The British University in Dubai
Institute of Education

Evaluation of CALL Software on Learning of English Grammar

By
Runak A. Hamad
20050054

A dissertation submitted to the
Institute of Education
in part fulfillment of the requirements
for the degree of
Master of Education
in
Teaching English as a Foreign or Second Language (TEFL/TESL)

December 2006

Abstract

The study was carried out to investigate the effectiveness of a computer Assisted Language Learning (CALL) programme in Al Ain University of Science and Technology (AAUST) in the UAE. It attempts to evaluate *Tense Buster* for its effectiveness in learning outcomes and attitudes toward grammar among students in an entry college level in comparison with teaching the same material in a traditional classroom.

This study compares the outcomes of two groups of students: the first was taught by *Tense Buster*, a CALL software programme, and the second by a traditional method or face–to–face instruction. In order to compare the learning outcomes of the two groups the author carried out a pretest-posttest randomized experimental design. The results show statistically significant differences among students who favour traditional teaching methods to CALL.

These differences can be attributed to a variety of factors such as sociocultural, students' mentality, teachers' attitudes and knowledge of technology, and lack of integration of material into the overall course design.

Table of Contents

Chapter I: Introduction

Although Computer Assisted Language Learning (CALL) is gaining ground and becoming more and more popular with the advances in technology and the spread of computers and laptops as study aids, it is still regarded as a young branch of applied linguistics. Besides, the availability of so many programmes means also there is a growing need to evaluate the software. But these programmes and software are not all successful and lead to better instruction. As a recent researcher has warned "computers and multimedia are not seen solely as positive agents of change in the classroom; they also face criticism"(Beatty, 2003). In a similar vein, another puts this caveat in the following manner, "an important question about Computer Assisted Language Learning (CALL) is whether it can be used as instructional tools and, if so, how beneficial are they to a second language (L2) learner" (Torlakovic & Deugo, 2004: 203).

Even though CALL was welcomed enthusiastically some thirty years ago as superior to conventional learning, there is no solid evidence that it surpasses traditional learning and language acquisition. My study will concentrate on how effective a piece of software known as *Tense Buster* is, which is used by many schools as a support to students to help them acquire the necessary language skills such as grammar and vocabulary.

CALL research is now a firmly established area of study although the earliest use of CALL goes back to 1960s. Many studies have shown that CALL instruction leads to more

balanced participation of the learners than traditional instruction (Chen, 1994; Kern, 1995; Sullivan & Pratt, 1996). As (Su & Kinshuk 2002: 2) have argued

> Computer-assisted learning has been an important are [sic] of research in recent years. Various studies have shown that computer assisted learning results in more balanced learner participation than in face-to-face environment…. This is probably due to the fact that learners do not feel inhibited by their emotions such as shyness.

One of the reasons behind the success of CALL is probably that learners do not feel singled out. Other advantages of CALL instruction is that it gives the learner control over the selection of material and helps students to study at their own pace. Another factor is the importance attached to the learner's emotional condition, which leads to students' motivation. Furthermore, CALL instruction usually takes into account individual differences among students. (Kinshuk and Su, 2002).

Evaluation of early software was usually conducted by teachers who used a rating form to evaluate each feature of the software (Tolhurst, 1992). Some scholars (Reiser and Kegelmann, 1992) emphasise the importance of inviting students to participate in the evaluation process rather than relying on teachers alone to evaluate the educational effects of given software. In this study, students were directly involved in the evaluation process through surveys, informal interviews and talks about the advantages and disadvantages of CALL instruction, the software and the whole experiment. Students were encouraged to elicit any reactions or responses about the positive and/or negative aspects of the experiment.

1.1 CALL and Language Learning

Although there are many theories of language learning, Pachler (1999) has managed to reduce them to only two: The first is the behaviourist tradition and the second is all those approaches associated with cognitive, humanist, and social interactionist. Behaviourism

emphasises learning as a process of conditioning in which the learner is exposed to a stimulus and his /her correct response is reinforced by reward. Pachler says:

> In ICT terms, applications in the behaviourist tradition tend to follow an instructional pattern. Learning is broken down into a sequential series of small steps each covering a piece of the subject domain or a particular skill. The computer program models the role of the tutor offering some input or paradigm which the learner can 'drill and practise' followed by the provision of feedback. (Pachler 1999: 22)

According to Prescott (2001: 2) behaviourist learning principles dominate much CALL software because they are based on stimulus/response patterns. As far as CALL software is concerned, we can draw the following behaviourist conclusions:

- It is beneficial to expose students to the same material repeatedly.

- Computers are ideal for carrying out this task of repeating drills and exercises, because machines never tire of repeating the same drill and they don't pass judgment on the learner (as opposed to the teacher who quickly tires of repeating the same exercises and who usually pass judgments on their students' performance).

- Computers can also present the material individually, that is, giving students the chance to study at their own pace.

In *Tense Buster*, the correct answer is rewarded by a dialogue which congratulates the students by the words "Well done!" and in this way the stimulus is rewarded by a psychologically satisfactory response. This is repeated after each exercise. Besides, there are numerous exercises and drills which students can repeat by using the "back" button. Moreover, students can either learn the material individually or collectively with the rest of the class. In this study, each student-worked on her own computer individually, without the intervention of the teacher, who was present in a supervisory capacity.

The problem with the behaviourist approach to CALL instruction may create what Pachler (1999) calls 'passive mentality' that leads students to adopt a 'trial and error' approach, which entails that students don't think about the answers of the questions. This negative aspect of Behaviourism is confirmed in my study by students' attitude and boredom with the exercises when dealing with *Tense Buster*, because students became interested only in knowing the results of the exercise without seeking answers to their problems. Moreover, since most of students in the Middle East are used to constant supervision and coaching by teachers, human contact and interaction along with the CALL software is necessary for any behaviourist drill and practice.

The second theories of language learning are the cognitive ones, which consider the learner a person whose mind participates actively in the learning process rather than a person who merely receives things the way they are. Learning, according to this model, emphasises understanding rather than showing a response to a situation, as Prescott (2001:2) puts it "new experiences are related to existing knowledge which, in turn, is derived from previous experiences". Mercer (1993) characterized Behaviourism as "a way of describing how people learn in terms of individual thoughts and actions", whereas constructivism can be regarded as the way people adopt themselves to the new situation in which they find themselves in.

But since people are individuals who interact within a social context, social interactionism is perceived as an expression of how learning occurs in the learners' own society and culture. Lev Vygotsky is the best known proponent of this school, who emphasises the interaction among learners as an important element in the learning process. Prescott (2001) says that Vygotsky's ideas underscore 'the importance of language in

cognitive development, problem solving and learning, and the prominence he gives to the social nature of cognitive change'. Prescott has argued that:

> The significance of these ideas for the role of the computer in the learning process and teacher's role in relation to computers ...is the potential of computers to reorganize classroom instruction and make possible the extension of education beyond (Prescott 2001: 3).

Shive (1999) has also stated that 'computers have no intrinsic pedagogy: the direction depends on teachers and their understanding of the functions and/or role of CALL in the classroom' Some teachers might use CALL software as a supplementary material; others as a support of their traditional teaching, and still others use it as part of blended learning elements. It:

> happens when some course meetings or training events are conducted virtually rather than face-to-face. Such classes or training experiences can blend students located at various remote regions or perhaps instructors collaboratively teaching a class at two or more locations. Of course, blended learning might simply supplement course readings and activities with online articles, simulations, events, and other resources. (Bonk, Kim, Zeng, 2005: 1-2)

1.2 Outline of the Study

The study contains two groups: experimental and control. We are interested in finding out whether or not students who received grammatical instructions with the software *Tense Buster* had a comparable improvement of performance to the group which received instruction from a teacher. Performance improvement will be measured by a pre-test, and a post-test.

The software *Tense Buster* was acquired by AAUST recently to be used in the language labs for first-year university students in the English Language Centre (ELC). Both conventional and the CALL lessons were matched with the same content except for the medium in which the lesson was being delivered. The use of the software is suitable for

AAUST environment because AAUST is a new, high-technology campus with many computers and networked computer laboratories.

The participants of this study are forty-one ESL learners from two ESL classes at AAUST, approximately between the ages of 19-22. The students are at the pre-intermediate proficiency (level 2), as was determined by the ELC's placement test of English proficiency.

1.3 Rational for the Choice of Topic

Because of the interest in applying technology to the process of learning languages, the author found out that there is a positive change in students' reception of modern software. *Tense Buster* software has been used in the ELC for SL2 students at AAUST, and it seems to be an effective tool of instruction and learning, a claim which needs to be further investigated and verified by empirical research.

Studies on learning strategies used in CALL environment have identified certain conditions which make the learning and acquisition of language skills easier, that is, "when the word is first presented in a visual context and then through exercises and an oral script" (Brown, 1993).

The problem of how useful CALL is in instruction is still a contested issue. Previous researchers reported beneficial effects of multimedia instruction and learning (Catenazzi and Sommaruga, (1999), Philips, Jenkin, Fyle, & Fyle, (1997). One of the issues involved in this type of instruction is how much mental effort is required by the student to go through CALL lesson. This will partly include the effort invested in attending to the medium as well as its content (Lowe, (1999). In contrast to the experimental group, students in the conventional group exerted mental effort in attending to a conventional classroom teaching.

6

1.4 Need for the Study

The mid 1980s was characterized by what can be termed "conscious learning"

As Hartzoulakis (2000: 7) has declared "**CALL activities were designed aiming at learning the language through drills and exercises focusing on the mechanics of the language rather than on its communicative value**". This happened at a time or perhaps it was caused by Krashen's idea, who emphasises that language 'acquisition' is a subconscious process which is different from 'learning', a process which is both conscious and deliberate (Chapelle, 2001a). This led to the tendency to design CALL software that would promote 'acquisition' rather than 'conscious learning'. But scholars differed on whether computers can promote either of two methods. Al-Jarf (2002) found that ESL studnets' achievement was better when taught with the help of CALL software. More recent studies, however, concur that learners need to pay attention to linguistic forms in order to facilitate the acquisition of language, thus merging these two positions into one. (Robinson, 1995). The appearance of multimedia, which is characterized by the ability to connect to the Internet besides its other features such as animation, graphics, video sound etc., has made a recent researcher to claim that these developments "led to the design of CALL activities of a more communicative value" (Hartzoulakis 2000: 7). This made it possible to produce authentic material (Bachman & Palmer, 1996; Motteram, 2000b), which implies that when we talk about computers in language learning, we refer to communicating through the Internet and searching for learning materials. Consequently, one would ask how effective might CALL teaching be in comparison with face-to-face classroom instruction. This problem can be studied from the point of view of teaching objectives and teaching conditions.

