the control and the experimental groups in favor of the experimental group who were taught using Multi Sensory Approach and there were no statistically significant differences due to the interaction between gender and group.

The researcher proposed some recommendations to enhance the effect of using Multi Sensory Approach in teaching English language skills on students' performance such as conducting further studies in other schools and other areas in the kingdom.

4. Haboush (2010)

Haboush (2010) studied the effectiveness of using a programme based on Multiple Intelligences Theory on eighth graders' English reading comprehension skills. The targeted skills were skimming, scanning, making inferences, knowing the meaning of words through context and sequencing. To achieve this aim, the researcher employed a representative sample of 65 EFL male students, who were divided into two equivalent groups: a control group, 32 students, and an experimental one, 33 students. Regarding the instrumentations, an achievement test and weekly quizzes, for the purpose of formative evaluation, were administered.

The findings indicated that there were statistically significant differences between both groups, favouring the experimental one, only in skimming, scanning and knowing the meaning of words through context due to the programme implemented.

Concerning the other remaining skills, no differences were observed. This was attributed to the fact that making inferences and sequencing are types of higher-order thinking skills that needed much more time to be mastered. It is also attributed to the bad psychological case the students had passed through because of a possible aggressive war on Gaza. It was also because students knew that the results of the post test would not be calculated and regarded in their school transcripts.

Additionally, implementing the effect size equation, the study revealed that the programme had a medium effect size favouring the experimental group. Therefore, the findings are tentative waiting for other studies to be conducted in this regard. Taking into account this medium effect the findings showed, the researcher recommended the re-use of the programme on the same reading skills. Moreover, he recommended the use of MI theory on other language skills, and other school subjects as well.

5. Abd elhadi (2009)

Abd elhadi, (2009) investigated the effectiveness of an individual teaching program (IEP) based on a Fernald multi-sensory approach (VAKT) in treating Dyslexia students in the third and fifth grades in the public schools of the First Directorate of Amman.

A sample of (60) students was selected randomly through a simple random way of nine public schools and was equally distributed into two experimental and control groups, taking into account equivalence in the classroom and difficulty level and socioeconomic family status. The division of students within each group of (30) students was (15) of third-grade students, and (15) students from the fifth grade, to be divided into three degrees of learning difficulty reading levels: simple (Independent reading level), medium (instructional reading level), and severe (defeated reading level).

To achieve the purposes of the study, the researcher constructed an individual instructional program based on Fernald multi-sensory approach, and its application to all members of the experimental group individually, by eight weeks, during the first semester (2007-2008). Meanwhile, the control group had learned the traditional way.

To assess the effectiveness of the teaching program, the researcher assessed the students before implementing the program using a pre-test, and after the completion of the program using a post-test, for both the experimental and control groups. Then, bilateral by-variance analysis (2Way Ancova) was used.

Results showed statistically significant differences in literacy skills among students in the experimental due to the program based on Fernald multi-sensory approach. The statistics also showed there were no significant differences in reading skills due to the interaction between the group and the class and there was an

improvement in reading vocabularies, reading aloud, and comprehension reading in the third and fifth grade students attributed to the program. Finally, the results showed that the degree of the impact of Fernald multi-sensory approach increased as the level of difficulty intensifies.

6. Dalecki (2007)

In Dalecki, (2007) thesis, the effects of multi-sensory instruction upon the letter and sight word recognition and reading of five- and six-year-old students were investigated during this study. A total of ten kindergarten and first grade students, identified as in need of extra reading support, were assigned to control and experimental groups. Five students were assigned to each group.

Students in the control group learned and practiced identifying letters and reading sight words using their visual and auditory modalities. Students in the experimental group used their visual, auditory, kinesthetic and tactile modalities to identify and read letters and sight words. Students were assessed on their recognition of letter names through Marie Clay's Letter Identification task. Sight words were assessed using a teacher made word recognition assessment based on sixteen sight words from Dolch Sight Words List I.

Informal oral interview questions were coupled with anecdotal records to triangulate the data gathering by the researcher. Upon completion of four weeks of instruction, each group was assessed for a second time on their recognition of letter names and sight word reading.

Results of this study yielded the finding that students instructed through Multi-sensory activities not only improved their number of sight words and letters, but students also expressed more pleasurable recounts of the lessons experienced.

Results from a paired sample t-test showed that students' learning of letters was statistically significant for both groups of students. The improvement in sight word recognition was statistically significant for the experimental group, but not for the control group; strengthening the notion that kinesthetic and tactile reading activities, supports students' recognition abilities. Multisensory reading strategies and activities also proved to be more interesting to young learners as they were able to use their touch, feel, say and hear words, letters, and sounds as they learned to read. Lastly, since this study only researched the short-term effects of multi-sensory reading instruction, long term effects of this type of learning might also yielded useful results.

7. Jones (2006)

Jones (2006) investigated "A Multiple Intelligences Approach to Spelling Instruction". The research main question was "How are second grade spelling scores impacted when spelling instruction is enhanced using different multiple intelligences activities?" In the rationale Jones explains the multiple intelligences approach and the rationale behind it.

This study was designed to determine whether spelling activities incorporating the multiple intelligences positively impacted the second grade spelling test scores. Research indicated that using Multiple Intelligences in the classroom gave students an opportunity to explore and understand their own learning processes. And about research design, this research study was set up as three-group comparative design. Three second grade classes rotated being the control group, which allowed the data from the classrooms with additional activities to be compared with the data from the classroom with only traditional activities.

Based on the statistical results, the spelling scores of second grade students were not significantly impacted, positively or negatively, after using different multiple intelligences activities. The multiple intelligences activities may have impacted some of the individual students' scores.

Even though there was no statistical significance of test scores during this research study, the multiple intelligence activities implemented over the three week period were practically important and significant to many students. Some individual students had higher success during the weeks they were completing the multiple intelligences activities compared to when they were not receiving additional instruction.

Another conclusion that can be drawn is that while there was no statistical significance in students' spelling scores, there was no decline either. Therefore, teachers who wish to use alternative forms of supplemental spelling instruction may include activities that focus on multiple intelligences, knowing that students did not do any worse on the spelling tests after they had been exposed to multiple intelligences activities.

8. Moustafa (1999)

Moustafa (1999) wrote a summary of reference papers titled "Multi-sensory Approaches and Learning Styles Theory in the Elementary School". In this summary, the author discussed the following ideas:

1. How learning styles theory is related to multi-sensory approaches to teaching.
2. A multi-sensory approach and the reading styles method.
3. How educational programs using these approaches have been effective in improving student achievement.

The paper concludes with recommendations for teachers to identify their students' learning styles and take them into consideration when designing instruction, and for administrators to provide training about learning styles and multi-sensory approaches. In addition, more research needs to be made to assess the success of programs that use multi-sensory approaches.

9. Murphy (1997)

Murphy (1997) examined whether a multi-sensory approach to spelling instruction would have an impact on spelling achievement. It was hypothesized that there would be no significant difference in the spelling performance of students using a multi-sensory approach and those using a conventional approach. Subjects were 20 heterogeneously grouped third-grade students (10 boys and 10 girls) in a middle-class suburban school district. The students were placed randomly into 2 different samples and given a pretest of 60 high frequency writing words, with the list broken down into 4 lists of 15 words, given each week in the form of a spelling contract. Students in the experimental sample were taught using a multi-sensory approach (VAKT), while a more conventional test/study/test approach was used with the second group. Visual and auditory activities were used. After instruction, posttests were given and results were analyzed using t-tests of mean differences. Pre- and post- writing samples were taken to evaluate the students' spelling in their daily writing. Results indicated that there was 1.1% difference in mean scores of posttests. Findings suggested that the study hypothesis was supported and no statistically significant difference between the two samples was found. More significant differences may have occurred if this study were conducted over a longer period of time.

10. Thorpe and Borden (1985)

Thorpe and Borden (1985) studied "The Effect of Multi-sensory Instruction Upon the On-Task Behaviors and Word Reading Accuracy of Learning Disabled Children" in their study they examines the multi-sensory instruction upon the word reading accuracy and on-task behaviors of seven-, eight-, and nine-year-old learning disabled students were investigated during a series of four experiments. Visual and auditory instruction with and without teacher praise was compared with a visual, auditory, kinesthetic and tactile instruction with and without teacher praise.

Results of the single subject reversal design experiments indicated that all four types of instruction increased word reading accuracy when compared with pretest scores. Nevertheless, there were significant differences in effectiveness among the four treatments. Visual-auditory instruction alone was far less effective than visual-auditory with praise and the multi-sensory procedure with or without praise. Alternatively, visual-auditory with praise was the most effective of all the procedures.

11. Taschow (1970)

In his descriptive thesis titled "Using The Visual-Auditory-Kinesthetic-Tactile Technique to Solve Spelling Problems in Elementary and Secondary Classrooms", Taschow (1970) discusses the following points:

- a. how spelling deficiencies affect reading,
- b. the sources of spelling problems,
- c. reasons for utilizing a multi-media approach in teaching elementary and secondary students to spell,
- d. what is a multi-media approach in teaching elementary and secondary students with spelling problems how to spell,
- e. how to make the multi-media of the Visual-Auditory-Kinesthetic-Tactile technique instructional for the teacher and functional for the student,
- f. How to teach using VAKT approach.

Taschow thinks that the steps of the Visual-Auditory-Kinesthetic-Tactile Technique, while being in agreement with sound educational procedures and psychological theories, will assure each student to learn to spell individually and independently.

12. Chapman (1964)

Chapman (1964) described a fifteen week reading program in which two remedial approaches were used with some perceptually impaired youngsters, in a thesis titled "Some Observations of Perceptually Impaired Children in Two Approaches to Reading".

The sample was eight boys who had average intellectual ability but were unable to learn and adjust in a regular classroom and they were between the ages of seven and eleven years.

The two remedial reading approaches "A Visual-Visual Approach to Word Development." and the "V.A.K.T." (Visual, auditory, kinesthetic, tactual) process of word study were combined and presented as a special program to supplement the regular reading assignments. Most of the materials were already in use in the classroom, such as the slide projector, special writing paper, flannel board with cut-out letters for those too poorly coordinated to write, a primer typewriter for typing stories, and the children's note books for recording words in dictionary form and for keeping stories. A printed chart of the "Steps in Word Study (V.A.K.T.)" by Carter and McGinnis, provided added incentive for the children during this procedure.

Information was collected on each child by 1) two forms of the Detroit Word Recognition Test, 2) first and final stories from each child and 3) two informal inventories of learning and behavior. Evaluation procedures were inadequate for providing objective evidence of growth which resulted from the special reading program. Initial scores on the Detroit Word Recognition Test revealed one boy with above average scores and seven boys with inferior scores, ranging from 1.5 to 3.6 years below age level. Five of the children repeated the test after fifteen weeks and showed gains ranging from four to eight months. The anecdotal records and the beginning and final stories provided the most effective means for evaluating observational growth resulting from the program. The two informal inventories were of little or no value. A reading test which measured a variety of reading skills would have been more meaningful.

In observations and conclusions the researcher said that the emphasis in this program was different for each child and changed as the program progressed. Immature readers needed emphasis in word recognition techniques. The story was less important to them. They seemed to know that the skills must come first for them. First

significant learning came through the "V.A.K.T." word study. This process provided a simple and meaningful structure in which they could use all senses at one time. The tracing makes them focus their eyes on words. Once they could look at a word and see all of its elements, phonetic techniques could be applied to the "V.A.K.T." process. They were later able to transfer the use of these skills into the "Visual-Visual" projector work and in picking out words and phrases in the story.

Improved spelling, as might be expected, resulted from the "V.A.K.T." process. Associations between letters and sounds became apparent to children who had sufficiently begun to understand sound sequences as related to pictures. This basic auditory skill could not be taught through this process, but had to be developed before a child could use the "V.A.K.T." process meaningfully in spelling and recognizing words.

Skill in handwriting became one of the most rewarding and unexpected by products of the entire reading process. The fine motor coordination of these children is such that writing becomes the most tedious and frustrating task for them. The use of tactual and kinesthetic senses in the tracing provided a meaningful and successful method for learning- to write Having- real words to write was important to them.

2.6 .2 Studies concerning the effect of using smart devices on developing English skills:

1. Meer, et al. (2014)

Meer, et al. (2014) investigated the effect of an iPad-based intervention for teaching picture and word matching on a Student with ASD and severe communication impairment. The results showed that iPads were successfully used as speech-generating devices (SGD) for children with autism spectrum disorder ASD, related developmental disabilities (DD) and limited speech, but little research has investigated the use of iPads to enhance academic skills, such as picture/word matching. In the present study, a 10-year student with ASD received intervention to teach picture and word matching using an iPad-based SGD as the response mode.

An iPad loaded with Proloquo2Go™ software to enable voice-output was used in this study. The iPad was configured with pictures and words. Selection of the pictures and words with a light touch or finger tap resulted in corresponding

synthesized speech-output (e.g., selecting the SHOES picture produced the voice-output “Shoes”). The study used the experimental design.

A multiple baseline across matching tasks design was used to evaluate the effects of a graduated guidance prompting procedure and differential reinforcement on correct matching across four matching tasks (i.e., picture to picture, word to picture, picture to word, and word to word). With intervention, the student showed increased correct matching across all four combinations, suggesting that picture and word matching with an iPad-based SGD can be successfully taught using graduated guidance and differential reinforcement. This approach might have relevance for teaching a range of academic/literacy skills to students with limited or no speech.

2. Nisbet D. and Austin D. (2013)

Nisbet and Austin (2013) wrote about using smart devices in teaching vocabulary in their thesis which is titled "Enhancing ESL Vocabulary Development. Through the Use of Mobile Technology". This article provides practical recommendations and resources for promoting vocabulary development among adult ESL students who have access to mobile devices. They present a compilation of recommended applications that can be utilized on smart phones and/or tablets as tools for promoting vocabulary growth. They conclude the article with a brief look at some practical considerations and recommendations for teachers. Thus, adult ESL students face unique challenges as they attempt to master English vocabulary while at the same time balancing work, social, and family obligations. An increased use of mobile technology for vocabulary learning offers these learners the opportunity to set their own schedules, set their own pace for practice, and focus on their individual needs and goals. It can also serve as a non-threatening means of expanding their current technological knowledge base in our rapidly-evolving society.

The resources presented in this article represent only a small sampling of the high quality applications that are presently available for enhancing vocabulary development. Teachers and students alike are encouraged not only to begin with these applications but also to use these tools as a launching pad for their own exploration into the vast, ever-evolving realm of technology resources for ESL teaching and learning.

3. Ball (2011)

Ball (2011) investigated the effect of technology in adult education ESOL classes. She assures that for some adult education ESOL teachers a whiteboard, worksheets and similar low tech options are staples of their class instruction. These tools have long been mainstays for successful ESOL teaching. But in today's 21st century society, new and creative resources are needed to help students achieve their goals of greater English proficiency and improved work skills.

As described in this article, most jobs already require some use of technology and soon nearly all will. Adult ESOL students want and need technology skills to compete for jobs. Adult education programs that incorporate technology in their teaching offer students the best opportunity to build not only their language skills but work and life skills as well.

2.6 .3 Studies concerning the effect of using smart devices on developing other skills or other school subjects:

1. Agostinho et al. (2015)

Agostinho et al. (2015) was designed to examine studied worked examples on an iPad either by tracing temperature graphs with their index finger or without such tracing. They evaluated by a post test.

The results showed that children who were instructed to trace on the temperature line graphs while studying them achieved a higher performance on transfer test problems than children who studied the same materials without tracing. In terms of response time to answer the test questions, it was found that overall the similar questions were answered more quickly than the transfer questions, but there was no significant difference between the conditions.

A practical implication that can be inferred from this study is giving learners a helping hand by encouraging finger tracing when learning mathematical concepts using a tablet device.

