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CALL and Students' Achievement: an Educational Study

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Abstract

Computer Assisted Language Learning (CALL) is now used in a variety of instructional settings. It can easily generate learner-centered, self-pacing activity. As in other programmed learning packages, CALL can change the proportion of learning from teacher-led to learner-controlled activity. There is a demand for technologically equipped teachers to meet the requirements of future generation teaching. In *CALL and Students' Achievement: an Educational Study*, the investigator is concerned about the effect of CALL in English Language Teaching.

The study is conducted with the objective to ascertain the achievement of students taught through CALL and NON-CALL with reference to giftedness, gender, and motivation. Based on the findings of the study, it is concluded that CALL can significantly enhance the students' achievement in English language learning as compared to the conventional methods. CALL may not be a significant determiner for the achievement of the gifted students, and non-gifted students are much benefited by learning through CALL irrespective of the gender. Students are more motivated by the autonomy enhanced by CALL as compared to the conventional methods.

Key words: CALL, Achievement, Educational Study

CALL – Originally a Supplement

The advent of Information and Communication Technology (ICT) has tremendously influenced the contemporary teaching learning process. The developments in technology

paved the way for an area of discussion in language teaching called Computer Assisted Language Learning (CALL). Spurred by the rapid development of technology from the early 1980s, CALL has now become an important component of second and foreign language learning pedagogy. Originally viewed as a supplement to classroom instruction, communicative interaction-based CALL activities are now used to promote learner autonomy and to encourage involvement with the target language both inside and outside of the classroom. CALL publications have evolved from explanation of computer and software to broad exploration of CALL-based pedagogy for a variety of instructional needs.

CALL: Concepts and Applications

Computer Assisted Language Learning (CALL) has been defined as "the search for and study of applications on the computer in language teaching and learning" (Levi, 1997). It is now used in a variety of instructional settings. This has necessitated the language teachers to possess CALL expertise that includes both practical skills and a thorough understanding of information technology (IT). Though Computer assisted Instruction (CAI) is common to teaching of all subjects, CALL has become an exclusive part of language teaching, especially Second Language (L2) learning. CALL covers a broad range of activities which makes it difficult to describe as a single idea. It has come to encompass issues of material design, technologies, pedagogical theories and modes of instruction. Materials for CALL can include those which are purposively made language learning and those which adapt existing computer based materials, video and other materials. In order to set a sense of direction in the general area of language learning, it is very important to attempt to examine CALL practice which may lead to effective venture in future.

CALL and Teaching Learning Process

One of the conventional rationales for the computer in language learning is the justification that it offers a powerful self-access facility. It can easily generate learner-centered, self-pacing activity. As in other programmed learning packages CALL can change the proportion of learning from teacher-led to learner-controlled activity. The role of teacher is more of a facilitator of learning situations. Autonomy is fostered by CALL in different ways.

As it is concerned with new technology, CALL brings about changes in the teaching methodology. This does not mean that the role of teacher is questioned by CALL because a computer managed simulation demands teaching skills of a very high order at least commensurate with anything required by the more sophisticated techniques in communicative language teaching. Anyhow a shift is taking place in the use of general technology and also in education from the teacher-centered classroom towards a learner-centered system where the learner is in control of the lesson content and the learning process.

CALL has historically been rooted in educational technology, and findings from the general field of education will continue to be influential on determining its future directions. The most effective uses of CALL support this new model of education and language teachers need to be able to respond by creating CALL-based activities for their particular instructional situation. It is rightly observed that there is no way the computer can replace the teacher, instead teachers who use technology will replace those who don't (Fotos and Browne, 2004).

The above-mentioned realities demand for technologically equipped teachers to meet the requirements of future generation teaching. Teachers may need to design, implement, and evaluate CALL activities in their classrooms, they may be asked to supervise an institution-wide project or to work with other institutions to develop CALL exchange program, or they may be put in charge of setting up and operating a multi-media language laboratory. It is thus becoming essential for L2 teachers to be familiar with CALL options within the classroom, at the institutional level, and at the broader level of inter-institutional collaboration.