Tense Buster can be regarded as software which makes use of the communicative approach in its emphasis on real-life situations and authentic material, although the repetitive exercises are behaviouristic in nature. We can summarize the need for the study in the following points:

- To identify problems associated with teaching grammar by using computers at AAUST.

- To assess the effectiveness of CALL instruction in comparison with traditional teaching.

- To discuss the underlined reasons behind the success of a particular method or mode of instruction (i.e. traditional vs. CALL).

1.5 The software

      Tense Buster is software produced by Clarity Language Consultants in 2001. It is intended for adult learners of English who need extra work primarily in grammar. It consists of five levels: Elementary, lower-intermediate, intermediate, upper-intermediate and advanced. Each level has a number of modules and each module consists of ten exercises. Each level of the software starts with a unit which guides students to other activities.

      Tense Buster is accompanied by its own authoring tool, so teachers can author their own exercises besides the ones that are already there in the software.

1.6 Purpose of the Study

      The study aims at investigating how effective CALL instruction is in teaching grammar in comparison with traditional, teacher-based teaching in AAUST, a private university in Al-Ain. Traditional teaching refers to the learning situation in which the instructor employs the white board as a teaching aid besides the traditional interaction with

students; whereas computer assisted language learning refers to a fully –equipped computer laboratory in which students have access to *Tense Buster*, but they work individually, with the teacher providing supervision only.

The study is based on a pretest-posttest examination, a questionnaire and interviews with the students who participated in the study and some of the teachers at the ELC in AAUST in order to compare how effective CALL instruction is in teaching English grammar teaching compared with face-to-face instruction. This is done by studying the results of traditional class instruction with that of CALL software.

1.7   Significance of the Study

It is hoped that the following groups will benefit from the results of this study:

- Teachers of TEFL who employ CALL in their instruction, where computers are part of their curriculum.

- Teachers of TEFL who are in favour of traditional teaching who can make use of certain aspects of CALL in their instruction.

- Students of English who are not used to utilizing computers in learning.

- Administrators and officials who favour CALL and the use of computers for instruction without paying due attention to teachers' training in the use of computers and software applications.

- Academics and researchers who are interested in investigating the applications of CALL to instruction, as opposed to traditional teaching.

- The study may be helpful to make teachers aware of sociocultural factors that might negatively affect CALL instruction.

- It may also be helpful to students who want to use CALL on individual bases.

In the next chapter, the author will present a short and concise review of some second language learning theories in order to put CALL instruction within the larger framework of those theories. This will enable us to be in a better position to tackle the issue of traditional instruction versus CALL.

Chapter II: Literature Review

2.1 Second Language Learning Theories

The main goal of English language learning is to accelerate language acquisition and literacy. Many factors affect the rate at which students are able to meet this goal. We should remember that although each student has an innate ability to acquire language, there is no fixed period of time which specifies this progress. In fact, there are only averages; and since each student is unique and comes to school with unique experiences, educators should not expect literacy to "occur" simply by integrating new methods (Garcia, 2000). Some of the theories will be discussed only in so far as they are relevant to CALL instruction, the first of which is Behaviourism. When we apply the ideas of Behaviourism to language learning, we can say that a certain situation will require a certain response. For instance, an invitation will elicit a positive or negative answer. If communication breaks down, it is because a particular response has not been obtained. This will lead the learner to abandon the original response and opt for another one which is successful and hence will be reinforced.

When we learn a language we simply learn new habits just as we learn to respond to different stimuli around us, but when we learn a second language we encounter a problem: We have to replace the older habits of the first language with the habits of the new language.

The implications of this fact for teaching are: first, learning a new language entails a lot of imitation and repetition, and second, teachers should emphasise those aspects of the language which are particularly difficult for the learner. In other words, teachers should emphasise the new habits of he new language rather than the old ones.

The behaviourist model came under attack with new advances in both psychology and linguistics. In psychology, Piaget's cognitive developmental theory emphasized the inner forces of the child in his/her interaction with the environment as apposed to the behaviourists' emphasis on environment. In linguistics, there was a shift from structural linguistics, based on the description of surface structure, to generative linguistics which emphasized the creative use of rule-governed human language. This shift occurred with the publication of Chomsky's *Syntactic Structures* (1957). Chomsky reviewed Skinner's *Verbal Behavior* (1957) in 1959, and criticized him for several issues, two of the most important are:

1. Children use language creatively rather than learn and produce a large set of sentences. This creative use of languages occurs because they internalize the rules of language rather than strings of words. Children very often use the rule of adding *ed* to a verb, even though it is an irregular verb, thus saying 'she *breaked* it' and 'he *goed*.'

2. Children learn the language at an amazing speed and with such efficiency despite the complexity and abstractness of linguistic rules. This phenomenon, which Chomsky referred to as "Plato's Problem", refers to some structural qualities in the language, which are too complex for children to learn, if we judge that by the language examples the child was exposed to.

Stephen Krashen drew an important distinction between two concepts: the 'acquisition' and 'learning' of a language, as the former refers to the 'subconscious process identical…to the process children utilize in acquiring their first language,

(Krashen, 1985, p.1). The conscious process of learning results in "knowing about language" (Krashen, 1985, p.1), which means that 'acquisition' is the way the child acquires the language naturally, whereas 'learning' is a conscious effort exerted by the learner. Furthermore, acquisition entails releasing or activitating all these natural processes which make 'picking up' a language so easy and 'natural.' Learning, however, is the deliberate effort exercised by the learner to learn a new language.

Krashen's second contribution is called the 'monitor hypothesis,' which refers to the notion that "learning has only one function, and that is as a monitor or editor," (Krashen 1982) leading to the situation that learning necessitates making changes in the "form of new utterance, after it has been produced". (Krashen 1982) Acquisition 'initiates' the utterance and therefore it is responsible for fluency. Krashen's third contribution to language is his 'input hypothesis,' which refers to how a person develops competency over time. This means that if a person is at 'level I then that person must receive comprehensible input that is at 'level i+1.' In other words, we can acquire only what we understand.

Finally, in the 'Affective Filter Hypothesis' Krashen emphasizes the role played by motivation, self-confidence, and anxiety in acquiring a language. This means that if a learner is self-conscious, then their filter is going to be "high" and they will therefore become bad learners. Conversely, if a learner is confident, then their filter is going to be "low," and thus they will be good learners of the language. Interestingly enough, CALL instruction, because it does not make learners self-conscious or anxious has an advantage over traditional teaching, since students do not have to face other members of the group or to be "singled out". The issue of motivation remains problematic, at least among Arab students, who react negatively

to being taught by a computer software programme alone. This might be accounted for by socio-cultural factors which form students' attitudes towards CALL instruction, as this study makes it clear.

2.2 CALL and Second Language Learning

In the past forty years or so Computer Assisted Language Learning (CALL) has gone through several stages, which reflect both changing pedagogical philosophies and technological advances in computers. We can roughly divide the context of using CALL in instruction into three stages: Behaviouristic, Communicative and Integrative. Behaviouristic CALL, which claimed that language was basically a habit structure, emphasised the use of repetitions, grammar and vocabulary, multiple choice, and drill and practice. This model was introduced in the 1950s and became common practice starting from the 1960s. The model looked at the computer as a machine which was capable of imitating, surpassing, or even replacing the teacher and assumed that the learning provided by computers is superior to humans, and thus 'machines are the preferred option for teaching and learning' (Levy, 1997:182-3). Programmes of this type usually dealt with one skill so students emphasized learning forms rather than how to communicate. In other words, in following the behaviourist principles of learning a language, this type of CALL emphasised reiterative language drills, which are commonly referred to as drill-and-practice. According to this view, the computer becomes a tutor which does not become tired or bored with the students and permits them to study and practice whenever and wherever they want to.

There were two criticisms leveled at this approach: First, the computer was used merely as "an expensive page turner to present traditional language workbook material" which renders the computer a limited resource for both teacher and learner (Burston 1996: 28). The second was that the activities of the CALL programmes should be directed to improve the learner's ability in the target language by participating in linguistic interaction rather than merely to memorize grammatical rules and vocabulary.

Because of the dissatisfaction with the behaviourist model, a new stage, started in the 1970s was called "communicative CALL". This occurred at the time when Behaviourism in language teaching was facing criticism both pedagogically and theoretically. In the same period, personal computers were becoming less expensive and offering numerous new opportunities for whatever people are engaged in. Besides, the traditional grammar activities and exercises related to vocabulary, programmed activities began to rely heavily on the communicative function of language. Communicative CALL stated that language learning should emphasise the use of forms than the forms themselves. This entails that grammar should be taught implicitly rather than explicitly, and to encourage students not to repeat their textbook exercises but to create original utterances, and to use the target language exclusively (Jones & Fortescue, 1987)

This shift in paradigm from behaviouristic to communicative CALL was enhanced by advances in technology, which increased computer powers and capacities and created new possibilities. This resulted in new software, giving at the same time the teachers the chance to produce their own materials. Besides, the technology made it possible to incorporate voice synthesis and analysis, and audio-

video media were incorporated in language teaching. In addition **Warschauer &**

Healey, (1998: 40) have argued that we can think of communicative CALL in terms

of its correspondence to

> Cognitive theories, which stressed that learning was a process of discovery, expression, and development. Popular CALL software developed in this period included text reconstruction programs (which allowed students working alone or in groups to rearrange words and texts to discover patterns of language and meaning) and simulations (which stimulated discussion and discovery among students working in pairs or groups). For many proponents of communicative CALL, the focus was not so much on what students did with the machine, but rather what they with each other while working at the computer. (Warschauer & Healey, 1998: 40)

Although communicative CALL was regarded as a step forward in

comparison to behaviouristic CALL, it also came under attack. By the late 1980s,

many scholars began to accuse it of using the computer merely in a specific way and

that it 'finds itself making a greater contribution to marginal rather than central

elements' of language acquisition (Kenning & Kenning, 1990: 90). The new trend

reflected the recent criticism leveled at the communicative approach. Many scholars

were calling for a more socio-cognitive approach, which highlights language use in

real-life social contexts. The call now was on "integrating learners in authentic

environments, and also to integrate the various skills of language learning and use"

(Warschauer & Healey, 1998). This was called 'Integrative CALL' by Warschauer

(1996), an approach that aims to integrate different language skills, coupled with the

utilization of various aspects of technology in the classroom. According to this

approach, learners do not visit the language lab once or twice weekly but use the

computer to access other means of language learning.