2. Burden & Hopkins (2015)

Burden and Hopkins' (2015) investigated how mobile technologies challenged pre-service teachers' pedagogical thinking. The study addressed this lacuna through the lens of an empirical study situated in a pre-service training programme at the

University of Hull. Since 2012 students on the one year PGCE programme have been supplied with an iPad to enhance their own learning during the university based elements of the programme and to support their integration of technology during their two teaching placements. In 2013-2014 this included just the secondary school trainees (n= 150), but in 2014-2015 this was extended to include the primary trainees (n = 90). This paper focused specifically on the evidence and findings collected in respect to the 'second-order' barriers which were identified including student's evolving attitudes and beliefs about mobile technologies and the relationship with their subsequent behaviours and use of the technology in the classroom.

Findings indicated that prolonged exposure and use of a mobile device (in this case the iPad) by pre-service teachers challenged many of their existing attitudes, not just about technology but about their pedagogical thinking and values and the kind of teacher they aspire to be. In effect it challenged students to reconsider their personal and professional identities and for some students this amounts to a transformational experience.

3. Eid and Al-Zuhair (2015)

Eid and Al-Zuhair (2015) evaluated of the use of iPad in teaching general chemistry lab to freshmen students. To do this evaluation, iPad was applied in teaching two sections of chemistry I lab for engineering selected to be taught using iPad whereas the other four sections were taught using the conventional teaching techniques. The effect of using iPad, compared to conventional way of running the lab sessions, was mainly evaluated based on the students' assessment of their achievements in meeting the main course outcomes.

The statistical analysis of the data collected showed that there was a significant difference between the two approaches, namely iPad and normal, in terms of students' assessment. And there was also a significant difference in the qualitative outcomes of the students in the iPad classes and their peers in the normal classes. The study conclusions were as follows:

- Using iPad in General Chemistry Lab was successful and received a very high appreciation by the piloted students.
- The students in the classes taught using iPad showed more satisfaction with the course, and believed that they had better achieved the outcomes of the course compared with the conventional classes

- All used Apps were highly appreciated by the students and students believed that the used Apps made their studying easier and more interesting.
- Using iPad in classroom boosted the interaction of students with their instructor and other class mates.

4. Kopecký and Hejsek (2015)

Kopecký and Hejsek, (2015) studied the effectiveness of mobile touch devices as tools of M-Learning and E-Learning. the study focused the newest trends connected with using specialized application for improvement of knowledge and skills of pupils, students and adults, the examples of good praxis, the experiments with using of tablets in frontal educational lessons, etc.

The study results indicated the effective use of mobile touch devices (tablets) to support education. Most primary schools in the experimental group appreciated using tablets to support teaching.

5. Alkhamis (2014)

Alkhamis' (2014) study examined the effectiveness of the implementation of iPads with elementary school students on the learning and teaching of language Arts. This study included a survey which was emailed to teachers of grades K-6 in Washington State. The survey included teachers' perceptions about the impact of iPads on student learning. Specifically, teachers responded to questions and statements around the content areas of reading and writing. Also, examined were perceptions about the classroom environment when iPads were used.

The analysis of the data found that half of the teachers had experience in the use of iPads in the classroom. However, there were a low percentage of participants who never used an iPad in their life. Interestingly, many of participants believed implementing iPads in classroom had a positive effect on a teacher's skills as well as on student learning. In fact, many of teachers were willing to integrate iPads in their classroom. Also, a majority of the respondents believed that implementing iPads in the elementary school students would help improve students' reading skills. However, many teachers believed that iPads would not improve a student's writing skills.

Also, the numbers of teachers who considered iPad applications as a good tool for learning were high. Indeed, the majority of the respondents believed iPad

applications would make students more motivated, more collaborative and more engaged. In addition, teachers agreed that students who used iPads in the classroom learned and performed better, exhibited good behaviors, explored the information independently as well were more willing to do their work.

The study recommended that more research is needed of the positive academic effects of using iPads in the classroom. This will allow teachers to integrate researched criteria and evidence-based practices while using iPads in the classrooms.

6. Khoo et. al. (2014)

Khoo et. al., (2014) investigated using the iPad as a communicative device to foster young children's spatial awareness. The study was a small exploratory research project in which there was collaboration between education researchers and two early childhood teachers in an early childhood education and care centre in Hamilton. The purpose of the study was to obtain a better understanding of iPad use for educational purposes from the perspectives of teachers, young children and their parents. A qualitative case study of up to 4 children (4 to 5 years) was used and data was collected from the observations (videotape and photos of teacher-children interactions), interviews (audio recordings of teachers, children, parents) and children's work produced on the iPad as part of the learning process.

The findings pointed that the iPad can be used to expand the way children's learning, support and foster children's independence in exploring resources, foster relationship building with the children, enable the recording and reviewing of child-led observations, and support communication in real-time across spaces.

7. Doenyas et al (2013)

Doenyas et al. (2013) investigated the effect of using tablet computers to teach students with autism picture sequencing skills via a web-based iPad application in Turkey. They conducted the first study on Turkish children with autism and tablet computers, with a web-based iPad application designed especially for them. They performed a pilot study on three Turkish boys of different ages with autism to observe their reactions to the tablet application and its effectiveness in teaching the sequencing skill, which is part of their educational curriculum. Their application had a testing

session with no prompts or rewards and a teaching session with prompts, rewards, and demonstration of correct responses.

First, their participants played the testing session to determine their baseline sequencing abilities. Next, they played the teaching session. Finally, they played the testing session again to see if they were now able to sequence the cards on their own. Through this application, the 11- years-old boy's sequencing skills improved without external help, via only the prompts and reinforcement of the iPad application. The application was not enough to teach sequencing to the 4-years-old, who required external help, and it was too simple for the 15-years- old, who did not use any prompts and quickly became bored.

Based on their findings, they discussed how to improve similar sequencing applications and offer suggestions for designs iPad applications for individuals with autism.

2.6.4 Studies concerning the effect of using other approaches on developing English spelling:

1. Brinegar et al. (2015)

Brinegar, et al. (2015) examined the effects of employing copy, cover, and compare [CCC] with a high student with intellectual disabilities. The number of correct spelling words was the dependent variable. The effects of CCC were evaluated in a combination multiple baseline and ABAB design. During baseline, student performance was low. However, when CCC was implemented, the participant's spelling improved.

2. Narang and Gupta (2014)

In their study examined the effectiveness of three remedial techniques to improve the spelling ability of students with learning disability. The three techniques, namely, TAK/v, visual orthographic method and listen, speak, read and write (LSRW) method were administered to three experimental groups, each having 13 students with learning disability. The students in the three groups differed in the kind of errors they made in spelling. TAK/v, group, visual orthographic group and LSRW group comprised of dyseidetic spellers, dysphonetic spellers and spellers with mixed errors respectively. The students in the sample had at least average intelligence, manifested

specified traits of learning disability, had significant deficits in spelling skills and had no sensorial problems. The results indicated that all the three remedial techniques were significantly effective in ameliorating spelling deficits among students.

3. Kemper, Verhoeven, and Bosman (2012)

Kemper, Verhoeven, and Bosman (2012) investigated the implicit and explicit instruction of spelling rules. The study aimed to compare the differential effectiveness of explicit and implicit instruction of two Dutch spelling rules. Students with and without spelling disabilities were instructed a spelling rule either implicitly or explicitly in two experiments. Effects were tested in a pretest-intervention-posttest control group design. Experiment 1 suggested that explicit instruction of a morphological spelling rule led to instance-based knowledge in students with spelling disabilities and to rule-based knowledge in students without. Implicit instruction led to instance-based knowledge in students with spelling disabilities, and in the group without spelling disabilities no learning at all occurred. Experiment 2 revealed that explicit and implicit instruction of an orthographical spelling rule was equally effective in both groups and that the spelling knowledge they had acquired was instance-based. Findings suggest that explicit instruction is more effective than implicit instruction for the teaching of spelling rules when generalization is aimed at.

4. Simmons and Carpenter (2010)

Simmons and Carpenter (2010) described evidence-based spelling supplements and assistive technology (AT) devices to help students with disabilities overcome spelling difficulties that hinder effective writing. The ability to write effectively is challenged and impeded by misconceptions regarding the writing process, lack of direct and explicit instruction in the elements of writing, issues with handwriting, and the inability to spell. Regardless of error type, a range of spelling programs, web-assisted sites, and assistive technology devices can help to remediate those errors. A large part of error diagnosis comes from the teachers knowing what the needs are of each individual student.

In this study, three profiles of students with varying disabilities who had problems with the writing process exacerbated by poor spelling ability were showed

to illustrate the complexities of spelling difficulties as well as solutions and possibilities for spelling improvement.

5. Howard et. al. (2008)

In their case study with three elementary-aged students with LD using a mnemonic approach to spelling sight words, Howard, et al. used an approach called PESTS. The first author chose the name “PESTS” because it refers to ‘words that bug you’ (i.e., difficult words to spell). This approach included acrostics, pictorial representation, and stories. The instruction was applied to key words in daily instruction and compared to a traditional approach to spelling sight words. This process typically took the entire class period (30-45 minutes), as the child worked on five words (with five worksheets). Each of the students improved his or her spelling, as measured by a standardized spelling test, a developmental spelling test, and a researcher-developed instrument.

The recommendations of the study were to use the PESTS method of instruction in different context than reported in their study. It should be used for specific words that children consistently misspell, and for high impact words (i.e., items that the child uses frequently in his or her writing), or whenever needed.

6. Chase-Lockwood and Masino (2002)

Chase-Lockwood and Masino (2002) examined improving student spelling skills through the use of effective teaching strategies. They targeted fifth grade classes, which included a cluster of students with learning disabilities, demonstrated difficulty applying spelling skills to daily written work due to ineffective teaching instruction. Evidence for this problem included written documentation of misspelled words on spelling tests, written work, and a teacher survey of instructional strategies in spelling not aligned with best practices in spelling.

They showed that the teachers were frustrated because they found that students did not master the high frequency words, and the students did not apply the words from their spelling tests to their daily writing. The researchers designed a series of learning activities that addressed improving spelling skills which included breaking up words and word sorts, and they asked teachers to construct morning messages for students to view words from their spelling list given on daily basis. After that they purchased some items for making personal dictionaries, word bank journals and word

wall bulletin board, they put the Action plan for the project with fixed time of fulfillment.

Based on the presentation and analysis of the data on teaching strategies for spelling, the students in the experimental groups showed a significant improvement in their mastery of spelling words. The intervention used to effectively teach spelling words to students is highly recommended. The teacher- researchers recommend using a combination of the various strategies for the most effective results. In order for the intervention to be most beneficial for the students, it is recommended that the 90 high frequency words be divided into six words per week. And the students should still be reviewing the previous week's words.

In conclusion, the teacher- researchers found that all the strategies used for the intervention were effective. They were most effective when they were used consistently and when they were used together. Students became more motivated and apt to learn their spelling words. The intervention can be successfully incorporated into any classroom. However, there would have to be teacher training. Many teachers are not familiar with the spelling strategies used throughout the research. If that is done, a high rate of success will be evident.

7. Ediger (2000)

Ediger (2000) assessed student achievement in spelling. The researcher analyzed different approaches to assess learner achievement in the spelling curriculum. The topics discussed were assessment of spelling and the basal textbook, using spelling words for mastery based on research, individualized spelling, use of spelling words in context, standardized spelling tests, and the functional approach of teaching spelling as needed. The paper considered special spelling programs in software packages, such as drills and practice programs, tutorial programs, and gaming. The study pointed out that a quality spelling program stresses worthwhile objectives for students to attain and that learning opportunities need to provide for individual differences and assist learners to achieve vital objectives in spelling.

8. Weeks and Brooks (1999)

Weeks and Brooks (1999) investigated improving spelling in children with literacy difficulties and all children in mainstream schools through the use of individual styles in learning to spell. They studied six 6-8 year old children with

dyslexic features in rigorous individual programmes, and in a group comparison of children with dyslexic features with children with moderate learning difficulties and those with no difficulties (12 children in each group). The study showed that children's rates of acquiring spellings can be much enhanced by simply applying individual learning strategies used within their usual English and spelling programmes. It also indicated the links between effective teaching of spelling and children's individual development and styles of learning.

2.6 .5 Studies concerning the effect of spelling on personality and intelligence:

1. Beech and Black (1984)

Beech and Black (1984) studied the cognitive and personality factors in the spelling of adults. The researchers selected 118 students, good and poor spellers, and tested them on repression and sensitization and other measures. The main purpose of this study was to see whether or not there is a relationship between spelling and personality, that is, if the subjects are divided into good and poor spellers, do they differ on the repression-sensitization dimension? Repressors are less likely to recognize anxiety-arousing material, whereas sensitizers are more sensitive in their detection of anxiety-arousing stimuli. In addition to the repression-sensitization scale, subjects in this experiment were given an intelligence test, a vocabulary test, and a test involving the learning of new spellings. These additional measures permitted the examination of other traits that might relate to spelling ability. The test was used to choose the good and poor spellers consisted of 48 words. The new-spelling test comprised ten familiar words that were assigned new spellings. The vocabulary test was made up of 26 words. The Cattle Culture-Fair Intelligence Test, Scale 3, Form A (1963 edition) was used because it is non-verbal and can be used for group testing of students. The measure of greatest interest, spelling ability, produced only one significant correlation, which was with the subjects' ability to memorize new spellings. There was a moderate correlation between the two measures, but not enough to attain statistical significance. Vocabulary level and spelling ability were also unrelated. Poor spelling, in other words, does not go hand in hand with an impoverished experience in the written language. There was no significant association between spelling ability and intelligence, so this cannot be a complete explanation for poor spelling ability.

2.6 .6 Studies concerning the effect of teaching spelling on developing English skills: listening, speaking, Reading and writing: 1. Kandel and Perret (2014)

Kandel and Perret, (2014) examined how the interaction between spelling and motor processing builds up during writing acquisition. Sixty-four French 8–10 year old children participated in the experiment. This is the age handwriting skills start to become automatic. They came from two schools in the Grenoble urban area.

The children wrote regular and irregular words that could be frequent or infrequent. They wrote on a digitizer so the researchers could collect data on latency, movement duration and fluency. The results revealed that the interaction between spelling and motor processing was present already at age 8. It became more adult-like at ages 9 and 10. Before starting to write, processing irregular words took longer than regular words. This processing load spread into movement production. It increased writing duration and rendered the movements more dysfluent. Word frequency affected latencies and cascaded into production. It modulated writing duration but not movement fluency. Writing infrequent words took longer than frequent words. The data suggests that orthographic regularity has a stronger impact on writing than word frequency. They do not cascade in the same extent.

2. Reis Thaize et.al. (2013):

Reis Thaize, et.al. (2013) investigated teaching spelling skills and sought to determine whether it affected reading skills. Four students learned to spell 30 Portuguese words using a computer-based constructed response matching-to-sample task. Simultaneously, with presentation of the sample (i.e., a picture and its corresponding printed word or a dictated word), the computer screen showed a pool of 14 letters. The task was to select the letters in the correct order to spell a word that corresponded to the sample. Differential consequences followed correct and incorrect responses. Spelling and reading improved for all of the participants. Spelling performance was as accurate as reading performance for three of the four participants. These results replicate previous data that showed the effectiveness of the constructed response matching-to-sample task in teaching spelling and promoting the emergence of reading. Kinesthetic modality was absent in visual and mixed group. Subjects still improved comparably to other groups.

3. Johnson (2013)

Johnson, (2013) examined the relationship between spelling ability and reading fluency and comprehension in elementary students. The development of this research was to present a theoretical model integrating identification between the ability to spell with reading fluency and reading comprehension. Different studies that were done gave elementary teachers the most effective practices and techniques to incorporate into their classrooms. Elementary teachers who integrate these techniques and strategies into their teaching should see improvements throughout their students' spelling skills that will then lead to improvements in reading fluency and reading comprehension.