Developmental Stages of CALL

In the last four decades, CALL materials have gone from an emphasis on basic textual gap-filling tasks and simple programming exercises to interactive multimedia presentations with sound, animations and full-motion videos. But this progress has not been purely linear and creative. Instead, many programmes being produced today are improvements upon the exercises used in the past. This prompts the necessity to study a brief history of CALL to understand the different developmental stages.

CALL in the 1950s and 1960s.

Influenced by Cold War (1945-91) political motivations, the first CALL programmes created at three pioneering institutions in USA, Stanford University, Dartmouth University and the University of Essex, focused on the teaching of Russian although, eventually, other languages were included as well.

Early programmes required the learner to choose one of two answers and the score was presented after the data had been processed. The challenge was to create a learner interface that presented the computer as an interactive tutor evaluating the student and providing subsequent activities.

Among the first and most significant applications for the teaching and learning of language at the computer were those used on the Programmed Logic/Learning for Automated Teaching Operations (PLATO) system, developed in 1959 by the University of Illinois. PLATO's computer and its programming language were custom-designed for the purpose of teaching language, as well as a range of other university-wide disciplines.

Much of PLATO's first language learning work was done in teaching Russian using Grammar Translation Approach, which dominated foreign language teaching from the 1840's to the 1940's. The earliest language learning programmes were strictly linear, requiring each learner to follow the same steps in the same fashion with rewards in the form of points and advancement for correct answers.

CALL in the 1960s and 1970s.

This first phase of CALL has been termed Behaviourist CALL (Warschauer, 2004). It dominated the 1960's and 1970's and replicated the teaching techniques of structural linguistics and the audio-lingual method, a behaviourist model of language learning based on habit formation. CALL consisted mainly of drill-and-practice programme and was regarded as supplement to classroom instruction rather than its replacement.

However, it should be noted that even today numerous drill programmes still exist for vocabulary study and grammar practice because repeated exposure to such material has been shown to promote its acquisition, and the computer provides both immediate feedback and presents material at the learner's pace, thereby encouraging learner autonomy.

These programmes were strictly linear, requiring each learner to follow the same steps in the same fashion with rewards in the form of points and advancement for correct answers. The tasks were essentially adaptations of traditional textbook exercises and did not take advantage of special features of the computer. The importance of simulation is that they create challenges for learners to explore multiple links and see the consequences of different actions and inputs.

CALL in the 1970s and 1980s.

The emergence of increasingly powerful microcomputers in the 1980's presented a greater range of possibilities for learner interaction and pioneer books on CALL methodology, such as Higgins and John's *Computers in Language Learning* (1984), Underwood's seminal *Linguistics, Computers and Language Teacher* (1984) began to appear. Microcomputers are what we would now call 'desktop computers' or 'personal computers'. 'Portable', or 'laptop', computers are included in this last category, but were introduced much later and are now far more powerful than the first mainframe computers.

This period also witnessed the establishment of key professional organizations such as the Computer Assisted Language Instruction Consortium (CALICO) in the United States and the European Association for Computer Assisted Language Learning (Euro CALL), and publication of their journals, CALICO Journal and Re CALL.

As mentioned above, changes to the field of CALL in 1980's were marked by a shift from mainframe computers and computer workstations such as UNIX machines to desktop models with applications that were more easily available for classroom use. Even though these machines were limited in power, it meant that classroom teachers could begin experimenting with creating their own, often simple, CALL applications to address local language teaching and learning concerns in a broad range of languages.

At the same time, the move to a more affordable platform with a larger installed base of computers within schools began to encourage and influence the production of commercial software programmes. In addition, language teachers themselves began to develop language-learning software using programmes such as HyperCard, which were based on a nonlinear concept of interactivity-one of the key concepts driving the subsequent development of Internet.