These shifts in pedagogy and philosophy of utilizing computers for learning go hand in hand with advances in technology. As Warschauer, M., & Healey, D. say:

> If the mainframe was the technology of behavioristic CALL, and the PC the technology of communicative CALL, the multimedia networked computer is the technology of integrative CALL. (Warschauer & Healey, 1998: 41)

In this stage, the computer offers students the possibilities of much more diverse and integrated uses and applications of technology such as the possibilities to use the computer for reading, writing and communication.

The software used for this study is *Tense Buster,* a communicative grammar programme which "aims at all students wishing to improve their English grammar. It provides structured, sequential activities in mastering the fundamentals of English grammar" (Chylinski, 2005:4). There are several positive aspects to this software, some of which are: It is attractive, user-friendly, requires minimal knowledge of computers, and it employs behaviouristic techniques heavily, such as the repetition of drills and exercises, and often rewards students' correct responses. Communicative CALL usually stresses the use of form rather than the forms themselves, that is to teach grammar in context but not by putting a lot of emphasis on drills and also to help learners to come up with their own sentences (Jones & Fortescue, 1987). The communicative aspect of *Tense Buster* lies in its contextualization of those aspects of grammar which the student is supposed to learn; also there is emphasis on language in use as opposed to isolated items. Furthermore *Tense Buster* combines behaviouristic elements by featuring repetitive language drills and communicative aspects by emphasizing activities which allow

students to generate sentences of their own rather than work on pre fabricated language. The main objection which can be leveled to *Tense Buster* is that it ignores the socio-cognitive elements which relate to actual language usage within real life environment.

This software can be very useful for students who are not beginners but who own sufficient skills to work independently. The software allows them to take notes, assess their own progress in a particular lesson, and use language in a variety of learning situations. The student can also expand his/her vocabulary by following the instructions in the software.

Tense Buster is a helpful programme which has been successfully used in the classroom in many countries all over the world, including some schools in the UAE. If we take the simple present tense, for instance, we notice that this can be expanded by teachers with reading and listening materials in class, which gives students the chance to be familiar with the material before the beginning of their class.

Tense Buster is not the ideal software which can be used without regard to the learner's psychological and sociocultural factors. The main weakness in this software could be the use of the listening activity in it, which is reading the written text, a feature which proved in the study to be a disadvantage rather than an advantage, because students actually got distracted by the voice. Instead, it would have been useful if the software used the audio for focusing on certain "connected speech, like the weak forms and contractions, etc." (as Graham (2004) has suggested

2.3 CALL in the classroom

The two elements which influence the use of CALL in teaching are: the teacher and the learner. The teachers can be viewed as "main resource person from whom students seek information on and about the target language. The language teacher also controls the input and pace of learning" (Lee 2003: 6). Besides, the teacher controls the amount of information and the speed with which students learn. The recent production of so many software programmes and their subsequent introduction into the classroom has meant that learners can use various channels and sources to use English. They also have the chance to determine their pace of learning and how and what to learn. Obviously, teachers have to cope with this new situation.

We should also remember that CALL has also led to the creation of a learner-centered learning environment. In this regard Nunan argues:

> It is impossible to teach learners everything they need to know in class. What little class time there is must therefore be used as effectively as possible to teach those aspects of the language which the learners themselves deem to be most urgently required, thus increasing surrender value and consequent student motivation (Nunan, 1988: 3).

This means that CALL allows learners to have more control over their learning processes and offers them the chance to learn both individually and at their own pace.

Tense Buster contains four levels of proficiency: Elementary, Lower-intermediate, Intermediate, Upper-intermediate, and Advanced. AAUST placed students after taking a placement test in three general categories: level I (Elementary in *Tense Buster*), level II (Lower-intermediate in *Tense Buster*) and level III

(Intermediate in *Tense Buster*). Students who score higher than 500 on the TOEFL test are exempted from the English proficiency program held at the language center at AAUST. *Tense Buster* also assumes that the institution using the software has already divided its students into levels that are suitable to the levels suggested by the software.

The second aspect of CALL for teachers is that they have to create a balance between the time students spend on the computer and their time. Teaches must decide the ways they can use CALL software materials to enhance the learning process in the classroom. For instance, if a teacher decides to work on improving pronunciation, she/he could make students practice certain exercises, there are no fixed rules that determine the ideal ratio between the amount of time spent by the teacher and the computer. In this regard, it has been suggested that 'one guideline is to keep the balance clearly tipped in favour of teacher contact time, while allowing the technology to enhance the course and help optimise learning, whenever appropriate' (Sharma, 1998: 17). In the present study, students were exposed to *Tense Buster* for one hour daily, which the author and the teacher agreed would be more than enough for the students who will be doing other things at the same time, such as attending classes of other teachers in the morning for four hours (from 8:00 to 12.00). Our hunch for the appropriateness of the time allotted to the course turned out to be right, because most students generally became bored after around thirty minutes of working on the computer for learning rules of grammar, and doing exercises but they were more than glad to spend more time on chatting, surfing the internet and games.

Although the employment of technology in teaching seems to be very attractive, we cannot be sure that its use will lead to the success of learners in the different language skills or that they will perform better than face-to-face instruction. There are many factors that affect the acquisition of the first and/or the second or foreign language, including the type of technology employed, its duration, and what will be taught. This has been the interest of many research studies such as Nagata (1996), Grant (1998), and Collentine (2000) and Friggard (2002). They all agree that in the teaching process technology has a great impact on learning outcomes, and it can be an effective tool. Nagata (1996) compared the results of teaching Ninongo-CALL [i.e., Japanese CALL] with traditional instruction. Her study "confirmed that the computer was more effective than the simple workbook answer sheets", which included exercises on teaching Japanese particles and sentences. Grant (1998) in another study investigated the achievement of two groups of 5th grade pupils: the first group studied English grammar by using CALL and the second group studied mathematics through the computer. Based on Grant's study, students showed great enthusiasm to CALL instruction because it increased their interest and learning. Frigaard (2002) examined high school students' performance in grammar, listening comprehension and vocabulary by using a CALL software programme in Spanish. He found that CALL instruction was useful, but some students benefited from it more than others. He comes to the conclusion that for most of the students the computer software made the class enjoyable, which was conducive to better learning. Students also found it interesting to have regular sessions in the lab. Surprisingly enough when it came to grammar and vocabulary, they preferred the traditional way. They explained this by saying that they felt that the instructor was important in the

classroom. This interaction with the teachers enhanced their comprehension; a conclusion which the present study also arrives at primarily due to fact that Arab students are accustomed to the intervention and supervision of the teacher in the classroom all the time.

Al-Jarf (2005) has also argued that the attitude of learners towards foreign language learning was influenced by the use of CALL. For instance, Chen (2004) studied of 1,026 EFL college students in Taiwan, "and they showed definite positive attitudes towards the use of CALL for EFL instruction" (as cited by Al-Jarf 2005:3). Felix (2001) has also shown that generally speaking, students showed positive attitudes towards working with the web. Students found it useful, and most of them favoured the use of the web as a complement to traditional teaching. In another study (Schnackenberg, (1997) showed that older ESL students in a community college preferred using the software LEE (learning English Electronically) to face-to-face instruction. Students' reaction was positive because they enjoyed the learning experience, especially since there was a teacher present in the lab while they were working on the computer on their own. In short, the advantages and disadvantages of using a CALL programme in the classroom or lab is still a controversial issue, as Frigaard's study (2002) emphasises that students favoured learning "vocabulary and grammar in the classroom rather than in the computer lab", whereas Al-Jarf (2005), Chen (2004) and Felix (2001) showed students are more interested in using CALL software than traditional learning, whereas Hartzoulakis (2002) has convincingly shown that Greek school students favoured traditional teaching to CALL instruction.

2.4   Advantages of using CALL

Because technology comes with its own glamour, university administrators and students usually associate computers with many positive learning results. Researchers and practitioners in the field suggest that CALL can contribute, when correctly used to the following (Lee, 2006: 2).

a. Motivation

Many people, especially the young associate computers with fun and games, and also consider computers to be a modern way of dealing with languages. This is why their motivation is increased and they feel more independent. However, the fun aspect of language learning in this study turned out to be a negative element because students are not accustomed to using computers for serious work and instruction.

b. Authentic materials

Students have access to a variety of authentic language materials, whether at home or school by using the software *(*Lee 2000: 3).

c. Individualization

Inhibited students whether due to shyness or insecurity feel greatly at ease when working on the computer. Both slow and active students can adjust their pace to the language practice offered by the environment. Kenny Graham confirms that *Tense Buster* is "for students who are already fairly autonomous learners [and for whom], this software could be very   useful" (Graham 2004: 11).

d. Enhanced student achievement

Because students develop self -instruction strategies which promote their self confidence, the linguistic skills they acquire through CALL usually have positive effects on them. As Higgins has suggested, "Students felt that they could use the language without too much anxiety about surface errors, and instead focus their attention on higher levels of text structure, such as creating and developing ideas"(Higgins 1986: 3).