2.7 Commentary on the previous studies:

Having reviewed the previous studies, the researcher widened and enriched her background about the problem of the current study which deals with the impact of smart and non smart styles of VAKT approach on 4th graders English spelling. The researcher found the previous studies very beneficial as they were conducted by different researchers all over the world and on different age groups (e.g. young learners, old learners, and adults). This proves the importance of the topic of the current study as it has been investigated in different contexts worldwide.

The researcher noticed some points of similarities and differences between the previous studies and her own current study. Regarding the first section concerning the effect of using VAKT approach and multisensory approaches on developing English spelling and other skills, Taschow (1970) confirms that the steps of the Visual-Auditory-Kinesthetic-Tactile Technique, while being in agreement with sound educational procedures and psychological theories, will assure each student to learn to spell individually and independently.

The findings of the study of Jubran (2011) indicated that there were statistically significant differences in the post-test between the control and the experimental groups in favor of the experimental group which was taught using Multi Sensory Approach. And that goes with Obaid's (2013) study, which indicated that there were statistically significant differences in the post-test between the control and the experimental groups in favor of the experimental group. Similarly, the findings of Haboush, (2010) indicated that there were statistically significant differences between

both groups, favouring the experimental one, only in skimming, scanning and knowing the meaning of words through context due to the programme implemented. Concerning the other remaining skills, no differences were observed. And agreed with this study EL-Modalal's (2012) study, in which the findings indicated that there were statistically significant differences between both groups, in favour of the experimental one, in ideas, organization, voice, word choice, word fluency and conventions due to the programme implemented.

Oppositely, Murphy's (1997) findings suggested that no significant difference between the two samples was found. The researcher thinks the sample of the study was not large enough to represent the population and to be able to generalize the results. And the samples of students' daily writing were difficult to evaluate also without a standard scale to find differences between the two groups. The researcher can take a guided writing sample with the same length and the same criteria for all students. But dictation and post tests are the best ways to evaluate spelling firmly.

Jones (2006) agreed with the study of Murphy (1997) that there was no significant difference in scores to support the use of multiple intelligences activities in spelling instruction, but he used the Multiple Intelligences separately. it would have been better if he had used them integral together.

Results of Thorpe and Borden (1985) were a little bit different in that was the single subject reversal design experiments which indicated that all four types of instruction increased word reading accuracy when compared with pretest scores. Nevertheless, there were significant differences in effectiveness among the four treatments. Visual-auditory instruction alone was far less effective than visual-auditory with praise and the multisensory procedure with or without praise. Alternatively, visual-auditory with praise was the most effective of all the procedures.

Moustafa, (1999) assures in his research the effectiveness of multi-sensory approach in improving student achievement. And for Chapman, (1964) the "V.A.K.T." Word Study process is a successful means for teaching spelling in combination with instruction in structural and phonetic analysis.

The results of Abdelhadi, (2009) showed statistically significant differences in literacy skills among students in the experimental due to the program based on Fernald multi-sensory approach.

In Dalecki, (2007) thesis, the improvement in sight word recognition was statistically significant for the experimental group, but not for the control group;

strengthening the notion that kinesthetic and tactile reading activities, supports students' recognition abilities.

While the above findings provide initial support for multi-sensory approach effect, they are limited because all of the above findings were generated through interactions with paper-based instructional materials, meaning it is as yet unclear whether the results generalize to interactions with other interfaces used for learning, such as computers, tablets, or interactive whiteboards. So, in the second section concerning the effect of using smart devices on developing English skills, they discussed the effect of using other interfaces. The majority of the studies affirmed the positive effects of using smart devices on developing students' English skills, as Nisbet and Austin (2013) provided practical recommendations and resources for promoting vocabulary development among adult ESL students who have access to mobile devices.

In Meer et al. (2014) study, after the intervention, students showed increased correct matching across all four combinations, suggesting that picture and word matching with an iPad-based SGD can be successfully taught using graded guidance and differential reinforcement.

Also, Ball (2011) assures that adult education programs that incorporate technology in their teaching offer students the best opportunity to build not only their language skills but work and life skills as well.

As regards the third section concerning the effect of using smart devices on developing other skills or other school subjects, Agostinho et al. (2015), Burden, K. & Hopkins P. (2015), Eid and Al-Zuhair, (2015), Kopecký and Hejsek, (2015), Alkhamis, (2014), Khoo et. al., (2014), and Doenyas et al. (2013), confirmed the significance of using smart devices on developing other skills or other school subjects.

For the fourth section concerning the effect of using other approaches on developing English spelling. In Kemper, Verhoeven, Bosman's (2012) study findings suggest that explicit instruction is more effective than implicit instruction for the teaching of spelling rules when generalization is aimed at.

Researchers Chase-Lockwood and Masino (2002) found that all the strategies used for the intervention were effective. They were most effective when they were used consistently and when they were used together.

Ediger (2000) in his paper presents almost every way of assessing student's spelling abilities and then presents the advantages and disadvantages of those ways. One did not see any solutions for these faults nor did one see the opinion of the researcher as the descriptive research should be. He did not relate his ideas nor did he make any comparisons between these ways.

He just describes the facts and an overlook of the ways to assess students' spelling abilities without making conclusions or finding relations and he did not offer solution and his own point of view was neither inside the research nor at the end.

For Weeks and Brooks' (1999) study showed the value of individualizing the learning styles of children, whether they are children with learning problems or normally developing children.

Brinegar, et al., (2015) found that when CCC was implemented participant's spelling improved. The researchers in this study made a case study and experiment the CCC strategy to treat the spelling deficits, but of a scientific perspective, one case is not enough to generalize the results on all students or students with disabilities. The CCC strategy is a useful strategy for teaching spelling, it's a part of VAKT approach and the researcher used it along with other strategies that forms the VAKT approach as a whole approach.

Also in Howard, DaDeppo and Paz (2008) study, each of the students improved his or her spelling, as measured by a standardized spelling test, a developmental spelling test, and a researcher-developed instrument. The PESTS method is really interesting method for spelling instruction, however it needs a lot of time to apply and it is suitable for students with learning disabilities and not all the students need such a method. Moreover, it does not fit large number classes.

All the remedial techniques made a notable difference in Narang, Susheela and Gupta, (2014) study. But if a sample had been larger, generalizations would have been better. A control group should be included to see the comparison of group. There was a descriptive study by Simmons and Carpenter (2010). Three profiles of students with varying disabilities who have problems with the writing process exacerbated by poor spelling ability were showed to illustrate the complexities of spelling difficulties as well as solutions and possibilities for spelling improvement.

In the fifth section concerning the effect of spelling on personality and intelligence, Beech and Black (1984) showed that there was no significant association

between spelling ability and intelligence, so this cannot be a complete explanation for poor spelling ability.

Therefore, the contradiction found in the results of the first two sections confused the researcher and increased her enthusiasm, as well, to pursue her current study in order to find out the effectiveness of using smart and non-smart styles of VAKT approach on developing fourth graders' English spelling. However, the results of the second section served the researcher's expectation that using smart devices may have a positive effects on developing the fourth graders' English spelling.

The researcher revised the methodology elements followed in the previous studies and got benefit from them. Concerning the research design, the great majority of researchers whose studies have been revised adopted the experimental and the quasi-experimental approach. Only those of Kopecký and Hejsek, (2015), Alkhamis, (2014), Nisbet and Austin (2013), Johnson (2013), Ball , (2011), Simmons and Carpenter (2010), Ediger (2000), Moustafa,(1999) and Taschow (1970), and adopted a descriptive approach

With regard to the research instruments, the previous studies utilized different research tools such as pre-post tests, questionnaires, interviews, surveys, informal inventories of learning and behavior, and observations. The researcher noticed that some studies used more than one tool. For example, in Khoo, et. al.'s (2014) study, they used the observations (videotape and photos of teacher-children interactions), interviews (audio recordings of teachers, children, parents) and children's work produced on the iPad as part of the learning process. Taking this point into consideration, the researcher used three tools which are Content analysis, a pretest and a posttest. The researcher benefited from the previous studies in constructing and applying her research tools.

The participants of the previous studies were from different ages and from different levels. The current study resembles those studies in that it was applied on the fourth graders, which is a very suitable age to be taught using VAKT approach.

To sum up, the current study benefited from the previous studies in selecting the sample of the study which consisted of (96) fourth graders divided into a control and two experimental groups in preparing and administering the tools of the study, in selecting the proper research design which is the experimental approach and in analyzing the results. In addition, the researcher had a clear idea about how to implement VAKT approach (smart and non-smart applications) in her classroom.

Nevertheless, the current study may differ from other studies in that it was the first study, to the researchers' best knowledge, which dealt with smart and non-smart styles of VAKT approach and its effect on fourth graders' English spelling in the Gaza Strip. The current study also differed in that it examined two independent variables; smart style and non-smart styles of VAKT approach, while other researchers examined only one variable.

2.8 Summary:

This chapter consisted of two sections: theoretical framework and previous studies. The first section discussed spelling; its definition; its relationships with other skills; the sources of inefficient spelling; its importance; the difference between spelling, orthography and dictation; methods of spelling assessment; technology and its effect on education, the advantages of cell phones; the benefits of technology use for ESL teaching and learning; theories for spelling instruction; multisensory approach; different learning styles; smart and non-smart styles of VAKT approach and steps for teaching them. Added to that the stages of the study and the challenges the researcher's faced in these stages and beside that the teacher and pupil's roles.

The second section cited some previous studies that were divided into six sections as mentioned earlier in this section. Finally, the researcher commented on these previous studies.

The literature review paved the way for the researcher, facilitated her job and benefited her greatly. However, smart and non-smart styles of VAKT approach are still in need for further research. By conducting this study, the researcher aims to add to the cumulative knowledge, to enrich the empirical studies in the field of teaching and learning English and to support English language teachers with a sufficient background about incorporating new approaches in their classrooms.

The next chapter deals with methodology of the study.

Chapter III

METHODOLOGY

Chapter III

METHODOLOGY

This chapter puts forward a holistic image of the methodology of the study: the population, the samples and the tools. It also describes the suggested program of smart and non-smart styles of VAKT approach.

3.1 Study approach and design:

The study adopted the experimental approach which was used to estimate the causal impact of an intervention on its target population (Abu-Allam, 2010:219) . It required dealing with three groups of students, two experimental groups and one control group. With a post test to compare the results and a pre-posttests' comparison too to assure the results. The control group was taught spelling by the traditional way, while the first experimental group was taught by smart applications of VAKT approach and the second experimental group was taught by the non-smart style of VAKT approach. The intervention lasted for one month.

3.2 Study population:

The population of this study consisted of all male and female 4th graders in Gaza Strip elementary schools for the second semester of the scholastic year 2014-2015. Their age ranged from 9 to10 years.

3.3 Study sample:

As shown in Table (3.1) below, the sample of the study consisted of (96) 4th graders equally distributed into three groups: two experimental groups consisting of (32) pupils each and one control group consisting of (32) pupils. The three groups were randomly chosen from four classes for 4th graders in Al-Shejaeia Elementary Co-ed School “B” in Gaza Governorate. Each of these classes was arranged at the beginning of the year to contain the three levels: high achievers, average students and low achievers. These participants were enrolled at UNRWA schools at the age of 6. Since then, they had been receiving English classes three times a week, 45 minutes each. None of them had received private education and none of them had sensorial problems. The three groups were almost equivalent in the economic, cultural and social levels. Age variable of the sample was controlled before the intervention.

Table (3.1)

The distribution of the sample according to the groups

Group	Experimental(1)	Experimental(2)	Control
Number of Participants	32	32	32

3.4 Controlling some study variables:

To ensure the accuracy of the study results and avoid any marginal interference, the researcher tried to control some variables before the study.

3.4.1 Teacher variable

All groups were taught by the same teacher, the researcher. This was to prevent any other factors related to the teacher difference from affecting the results. This was also because she could not find other teachers who were familiar with the VAKT approach to help conduct the research.

3.4.2 Time Variable

All groups received four-week instruction.

3.4.3 Age variable:

The researcher recorded pupils' ages from their school files at the beginning of the school year (2014-2015). One way ANOVA was used to measure whether there were statistically significant age differences among the participants. The mean of the age of the whole sample was (9.55) year, as shown in Table (3.2) below.

Table (3.2)

One Way ANOVA results of controlling age variable

scope	Variance resource	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
AGE	Among Groups	0.040	2	0.020	0.355	0.702	non sig.
	Within Groups	5.239	93	0.056			
	Total	5.279	95				

“f” table value at (2, 93) d f. at (0.05) sig. level equal 3.09

Table (3.2) indicates that F computed value is 0.355 which is smaller than the F table value = (3.09). So, there are no statistically significant differences at (0.05) level among experimental and the control groups due to the age variable.

3.4.4 General achievement variable:

One Way ANOVA was used to measure the statistical differences among the groups due to their general achievement. The participants' results in the second term test of the school year (2014-2015) were recorded and analyzed as shown in Table (3.3) below.

Table (3.3)

One Way ANOVA results of controlling general achievement variable

scope	Variance resource	Sum of Squares	df	Square Mean	F	Sig.	Sig. level
GENERAL ACHIEVEMENT	Among Groups	29.521	2	14.760	0.035	0.965	non sig.
	Within Groups	38770.313	93	416.885			
	Total	38799.833	95				

“f” table value at (2, 93) d f. at (0.05) sig. level equal 3.09

Table (3.3) shows that F computed value is 0.355 which is smaller than the F table value = (3.09). So, there were no statistically significant differences at (0.05) among the experimental and the control groups due to the general achievement variable.

3.4.5 General achievement in English language variable:

One Way ANOVA was used to measure the statistically significant differences among the groups due to their general achievement in English language. The participants' results in the mid-first term test of the school year (2014-2015) were recorded and analyzed as shown in Table (3.4) below.

Table (3.4)

**One Way ANOVA results of controlling general achievement in English
language variable**

scope	Variance resource	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
ENGLISH GENERAL ACHIEVEMENT T	Among Groups	187.750	2	93.875	0.262	0.770	non sig.
	Within Groups	33374.656	93	358.867			
	Total	33562.406	95				

“f” table value at (2, 93) d f. at (0.05) sig. level equal 3.09

Table (3.4) shows that F computed value is 0.262 which is smaller than the F table value = (3.09). So, there were no statistically significant differences at (0.05) among the experimental groups and the control group due to the general achievement in English language variable.

3.4.6 Previous learning variable in English Spelling test:

To make sure that the participants were equivalent in their previous learning variable in English Spelling skills, the researcher applied the pre- achievement test. The results of the participants were recorded and statistically analyzed using One Way ANOVA as shown in Table (3.5) below.

Table (3.5)

**One Way ANOVA results of controlling previous learning variable in spelling
skills**

scope	Variance resource	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
Isolation	Among Groups	1.938	2	0.969	0.408	0.666	non sig.
	Within Groups	220.977	93	2.376			
	Total	222.914	95				
Exchanging	Among Groups	4.328	2	2.164	1.232	0.296	non sig.
	Within Groups	163.297	93	1.756			
	Total	167.625	95				
Visual Memory	Among Groups	4.255	2	2.128	2.378	0.098	non sig.
	Within Groups	83.203	93	0.895			

scope	Variance resource	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
	Total	87.458	95				
Syllable blending	Among Groups	3.943	2	1.971	1.305	0.276	non sig.
	Within Groups	140.492	93	1.511			
	Total	144.435	95				
Encoding	Among Groups	0.016	2	0.008	0.141	0.868	non sig.
	Within Groups	5.141	93	0.055			
	Total	5.156	95				
Auditory analysis and perception	Among Groups	1.161	2	0.581	0.787	0.458	non sig.
	Within Groups	68.648	93	0.738			
	Total	69.810	95				
Auditory discrimination	Among Groups	1.021	2	0.510	0.209	0.812	non sig.
	Within Groups	226.969	93	2.441			
	Total	227.990	95				
Total degree	Among Groups	58.328	2	29.164	0.821	0.443	non sig.
	Within Groups	3303.836	93	35.525			
	Total	3362.164	95				

“f” table value at (2, 93) d f. at (0.05) sig. level equal 3.09

Table (3.5) shows that F computed value is 0.821 which is smaller than the F table value = (3.09). So, there are no statistically significant differences among the experimental and the control groups at (0.05) level.