This next generation of CALL software was characterized as communicative CALL because it emphasized communicative use of the language rather than mastery of isolated forms. Programmes consisted of language games, reading and writing practice, text reconstruction, cloze tests, and puzzles. However, once again the prevailing model was the computer as tutor for the student, a teacher in the machine, and some researchers evaluating CALL questioned whether this technology was truly compatible with communicative methodology.

CALL in the 1990s.

In reaction to the criticism that CALL was limited to mechanic drills and lacked the ability to give learners essential feedback, the early 1990's was characterized by a different model, the computer as stimulus. Here, software followed cognitive model of language learning that aimed to stimulate students' motivation, critical thinking, creativity, and analytical skills rather than merely the achievement of correct answer or the passive comprehension of meaning. A related learning model was the use of computer as a tool providing the means for students to become active learners (Levy, 1997). Software in this category, such as word processor, spelling and grammar checkers, desktop publishing programmes, and concordancers did not supply language-learning activities but facilitated the students understanding and manipulation of the target language (Warschauer, 2004).

The Present Stage of CALL

The present stage of CALL, integrative CALL, arose in the mid 1990's and has been made possible by the development of powerful desktop computers that support rapid use of Internet, local area networks (LANs), multimedia, and linked resources known as hypermedia. Currently, a typical multimedia language program might allow students to do a reading assignment in the target language, use a dictionary, study grammar and pronunciation related to the reading, perhaps access support materials and translations in the first language (L1), view a movie of the reading, and take a comprehension test on the reading content, receiving immediate feedback, all within the same program. This is a highly interactive and individualized approach, with the main focus on content supported by modules instructing learners on specific skills. (For a glance at stages of CALL, see table 1)

Integration is regarded as essential for the creation of meaning in many of current CALL activities. Thus person-to-person interaction is a conspicuous feature of many current CALL activities. The rise of LANs to teach writing interactively and email exchange programmes among students, classes, and institutions are examples of interactive language learning activities. The rise of internet has promoted the use of CALL for information retrieval, creating the concept of computer literacy, a term referring to the development of skills for data retrieval, critical interpretation, and participation in online discourse communities.

Learner autonomy - the influential concept from general education suggesting that students learn better when they discover things through their own efforts rather than when they receive knowledge through instruction- is an important goal of the current view of CALL.

Another feature of integrative CALL is the movement away from language learning software and CD-ROMs to Web-based activities that allow learners flexible, self-paced access to information.

Thus both teachers and students increasingly view computers and CALL as means to an end- the end being authentic, web-based communication for meaningful purpose-rather than merely as a tool for language learning (Fotos and Browne, 2004).

TABLE 1
The Three Stages of CALL

Stage	*1970s-1980s: Structural CALL*	*1980s-1990s: Communicative CALL*	*21st Century: Integrative CALL*
Technology	**Mainframe**	**PCs**	**Multimedia and Internet**
English teaching paradigm	**Grammar translation and audio-lingual**	**Communicative language teaching**	**Content based, English for Specific Purposes**
View of language	**Structural(a formal structural system)**	**Cognitive(a mentally constructed system)**	**Sociocognitive(developed in social interaction)**
Principal use of computer	**Drill and practice**	**Communicative exercises**	**Authentic discourse**
Principle objective	**Accuracy**	**Fluency**	**Agency**

Based on Warschauer (2004)

Because of the rapidly changing nature of technology, it is impossible to visualize the changes that will occur as a result of future developments in CALL. It can be observed that we are heading toward a world without borders, with the rise of knowledge brokers and information literates as new aristocracy and power elite. However, the expensive technology and infrastructure required for online activities tend to privilege the culture and educational pedagogies of the advanced nations, creating a hegemonic digital divide between technological haves and have-nots (Murray, 2000).