2.5 Barriers to the Use of CALL

The barriers which prevent or restrict the use of CALL in the classroom have been summarized as follows (a) financial barriers, (b) availability of computer hardware and software, (c) technical and theoretical knowledge, and (d) acceptance of the technology (Lee, 2003).

a. Financial barriers

This barrier is usually the most frequently cited reason for the use of CALL in the classroom by educators. This includes the cost of hardware software, maintenance, and staff development. Most educational institutions are reluctant to invest large amounts of money on high tech CALL materials; Herschbach (1994), for example, confirms "that the new technologies probably will not replace the teachers, but will supplement their efforts" (as cited by Lee, 2003), a situation which follows the pattern of other technologies. In the current study the financial barrier was not an issue discussed by the teachers, because the institution administration had already purchased the software to complement the curriculum. The software, however, could not be fully

utilized because of the limited number of language labs available to students since the cost of opening new labs and maintaining them is too high for the institution, especially because this is its first year of work.

b. Availability of the computer hardware and software

The availability of high quality software is the most challenging aspect of CALL in educational institutions. This entails not knowing what elements of the software will promote different kinds of learning. This problem is aggravated by the fact that very few people are skilled to design software, besides being costly and time-consuming. (McClelland, 1996). The other problem posed by technology is the issue of computer hardware and software compatibility. The choice of hardware is difficult due to the existence of many systems and the fast pace of technology and technological changes. In the current study students have no problem of hardware or software compatibility because the software, *Tense Buster*, is already installed in the university computer lab system. Students can access the software from any lab without problems on condition that the lab is not occupied by others.

c. Technical and Theoretical Knowledge

The fact that many teachers do not know how to use the new technology is a major hurdle against using CALL, or at best they are afraid that they might not be able to use it effectively in the classroom. Besides, not much has been done to integrate the newer methods of learning into the teaching plan. Sometimes the improper use of technology

can have adverse effects on both teacher and learner (Office of technical Assessment, 1997). In the current study, although the teacher was proficient in the use of technology, there were two instances when she needed the technical support of an IT specialist in dealing with some hardware problem.

d. Acceptance of Technology

Academic institutions are well-known for resisting change and for favoring the status quo. Technology has changed the world at tremendous speed and has forced people to communicate more efficiently and faster than ever before. Such rapid changes violate accepted norms and create new opportunities. But technology by itself cannot solve all our problems; the key to it is how we use that technology. In the field of education, technology can make learning significantly richer and more enjoyable. Younger generations who grew up with computers and computer games find it easier and more fun to work with computers. In my study, I found out that technology can also affect students' performance negatively because they associated it with games and fun rather than serious work.

2.6 Evaluating CALL

One of the most controversial issues associated with CALL research is how to evaluate CALL teaching outcomes, since it has presented numerous difficulties but at the same time offered fresh insights. According to Lee (2003) the 1980s witnessed the publication of the earliest articles that dealt with the evaluation of CALL software

were, a time which marks the beginnings of the interest in CALL. One of the earliest researchers who commented on the PLATO project was Hart (1981: 16), who said that the authors of CALL software "have given far too little attention to evaluation." But Hart also acknowledges the difficulty of coming up with appropriate methods for the evaluation of CALL. Some of these difficulties have been addressed by other researchers (Chapelle 2001a; Pederson, 1987). Chapelle (2001 b) says that traditional teaching methods based on classroom environment probably do not apply to CALL because of the difference in the learner's and teacher's roles, location, and interactivity. Pederson (1987) on the other hand argues that comparing classroom outcomes with CALL learning outcomes creates an ironic situation because the educational research methods are crude and dated, whereas CALL is a "highly sophisticated educational tool."

Generally speaking, one can summarize the findings on studies that compare the results of CALL instruction versus traditional classroom as those 'in which CALL users performed better than learners who did not use CALL, others in which no differences were found, and even a few in which the control group performed better' (Chapelle, 2001a: 30). This can be contrasted with the following statement by Al-Jarf: "Despite the glamour of technology, its use in language teaching does not guarantee students' success in skills acquisition or higher levels of achievement than traditional classroom environment" (Al-Jarf 2005:2). However, researchers found such results challenging and further research in the field investigated the comparison of CALL with traditional class outcomes. The majority of this literature is based on Russell's website (2002) 'No Significant Difference'. In the introduction, Russell says the site consists of

335 studies which are published as papers, summaries and research reports. There are seventy three studies out of seventy eight which focus on projects of distance learning and how effective they are for the institutions they belong to. Most of the research was carried out by American universities, which offer traditional classroom instruction besides their online courses. This is done to encourage students to make use of the network facilities of the university. The remaining five studies are related to the effectiveness of some course software which was developed by institutions. These studies are done by educators who are involved in distance learning and who defend their programmes against traditional learning. Students' achievement is measured by posttest marks which are then compared with the results of the learners enrolled in face-to-face classes in the university (Colorito, 2001; Carey, 2001). In the present study, I compare the results of two groups of full-time students, one exposed to traditional teaching and the other to CALL. The traditional group studied the English grammar without the use of computer software. The experimental group studied grammar with the help of the software *Tense Buster*.

Russell's site shows that of the seventy eight published reports, twenty one of them preferred CALL, whereas four studies favoured face-to-face instruction and they did not find any important difference between the two in the remaining fifty-three studies. These results are confirmed by Chapelle's (2001a) findings which are based on Chapelle, Jamieson & Park (1996), that the outcomes are almost equally distributed among those who favour technology, find no significant differences between traditional and CALL instruction, and those who favour traditional teaching.

Therefore, she comes to the conclusion that these results 'do not warrant conclusions to be drawn about 'the computer' as a teaching method' (Chapelle, 2001a:30).

In short, one can say that based on Tomas Russell's reviews, there is not a significant difference in students' performance when one compares the results of distance learning and classroom environments. Scholars have interpreted these results differently. Some researchers (Threlkeld & Brzoska 1994; Long & Javidi, 2001) refer the results to samples characteristics. These samples represent learners who are not similar to full time students. Threlkeld & Brzoska (1994) have described them as "part-time students, [who] preferred not to commute, were self-directed, older than most full-time students, frequently employed full-time and often married". The idea that the learning outcomes showed no significant difference is controversial, because it depends on outcomes of participants who have different rather than similar traits. In the current study the students were all full-time females who were of the same age, roughly 19-22 years old and they were all from level two of English proficiency (pre-Intermediate).

2.7 Computers and Grammar Teaching

According to Higgins there are three different ways of teaching grammar: these are instructional, revelatory and conjectural (Higgins 1986:35).

In the first one, the instructional, formal rules of grammar are consciously presented and learned in a systematic and organized way. In revelatory grammar, grammatical correctness is not the goal and students are not even corrected. Knowledge of grammar is not demanded of them; instead the emphasis is on exchange

of meaningful language. Students do not memorize any rules of grammar and there is an absence of any systematic progression of contents. Finally, conjectural grammar emphasizes working in an inductive way with the target language. Therefore, students work out the rules from data, form hypotheses, and finally test them.

Most of the instruction in an English language classroom follows instructional grammar and it is easy to computerize. This is true of the English grammar teaching classes at AAUST. The functions are presented to the students in the form of rules and students are asked to memorize those rules. Besides, there are examples that explain the theoretical points. Finally, correction of errors is very important and is highlighted by teachers. Correcting students' mistakes is easier done by teachers than by computers because teachers know their students as individuals, which enables them to distinguish between errors due to carelessness or those due to misunderstanding grammatical rules. This ability by teachers to tell which mistakes are committed by students and why is actually instinctive (Higgins, 1986: 2), and this instinctive knowledge cannot by transferred into a language that computers can systematize.

Computers play a much more active role in teaching revelatory and conjecture grammar, because they not only give traditional exercises a new format but "directly" help to enhance acquisition by means of the many resources they offer and thanks to their motivating power (Murdick ,1996: 7). Items which are used to enhance the target language and any text shown by the computer are considered to be meaningful language, and this includes even the instructions given to install a programme. In order to make students more motivated it is essential that the tasks are made interesting.

Some of the tasks favoured by the students are adventures, puzzles, and stories which are usually directed towards particular grammatical forms.

2.8 Autonomy and individualization in CALL

There are two main types of CALL packages that are used in language centres, and each one of them has its own advantages and disadvantages. The ready-made packages require no input from the teacher, but may not be appropriate to both contents of the course and its structure. The second type is the advanced authoring programmes which require teacher input from instructors who must possess the required programming skills to better use the programme. Unfortunately, many teachers neither have the time, resources nor the technical support to handle advanced authoring tools. *Tense Buster* includes a section called *On Your Own*, which is placed at the end of each unit. After leaning the grammatical rules and exercises, students are guided to type their own learning plans for their study of grammar. It can be copied and printed into their *Scratch Pads*. However, if they lack the ideas to carry out the job, they can search the web for further ideas. Moreover, students can refer to certain sections which emphasise verbs which have many words and ways of memorizing them. The idea behind this feature of *Tense Buster* is that students develop their own autonomy with the software.

In order to assess the effectiveness of CALL materials one has to remember Benson's (2001:140) observation that "there is an assumption that technology can provide learners with the kinds of support they need in order to develop the skills associated with autonomy." Technology-based learning materials in general and many CALL instructional programmes in particular have been promising their users with providing them with

developing autonomous learning skills for many decades. As Chapelle (2001: 78) has argued, "the CALL materials which need to support autonomous learners must adopt to the learner's linguistic knowledge, content, interests, learning styles and meta-linguistic features which should provide individually tailored learning." In the present study and with the help of the authoring tool, many activities that were of interest to students' needs were carried out. These included many types such as gapfill, multiple choice, free practice, etc. The teacher employed multiple choice exercises to enhance the usages of the simple tense.

In other words, the employment of technology in teaching and learning a language is not restricted to the simple utilization of software and computers in the classroom; it is a complicated issue which involves studying the needs and difficulties of the learner besides integrating technology within the curriculum instead of treating it as a fashionable addition to the lesson.

2.9 The Research Questions

The study was designed to investigate the following question: Is CALL instruction more, less than or equally effective as face-to-face teaching grammar in a university environment in Al Ain? That is, the main question in the study: Do students show a difference in leaning certain grammatical points who were taught by a conventional teacher in a traditional face-to-face class environment as opposed to who were taught the same material by the software *Tense Buster*. The subquestions are: why a particular method was more effective than the other and the second subquestion is: what are the obstacles and hurdles that face teachers when they adopt CALL when teaching grammar. Finally, what effects, if any, do sociocultural and psychological considerations have on students' progress and learning with CALL.

2.10 Conclusion

Computers have become a reality in second language learning, but like all aspects of technology they come with their own price. Computers have added colour and excitement to the classroom, they have given the teacher great aid to help them in teaching students' different grammatical tasks. Unfortunately, neither the computer *per se* nor its use is a guarantee to better learning. Despite these difficulties, more software is being marketed almost everywhere to meet the specific needs of different learners and learning situations. Moreover, as technology becomes more powerful and cheaper to purchase and as students and teachers become more familiar with computers and software, the role of CALL is expected to be more pervasive and more influential in the classroom

In the next chapter the author will investigate those aspects which are related to the methodology employed in the study, such as the population of the study, selecting group, research design, research tools, etc.

Chapter III: Methodology

In the introductory section of this study, I identified the following factors which need to be researched and clarified. These are as follows:

1. To identify how effective a CALL software programme is in teaching English grammar compared with traditional teacher-based instruction.