3.5 Data statistical analysis

The data were collected and computed by using Statistical Package for Social Sciences (SPSS). Spearman correlation, Alpha Cronbach Technique and Spilt–half Technique were used to confirm the test validity and reliability. On the other hand, One Way ANOVA was used to measure the statistically significant differences in means among the three groups due to the teaching method, and level in English language whether high or low.

3.6 Study Variables:

The study included the following variables:

3.6.1 Independent Variables:

The independent variables of the study were as follows:

1. Non-Smart Style of VAKT Approach.
2. Smart Style of VAKT Approach

3.6.2 Dependent Variable:

The dependent variable in the study was the 4th graders' achievement in English spelling.

3.7 Study Instruments and Tools:

To achieve the aims of the study, the researcher used content analysis, a pre-posttest as instruments to collect relevant data. And smart applications as a tool to teach pupils the smart style of VAKT approach.

3.7.1 Content analysis:

Holsti (1969:14) offers a broad definition of content analysis as, "any technique for making inferences by objectively and systematically identifying specified characteristics of messages". According to Babbie (2001: 304), content analysis "the study of recorded human communications". It is "essentially a coding operation," with coding being "the process of transforming raw data into a standardized form" (Babbie, 2001:309).

The researcher analyzed units 16 and 17 from the 4th grade students' book to find out the words that 4th graders should learn for the posttest.

Analysis Unit: the word is the sampling unit.

Context unit: any word that 4th graders have not learned before in 4th grade, they see this word for the first time this year.

Recording unit: words that are taught for 4th graders for the first time.

To ensure the reliability of the analysis, the researcher adopted the inter-rater type of reliability (reliability across people or reproducibility). This type refers to measuring the percentage of agreement between raters (Stemler, 2001: 6).

Accordingly, the researcher asked another English teacher who taught English for about ten years to analyze the same units. Table (3.6) shows these findings.

Table (3.6)

Results of content Analysis of the words for 4th grade student's book

Units	Second analysis (Teacher 2)	First analysis (Teacher 1)
units 16 and 17	62 words	60 words

In order to treat both analyses statistically, the following equation was used to compute the Coefficient of Reliability (CR) between both analyses. $CR = \frac{2M}{N1+N2}$, where: CR = the coefficient of reliability, M = the number of the agreed on categories during analysis, and N1+N2 = the summation of analysis categories (Holsti, 1969:142). Table (3.7) shows the findings of the inter-rater reliability.

Table (3.7)

The Coefficient of Reliability (CR) between both analyses

Units	First Teacher	Second Teacher	Coefficient of Reliability CR
units 16 and 17	60 words	62 words	98.4%

Table (3.7) shows a high coefficient of reliability between the two raters, after that analyses the researcher discussed with the second teacher about the words not agreed upon them, and the second teacher understands that some of the words in her analysis have been studied before in the 3rd grade English curriculum, so the two analyzers decided to choose the 60 words analysis to be the basis of the this study.

3.7.2 The pre- posttest:

The pretest was applied on the three groups: one control group and two experimental groups. The purpose of the test was to recognize the three groups' level at spelling before starting the intervention and to compare the results of the pretest with those of the posttest after the intervention.

The test was built according to table of test specifications. It is worth noting that the sub-skills under investigation were isolation, exchanging, visual memory,

syllable blending, encoding, auditory analysis and perception, and auditory discrimination, those skills were chosen after analyzing the content of 4th grade by the researcher and discussing those skills with other English teachers and supervisors. The objectives of the test were to check pupils' ability in the spelling sub-skills. The test was introduced to a jury of specialists in English language and methodology in Gaza, and their recommendations were taken into consideration before applying the pilot study. The total number of the items was sixty and they are listed in the Table of Specifications (3.8) below.

Table (3.8)

Table of Specifications

Skills	No. of items	%
Isolation	12	20.00
Exchanging	10	16.67
Visual Memory	8	13.33
Syllable blending	6	10.00
Encoding	4	6.67
Auditory analysis and perception	8	13.33
Auditory discrimination	12	20.00
Total	60	100

3.7.2.1 The items of the test

The items of the test (see appendix 3) were designed to fulfill the requirements of each sub-skill as follows.

1. Isolation sub- skill

This domain included (12) items: 4 items with a missing initial letter, 4 items with a missing middle letter and 4 items with a missing final letter. The purpose was to measure pupils' ability to identify not only the initial sound in a word but also middle and final sounds.

2. Exchanging sub-skill

This domain consisted of (10) items designed to measure pupils' ability to substitute a new sound or letter for another to produce a new word.

3. Visual Memory sub-skill

This domain consisted of (8) items designed to measure pupils' ability to analyze words and sequence letters.

4. Syllable –blending sub- skill

This domain consisted of (6) items designed to measure pupils' ability to combine syllables into words.

5. Encoding sub-skill

This domain consisted of (4) items designed to measure pupils' ability to compose words by using scrambled letters and visual input.

6. Auditory analysis and perception

This domain consisted of (8) items designed to measure pupils' ability to recognize or interpret what is heard.

7. Auditory discrimination

This domain consisted of (12) items designed to measure pupils' ability to organize and make sense of language sounds.

3.7.2.2 The pilot study

To maintain the validity and reliability of the pre -post test, a pilot study was conducted. The spelling test was administrated on a random group consisting of (36) 4th graders in Al-Shejaeia Elementary Co-ed School “B” other than the experimental and control groups. After the statistical analysis, the test was modified and some clarifications were added (Appendix 3).

3.7.2.3 Difficulty Coefficient:

The difficulty coefficient is calculated by dividing the number of the failing pupils by the total number of pupils taking the test (Melhem, 2000). As shown in the equation below.

$$\text{Difficulty Coefficient} = \frac{\text{No. of failing pupils}}{\text{Total of pupils taking the test}} \times 100$$

Table (3.9) shows the difficulty coefficient for each item of the test:

Table (3.9)

Difficulty coefficient for each items of the test

No.	Difficulty coefficient	No.	Difficulty coefficient
1	0.70	31	0.50
2	0.50	32	0.40
3	0.65	33	0.45
4	0.75	34	0.65
5	0.65	35	0.60
6	0.55	36	0.55
7	0.50	37	0.30
8	0.75	38	0.30
9	0.60	39	0.30
10	0.55	40	0.30
11	0.50	41	0.25
12	0.55	42	0.35
13	0.65	43	0.50
14	0.60	44	0.30
15	0.40	45	0.30
16	0.55	46	0.55
17	0.65	47	0.30
18	0.50	48	0.30
19	0.45	49	0.70
20	0.75	50	0.65
21	0.55	51	0.70
22	0.65	52	0.65
23	0.35	53	0.55
24	0.50	54	0.65
25	0.65	55	0.75
26	0.30	56	0.25
27	0.30	57	0.75
28	0.65	58	0.75
29	0.30	59	0.70
30	0.35	60	0.75
Total difficulty coefficient		0.52	

Table (3.9) shows that the difficulty coefficient wobbled between (0.25 – 0.75) with a total average of (0.52), which means each item is acceptable or in the normal limit of difficulty according to the viewpoints of assessment and evaluation specialists.

3.7.2.4 Discrimination coefficient:

The discrimination coefficient differentiates between high achievers and the low achievers and is calculated by the equation illustrated below.

$$\text{Discrimination Coefficient} = \frac{\text{No. of pupils getting correct answers among high achievers}}{\text{No. of high achievers}} - \frac{\text{No. of pupils getting correct answers among low achievers}}{\text{No. of low achievers}}$$

Table (3.10) shows the discrimination coefficient for each item of the test:

Table (3.10)
Discrimination coefficient for each item of the test

No.	Discrimination coefficient	No.	Discrimination coefficient
1	0.40	31	0.60
2	0.60	32	0.40
3	0.30	33	0.70
4	0.30	34	0.50
5	0.50	35	0.60
6	0.50	36	0.70
7	0.40	37	0.60
8	0.30	38	0.60
9	0.60	39	0.60
10	0.30	40	0.60
11	0.60	41	0.50
12	0.70	42	0.50
13	0.50	43	0.60
14	0.60	44	0.60

No.	Discrimination coefficient	No.	Discrimination coefficient
15	0.40	45	0.60
16	0.70	46	0.70
17	0.70	47	0.40
18	0.60	48	0.40
19	0.70	49	0.40
20	0.50	50	0.70
21	0.70	51	0.60
22	0.70	52	0.70
23	0.50	53	0.70
24	0.60	54	0.70
25	0.30	55	0.50
26	0.60	56	0.50
27	0.40	57	0.30
28	0.50	58	0.50
29	0.60	59	0.60
30	0.70	60	0.50
Total Discrimination coefficient		0.55	

Table (3.10) shows that the discrimination coefficient wobbled between (0.30 – 0.70) with a total average of (0.55), which means each item is acceptable or in the normal limit of difficulty according to the viewpoints of assessment and evaluation specialists.

3.7.2.5 Test Validity

Mackey and Gass (2005:107) state that content validity refers to the representativeness of the measurement regarding the phenomenon about which we want information. In other words, a test should measure what it is intended to measure.

3.7.2.6 The referee validity

The test was introduced to a jury of specialists in English language and methodology in Gaza universities, and experienced supervisors and teachers at schools. The items of the test were modified according to their recommendations (See Appendix 5)

3.7.2.7 Test internal consistency validity

Al Agha (1996:121) states that the internal consistency validity indicates the correlation of the degree 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 by using Pearson formula. According to Table (3.9), the coefficient correlation of each item within its domain, and with the whole test is significant at levels (0.01) and (0.05).

Table (3.11) shows the correlation coefficient of each scope with the whole test. According to the following tables, it can be concluded that the test was highly consistent and valid as a tool to collect data relevant to the study.

Table (3.11)

Pearson Correlation of the Items with their Domains of the Test

Levels of the skills	Item No	Pearson Correlation	Sig. level	Levels of the skills	Item No	Pearson Correlation	Sig. level
Isolation	1	0.615**	sig. at 0.01	Exchanging	1	0.388*	sig. at 0.05
	2	0.658**	sig. at 0.01		2	0.653**	sig. at 0.01
	3	0.369*	sig. at 0.05		3	0.395*	sig. at 0.05
	4	0.625**	sig. at 0.01		4	0.770**	sig. at 0.01
	5	0.731**	sig. at 0.01		5	0.721**	sig. at 0.01
	6	0.689**	sig. at 0.01		6	0.728**	sig. at 0.01
	7	0.437**	sig. at 0.01		7	0.717**	sig. at 0.01
	8	0.356**	sig. at 0.05		8	0.602**	sig. at 0.01
	9	0.555**	sig. at 0.01		9	0.693**	sig. at 0.01
	10	0.408*	sig. at 0.05		10	0.847**	sig. at 0.01
	11	0.494**	sig. at 0.01				
	12	0.603**	sig. at 0.01				
Visual Memory	1	0.518**	sig. at 0.01	Syllable blending	1	0.828**	sig. at 0.01
	2	0.591**	sig. at 0.01		2	0.735**	sig. at 0.01
	3	0.597**	sig. at 0.01		3	0.758**	sig. at 0.01
	4	0.385*	sig. at 0.05		4	0.828**	sig. at 0.01
	5	0.620**	sig. at 0.01		5	0.896**	sig. at 0.01
	6	0.671**	sig. at 0.01		6	0.785**	sig. at 0.01
	7	0.760**	sig. at 0.01				
	8	0.729**	sig. at 0.01				
Encoding	1	0.805**	sig. at 0.01	Auditory analysis and perception	1	0.438**	sig. at 0.01
	2	0.774**	sig. at 0.01		2	0.713**	sig. at 0.01
	3	0.659**	sig. at 0.01		3	0.696**	sig. at 0.01
	4	0.843**	sig. at 0.01		4	0.786**	sig. at 0.01
Auditory discrimination	1	0.608**	sig. at 0.01		5	0.705**	sig. at 0.01
	2	0.782**	sig. at 0.01		6	0.805**	sig. at 0.01
	3	0.711**	sig. at 0.01		7	0.750**	sig. at 0.01
	4	0.865**	sig. at 0.01		8	0.552**	sig. at 0.01
	5	0.743**	sig. at 0.01				
	6	0.772**	sig. at 0.01				
	7	0.403*	sig. at 0.05				
	8	0.433**	sig. at 0.01				
	9	0.520**	sig. at 0.01				
	10	0.450**	sig. at 0.01				
	11	0.445**	sig. at 0.01				
	12	0.674**	sig. at 0.01				

r table value at df (34) and sig. level (0.05) = 0.325

r table value at df (34) and sig. level (0.01) = 0.418

Depending on the data presented in Table (3.11), the researcher estimated the correlation coefficient among each level and the total marks of the test. The correlation coefficients ranged between (0.365 – 0.896) and were significant at (0.01,0.05). Thus it can be concluded that the test was highly valid and included a high degree of validity. In addition, Table (3.12) shows the Pearson Correlation of each domain with the test as a whole.

Table (3.12)

The Correlation Coefficient of Each Domain with the Total Test Scores

Levels of the Skills	Total scores	Isolation	Exchanging	Visual Memory	Syllable blending	Encoding	Auditory analysis and perception	Auditory discrimination
Isolation	0.807* *	1						
Exchanging	0.815* *	0.483* *	1					
Visual Memory	0.814* *	0.634* *	0.638**	1				
Syllable blending	0.801* *	0.625* *	0.502**	0.632* *	1			
Encoding	0.429* *	0.447* *	0.426**	0.506* *	0.576**	1		
Auditory analysis and perception	0.840* *	0.616* *	0.687**	0.615* *	0.605**	0.493* *	1	
Auditory discrimination	0.838* *	0.601* *	0.623**	0.606* *	0.648**	0.495* *	0.626**	1

r table value at df (34) and sig. level (0.05) = 0.325

r table value at df (34) and sig. level (0.01) = 0.418

As shown in Table (3.12), all of the items had good levels of validity. The correlation coefficients for the domains of the skills ranged between (0.426 - 0.815) and significant at (0.01). So, it can be concluded that the test was highly valid to be used as a tool of the study.

3.7.2.8 Test Reliability:

The reliability of the test was measured by the Spilt-half (Spearman Brown Formula) and Kuder-Richardson (K-R20) Techniques.

3.7.2.9 Split half:

Split half technique relies on splitting the test into two equal parts and calculating the correlation coefficient between the parts by using Spearman-Brown formula (Al Agha & Al Ostaz, 2004:P.108). As shown in Table (3.13) below.

Table (3.13)
Spearman-Brown Correlation between two parts (even X odd)

SPILT –HALF TECHNIQUE			
Scope	TOTAL	BEFORE MODIFICATION	AFTER MODIFICATION
Isolation	12	0.674	0.805
Exchanging	10	0.621	0.767
Visual Memory	8	0.698	0.822
Syllable blending	6	0.721	0.838
Encoding	4	0.627	0.771
Auditory analysis and perception	8	0.784	0.879
Auditory discrimination	12	0.654	0.791
Test	60	0.832	0.907

It can be concluded from Table (3.13) that the test proved to be reliable. The Spilt- half coefficient is (0.907), which is above (0.7) indicates that the test was reliable as a study tool.