CALL Approaches in Language Acquisition

Language Acquisition can be offered at the computer as learners are exposed to new language and when learners promoted to engage in collaboration that promotes negotiation of meaning, i.e., the interactional work done by speakers and listeners to ensure they have a common understanding of the ongoing meanings of the discourse. It is based on the fact that language learning and teaching is a fluid process in which different learner and teacher learning styles to be accommodated on an almost individual basis.

In terms of CALL, the individualization of instruction makes for even greater opportunities for Second Language Acquisition (SLA) to be, promoted through software designs that assess learners' learning styles and track their acquisition through tests which remember and revisit individual items with which each learner has difficulty. The possibilities of CALL in English Language Teaching (ELT) is an important area of study, especially in the context of the third world countries like India, where English has become a link language of the people. However, the discussion o the effectiveness of CALL in language learning is not free from the contemporary theoretical disposition on the nature of language acquisitions. This prompts the need for discussion of the approaches involved in CALL.

Behaviourist Approach.

A behaviourist model of instruction suggests that learners can be taught a wide variety of subjects if presented with information in small steps, each step requiring appropriate responses from the learner before going to more difficult or more advanced steps. This promoted the idea of machine instruction as a way of increasing learner autonomy to avoid an essential problem in class-room instruction, the pace of instruction in a group of learners whose comprehension and learning rates are at different levels.

Many features of programmed instruction are found in CALL such as the use of multi-choice questions, constructed response answers and hotlinks. But critics soon saw that programmed instruction had its faults, pointing out that programmed instruction tended to teach details about language but not communication. Despite this criticism, programmed instruction continues to be pervasive in CALL, sometimes combined with other less behaviourist features.

The reason for its enduring appeal is simply that programmed instruction is an easy thing for the computer to do, though not pedagogically ideal. This aspect of programmed instruction is also seen in another approach, mastery learning. Mastery learning assumes that wholes can be broken into parts, that skills can be broken onto sub-skills. Learners are diagnosed in terms of deficiencies, called 'needs', then taught until 'mastery' is achieved at each level. If this mastery, defined as behavioural competence, is achieved at each level, then the more general concept of the accumulation of the skills has also been taught.

Constructivist Approach

It is argued that behaviourism, with its focus on stimulus of an organism leading to a response behaviour that was either reinforced or not, is not a true picture of the working of the mind or an accurate description of the learning of language. Cognitivists criticized the behaviourist approach and it resulted in another model of instruction, known as constructivism.

Constructivism is a humanist model that differs radically from behaviourism, suggesting that learning is a process by which learners construct new ideas or concepts by making use of their own knowledge and experiences. The learner has greater control and responsibility over what he or she learns and relies on schema to select and transform information, create hypotheses ad make decisions.

Schema theory is important to CALL because it provides an idea of how knowledge is organized. Schema theory of language processing suggests that discourse is interpreted with reference to the background knowledge of the reader or listener. It also suggests that the knowledge we carry around I our heads is organized into interrelated patterns. These are constructed from all our previous experiences and they enable us to make predictions about future experience.

Schema theory is important to CALL because many aspects of schema mirror the organization of hypertext, hypermedia ad multimedia. Schema theory offers a dividing line between behaviourism and constructivism. Behaviourism often assumes that the learner's state of mind is that of a blank slate, waiting to be written on; constructivism assumes that the learner comes to the class-room with a rich set of ideas and experiences. As Beatty says, a constructivist model allows and encourages learners to build on what they already know and

go beyond the simple collection and memorization of information to develop individualized internalized principles (Beatty, 2003).

Constructivism supports key concepts of CALL, collaboration and negotiation of meaning. Collaboration provides opportunities for negotiation of meaning as learners struggle to build new schema and extend existing ones. The role of the teacher in a constructivist model includes presenting opportunities for learning and encouraging reflective thinking in learners, partly through collaborative peer activities. This process orientation of constructivism assumes that good methods for structuring knowledge should result in simplifying, generating new propositions and increasing the manipulation of information. Thus, like behaviourism, constructivism has also had a close connection with CALL. Many teachers would recognize aspects of constructivism in both class-room practice and some CALL programmes.