2. To determine which of the two methods leads to the improvement of students' performance at the end of the experimental period.

3. To investigate the problems and the possible causes and factors which affected the learning process for both methods, i.e. traditional teaching versus CALL.

4. To make recommendations based on teacher and student feedback for more effective CALL instruction.

Participants were given a pre assessment survey (Appendix 4) prior to the study; this ensured that both groups had positive attitudes towards the use of the CALL programme. A post-assessment participant survey (Appendix 5) was given to the experimental group to reveal

their attitudes towards the CALL software to measure the changes in their attitudes after the end of their CALL software instruction.

Prior to the study and in informal and unrecorded talks with both groups (control and experiment), students expressed positive attitudes and showed enthusiasm for the use of a CALL programme to study grammar.   The idea in this study is to concentrate on grammar because the software I used, *Tense Buster*, is primarily grammar-based software. Therefore the main objectives behind this study can be stated as follows:

    a. Develop grammar skills through two types of instruction.

    b. Determine which method motivates students to improve their grammar skills.

    c. Identify the problems students face with CALL instruction.

    d. To find ways of improving both students' attitudes and performance

        towards CALL instruction.

This was a quantitative and qualitative study, with a pre-and posttest grammar tests. All subjects were enrolled in intensive classes that met one hour a day, five days a week, in AUST in Al Ain city. The participants in the control and the experimental group were intermediate level female students at AAUST. Students were given a pre-test (Appendix 6) and again as a post test immediately after the completion of the instruction. Students' scores were collected and calculated into a mean score.

In addition, at the end of the experiment a post assessment survey (Appendix 5) was given to the students in the experimental group in an effort to measure attitudes, confidence, and motivation. The survey ensured that the researcher's attitudes and preferences did not interfere with the selection of the groups; furthermore, this method made the results valid since all other variables were equal (students' age, education, English proficiency level, interest in computers, etc.).

The software adopted in this study was *Tense Buster*, which will be used to study any probable differences in the results of the two learning methods: CALL and face-to-face teaching. The author will employ a pre-test-posttest randomized experiment to study the hypothetical causal relationship between the teaching method and learning outcomes. The method can be summarized as follows.

- The subjects of the study are identified.

- The subjects were assigned randomly to one of two groups. From a list of forty- one registered level two students, the first 21 students were assigned to the control group and the remaining twenty students were assigned to the experimental group.

- The students are assigned randomly into two groups: a control and an experimental group.

- Both groups were given a pretest.

- The same grammatical lessons were taught in different methods.

- At the end of the study a posttest is given to check how effective one of the teaching methods is.

3.1 Population of the Study

The study took place at AAUST in the UAE. It investigates the results of two methods of learning of two groups of randomly selected pre-intermediate students. It was carried out by the researcher and it was restricted by limitations of time and geography. It was not possible to extend the experiment to more than twenty female students in a specific place.

AAUST is a newly established institution. The language center is responsible for training students and improving their English so that they can pursue their studies in the colleges of their choice, since English is the language of instruction in AAUST.

3.2 Selecting Group

The sample of the study was the 41 female students of the Pre-Intermediate, level two. The placement of the students is the result of a homemade English proficiency test prepared by the Language Center in the University. The test was conducted at the beginning of the term. It consists of five sections: grammar, vocabulary, reading comprehension, listening, and writing. The results of this test determine the students' proficiency level: elementary, pre-intermediate, and intermediate, and it was the results of this test that determined students levels before starting the experiment.

3.3. Research Design

The length of this study will be eight weeks at AAUST. The idea is to conduct a pretest to all participating students prior to their first lesson in the class or lab, with model lessons and various activities conducted during the duration of the teaching course, based on students' textbook, *The New Cutting Edge,* Pre-Intermediate. During the study the experimental group will have access to *Tense Buster*, to assist them with their grammar activities. There were also quizzes, exams and various other activities such as discussions and homework assignments. After the eight week study, the participants will be subjected to a posttest which will assess the students' grammar skills improvements. The posttest is the same as the pretest.

3.4 Research Tools

As the aim of study is to investigate the effectiveness of using technology to teach some grammatical topics such as the simple present tense, present continuous, simple

past, and prepositions, there will be different research tools: these include interviews, surveys, and pre and posttests results. The tools also included interviews which asked students questions about the frequency of using computers, their attitudes towards learning through a software, etc. As for surveys, the questions were formulated around enjoyment/enthusiasm, comfort levels, production, etc.

The pre-posttest results revealed how much progress students have achieved or failed or achieve, and which areas of grammar were particularly difficult or easy for students to master. In other words, these results showed which of the two methods was more effective than the other.

a. Interviews

The study contains two types of interviews: One with students and the other with teachers. As for the students of the experimental group and before embarking on the study, the author conducted several informal and unrecorded discussions with them, both individually and in groups. These discussions were again repeated at the end of the study, sometimes with the same students and at other times with different ones, because it was important to collect as many responses as possible to better reflect the reality of the outcomes of the study. These discussions were intended to elicit students' spontaneous responses, feelings, and reactions to the unique experience of what it feels to be taught by a computer and what are the advantages and disadvantages of such instruction. Moreover, students often get influenced by each others' reactions and usually a loose consensus is formed among them, in this case about the effectiveness of CALL instruction as opposed to what they have learned traditionally. The students' interview focused on such issues as questions related to their expectations, feelings and attitudes to the experiment of using CALL instruction. Prior to the interviews all

participants were informed that their discussions and questionnaires were part of a study designed to assess the effectiveness of CALL instruction. They were also informed that all materials collected by the researcher would not contain any identifying characteristics of the participants, a strategy designed to encourage the participants to be frank in case they were apprehensive of any comments they made which might be linked or attributed back to them personally.

Insights into students' experience with CALL appeared from these interviews. Generally speaking, students at the beginning of the study were enthusiastic about the prospect of learning by the use of a CALL programme alone, because they thought that learning was simply the use of the computer to review the lessons as many times as they wanted at their own learning pace. They also liked the idea of not being singled out.

Teachers' interviews (Appendix 3) involved a teacher who was enthusiastic about the use of technology in instruction and the other (Appendix 2) held negative views on the use of technology in instruction. These interviews were centered on the frequency of the use of the computer in the classroom, how comfortable the teacher is with the use of technology, how successful technology is in delivering the required material and what do teachers think are the positive points of technology from the students' point of views. In this study, the teacher played a minimal role with the experimental group, which was primarily supervising the students and authoring some exercises. But it was essential that the teacher who was involved in the CALL instruction was a believer in the value of technology and be ready to extend help to students, if needed in typing, word processing, and other duties. In contrast, since *Tense Buster* is used by all teachers at the English Language Center at AAUST as a supplement, it was also important to see how a teacher who opposed CALL instruction thought about *Tense Buster*, and what their ideas were.

One teacher from each group was sufficient since the number of teachers at ELC is small (six teachers) -- four teachers were pro technology and two were against-- and the issue was restricted to using technology in the class or lab, and how useful it was. The software, its use, and its possible advantages and disadvantages were issues frequently discussed openly by the teachers at the ELC.

b. Surveys

As explained by Zechmeister et.al (1997), "survey research is "the method of gathering data from respondents which are considered to be representative of some population, using an instrument composed of questions". In social sciences, surveys are considered one of the main methods of data collection because they give the chance to efficient data collection from a large number of subjects.

According to Babbie (2001), there are many advantages to a survey: Some of them can be summarised in the following:

- It is a good way of gathering information from a large number of respondents, and its validity, reliability, and statistical significance can be determined by using statistical methods.

- A survey is a flexible research tool and can be used to study beliefs, values and attitudes.

- It is relatively easy to administer.

- As a research tool, it is versatile.

- It is economical because of its focus on what the researcher is interested in.

The qualitative aspect of my research lies in the surveys conducted, the notes I made during the experiment, the students' informal and unrecorded conversations, and the interviews with both students and teachers.

c. Pre-and Post-Assessment Student Surveys

A student survey was conducted to confirm the appropriateness of CALL software. The results of the students' survey confirmed that students showed positive attitudes towards the use of computers and other technology. The survey was centered on the following five domains: Enjoyment/enthusiasm, comfort level, productivity, classroom use, and access (Appendix 4). After the two-month experiment, another survey, called 'post assessment student survey' was given to students to assess their reaction to the software's presentations, whether the software was interesting, enjoyable, clear and easy to understand, etc. (Appendix 5).

d. Pre and Posttest

The pre and posttests used for the study consisted of a homemade examination which included questions about the rules for a specific grammar topic, appropriate language examples and a multiple choice exercise, where the subjects had to select the correct language examples for a grammar topic out of three given. The posttest, which was the same as the pretest, was conducted at the end of the experiment (Appendix 6).

3.5 The Lessons

One teacher taught both the control and the experimental group in order to eliminate the problems associated with two different teachers teaching the two groups. Long & Javidi (2001) have argued that when two teachers teach the same material then

many variables affect the analysis of the study. These variables include the instructor's expertise in the course content, ability to communicate course content, ability to interact with the students, to use technology effectively, and finally to facilitate the complexity of theories to students.

The next step after taking the pretest, the students in the experimental group were taken to the computer lab, where each one of them had access to her own computer to work individually and at their own pace. Jones & Fortescure, (1987), however, have criticized this seating arrangement because it isolates students and does not promote collaboration. The researcher had to rely on this arrangement because the computers are fixed on tables arranged in that manner in the language lab; moreover, the author wanted to investigate the effectiveness of technology on individual subjects, without the interference that will emerge as a result of the situation in which students face each other and engage in activities other than the course material such as socializing and chatting.

The second group (the control group) was taught in a traditional face-to-face class, not in a CALL environment.. The author wanted to make sure that the lessons in both types of instruction are similar and follow the same procedure so that findings and results will be more accurate. In the face-to face group, the teacher copied each lesson from the software on paper and followed the same steps of teaching as in the lessons in *Tense Buster*. The handouts she gave to her students in class for extra practice on the subject matter were authored by the teacher in the experimental group. So the lessons were similar to a great extent. As an example, the steps of teaching comparisons in *Tense Buster* software were employed as a guide line to teach the same subject for the face-to-face group, such as introduction, rules, practice, quizzes etc.

Extra material and tests were introduced to the face-to-face group in the form of hand outs. As for tests and other material for the experimental group, they were authored by the teacher and presented to the students on the computer.