3.7.2.10 Kuder-Richardson (K-R20)

Kuder-Richardson (K-R20) depends on calculating the percentages of correct answers of the test items, and also on the variance of each item According to the following equation,

$$r = \frac{K}{K-1} \left[1 - \frac{\sum_{i=1}^K p_i q_i}{\sigma_x^2} \right]$$

as shown in Table (3.14) below.

Table (3.14)
(K_R20) Coefficients for the Questions of the Test

Kuder-Richardson (K-R20)		
Domain	Total	(K_R20) coefficient
Isolation	12	0.786
Exchanging	10	0.851
Visual Memory	8	0.763
Syllable blending	6	0.891
Encoding	4	0.722
Auditory analysis and perception	8	0.833
Auditory discrimination	12	0.795
Test	60	0.949

O'dah, (2002: 176) assures that if the results show that the reliability coefficients are above 0.70, so they are acceptable. As (K_R20) coefficient is (0.949), it means that the diagnostic test was reliable to be applied. Look at appendix (3)

3.7.2.11 The following statistical techniques were utilized:

1. Spearman correlation to determine the internal consistency of the test.
2. Alpha Cronbach technique and Kuder-Richardson (K-R20)to measure the reliability of the test
3. On the other hand, One Way ANOVA test was used to measure the statistical differences in mean between the experimental and the control groups.

4. Scheffe Post Hoc test matrix was used to identify the direction of differences among the fields.
5. T-test Paired Samples was used to measure the mean scores of the experimental groups results of the pre- and post-tests.

3.7.3 The smart applications:

As the researcher mentioned the definition of the smart app. is a software program for a mobile phone or computer operating system (American Dialect Society, 2011).

3.7.3.1 The general aim of the smart applications:

The general aim of the smart applications was to improve students' achievement in English spelling.

3.7.3.2 Content of the smart applications:

The smart applications were chosen to be based on VAKT approach, therefore they employ the visual, auditory and the kinesthetic-tactile abilities. They include all the vocabulary items in the target units of "English for Palestine" for the fourth grade. The researcher used two smart applications mainly, and used other applications for some games. The first application was called "little writer" and the second called "the white board" as shown in appendix (8).

In the little writer application, pupils can trace the word letter by letter then see the whole word with its picture and at the same time listen to the pronunciation of the word. In the white board application, the teacher and pupils can write the words in different colours and can underline the syllables of the word also with any colour they want. See appendix (8). Actually, both of the applications are integrated together as they serve the same objectives. In addition, any teacher who will use the VAKT approach will realize the suitability of those applications to the content and method of VAKT approach.

3.7.3.3 Implementation of the smart applications:

The researcher applied the smart applications on a random sample of fourth female graders at Al- Shejaeia elementary Co-ed "B" school in the second semester of the scholastic year (2014-2015) to teach the spelling included in units 16 and 17. At first, the researcher explained the idea of the experiment to the pupils of the first experimental group in a simple way. They were very excited especially when the

teacher told them about taking their English periods with smart devices and games. They told the teacher that they liked smart applications and touch screens that this was the first time for most of them.

To use the same smart applications, the teacher uploaded the smart applications to all smart devices, programmed the applications and supplied them with the target vocabulary items, their pictures and then recorded their pronunciation so that all pupils could use them at the same time independently. Before starting the experiment, the teacher gave the pupils a short training period in using the smart applications and dealing with the smart devices.

The teacher organized the pupils in a way that every group of pupils had a leader who was responsible for giving the device to the pupils, monitoring their progress and moving to the next word.

The teacher presented the word on the main smart device so that all pupils could see and listen to the word at the same time. Pupils were very happy as soon as they heard the sounds of words and started seeing the pictures of every word, and then students were allowed to record their own pronunciation on the smart devices by themselves.

Afterwards, they were asked to trace the word on the little writer application. Look and listen to the word and then to write it on the white board application which gave them immediate feedback about their performance, so pupils worked at their own pace and learned from their own mistakes, which encouraged self-learning.

Finally, the teacher asked pupils to write the word on a card and put it in their own dictionary file to keep it and revise it later.

3.7.3.4 Validity of the smart applications:

To test the smart applications validity, the researcher presented the smart applications to a group of English Language supervisors, university instructors and school teachers. All the referees approved of the use of those applications to teach spelling according to VAKT approach. Moreover, the researcher applied the smart applications on a pilot study consisting of (40) pupils in order to investigate if there was any technological problems, unclear instructions, or any other problems, and she found a huge interaction from pupils in that pilot sample.

IV

Study Findings

IV

Study Findings

This chapter puts forward the statistical analysis of the data collected throughout the study. The present study aims to investigate **the impact of smart and non-smart styles of VAKT Approach on 4th graders' English spelling**. To answer the study questions and test its hypotheses, the researcher randomly assigned three groups (two experimental and one control). Pre-post tests were the instruments used to collect data.

4.1 Answer to the study first question:

To answer the study first question formulated as "**What are the words that 4th graders should be able to spell?**", the researcher analyzed the target units of English for Palestine, book 4 by initially taking into consideration the highlighted words and the most important words that 4th graders should learn. The analysis of words was done by two people, the researcher and another English teacher. The results of the content analysis showed that there are 60 words that 4th graders should be able to spell, so these 60 words were the target of the study. For more details, please refer to the content analysis outlined in Chapter Three, and for the 60 words themselves, please refer to appendix 5.

4.2 Answer to the study second question:

To answer the study second question formulated as "**Are there statistically significant differences at ($\alpha \leq .05$) among the mean scores of the achievement post test of the three groups due to the teaching approach?**", the researcher tested the following hypothesis "**There are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the achievement post test for the three groups due to the teaching approach.**"

To answer the questions and test the hypothesis, the researcher used One Way ANOVA test. Table (4.1) below shows the One Way ANOVA results.

Table (4.1)**One Way ANOVA test results of differences among the three groups in the spelling**

Domain	Variance resource	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
Isolation	Among Groups	123.755	2	61.878	32.376	0.000	sig. at 0.01
	Within Groups	177.742	93	1.911			
	Total	301.497	95				
Exchanging	Among Groups	113.974	2	56.987	31.929	0.000	sig. at 0.01
	Within Groups	165.984	93	1.785			
	Total	279.958	95				
Visual Memory	Among Groups	61.099	2	30.549	22.246	0.000	sig. at 0.01
	Within Groups	127.711	93	1.373			
	Total	188.810	95				
Syllable blending	Among Groups	28.443	2	14.221	14.452	0.000	sig. at 0.01
	Within Groups	91.516	93	0.984			
	Total	119.958	95				
Encoding	Among Groups	32.568	2	16.284	36.699	0.000	sig. at 0.01
	Within Groups	41.266	93	0.444			
	Total	73.833	95				
Auditory analysis and perception	Among Groups	73.891	2	36.945	26.760	0.000	sig. at 0.01
	Within Groups	128.398	93	1.381			
	Total	202.289	95				
Auditory discrimination	Among Groups	28.083	2	14.042	28.874	0.000	sig. at 0.01
	Within Groups	45.227	93	0.486			
	Total	73.310	95				
total	Among Groups	2951.755	2	1475.878	71.541	0.000	sig. at 0.01
	Within Groups	1918.578	93	20.630			
	Total	4870.333	95				

“f” table value at (2, 93) df. at (0.05) sig. level equals 3.09

Table (4.1) shows that F computed value is 71.541 which is larger than the F table value = (3.09). So, there are statistically significant differences at (0.01) among the three groups at the level of spelling strategy.

To determine direction of the differences in the domain of isolation, the researcher used Scheffe test, whose results are outlined in Table (4.2) below.

Table (4.2)

**Scheffe test results of the direction of differences among the three groups in
Isolation Domain**

Isolation	Experimental Group 1	Experimental Group 2	control group
	4.484	5.500	2.750
Experimental Group 1 4.484	0		
Experimental Group 2 5.500	*1.016	0	
control group 2.750	*1.734	*2.750	0

Table (4.2) shows that the mean score of the 1st experimental group is 4.484 while the mean score of the 2nd experimental group is 5.500. The difference between the two mean scores is 1.016 and this value is statistically significant. Also the mean score of the 2nd experimental group is 5.500, while the mean score of the control group is 2.750 and the difference between the two differences is 2.750 and this value is statistically significant. So, there are statistically significant differences between the 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group. In addition, the mean score of the 1st experimental group is 4.484. while the mean score of the control group is 2.750. The difference between the two mean scores is 1.734 and this value is statistically significant. So, there are statistically significant differences between 1st experimental group and control group in favor of the 1st experimental group.

To determine direction of the differences in the domain of exchanging, the researcher used Scheffe test, whose results are outlined in Table (4.3) below.

Table (4.3)

Scheffe test to know the direction of the differences among the three groups in Exchanging Domain

Exchanging	Experimental Group 1	Experimental Group 2	control group
	3.328	4.313	1.672
Experimental Group 1 3.328	0		
Experimental Group 2 4.313	*0.984	0	
control group 1.672	*1.656	*2.641	0

Table (4.3) shows that the mean score of the 1st experimental group is 3.328, while the mean score of the 2nd experimental group is 4.313. The difference between the two mean scores is 0.984 and this value is statistically significant. Also, the mean score of the 2nd experimental group is 4.313, while the mean score of the control group is 1.672, and the difference between the two differences is 2.641. This value is statistically significant, so there are statistically significant differences between 2nd experimental group and both 1st experimental group and control group in favor of the 2nd Experimental group. Further, the mean score of the 1st experimental group is 3.328, while the mean score of the control group is 1.672; the difference between the two mean scores is 1.656 and this value is statistically significant. So, there are statistically significant differences between 1st experimental group and the control group in favor of the 1st experimental group.

To determine direction of the differences in the visual memory domain, the researcher used Scheffe test, whose results are outlined in Table (4.4) below.

Table (4.4)

**Scheffe test to know the direction of the differences among the three groups in
Visual Memory Domain**

Visual Memory	Experimental Group 1	Experimental Group 2	control group
	1.531	2.563	0.609
Experimental Group 1 1.531	0		
Experimental Group 2 2.563	*1.031	0	
control group 0.609	*0.922	*1.953	0

Table (4.4) shows that the mean score of the 1st experimental group is 1.531, while the mean score of the 2nd experimental group is 2.563. The difference between the two mean scores is 1.031 and this value is statistically significant. Also, the mean score of the 2nd experimental group is 2.563, while the mean score of the control group is 0.609 and the difference between the two differences is 1.953, and this value is statistically significant. So, there are statistically significant differences between 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group, and the mean score of the 1st experimental group is 1.531, while the mean score of the control group is 0.609. The difference between the two mean scores is 0.922, and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and control group in favor of the 1st experimental group.

To determine direction of the differences in the syllable blending domain, the researcher used Scheffe test, whose results are outlined in Table (4.5) below.

Table (4.5)

Scheffe test to know the direction of the differences among the three groups in Syllable blending domain

Syllable blending	Experimental Group 1	Experimental Group 2	control group
	2.047	2.609	1.281
Experimental Group 1 2.047	0		
Experimental Group 2 2.609	*0.563	0	
control group 1.281	*0.766	*1.328	0

Table (4.5) shows that the mean score of the 1st experimental group is 2.047, while the mean score of the 2nd experimental group is 2.609. The difference between the two mean scores is 0.563 and this value is statistically significant. Also, the mean score of the 2nd experimental group is 2.609, while the mean score of the control group is 1.281, and the difference between the two differences is 1.328. This value is statistically significant. So, there are statistically significant differences between 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group. In addition, the mean score of the 1st experimental group is 2.047. While the mean score of the control group is 1.281. The difference between the two mean scores is 0.766 and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and control group in favor of the 1st experimental group.

To determine direction of the differences in the encoding domain, the researcher used Scheffe test, whose results are outlined in Table (4.6) below.

Table (4.6)

**Scheffe test to know the direction of the differences among the three groups in
Encoding domain**

Encoding	Experimental Group 1	Experimental Group 2	Control group
	1.109	1.719	0.297
Experimental Group 1 1.109	0		
Experimental Group 2 1.719	*0.609	0	
control group 0.297	*0.813	*1.422	0

Table (4.6) shows that the mean score of the 1st experimental group is 1.109 while the mean score of the 2nd experimental group is 1.719. The difference between the two mean scores is 0.609 and this value is statistically significant. Also the mean score of the 2nd experimental group is 1.719, while that of the control group is 0.297 and the difference between the two differences is 1.422. This value is statistically significant. So, there are statistically significant differences between 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group. Also, the mean score of the 1st experimental group is 1.109, while that of the control group is 0.297. The difference between the two means is 0.813 and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and the control group in favor of the 1st experimental group.

To determine direction of the differences in the auditory analysis and perception domain, the researcher used Scheffe test, whose results are outlined in Table (4.7) below.

Table (4.7)

**Scheffe test to know the direction of the differences among the three groups in
Auditory analysis and perception domain**

Auditory analysis and perception	Experimental Group 1	Experimental Group 2	Control group
	1.906	2.813	1.906
Experimental Group 1 1.906	0		0
Experimental Group 2 2.813	*0.906	0	*0.906
Control group 1.906	*1.234	*2.141	*1.234

Table (4.7) shows that the mean score of the 1st experimental group is 1.906, while that of the 2nd experimental group is 2.813. The difference between the two mean scores is 0.906 and this value is statistically significant. Also, the mean score of the 2nd experimental group is 5.641, while that of the control group is 1.906, and the difference between the two means is 2.141. This value is statistically significant. So, there are statistically significant differences between 2nd experimental group and both the 1st experimental group and the control group in favor of the 2nd experimental group. Also, the mean score of the 1st experimental group is 1.906, while that of the control group is 1.906. The difference between the two mean scores is 1.234, and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and the control group in favor of the 1st experimental group.

To determine the direction of the differences in the auditory discrimination domain, the researcher used Scheffe test, whose results are outlined in Table (4.8) below.

Table (4.8)

**Scheffe test to know the direction of the differences among the three groups in
Auditory discrimination Domain**

Auditory discrimination	Experimental Group 1	Experimental Group 2	Control group
	4.828	5.641	4.328
Experimental Group 1 4.828	0		
Experimental Group 2 5.641	*0.812	0	
Control group 4.328	*0.500	*1.313	0

Table (4.8) shows that the mean score of the 1st experimental group is 4.828, while that of the 2nd experimental group is 5.641. The difference between the two mean score is 0.812, and this value is statistically significant. Also, the mean score of the 2nd experimental group is 5.641, while the mean score of the control group is 4.328, and the difference between the two differences is 1.313, which is a statistically significant value. So, there are statistically significant differences between the 2nd experimental group and both the 1st experimental group and the control group in favor of the 2nd experimental group. Also, the mean score of the 1st experimental group is 4.828, while that of the control group is 4.328. The difference between the two mean scores is 0.500 and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and the control group in favor of the 1st experimental group.

To determine the direction of the differences in all domains, the researcher used Scheffe test, whose results are outlined in Table (4.9) below.

Table (4.9)

Scheffe test to know the direction of the differences among the three groups in all domains

Total	Experimental Group 1	Experimental Group 2	control group
	19.234	25.156	11.609
Experimental Group 1 19.234	0		
Experimental Group 2 25.156	*5.922	0	
control group 11.609	*7.625	*13.547	0

* sig. at ($\alpha \leq 0.05$)

Table (4.9) shows that the mean score of the 1st experimental group is 19.234 while that of the 2nd experimental group is 25.156. The difference between the two mean scores is 5.922 and this value is statistically significant. Also, the mean score of the 2nd experimental group is 5.641, while that of the control group is 11.609 and the difference between the two differences is 13.547, which is a statistically significant value. So, there are statistically significant differences between 2nd experimental group and both the 1st experimental group and the control group in favor of the 2nd experimental group. Furthermore, the mean score of the 1st experimental group is 4.828, while that of the control group is 11.609. The difference between the two mean scores is 7.625 and this value is statistically significant. So, there are statistically significant differences between the 1st experimental group and the control group in favor of the 1st experimental group. That means the top effectiveness was achieved by the non-smart style of VAKT Approach and second came the smart style of VAKT Approach.