The following topics were covered in the two-month study: The simple present, comparisons, the simple past, present continuous, prepositions of place and prepositions of time. Both control and experimental groups were taught the same topics and the same exercises.

3.6 Software

AAUST bought *Tense Buster* and downloaded it in the language labs. The software helps students tackle key grammar issues in a lively and interesting way. *Tense Buster* is a software programme that target adult learners of English as a second or foreign language. The programme follows a structured, guided discovery approach to learning to help students grasp grammar easily. Although the emphasis is primarily on grammar and vocabulary, a typical lesson starts with an introduction to the grammatical topic which is followed by a section called "Do you Understand?" in which learners are required to answer questions concerning particular grammar points in the from of True/False. Then comes the unit rules, which explains the grammatical rules. The next section is "Unit Practice Exercises" in which students can practice what they have learned. Finally comes "Testing Exercises" in which the context of the grammar rules is widened to include, for instance, wrongly used expressions and pronouns. Students have to type the

correct answers. In the feedback section, students are given the chance of going back and checking the rules of grammar they could not refer to while performing their exercises.

Chapter IV: Results and Analysis

4.1 Quantitative Study

I used t-test to determine if there is a statistically significant difference between the pre and post tests. The t-test "computes the differences between the values of the two variables for each case and tests whether the average differs from 0" (Sourish 2005:13).

One of the most common experimental designs is the "pre-posttest." A study of this type often consists of two measurements taken on the same subject, one before and one after the introduction of a treatment or a stimulus. The basic idea is simple. If the treatment had no effect, the average difference between the measurements is equal to 0 and the null hypothesis holds. On the other hand, if the treatment did have an effect (intended or unintended), the average difference is not 0 and the null hypothesis is rejected.

The t-test procedure is used to test the hypothesis of no difference between two variables. The data may consist of two measurements taken on the same subject or one measurement taken on a matched pair of subjects.

Additionally, the procedure produces:

- Descriptive statistics for each test variable.

- The Pearson correlation between each pair and its significance.

- A confidence interval for the average difference (95% or a value you specify).

Table (1)   t-test group statistics (Pre-Test)

Pre-Test Scores	N	Mean	Sig. (2-tailed)	Std. Deviation	t	df
Control Group	21	13.10	.260	1.640	1.44	39
Experimental Group	20	12.55	.258	1.395	1.49	38.522

The descriptive table displays the mean, sample size, standard deviation, and standard error for both control and experimental pre and post test groups.

In the pre-test, both groups showed no significant differences in their performance, as table (1) shows. The means between the two groups was very close, which indicates that the two groups were equivalent at this stage. Furthermore, as time went by, and judging from the quizzes given to both groups, increasing differences in the means between the two groups, especially quizzes, became apparent.

Descriptives

Table (2)   t-test group statistics (Mid-Term)

Mid-term Scores	N	Mean	Sig. (2-tailed)	Std. Deviation	t	df
Control Group	21	14.43	.000	1.859	3.647	39
Experimental Group	20	11.60	.001	2.780	3.811	32.958

The difference grew in the mid term exam too (Table 2). For the control group the mean was 14.43 and the mean for the experimental was 11.60, with t=.000 for the Control group and t=.001 for the experimental group, which is highly significant at p<0.001.

Table (3) shows the gain scores for the final examination for both groups. We can see increasing differences in means in the final exam. For the control group, (76.67), and the experimental group (61.35) .The control group scores are much higher than the experimental group.

Table (3) t-test group statistics (Final-Exam)

Final Scores	N	Mean	Sig. (2-tailed)	Std. Deviation	t	Df
Control Group	21	31.90	.000	4.242	3.985	39
Experimental Group	20	25.20	.000	6.371	3.947	32.863

The correlation between the pre and post test scores of the control group is statistically significant (Table 4). Using the one-tailed t-test on the gain scores of the two groups, it was found that the experimental group did not improve more than the control group.

Table (4) Pre and Posttest Scores

		Mean	N	Std. Deviation	Std. Error Mean
Control Group	Pre Test Scores	13.25	20	1.517	.339
	Post Test Scores	15.20	20	1.908	.427
Experimental Group	Pre Test Scores	12.86	21	1.459	.318
	Post Test Scores	13.19	21	1.861	.406

The mean column in the t test table displays the average difference between control and experimental group measurements between the pre and post scores. The Std. Deviation column displays the standard deviation of the average difference score. The Std. Error Mean

column provides an index of the variability one can expect in repeated random samples of all subjects. These are not different from our samples.

The t- test statistic is obtained by dividing the mean difference by its standard error. The Sig. (2-tailed) column "displays the probability of obtaining a t statistic whose absolute value is equal to or greater than the obtained t statistic" (Heiberger & Holland 2004). Since the significance value for change in scores of control group is less than 0.05, we can conclude that the average loss of 1.950 scores per sample is not due to chance variation.

The t- test is appropriate whenever two related sample means are to be compared. The differences in scores are assumed to follow a reasonably normal distribution, especially with respect to skewness. Before running the t test, we can assess the distribution of difference scores by examining the histogram of a computed difference variable. Test variables with extreme or outlying values should be carefully checked; box plots and line graph can be used for this.

4.2 Qualitative Study

In response to an interview with the instructor who does not favor technology (Appendix 2), the author collected the qualitative responses. She responded that recently students have been using computers with their English class once a week in the computer lab. She used the computer also for Internet sites and typing. Sometimes it was useful to use computers in class but at other times it wasted so much time trying to look for an explanation or a rule.

She also said that students tend to get distracted easily and they cannot concentrate on the lesson for a long time. She thinks that computers did not increase learners' time on task. On the contrary, because students are not used to being taught without the help of a teacher they tend to drift away from the task on hand. Students do not take computers

seriously for study purposes and they need constant observation and guidance from the teacher. Besides, most of them cannot type, and their word processing abilities are minimal. She also agrees that student' grades are related to how well they understand lectures. She also doesn't think that students need computers in the classroom or labs to understand teacher's lecture. Computers would only distract them. In response to the question that would you consider the use of technology to aide the students in understanding your lectures and/or verbal directions, she said no she does not think so, because she has noticed that students interact with us much better than with the computer in the lab. Teachers on the other hand give students examples and ask each student to provide an example of her own and do the exercises in the classroom. The instructor also does not see how could computers increase students' confidence or make them feel more successful. They need the encouragement of the teacher to make them feel confident, because the computer is only a machine and a machine can neither encourage nor discourage a learner. Also she does not see the point of taking any courses in employing technology with English language learners. She has always been a successful teacher with the marker and white board, and computers are only toys students' play with and they do not take them seriously. She cannot think of any benefit technology can give to students. Based on their experience, our students are not used to technology and they have not accepted it as a tool of learning and instruction. Most of the students have little computer knowledge, and also most of them cannot type and word-process. The crux of the matter is that most students do not take computers seriously and they think that computers are only for games, writing Emails, and songs. Also she believes computers lack the ability of humans to interact with students and respond to their individual needs.

Alternatively, when the author collected the responses from the instructor who favours technology (Appendix 3), she responded that she uses it every day, mostly to search for ESL sites, and to keep up to date with the latest in ESL and EFL. According to the instructor's experience of using computers with her English learners, she said it is somewhat successful, but it could have been better had the students not wandered off to other sites. She also feels the use of computers increases the English learner's interest in their content area, sometimes in dealing with drills and exercises. They associate computers with games and fun, songs and puzzles. In response to the question that do you feel that the use of computers increases the English learner's time on task, she replied, I think that computers increased learners' time on task somewhat. Sometimes after finishing a certain exercise there was time for additional exercises from ESL sites. In terms of barriers she replied that I like to use the computer in my teaching, I find my students drifting away and concentrating on whatever they find interesting rather than the job at hand. In this sense the computer challenges my authority in the classroom unless I control its use. She would agree that students' grades are related to how well they understand lectures. She definitely believes that technology aids the students in understanding, especially the grammar lessons because each tense is presented in a different color so it is visually appealing to students, and hence more interesting. In response to the question that do you feel your students perform much better if they were able to work more often on *Tense Buster*, she replied positively, because the more students are exposed to the software, the better. The immediate feedback helps students remember the grammatical rules.

According to her, most of the students gain a lot of confidence from dealing with computers, because they do not feel threatened or embarrassed by it. She would love to learn new technologies to improve her teaching. This is why she keeps up with the latest in the

field and regularly attends TESOL seminars and lectures whenever she can. She thinks that there is a positive interaction between students and computers, and it is this that makes technology so wonderful. Some students have little computer knowledge, some cannot type, and some cannot word-process. The major problem is that some students do not take computers seriously and they think that computers are not for serious study: They are just for songs, games, and chatting.

Qualitative data was collected also from students' pre-assessment survey (Appendix 4) and post assessment survey (Appendix 5) before and after the experiment.

Table (5) shows the students' survey data pre-assessment survey (41 students)

Item Number	No. of Partially Agree and Partially Disagree	Percentage of Strongly Agree and Agree	No. Disagree
1. Enjoyment/ Enthusiasm	37	91%	4
2. Comfort/Confidence	38	92%	3
3. Productivity	38	92%	3
4. Importance of Teachers' computer knowledge	35	85%	6
5. Access	35	86%	6
6. Other technology	40	98%	1

At the beginning of the experiment students showed enjoyment, pride and enthusiasm for participating in a pioneering study (strongly agree, 92%). More importantly, they felt quite comfortable with the discrete nature of the experiment (strongly agree, 92%). There was a range of responses as to how computers can help students in their work productivity (strongly agree 84%). This might be attributed to

the fact that they have not been exposed to such an experiment before, although some of them (16%) were not sure of the outcome of the experiment. As for the question of how important the teacher's knowledge of computer was, the majority of students (Strongly Agree 85%) expressed their need for a knowledgeable teacher, in case students felt they needed help from the teacher. Regarding the ability of the students to hear and see the word, what I termed "Other Technology," 98% of the students responded (Strongly Agree), which reflects their preference for a new feature in the software.