4.3 Answer to the study third question:

To answer the study third question formulated as "**Are there statistically significant differences at ($\alpha \leq .05$) between the mean scores of the achievement pre test and the post test for 1st experimental group?**", and to test the null hypothesis based on it and stated as "**There are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the achievement pre test and the post test for 1st experimental group**", the researcher computed the mean scores of the experimental group results of the pre- and post-tests . The results of the T-test Paired Samples statistics are shown in Table (4.10) below.

Table (4.10)

T- Test Paired-Samples Differences between the Pre- and the Post-Test for the 1st experimental group.

Scope	GROUP	N	Mean	Std. Deviation	t	Sig. value	sig. level
Isolation	Pre test	32	2.828	1.324	4.924	0.000	sig. at 0.01
	Post test	32	4.484	1.516			
Exchanging	Pre test	32	1.609	1.600	4.862	0.000	sig. at 0.01
	Post test	32	3.328	1.473			
Visual Memory	Pre test	32	0.609	0.877	3.139	0.004	sig. at 0.01
	Post test	32	1.531	1.448			
Syllable blending	Pre test	32	1.219	1.204	3.359	0.002	sig. at 0.01
	Post test	32	2.047	1.058			
Encoding	Pre test	32	0.109	0.276	6.177	0.000	sig. at 0.01
	Post test	32	1.109	0.859			
Auditory analysis and perception	Pre test	32	0.594	0.920	4.500	0.000	sig. at 0.01
	Post test	32	1.906	1.483			
Auditory discrimination	Pre test	32	3.906	1.370	3.432	0.002	sig. at 0.01
	Post test	32	4.828	0.867			
Total	Pre test	32	10.875	5.218	7.090	0.000	sig. at 0.01
	Post test	32	19.234	5.040			

The results shown in Table (4.10) indicate that the T. computed value (10.214), is larger than T. tabled value (2.04). This means that there are statistically significant differences between the mean scores of the pre-test and post-test at ($\alpha = 0.05$) in English spelling in favor of the post-test.

The following equation, according to Afanah (2000: 43) and Mackey and Gass (2005: 349), was employed to calculate the effect size:

$$\eta^2 P^2 = \frac{t^2 P^2}{(t^2 P^2 + D.F)} \text{ Since: } D.F = n_{B1} + n_{B2} - 2$$

The calculated ($\eta^2 P^2$) values were interpreted according to table (4.4) (Afanah 2000:38).

Table (4.11)
The critical values for effect size levels

Scale	effect Size levels		
	Small	Medium	Large
$\eta^2 P^2$	0.01	0.06	0.14

To measure the effect size of the smart style of VAKT Approach on 4th graders' English spelling in the posttest of English spelling, the researcher applied the "Effect Size" technique according to the equation and the critical values for the effect size levels. (Affana,2000: 38-42) as shown in table (4.12) below.

Table (4.12)

"t" value, eta square " η^2 ", and "d" for the total degree

Scope	T value	η^2	d	Effect size
Isolation	9.463	0.743	3.399	Large
Exchanging	9.386	0.740	3.372	Large
Visual Memory	7.098	0.619	2.550	Large
Syllable blending	3.883	0.327	1.395	Large
Encoding	14.844	0.877	5.332	Large
Auditory analysis and perception	7.554	0.648	2.713	Large
Auditory discrimination	4.376	0.382	1.572	Large

Scope	T value	η^2	d	Effect size
Test	10.214	0.771	3.669	Large

The results of (η^2) shown in table (4.12) indicate the large effect size of the Smart Style of VAKT Approach on 4th graders' English Spelling in the Total degree of the English Spelling.

4.4 Answer to the study fourth question:

To answer the study fourth question formulated as "**Are there statistically significant differences at ($\alpha \leq .05$) between the mean scores of the achievement pre test and the post test for 2nd experimental group?**", and to test the hypothesis based on it which was stated as **there are no statistically significant differences at ($\alpha \leq .05$) between the mean scores of the achievement pre test and the post test for 2nd experimental group**, the researcher statistically computed mean scores of the experimental group results of the pre- and post-tests. T-test Paired Samples statistics, whose results are shown in Table (4.13) below, was used to analyze the data statistically.

Table (4.13)

T- Test Paired-Samples Differences between the Pre- and the Post-Test for the 2nd experimental group.

Scope	GROUP	N	Mean	Std. Deviation	t	Sig. value	sig. level
Isolation	Pre test	32	2.484	1.604	9.463	0.000	sig. at 0.01
	Post test	32	5.500	1.122			
Exchanging	Pre test	32	1.203	1.224	9.386	0.000	sig. at 0.01
	Post test	32	4.313	1.134			
Visual Memory	Pre test	32	0.734	0.950	7.098	0.000	sig. at 0.01
	Post test	32	2.563	1.210			
Syllable blending	Pre test	32	1.578	1.320	3.883	0.001	sig. at 0.01
	Post test	32	2.609	0.681			
Encoding	Pre test	32	0.078	0.184	14.844	0.000	sig. at 0.01
	Post test	32	1.719	0.567			
Auditory analysis and	Pre test	32	0.688	0.990	7.554	0.000	sig. at 0.01
	Post test	32	2.813	1.155			

perception							
Auditory discrimination	Pre test	32	4.375	1.561	4.376	0.000	sig. at 0.01
	Post test	32	5.641	0.462			
Total	Pre test	32	11.141	6.059	10.214	0.000	sig. at 0.01
	Post test	32	25.156	4.011			

Results shown in Table (4.13) indicate that the T. computed value (7.090) is larger than T. tabled value (2.04) in the test. This means that there are statistically significant differences between the mean scores of the pre-test and post-test at ($\alpha = 0.05$) in English spelling in favor of the post-test. This shows that using the non-smart style of VAKT Approach results in improving English spelling among 4th graders.

To measure the effect size of the non-smart style of VAKT Approach on 4th graders' English spelling in the post English spelling, the researcher applied the "Effect Size" technique according to the equation and the critical values for the effect size levels. (Affana, 2000: 38-42) as shown in table (4.14) below..

Table (4.14)
"t" value, eta square " η^2 ", and " d " for the total degree

Scope	T value	η^2	d	Effect size
Isolation	4.924	0.439	1.769	Large
Exchanging	4.862	0.433	1.746	Large
Visual Memory	3.139	0.241	1.128	Large
Syllable blending	3.359	0.267	1.206	Large
Encoding	6.177	0.552	2.219	Large
Auditory analysis and perception	4.500	0.395	1.617	Large
Auditory discrimination	3.432	0.275	1.233	Large
Test	7.090	0.619	2.547	Large

The results of (η^2) and Black values shown in Table (4.14) indicate the large effect size of the non-smart Style of VAKT Approach on 4th graders' English spelling in the Total degree of the English spelling test.

4.5 Summary:

This chapter has discussed the statistical analysis of the data collected throughout the study. The current study aimed at investigating the impact of smart and non smart styles of VAKT approach on 4th graders English spelling in Al-Shejaeia Elementary Co-ed "B" School in UNRWA. The results presented above were all intended to test the three hypotheses of the study.

After analyzing the data of the spelling achievement test, the results of the first hypothesis showed statistically significant differences between the two experimental and the control groups' spelling achievement in favor of the second experimental group due to the teaching method. And there were statistically significant differences between the first experimental group and control group in favor of the first experimental group. That means the top effectiveness was achieved by the non-smart style of VAKT Approach and second came the smart style of VAKT Approach.

Then, after analyzing the results obtained through the comparison between the pre and the post test for the first experimental group, the second null hypothesis was completely rejected as there were statistically significant differences between the pre and the post test in favor of the post test due to the teaching method, which means the use of the smart style of VAKT approach could improve pupils' English spelling.

Finally, after analyzing the data of the comparison between the pre and the post test for the second experimental group, the results of the third hypothesis pointed out differences of statistical significance between the pre and the post test for the first experimental group in favor of the post application. In other words, the use of the non-smart VAKT approach in English classes could improve pupils' achievement in English spelling.

To sum up, the use of the smart and non-smart styles of VAKT approach in teaching English can be a good solution to students' low achievement in English spelling in English classes.

The next chapter will discuss and interpret the results before coming up with suggestions and recommendations.

Chapter V
Discussion of Findings, Conclusions, Pedagogical
Implications and Recommendations

Chapter V

Discussion of Findings, Conclusions, Pedagogical Implications and Recommendations

5.1 Introduction

This chapter discusses the results of the study and summarizes the conclusions obtained from the interpretations of those results. Some pedagogical implications and recommendations which can be beneficial for curriculum designers, educators, teachers and researchers have been put forward in the hope of helping improve the EFL teaching-learning process in the Gaza Strip.

5.2 Discussion of the findings of the first hypothesis:

The researcher investigated the first hypothesis which examined if there were no statistically significant differences at ($\alpha \leq 0.05$) level between the mean scores of the spelling achievement posttest of the three groups due to the teaching approach. The findings of this hypothesis outlined previously in Chapter IV, showed that there were statistically significant differences at (0.01) among the three groups at the level of spelling teaching strategy. Thus, the first null hypothesis was rejected and the alternative one was accepted.

To determine direction of the differences in the domain of isolation, the researcher used Scheffe test, whose results showed that there were statistically significant differences between the 2nd experimental group and both the 1st experimental group and control group in favor of the 2nd experimental group, and there were statistically significant differences between the 1st experimental group and control group in favor of the 1st experimental group.

It can be concluded that the pupils in the experimental groups improved their spelling achievement at the end of the study compared with that of the pupils in the control group. It was found out that the use of the VAKT approach (smart and non-smart styles) as a teaching and learning approach influenced the spelling achievement of the pupils in the experimental groups, and that the spelling achievement was greater in the non-smart style of VAKT approach than that in smart style of VAKT approach. However, both of them were greater than the achievement of the control group.

The researcher attributes this result to the nature of the VAKT approach, which presents vocabulary in an attractive way and suitable to differences in learning styles among learners, as it employs more channels that can facilitate learning and make it more meaningful.

The attractive nature of the VAKT approach made vocabulary spelling easy to memorize and recall because the materials and the applications chosen were suitable to the pupils' age and learning styles. The pupils in the two experimental groups seemed to like VAKT approach in its two styles (smart and non-smart), and thus interacted more effectively with the materials introduced to them. They liked seeing, listening, touching and moving. They interact tremendously with the smart applications despite the difficulties encountered throughout experimentation.

The researcher noticed that pupils of the first experimental group liked learning English spelling via the smart devices. They were waiting for the English class passionately, and they asked the teacher to give them the smart devices to play on the English smart applications. The control group pupils were very envious; they asked the teacher to let them play and write on the smart devices and teach them like the experimental groups and this proves the researchers' point of view that children like new technology and smart applications and as a result they learn better if smart applications are integrated as a teaching-learning tool in all classes, especially English classes.

Likewise, the technological environment brought to the classroom as a result of using smart devices in teaching spelling heightened students' motivation and their willingness to learn those vocabulary items; it also lowered their affective filter and anxiety. Thus students learned English vocabulary items and spelled them in a relaxed learning atmosphere, which directly and positively affected their achievement in spelling as the results of the first hypothesis revealed.

The same can be said about the second experimental group; one could easily and clearly notice that there was an energetic power in the atmosphere. There was visual, auditory, kinesthetic-tactile input. Pupils waited for the English class impatiently, and they spread the cards, coloured pens, mini-black boards prior to the coming of the teacher. Moreover, they competed each other in decorating their own dictionary files and hurry to show the teacher what they did and what they drew or

coloured. That shows that pupils really need an approach like this to make them interact and learn. It is definitely better than the traditional approach in which the learners were receptive and passive.

In addition, fourth graders who are young learners are required to identify and memorize a large number of English vocabulary items at the end of every lesson and unit. Presenting all these words through the conventional methods causes boredom and does not help pupils memorize them, but using the VAKT approach to teach these words makes it easier for children to memorize these words and recall them whenever they want. To sum up, the researcher believes that VAKT approach could be a promising alternative to the conventional methods of teaching English language in general and English spelling in particular.

The VAKT approach is the baby of the multi-sensory approach, so the results of the first hypothesis are in agreement with those reported in some other related studies such as those of Obaid (2013), ELModalal (2012), Jubran (2011), Haboush (2010), Abdelhadi (2009), Dalecki (2007), Jones (2006), Thorpe H. W. and Borden K. S.(1985), Taschow H. G.(1970), and Chapman (1964). All of these studies demonstrated that a multi-sensory approach could improve students' achievement in English skills like spelling or reading.

In contrast, these results disagree with the results of the study of Murphy (1997), which claimed that there were no significant differences between the control group and the experimental one which was taught using the VAKT approach. However, Murphy justified this result by saying that more significant differences may have occurred if this study had been conducted over a longer period of time.

As mentioned above, the spelling achievement development was greater in the non-smart style VAKT approach than the smart style of VAKT approach, but of the achievement of both experimental groups was greater than that of the control group. That could be due to the lack of sufficient number of smart devices, which led to minimizing the time of practice for experimental group. For example, if a student wanted to trace, write or pronounce a word, she had to wait for her turn to use the smart device. On the other hand, the second experimental group had all the material that they needed in their hands and their time of practice was as it was supposed to be or more; they did not lose time and they had the chance to practice tracing, writing,

reading and pronouncing words on their manual materials whenever they wanted. There were no technological obstacles.

More significant differences may have occurred if this study had been conducted over a longer period than the four weeks which this study took. However, if this approach had been applied throughout a whole semester or a whole scholastic year, there would have been a greater and more noticeable difference and impact.

The researcher also attributes this result to the following reasons:

- Using smart style of VAKT approach facilitated learning the vocabulary and spelling among the first experimental group pupils as these smart applications presented the vocabulary and the techniques of spelling pupils were required to learn in an interesting and attractive manner suitable for young learners.
- Using non-smart style of VAKT approach eased dealing with the individual differences among learners and suited everyone's interests. Furthermore, it motivated pupils to learn English spelling and to feel enthusiastic during the teaching-learning process.
- The attractive nature of the smart devices, multi-media, realia, dictionary files, cards, coloured pens, and mini-black boards used throughout the experiment created a relaxed teaching-learning environment free of any tension. The researcher noticed that, unlike the control group pupils, the experimental group pupils felt comfortable and highly motivated to learn English spelling. They were very happy with the real objects, sounds, movements, smart devices and they memorized them by heart. They asked the teacher to teach them to use more applications and to write more words every class. Some parents came to the school and told the researcher that their daughters liked learning English spelling as a result of using the VAKT approach and asked the researcher to keep using this approach as it facilitated learning the large number of words included in their textbooks.
- While taking the posttest, the first experimental group students told the teacher that when they saw any word in the test, they started remembering the coloured, bright pictures of that word. And the same was true about the second experimental group; their minds were naturally attached to the pictures and sounds they had seen or heard.

- Unlike the control group pupils who were asked to do traditional paper and pencil activities, the experimental groups' students' learning of the vocabulary presented every class was much faster and greater. This can be attributed to the fact their learning of the vocabulary was immediately evaluated through the teacher or the smart devices which provided them with immediate feedback about their spelling. They liked interacting with the multimedia and learning from their own mistakes.

5.3 Discussion of the Findings of the Second Hypothesis:

The researcher tested the second hypothesis which examined if there are statistically significant differences at ($\alpha \leq 0.05$) level between the mean scores of the spelling achievement pretest and the posttest of the first experimental group. The results concerning this hypothesis indicated that there were statistically significant differences between the mean scores of the pretest and posttest at ($\alpha = 0.05$) in English spelling in favor of the post-test. This means that the mean scores of the achievement posttest of the first experimental group was higher than the mean scores of the achievement pretest. This shows that using the smart style of VAKT approach resulted in improving English spelling among 4th graders. As a result, this null hypothesis was rejected.

The effect size measurement of the smart style of VAKT Approach on 4th graders' English spelling in the posttest of English spelling also indicated the large effect size of the smart style of VAKT Approach on 4th graders' English spelling in the total degree of the English spelling test. This means that the smart style of VAKT approach highly affected the spelling achievement mean score, and that proved the effectiveness of using smart style of VAKT approach in developing English spelling.

This result can be attributed to the technological learning environment pupils were involved in. Every pupil worked on the smart devices where she could watch the picture, listen to its pronunciation, touch the word or trace it and write it. Thus, the pupils were more self-confident and interested. This was clearly evident through the smiles on their faces as soon as they had the smart devices.

The first experimental group pupils were very happy with the words on the smart applications which they memorized by heart and wrote them many times on the smart device and on the dictionary cards. Many pupils told the teacher that they grew

to like English more than any other subject because they had the chance to play and write on smart devices and learnt through smart applications since the environment of the school was almost poor and they did not have such devices at home.

The researcher thinks if the pupils had had an earlier chance to practice on smart applications such as games in their own homes, that could have maximized the effect of using smart devices in the teaching-learning process. However, for most of them it was the first time to touch such devices. In a result, the teacher faced difficulty in teaching them how to deal with those devices. This was an obstacle at the beginning of the experiment. The positive factor in this dilemma is that the pupils learnt quickly because of the natural ease of the smart devices, and the motivation to use these devices for the first time.

Agostinho et al. (2015), Burden, K. & Hopkins P. (2015), Eid and Al-Zuhair, (2015), Kopecký and Hejsek, (2015), Meer et al. (2014), Alkhamis, (2014), Khoo et. al., (2014), Nisbet D. and Austin D.(2013), Doenyas et al. (2013), and Ball (2011), also emphasized in their research the positive effects of smart applications in developing language skills and other skills.

5.4 Discussion of the Findings of the third hypothesis:

The researcher investigated the third hypothesis which examined if there are statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the spelling achievement pretest and the posttest of the second experimental group. The results revealed that there were statistically significant differences between the mean scores of the pretest and posttest at ($\alpha = 0.05$) in English spelling in favor of the posttest application. This shows that using the non-smart style of VAKT Approach resulted in improving English spelling among 4th graders.

The results of the effect size measurement also indicated that there was a large effect size of the non-smart style of VAKT Approach on 4th graders' English spelling in the total degree of the English spelling test. This means that the non-smart style of VAKT approach highly affected the spelling achievement mean score.

The researcher noticed that second experimental group pupils liked their English classes more than their counterparts in the control group who always asked the teacher to give them realia and treat them as she did with the experimental groups.

The great enhancement in pupils' motivation towards learning English can also be attributed to the nature of the VAKT approach and multi-sensory use; they were presented through coloured and clear pictures, mini black boards, dictionary files, cards and coloured pens which brought especially for the study pupils. The children liked the realia, so they became highly motivated when those objects were used in their English classes for educational purposes, which increased their mean scores in the spelling achievement posttest.

Obaid (2013), ELModalal (2012), Jubran (2011), Haboush (2010), Abdelhadi (2009), Dalecki (2007), Jones (2006), Thorpe H. W. and Borden K. S.(1985), Taschow H. G.(1970),and Chapman (1964). Assure the results of the third hypothesis, and confirm that the multisensory approaches can affect teaching and learning spelling positively.

5.5 Study Conclusions:

In the light of the study findings, it can be concluded that the current study proved that using smart and non-smart styles of VAKT approach in teaching English spelling to young learners was highly effective and fruitful.

To summarize these results, it was noticed throughout the study that pupils' achievement in English spelling was improved as a result of using smart and non-smart styles of VAKT approach instead of the conventional methods. Moreover, the use of the smart style of VAKT approach enhanced pupils' motivation towards learning English as it created an active, co-operative and enjoyable technological learning environment.

Based on the results obtained throughout the current study, it can be concluded that smart and non-smart styles of VAKT approach:

- Had the superiority over the conventional methods of teaching English vocabulary and spelling to young learners.
- Created a co-operative, motivating learning environment where pupils could learn without any kind of pressure or tension.
- Increased pupils' participation as all pupils, even the shy ones, were able to participate and interact with the multi-sensory approach.
- Improved pupils' achievement in English vocabulary and spelling as their test results revealed.

- Enhanced pupils' motivation towards learning English.
- Enhanced the type of relationship between pupils and their English teacher.
- Added variety and enthusiasm to English classrooms.

5.6 Pedagogical Implications:

In light of the study results, the researcher suggests the following:

- Smart and non-smart styles of VAKT approach should be adopted by English language teachers as they improve pupils' achievement in English more than the conventional methods do.
- Using Smart and non-smart styles of VAKT approach enhances learners' extrinsic motivation towards learning English.
- Pupils' learning and interaction with the smart devices and real objects were very effective, so teachers should be encouraged to teach English via realia, smart devices and other technological devices.
- Using smart and non-smart styles of VAKT approach to evaluate pupils' work is better than using traditional paper and pencil activities as the former provides pupils with suitable reinforcement and immediate feedback about their performance.
- Teachers should be aware of the importance of using a variety of new methods in teaching English to young learners such as using modern technologies.
- Smart and non-smart styles of VAKT approach can help to improve attention span, concentration and English skills.
- Using smart and non-smart styles of VAKT approach helps shy and less motivated pupils to participate and to be more active in the classroom.
- Smart and non-smart styles of VAKT approach create a relaxed and fun learning environment because they reduce pupils' affective filter.
- Smart and non-smart styles of VAKT approach increase competition between pupils and groups in memorizing the words and answering the spelling activities.

5.7 Study Recommendations:

In light of the results of the study, the following recommendations are suggested to the different stakeholders involved in the process of teaching English to young children:

- **Curriculum designers and decision makers are recommended to:**
 - Include smart and non-smart styles of VAKT approach as a basic component for presenting English vocabulary and spelling and all language skills and sub-skills in the Palestinian curriculum
 - Increase English language periods to help the teachers concentrate on learning quality and to be able to use such new techniques.
 - Supply schools with necessary materials for employing smart and non-smart styles of VAKT approach, for example providing schools with good and well-equipped smart device laboratories and the real objects needed for non-smart style of VAKT approach.
- **English language supervisors are recommended to:**
 - Prepare and distribute instructional materials that increase teachers' awareness of the significance of the VAKT approach and the necessity of using this approach in teaching English, especially to young learners.
 - Persuade teachers that VAKT approach can be used basically in teaching all language skills in general and teaching vocabulary and spelling in particular.
 - Conduct training courses that may help teachers enhance their competencies of technological skills in general to be able to implement smart style of VAKT approach in their classes.
- **English language teachers are recommended to:**
 - Integrate VAKT approach as a basic approach in teaching English vocabulary and structures, especially to young learners.
 - Be creative in composing or selecting the tools or apps they use as they should take into account students' different levels of proficiency and learning styles.
 - Attend the training courses that help them to use recent teaching methods in their classes such as integrating smart and non-smart styles of VAKT approach in teaching English.

- Help students, especially young learners, to develop their motivation towards English by using simple, colourful pictures and multi-media presented through the latest technological inventions.
- Shift the focus from using teacher-centered approach to student-centered approach by transferring teachers' role from being instructors who dominate the class into educators whose role is to organize, help, guide, coordinate, lead, and support the students to learn English in the best ways possible.
- Use different and new activities to evaluate students' performance as they are more competitive and motivating than the traditional paper and pencil activities.

• **Recommendations for further studies:**

The researcher suggests the following titles for further studies:

- The effect of smart and non-smart styles of VAKT approach on developing students' listening, speaking, reading and writing skills.
- The effect of smart and non-smart styles of VAKT approach on the achievement of students in different grades and levels.
- The effect of smart and non-smart styles of VAKT approach on developing students' pronunciation.
- The effect of smart and non-smart styles of VAKT approach on developing students' cognitive skills.
- The effect of smart and non-smart styles of VAKT approach on the development of affective and motor skills.
- The effect of smart and non-smart styles of VAKT approach on teaching other school subjects.
- The effect of smart and non-smart styles of VAKT approach on students' attitudes toward English language learning.

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Appendices

Appendix (1)

Sample steps for teachers to use Non-Smart Style of VAKT Approach in teaching spelling:

Materials Needed: Index Cards, Markers, Word files, mini blackboards, clay, appropriate spelling word list, worksheets.

Stage 1

1. Explain to the student that there is a method that will help with learning to spell new words.

2. Select a word. Talk about the definition of the word.

A. Say the word.

B. Write the word in large letters .

C. Say the word as you run your finger under the word.

D. Underline each syllable with different colour if there is more than one syllable.

3. Say to the students “listen to what I say and watch what I do”.

A. Say the word.

B. Using a finger, trace the word, phonetically pronounce the word.

C. Say the word again, running finger under the word.

D. Instruct student to trace the word with their finger.

E. Have student trace word until they are ready to write the word correctly on their own.

4. Give the students an index card and a marker. Turn original card over. Instruct the student to write the word on the index card.

A. If an error is made, immediately stop the student, erase the error, and restart the method.

B. Once student correctly writes the word, place the word in their word file. The word file should be organized in alphabetical order.

C. Distribute worksheet with the new words to be traced then written as a home work.

5. Within 24 hours, create a typed word list, to help the student develop a connection between handwritten and typed words.

Some Important Points:

A. It is important that the student does touch the paper when tracing the word.

B. The student immediately attempts to write letter after the teacher Indicates he can write the word.

C. When an error occurs, stop, use a new card and begin again.

D. Meaning of words is important, so always use the word in context.

Stage 2

In this stage, the student will not trace the word with their finger. Learning will be done through seeing it, hearing it, and writing it.

2.Using an index card:

A. Write the word.

B. Sound out the word as you read it. The student is to be watching and listening.

C. The student will look at the word, say the word, and write the word, from memory, on an index card.

D. If an error occurs, stop, take out a new index card and begin again.

E. Once the student has written the word correctly, add the new word to the word file.

Stage 3:

In Stage 3, the teacher will no longer write out the word, printed words will replace the written word.

A. Pronounce the word.

B. Instruct the student to look at the word, pronounce the word, and write the word on mini black boards.

C. If incorrect, restart stage.

D. To assess students in this stage use direct observation, oral questioning, oral or written vocabulary test, written work, spelling words orally.

Stage 4:

1. In this final stage, the student will recognize words and begin to recognize the similarities between known and unknown words.

2. The student will begin to recognize unknown words, reading independently.

3. Provide assistance as needed so reading moves effortlessly. Adaptations: Play multiple word games with students, shape the word using clay, have students work

with a partner; or in groups; have students draw a picture book that has a picture for each word.

Appendix (2)

Sample steps for teachers to use Smart Applications based on VAKT Approach in teaching spelling:

Materials Needed: Index Cards, Markers, Word files, smart applications (white board and little writer), appropriate spelling word list, worksheets.

Stage 1

1. Explain to the student that there is a method that will help learn how to spell new words.
2. Select a word. Demonstrate the meaning of this word using iPad pictures.
 - A. Say the word.
 - B. Write the word using the white board application .
 - C. Say the word as you run your finger under the word.
 - D. Underline each syllable with different colour if there are more than one syllable.
3. Say to the students, “Listen to what I say and watch what I do”.
 - A. Say the word.
 - B. Use a finger, trace the word using little writer application and the application pronounces the word.
 - C. Say the word again, running your finger under the word.
 - D. Instruct students to trace the word with their finger.

E. Have students trace word until they are ready to spell the word correctly on their own.

4. Give the students the iPad and let them write the word. Clear original word. Instruct the student to write the word on the white board application and to record their own pronunciation on the little writer application.

A. If an error is made, immediately stop the student, erase the error, and restart the method.

B. Once students correctly writes the word, ask them to copy it on an index card, place the word in their word file. The word file should be organized in alphabetical order.

C. Distribute worksheet with the new words to be traced then written as homework.

5. Within 24 hours, create a typed word list, to help the students develop a connection between handwritten and typed words.

Some Important Points:

A. It is important that the students do touch the iPad when tracing the word.

B. Students should immediately attempt to write the words after the teacher indicates they can write the word.

C. When an error occurs, stop, use a new page and begin again.

D. Meaning of words is important, so always use the word in context.

Stage 2

1. At this stage, the students will not trace the word with their finger. Learning will be through seeing , hearing, acting out, and writing the word.

2.Using an index card:

A. Write the word.

B. Sound out the word as you read it. The students are to be watching and listening.

C. The students will look at, say, and write the word, from memory, on an index card.

D. If an error occurs, stop, take out a new index card and begin again.

E. Once the student has written the word correctly, add the new word to the word file.

Stage 3:

At Stage 3, the teacher will no longer write out the word. Printed words will replace the written ones.

A. Pronounce the word.

B. Instruct the student to look at the word, pronounce the word, and write the word on the white board application.

C. If incorrect, restart stage.

D. To assess students at this stage, use direct observation, oral questioning, oral or written vocabulary test, written work, and spelling words orally.

Stage 4:

1. At this final stage, the students will recognize words and begin to recognize the similarities between different words.

2. Provide assistance as needed so reading moves effortlessly. Adaptations: Play multiple word games with students, use games applications, have students work with a partner or in groups, have students draw a picture book that has a picture for each word.

Appendix (3)

4th grade / Spelling test

Name: _____ Class: _____

Time: 45 minutes Mark ____/30

1) Fill in the missing letter using one from the box
(6marks)

b	a	c	w
---	---	---	---

A) _unt _ousin _uy _ent











r	g	n	i
---	---	---	---

B) bou_ht r_ce u_cle bo_ing







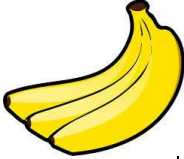

o	h	t	y
---	---	---	---

C) grea_ g_ wit_ yesterda_

2) Look at the picture and then replace the first letter to make a new word: (5 marks)

1	<u>s</u> eat		_____	5	<u>w</u> orse		_____
2	<u>r</u> ocks		_____	6	<u>s</u> and		_____
3	<u>p</u> ress		_____	7	<u>P</u> arrot		_____
4	<u>w</u> arm		_____	8	<u>m</u> onkey		_____
5	<u>r</u> oot		_____	10	<u>n</u> ow		_____

3) Write the words correctly: (4 marks)

1	rdeba		_____	5	ehpes		_____
2	awctehd		_____	6	dlypae		_____
3	tubrsceh		_____	7	innoo		_____
4	nsaBaan		_____	8	eotmosta		_____

4) Read, match and write: (3 marks)

1- clothes () site 1- _____

2- po () grocer's 2- _____

3- Py () shop 3- _____

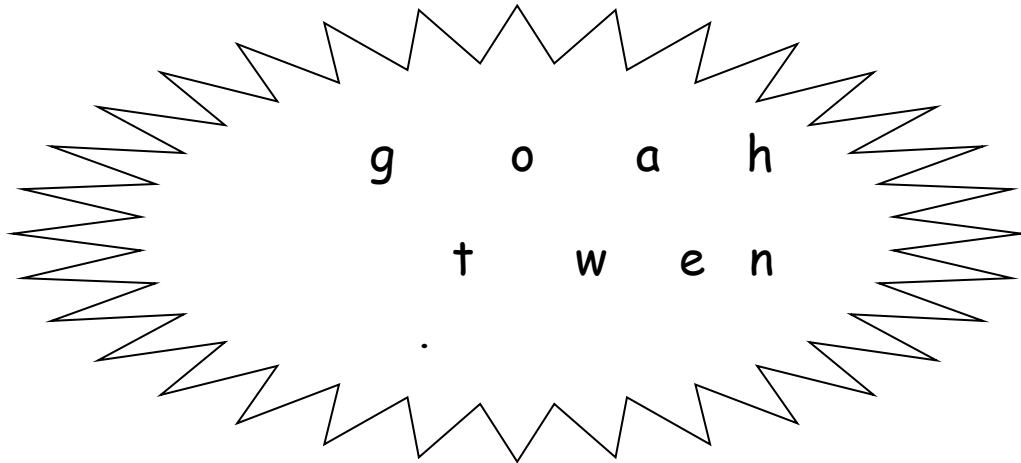
4- oppo () ted 4- _____

5- green () tatoes 5- _____

6- collec () jamas 6- _____

5) Look at the pictures and use the letters to write words:

(2 marks)



1- _____



2- _____



3- _____



4- _____



6) Read the sentences silently and then write the words you hear: (4 marks)

1- My_____ is red.