Table (6) shows the students' survey data post-assessment survey (20 students) (Experimental Group)

Item Number	No. of Partially Agree and Partially Disagree	Percentage of Strongly Agree and Agree	No. Disagree
1. Enjoyment/ Enthusiasm	18	82%	4
2. Comfort/Confidence	18	91%	2
3. Productivity	14	69%	6
4. Importance of Teachers' computer knowledge	12	62%	8
5. Access	18	82%	2
6. Other technology	12	61%	8

At the end of the experiment the same survey was given to the students of the experimental group. The two items "Enjoyment /Enthusiasm" and "Comfort/Confidence" did not show much difference since students' comfort and confidence continued to be the same although the enjoyment dropped from (91% to 82%). This is because students like to use computers for games, chat, and fun. The

51

use of the computer in the study was for a tool of instruction rather than games. The most significant change in the students' response was concerning productivity from (Strongly Agree 92% to Strongly Agree 69%). In order to investigate this particular aspect of the survey further, the author conducted several informal and individual meetings and interviews with the students to explain the discrepancy between their initial impressions of what the computer might offer them and the reality which appeared after the experiment.

At the end of the study the author conducted "Software Post-Assessment Participant Survey", a student's survey for the experimental group to investigate the software's effectiveness in language learning skills. The survey shows students' disappointment with CALL software as a means of instruction. Their enthusiasm for working on computers unaided by the teacher seems to have been an unfavourable experience. Thus question three of the survey "I prefer my teacher's class over computer software and other types of technology" the students' answers were 91% Strongly Agree. This, however, has not diminished students' interest in the software presentation (question #1) since 90% of the students agreed that the presentation were interesting and enjoyable.

Chapter V: Discussion of Results

The findings of this study suggest some variable implications for the use of computers for instruction. This came as a surprise to the author who had always believed that instruction with the help of technology is superior to traditional teaching. When CALL instruction and traditional teaching were compared, students at AAUST in Al Ain city benefited more from face-to-face instruction than from CALL. However, this conclusion requires further clarifications. The administrative constrains limited the study to a small sample at the university, i.e. the language lab at AAUST. One cannot claim that these results will be the same in a different place. Besides, the two groups for the study were homogeneous, as they consisted of students with a level of English proficiency that was pre-intermediate, level 2 as was confirmed by the pretest results.

The students in both groups benefited from the experiment. The achievement of the students in the experimental group was not as significant as the achievement of the students in the face-to-face group. One way of explaining this result is that Arab learners still favour face-to-face instruction in learning. At the beginning of the experiment, students from both groups were enthusiastic about using computers, but in the author's unrecorded and informal discussions with the participants, the experimental group tended to think less highly of CALL instruction as time went on. This might be explained by the fact that most of the students came from government schools that employ traditional teaching methods, discouraging students from becoming autonomous learners. One of the consequences of

such teaching method is that students think of computers not as instructional tools. In their minds as well as in their daily lives computers are primarily associated with games, music, and fun. To be left alone to work on the computer to learn English grammar is a novel experience since learning in the students' mind is linked to both teacher and board: without these two, the learning process does not seem normal. This is why the experimental group eventually was less successful than the face-to-face group. Conversely, the traditional group performed better since the teaching was going in the classroom exactly the way they are used to and the way they expect learning to be. Alternatively, the face-to-face group performed better because of the teacher's presence and because of the usual routine students are used to. In a similar study on a Greek State Lykio school, Hartzoulakis arrives at similar conclusions and argues that

> However, the study led us to believe that computer lab activities need to be supported with 'traditional' elements of teaching -like for example explanations on the board or attention to individual questions. The differentiating characteristic of the lab group was that the students worked on their own and tried to grasp the particulars of inversion by going back and forth to the web pages presenting the rules and the examples. The traditional group on the other hand, had the chance to exchange ideas and listen to answers as a group rather than individually. This, probably helped students to clarify more fine points than they had originally thought of, as they could listen to their peers' remarks. **(**Hartzoulakis, 2002: 42)

However, the students benefited from CALL instruction, but judging from students' reactions it seems that computer instruction needs to be blended with such traditional aspects of teaching as using the board and interacting with individual questions. On the one hand, the face to face instruction group had the chance to ask for the teacher's help regarding finer points of the grammatical lessons. On the other hand, the members of the experimental group worked on their own and had the chance to go back and forth to the grammatical rules. Based on the students' post assessment survey answers, it is clear that

students do not lack technical knowledge of using the computer, but their problem lies in the instructional utilization of the computer. This is clear from their enthusiastic attitude to the computer and their interaction with it. The interview with the teacher who supports the use of technology in teaching confirms these positive aspects of computer instruction, since computers neither threaten nor embarrass students, but still the problem of maintaining students' concentration for more than half an hour a day for instructional purposes is a challenge which has to be faced by teachers who intend to employ CALL instruction.

The interviews with the students revealed their positive attitudes towards the use of CALL instruction. They specifically liked such features as colour, sound, the ability to go back and forward to check their progress, the scratch pad, the immediate feed back, and the psychological factors of the computer not being threatening. Unfortunately, all these advantages are not as important for students as working in a group or collaborating with their peers in the classroom, interacting with the teacher who could respond to their queries and questions.

Qualitative data collected from field notes collected by the author before and after the experiment included interviews, and surveys, with both students and teachers can be summarized in the following points

1. The majority of the learners preferred traditional teaching environment in which the teacher and the white board dominate the classroom to CALL environment.

2. Most of the participants of the experimental group felt more that they were "playing" rather than "working".

3. Most of the participants in the experimental group were not motivated to stay on task when using computers.

4.   The control group preferred textbook-directed lessons to technology.

5.   Students complained of lack of human contact and lack of teacher's involvement in the instruction.

6.   Students are not used to being left to learn on their own, once they are alone; they immediately leave the course and begin to use the computer for other purposes, such as chatting, games, etc.

7.   Students felt bored by sitting in front of the computer to learn rather than play.

Furthermore, students had high hopes for the teacher's knowledge of the computer at the beginning of the survey (strongly Agree 85%). At the end of the course, however, the percentage dropped to (Strongly Agree 65%). The students told the author that they expected great need for the teacher's knowledge but it turned out that the software was user friendly, and this made the teacher's knowledge of the computer not a crucial issue.

Another significant change occurred with regard to whether it is helpful to see the words and hear them simultaneously by the students--what I called "Other Technology"—which dropped from (Strongly Agree 98% to Strongly Agree 61%). Students reported in oral and non-formal interviews that seeing and hearing the words in the passages of the software was confusing, because the activity of listening should not interfere with reading. This is contrary to students' expectations in the pre assessment survey.

Chapter VI: Conclusion

Before embarking on the study, the author predicted that by using the software *Tense Buster* to teach English grammar to pre-intermediate level students at AAUST would give results that are different from teaching the same grammatical material by a different method, i.e. face-to-face instruction. This is why the main aim of the study was to check whether in teaching grammar CALL was as effective as face-to-face instruction, or achieved better or less significant results.

The author postulated that both teaching methods will lead to different results. To investigate this hypothesis the author formulated a null hypothesis in order to verify this assumption. Because the author did not favour either of the two methods, a two-tailed hypothesis was formulated: in other words, CALL instruction

might be more or less successful in teaching grammar than face-to-face teaching. The outcomes were discussed earlier (in Chapter Four), and they made us not accept the null hypothesis and instead adopt the view that each teaching method yielded a different result. The learning outcomes of the face-to-face instruction showed a significant difference over CALL instruction.

6. 1 Inferences

The statistical analyses that were conducted in this research make us infer that the group of students selected for the study at the AAUST benefited more from face-to-face t grammar instruction (control) than the other group (experimental), who used *Tense Buster* for learning grammar on their own. This inference needs some clarifications and qualifications. The administrative limitations confined the number of students who participated in the study and the number of hours taught every day. We can assume that the same experiment with a different group of students would yield the same results, since the group that participated in this study was all females whose educational background was predominantly traditional and therefore homogenous and thus the outcomes of the study cannot be generalized to include a heterogeneous group too. However, gender has been the focus of other research (Heartel, 1978;). Some studies claim that new technologies and gender have a great impact on second language learning. (Elton and Carey, 1982), whereas other researchers consider such attitudes as indefinite and ultimately controversial (Sacks, Bellisimo and Mergendoller, 1994, and Hartzoulakis 2002).

6.2 Implications of the Study

Students from both groups benefited from CALL and face-to-face instruction. Compared with the students in the CALL environment (experimental

group), students in the face-to-face (control group) achieved significantly better results. Because both groups of students volunteered to the study, the author attributed the difference in performance to sociocultural influences: students value traditional methods of teaching over CALL. In informal and unrecorded discussions with students from both groups there was unanimous agreement that even the CALL group needed the teacher's presence in the lab. Furthermore, students still associate computers with games and fun and they do not consider learning from CALL software as serious enough. Finally the members of CALL group very often were distracted from the lesson at hand and surfed in the Internet, because working with the software on their own after a while made them bored and they wanted something different.

The author believes that in societies where students are still under the influence of traditional methods of teaching which are highly valued by the students' parents and community, CALL activities need to be supported by teachers who would give guidance and advice to students. Besides, students in such environments frequently need the presence of the teacher for clarifications and explanations.

6.3 Limitations of the Study

- The sample of the study for both groups was limited to 41 students.

- The study was conducted at the author's educational institution where students were taught either traditionally or through CALL software for an hour daily for two months. This entails that the study is limited to one place at a particular time.

- The study was restricted to female students only and while there are no indications that including boys in a similar study might have affected the results, there is no

guarantee that differences might be noticed and a similar study could include boys as part of the sample population, as well as a boys only study would be beneficial to validating the research study model.

6.4 Further Research and Recommendations

Although computer assisted learning is still a burgeoning field in education in this part of the world, the effectiveness of teaching grammar solely by relying on software is highly controversial: there are studies that suggest that teaching with the aid of CALL is as effective as or even superior to traditional methods of teaching grammar. The author believes that further research should be carried out on heterogeneous groups involving both males and females who come from different cultural backgrounds. In addition to that, the author recommends that more research be done on different samples such as students who belong to different level of learning. Moreover, different language skills should be also investigated. What the students in the study liked most about CALL instruction was the advantage the computer gave them to go over the study materials as often as they wanted. They also liked the way they determined their individual learning speed and style and to obtain instant feedback. The more self –conscious students liked especially the fact that computers do not "singled them out". Further study on the effectiveness of CALL instruction as opposed to traditional methods of learning need to take into consideration all these factors.

Another important issue which the author could not investigate was retention, and whether students' achievement was of temporary nature. Finally, students need to be exposed to technology more often for purposes other than fun and games so that they associate technology with serious goals. What is needed is

more work on the sociocultural factors that make students get used to autonomous learning and appreciate the CALL software they use in the lab. Moreover, producers of CALL software need perhaps to pay more attention to specific needs of specific societies where teacher/student interaction is still an important factor in the learning process.

Finally, the author is of the opinion that the employment of blended learning, which is the use of the online teaching material and CALL software programmes to supplement traditional modes of teaching because blended learning will ensure students' enjoyment of the technology, colours, and animation. In addition to that, it combines the benefits of the presence of a teacher in the classroom, which in a traditional-type instruction is vital for students' learning. **Word count 16, o33**

References

Al-Jarf, R. (2004)*The Effects of Online Grammar Instruction on Low Proficiency EFL College Students'* . Asian EFL Journal, Vol. 7

Babbie, E. (2001). *Practice of social research.* 9th Ed. Belmont, CA: Wadsworth Thomson Learning

Bachman, L. & Palmer A. (1996). *Language Testing in Practice,* Oxford: Oxford University Press

Benson, **P**. (2001). *Teaching and Researching Autonomy in Language Learning*: Harlow, England: Pearson Education.

Beatty, **K**. (2003) *Teaching and Researching Computer – assisted Language Learning.* London, Longman, 2003, pp. 148-171.

Bonk C. & Zeng, T. (2005). Proceedings of ED-MEDIA World Conference on Educational 2005 p.1-22

Brown, C. (1993). *Evaluating instructional software: A review and critique of current methods.* Educational Technology Research and Development Vol. 31, No. 4, pp. 327-349

Burston, **J.** (1996). *CALL at the crossroads: Myths, realities, promises and challenges.* ARAL, 19(2), 27-36.

Carey J. M., (2001) *Effective Student Outcomes: A Comparison of Online and Face-to-Face Delivery Modes*[Online].Available: http://www.ed.psu.edu/ascde/deos/deosnews/deosarchives.asp [8 May 2002].

Catenazzi, N., & Sommaruga, L. (1999a). *The evaluation of the Hyper Apuntes interactive learning environment. Computers & Education, 32,* 35-49.

Chapelle, C. (2001a). *Computer Applications in Second Language Acquisition*, Cambridge: Cambridge University Press

Chapelle, C., Jamieson J. & Park Y. (1996). *Second Language Classroom Research Traditions: How does CALL fit in?* In M. Pennington (ed.) The Power of CALL. Houston TX: Athelstan Publishing.

Chen, Pi-Ching (2004). *EFL student learning style preferences and attitudes toward technology-integrated instruction.* Ph.D. Dissertation. University of South Dakota DAI-A.

Chomsky, **N.** (1957). *Syntactic Structures* (2nd Edition) Berlin: Mouton de Gruyter, PP. 93- 99

Chylinski, R. (2005). *CALL Handbook-Version 7*. MUELC: Monash University: English Language Center.

Colorito, R. (2001). *Learning Online*. Indiana Alumni Magazine Vol. 64, No.1- September/October

Elton, M. & Carcy, J. (1982). *Computerizing Information: Consumer Reactions to Teletext.* Journal of Communication 33. 162-173.

Felix, U. (2001). A multivariate analysis of students' experience of web based learning. *Australian Journal of Educational Technology, 17*(1), 21-36.

Frigaard, A. (2002). *Does the computer lab improve student performance on vocabulary, grammar, and listening comprehension?* ERIC Document Reproduction Service No. ED476749.

Garcia, G.E. (2000). Bilingual children's reading. In M.L Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.). *Handbook of reading research: Volume III* (pp. 813–834). Mahwah, NJ: Erlbaum.*Quarterly*, *30*, 665–691

Graham, K. (2004) "*Tense Buster*", TESL-EJ. Cambridge: Bell Educational Trust. Vol.8.No.3

Grant, J. (1998). *Does integrating technology into the curriculum increase student learning?* ERIC No. ED431006.

Hart, R. S. (1981) *Language Study and the PLATO System*. Studies in Language Learning, 3 1-24. Hellenic Republic Government Gazette Issue Two, (1999). No 1868/11-10-1999

Hartzoulakis V.H. **(**2002) *"Investigating Computer Mediated Instruction in a Greek State Lykeio"*, Unpublished Master's Thesis, Hellenic Open University.

Heiberger, R. & Holland, B. (2004) *Statistical Analysis and Data Display: An Intermediate Course with Examples in S-PLUS, R, and SAS*. New York: Springer Science and Business. P.99-102

Herschbach, D. (1994). Addressing vocational training and retaining through educational technology: Policy alternative. (Information Series No. 276). Columbus,Oh: The National Center for Research in Vocational Education.

Higgins, J. (1986) The Computer and Grammar Teaching, in LEECH, G. and CANDLINE, N.L . Computers in English Language Teaching and Research. London: Longman, 31-45.

Jones, C. & Fortescue S. (1987). *Using Computers in the Language Classroom.* London: Longman.

Colorito, R. (2001). *Learning Online.* Indiana Alumni Magazine Vol. 64, No. 1 - September/October

Kenning, M.M. & Kenning, M. J. (1990). *Computers and language learning: current theory and practice.* New York: Ellis Horwood

Kinshuk Q. & Su W. (2002). Web-based Computer Assisted Language Learning. *Proceedings of the DistanceEducation Association of New Zealand Conference* (10-12 April 2002, Wellington, New Zealand), Wellington:DEANZ, 99-107 (ISBN 0-9598036-3-7)

Krashen, S. (1982). *Principles and practices in second language acquisition.* Oxford: Pergamon.

Lee, Kuang-wu (2003) *English Teacher's Barriers to the Use of Computer-assisted Language Learning,*

Levy, M. (1997). *Computer-assisted language learning Computer-Assisted Language Learning: Context and Conceptualization.* Oxford: Clarendon Press.

Long, L. W. & Javidi A. (2001). *A Comparison of Course Outcomes: Online Distance Learning Versus Traditional Classroom Settings.* [Online]. Available: *http://www.communication.ilstu.edu/activities/NCA2001/paper_distance_learning.pdf* [15 April 2002].

Lowe, R. (1999). Extracting information from an animation during complex visual learning. *European Journal of Psychology of Education, 14*, 225-244.

McClelland, C..(1996). *Interrelations of prosody, clause structure and discourse pragmatics in Tarifit Berber.* Ph.D. thesis. University of Texas at Arlington. xxvi, 276

Mercer, N. (1993) *Computer-based activities in classroom contexts, Language, Classrooms and computers.* New York: Routledge

Murdick, W. (1996)*English Journal,* Vol. 85, No. 7, The Great Debate (Again): Teaching Grammar and Usage, pp. 38-45

Murray, D. E. (2000). *Protean Communication: The Language of Computer Mediated Communication.* TESOL Quarterly. 34:397-421

Nagata, N. (1996). Computer vs. workbook instruction in second language acquisition. *CALICO Journal, 14*(1), 53-75.

Nunan D. (1988). *The learner-centred curriculum.* Cambridge: Cambridge University Press.

Office of Technology Assessment. (1995). I*nformation technology and its impact on American education*. Washington, DC: U.S. Government Printing Office.

Pachler, N. (1999) 'Theories of learning and Information and Communications Technology', in Leask, M. and Pachler, N. (eds.) *Learning to teach using ICT in the Secondary school*. London: Routledge

Pederson, K. (1987). *Research on CALL*. In W.F. Smith (Ed.) Modern Media in Foreign Language Education: Theory and Implementation pp. 99-132

Philips, R., Jenkin, N., Fyle, G., & Fyle, S. (1997). *The user interface design of learner-centered interactive multimedia programs*. Retrieved January 15, 2000 from World Wide Web: http://cleo.murdoch.edu.au/tlc/Philips/Ed-Media97/ Paper294.html.

Prescott, D. (2001) Developing Evaluation Instruments for CALL Software and English Second Language Websites with Pre-Service English Second Language Teachers, Papers from the *ITMELT* 2001 Conference,[online], Available from: http://elc.polyu.edu.hk/conference/papers2001/prescott.htm

Reiser, R. & Keglemann, H. (1994) *Evaluating instructional software: A review and critique of current methods*. Educational Technology Research and Development Vol. 42, No. 3, pp. 63-69

Robinson, P. (1995). *Attention, memory and the 'noticing' hypothesis*. Language Learning, 45: 285-331.

Russell, T. (2002). *The No Significant Difference Website*. [Online]. Available: http://teleeducation.nb.ca/nosignificantdifference/. [4 April 2002].

Sacks, C. Bellisimo, Y., & Mergendoller, J. (1994). Attitudes Towards Computers and Computer Use: The Issue of Gender. Journal of Research on Computing in Education. 26. 2:256-269.

Schnackenberg, H. L. (1997). *Learning English electronically: Formative evaluation in ESL software*. ERIC Document Reproduction Service No. ED403877.

Sharma, P. (1998). *CD-Rom: A Teacher's Handbook*. Oxford: Summertown Publishing.

Shive, G. (1999). *Information Technology, School Change and the Teacher's Role. Paper presented at the Conference on New Professionalism in Teaching, Chinese* University of Hong Kong, January 1999.

Threlkeld, R., & Brzoska, K. (1994). Research in distance education. In B. Willis (Ed.), Distance Education: Strategies and Tools. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Tolhurst, D. (1992). A checklist for evaluating content-based hypertext computer software. Educational Technology, Vol.3), P.17-21.

Torlakovic, I & Deugo, D. (2004). Application of a CALL System in the Acquisition of Adverbs in English. *Computer Assisted Language Learning*. Vol.17. Issue 2 (pp.203-235)

Underwood, J. (1984). *Linguistics, Computers and the Language Teacher*. Rowley, MA: Newbury House

Warschauer, M. & Healey D. (1998). *Computers and Language Learning: An overview.* Language Teaching, 31, 57-71. [Online] Available: http://www.gse.uci.edu/markw/overview.html [5 June 2002].

Warchauer, M. 1996. Computer-Assisted Language Learning: An Introduction. In S. Fotos (Ed.), Multimedia Language Teaching. Tokyo: Logos International.

Sourish, S. (2005), Implementation of Statistical Methods. University of www.**s**tat.ufl.edu/~**ss**aha/Publication**s**/Statistical

Zechmeister, J, & Shaughnessy, J. (1997) A Practical Introduction to Research Methods in Psychology Research Methods in Psychology 4th. New York: Springer.