2- There are many _____ in my street.

3- I bought bread at the _____.

4- You have to drink _____ in the morning.

5- I read my English _____.

6- My sister eats the _____.

7- There is a _____ on my aunt's farm.

8- Yesterday, I _____ my mum.

7) Listen and fill in the missing letters: (3 marks)

A) _Ds _houlder

B) bet_eeen Musi_ shop

C) t-shir_ biscuit_

8) Listen and circle the word you hear: (3 marks)

1. Today, I eat an (egg- leg).
2. The music shop is on the (foot - left).
3. We buy (tomatoes - potatoes) at the greengrocer's.
4. I went to the (book shop - butcher's)
5. There are many shops in my (skirt - street)
6. On our farm, there is a (duck - dog)

Thank you

Appendix (4)

Referee Committee








No.	Name of Referee	Qualifications	Job title	Pre and Posttest	Smart Applications
1	Ibrahim Al-Astal	Associate Prof.	Dean of South Branch - IUG	√	
2	Akram Habib	Assistant. Prof.	Head of Dept. of English - IUG	√	
3	Said Farahat	Assistant. Prof.	Head of Dept. of English - Al-Aqsa University	√	
4	Mosher Amer	Associate Prof.	Lecturer - Dept. of English - IUG	√	
5	Muhammed Abu Shqair	Associate Prof.	Vice-dean of Faculty of Education - IUG	√	√
6	Awad Qeshta	Professor	South Branch Coordinator - IUG	√	
7	Khader Khader	Associate Prof.	Lecturer - Dept. of English - IUG	√	
8	Maha Barzaq	M.A.	Project coordinator of developing access and development of pre schools in Gaza Strip	√	√
9	Suha Dawood	M.A.	Director of Professional Development and Curriculum Unit - UNRWA	√	
10	Maher Sharaf	M.A.	Assessment and Evaluation Co-ordinator - UNRWA	√	
11	Yousef Hamdouna	M.A.	School principal - UNRWA	√	
12	Mohammed Seifan	M.A.	English supervisor - UNRWA	√	









13	Khaled Jaber	M.A.	English supervisor - MOE	√	
14	Khadra Abu Jahjough	M.A.	English supervisor - MOE	√	
15	Yosra Al- Kahlout	M.A.	English supervisor - MOE	√	
16	Ala'a Al-Adeini	M.A.	English TV. Presenter - UNRWA TV.	√	√
17	Mahmoud Ba'lousha	B.A.	English teacher - UNRWA	√	√
18	Iman Ayad	B.A.	English teacher - UNRWA	√	√
19	Amal Ayad	B.A.	English teacher - UNRWA	√	√
20	Mohammed Asqoul		Lecturer - IUG		√

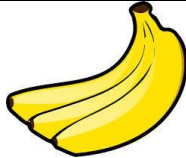



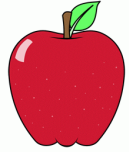




Appendix (5)







4th grade words for the post test/ units 16-17

NO	WORD	MEANING	PICTURE	COPY
1	Street	الشارع		_____
2	Shops	المحلات		_____
3	Baker's	الخباز		_____
4	Butcher's	الجزار		_____
5	Bookshop	محل بيع الكتب		_____
6	Clothes shop	محل الملابس		_____
7	Grocer's	البقال		_____
8	Greengrocer's	بائع الخضار		_____





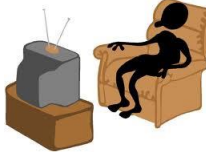

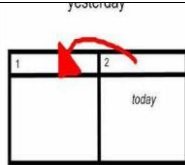
9	Music shop	محل الآلات الموسيقية		_____
10	Skirt	تنورة		_____
11	t-shirt	بلوزة نص كم		_____
12	Dress	فستان		_____
1 3	buy	يشترى		_____
14	bought	اشترى		_____
15	go	يذهب		_____
16	went	ذهب		_____
17	potatoes	بطاطا		_____
18	tomatoes	طماطم		_____

19	meat	لحم		<hr/> <hr/> <hr/>
20	socks	جوارب		<hr/> <hr/> <hr/>
21	bread	خبز		<hr/> <hr/> <hr/>
22	pyjamas	بيجامة		<hr/> <hr/> <hr/>
23	sweater	بلوزة كم طويل		<hr/> <hr/> <hr/>
24	rice	أرز		<hr/> <hr/> <hr/>
25	carrot	جزر		<hr/> <hr/> <hr/>
26	CDs	أسطوانات		<hr/> <hr/> <hr/>

27	bananas	موز		
28	milk	حليب		
29	biscuits	بسكويت		
30	book	كتاب		
31	apple	تفاحة		
32	onion	بصلة		
33	egg	بيضة		
34	hand	يد		
35	leg	ساق		

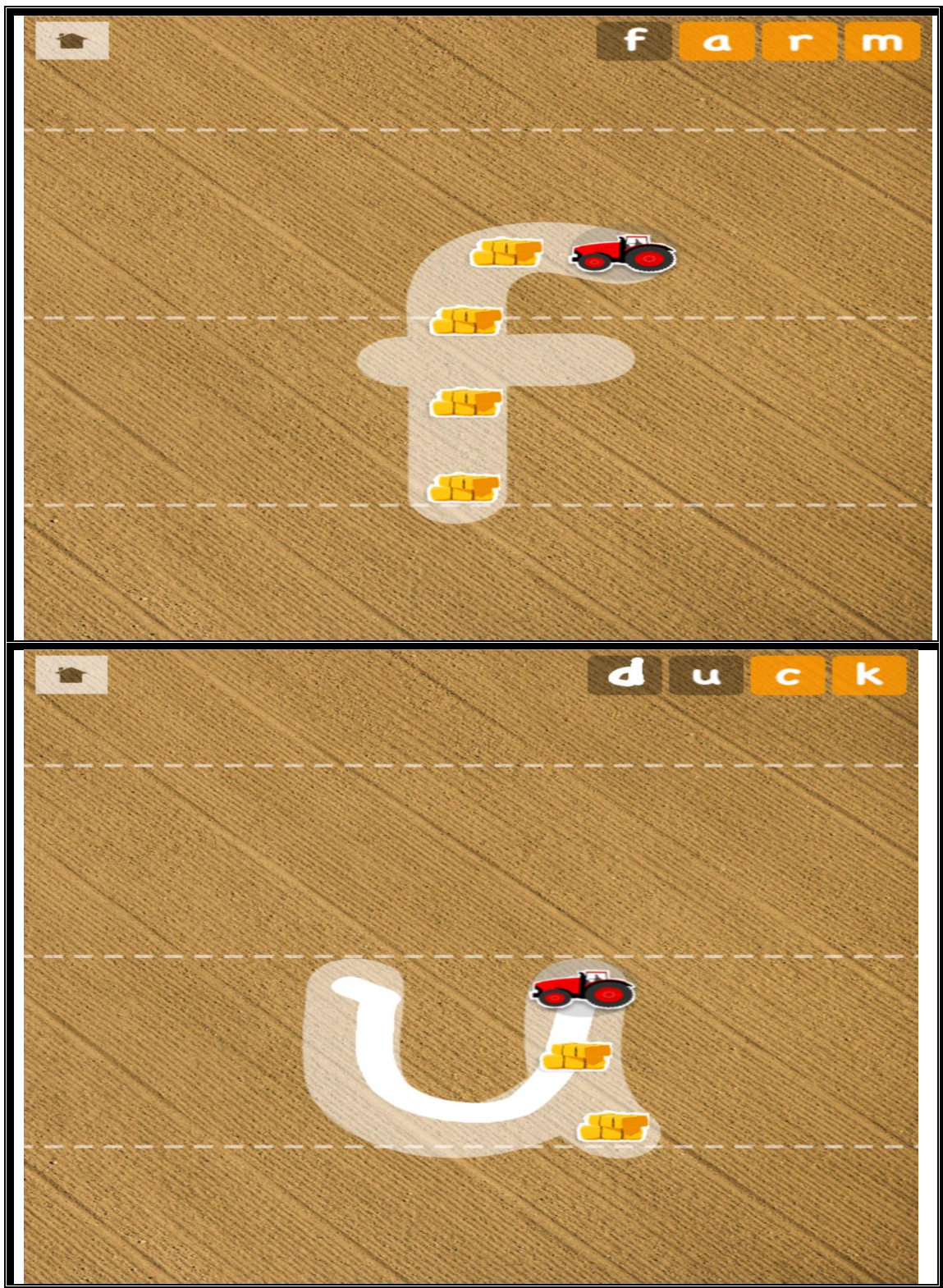
36	foot	قدم		<hr/> <hr/> <hr/>
37	shoulder	كتف		<hr/> <hr/> <hr/>
38	Opposite	مقابل		<hr/> <hr/> <hr/>
39	between	بين		<hr/> <hr/> <hr/>
40	right	يمين		<hr/> <hr/> <hr/>
41	Left	يسار		<hr/> <hr/> <hr/>
42	FARM	مزرعة		<hr/> <hr/> <hr/>
43	duck	بطة		<hr/> <hr/> <hr/>
44	Horse	حصان		<hr/> <hr/> <hr/>

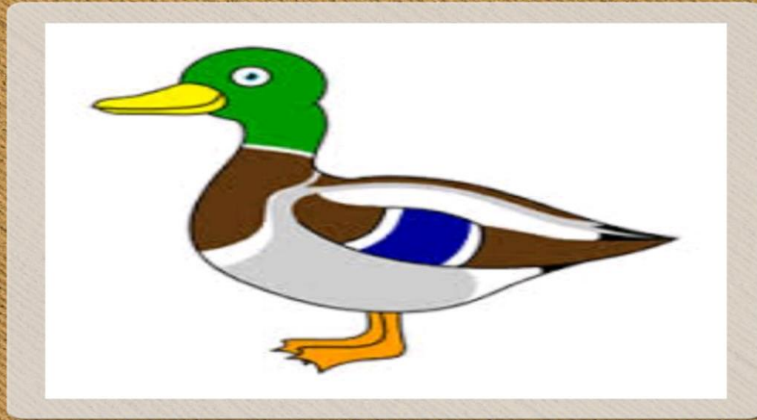
45	Cow	بقرة		
46	Dog	كلب		
47	Sheep	خروف		
48	hen	دجاجة		
49	donkey	حمار		
50	cousin	ابن العم / بنت العم		
51	boring	ممل		
52	great	عظيم / رائع		

53	uncle	عم / خال		
54	aunt	عمة / خالة		
55	played	لعب		
56	Collected	جمع		
57	Watched	راقب/ شاهد		
58	helped	ساعد		
59	Yesterday	الأمس		
60	With	مع		

Appendix (6)



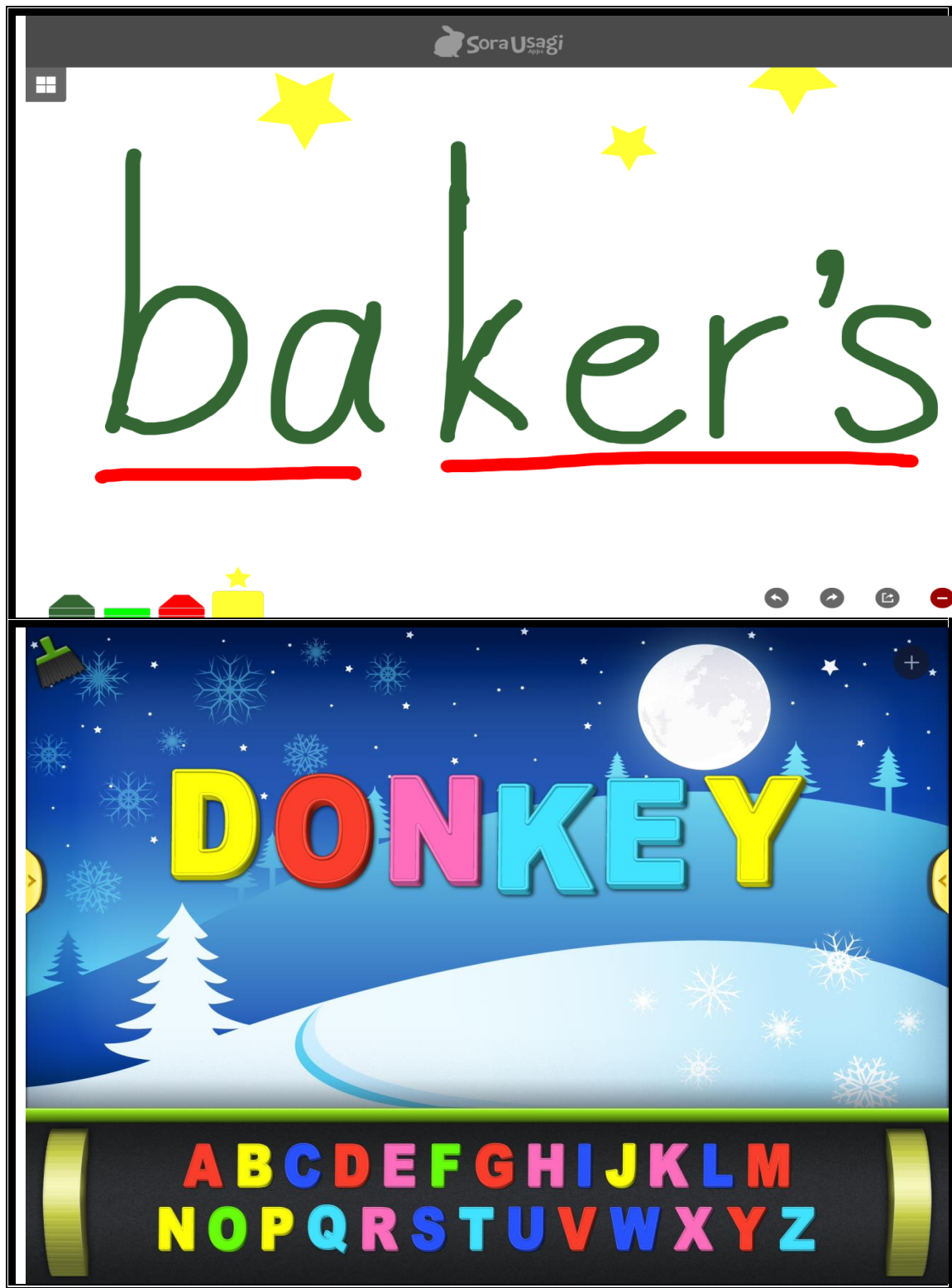




duck



collect



Appendix (7)

Street

Baker's

butcher's

Grocer's

Greengrocer's

Clothes shop

Music shop

Book shop

pyjamas

bread

bananas

CDs

sweater

rice

meat

went

buy

bought

right
Left
opposite

Appendix (8)