Collaboration and Negotiation of Meaning

Collaboration is among the most useful ways in which learners acquire language at the computer. Beatty defines collaboration a process in which two or more learners need to work together to achieve a common goal, usually the completion of a task or the answering of a question (Beatty, 2003). It is manifested in the actions a learner takes when working with others. When two or more learners sit at a computer and discuss process and content in the target language, they often engage in scaffolded learning, helping each other improve their language. Learners often collaborate, either on their own initiative or as an assigned activity. Collaboration is an important activity in the class-room because it encourages social skills and thinking skills and mirrors the way in which learners often need to work once they leave an academic setting. From the point of view of learning a language, there is an additional benefit, in the process of negotiating the meaning of a task and the means by which it may be addressed; learners make decisions about the learning materials they study and the ways in which they should study.

To negotiate meaning, learners engage in discourse that provides opportunities for comprehensible input and encourage comprehensible output. This helps learners build vocabulary, skills and language awareness. Further, it is suggested that collaboration supports a communicative approach to learning. This requires coordination and decision-making and interpersonal and communication skills. Such activities often work best with group members of different language and cultural background, such as in a mixed ESL classroom where English is the only common language.

Much research has been focused on individual learners using computer to collaborate over distance with other learners. In one version of this approach, collaboration takes place through local area networks within a classroom or among different classrooms in a school. Another approach is o offer opportunities for learners to use email and the World Wide Web (WWW) to communicate with the wider world. This approach is particularly appropriate for distance learning situations in which learners need to communicate with their teachers at greater regularity than is practical through correspondence-course mail.

A commonly observed collaborative phenomenon is pair or small groups of learners working on their own outside of a class at a single computer to complete a task or series of tasks. This type of collaboration is sometimes teacher-initiated but is more often learner-

initiated. The greatest reason for collaboration at the computer is the simple human desire for social contact; learners like to explore together and work together. Working together is an aspect of education consistent with one of the goals of modern schools, fostering the socialization of learners.

However, a concern of CALL is how collaboration promotes language learning through exposure to new language and opportunities to use it through negotiation of meaning with peers. Traditional class room settings are likely to be poor places for learners to acquire language compared to the world outside the class room, in part because teachers dominate the conversation with display question mean to elicit set responses. This criticism is largely answered by collaboration, whether within or outside of a class room context in which learners are able and encourage to engage in discourse freely. So it is the responsibility of the teachers and the institutions to organize the CALL class room in such a way to promote maximum collaboration.

CALL Applications in Language Acquisition

Although current language teaching practices emphasize meaning –focused language use, and learners are encouraged to process target structures in authentic discourse, the effectiveness of structure-based computer software tutorials for improving learner accuracy in the drilled structure has been noted from the earlier reviews of CALL effectiveness and continues up to the present. The challenge, therefore, is to retain those elements that promote the development of accuracy while providing meaning-focused use of the target structure to enhance language acquisition. This challenge is met by today's language learning software. Whereas early CALL software was text-based and was characterized by low interactivity, today's hypermedia programmes provide students with instruction on and practice in using target forms, listening exercises, dictionary assistance, pronunciation exercise, translation, and communicative usages of the forms through authentic texts, sound and video clips software.

Ken Beatty points out that there are eight current CALL applications available for language acquisition. They are:

- Word processing
- Games
- Corpus linguistics
- Computer-mediated Communication
- WWW resources
- Adapting other materials for CALL
- Personal Digital Assistants (Beatty, 2003).

CALL Applications in ELT

Skills-oriented language teaching remains a common approach for classes as well as for self-learning, and computer-assisted language learning is no exception. The followings are some of the possible applications of CALL in English Language Teaching.

Listening

Listening is potentially one of the most promising areas for CALL development. This is because multimedia computing has everything standard audio and video have with the addition of a variety of meaning technologies such as text support, hyperlinked glossaries, and even translations. Listening activities typically involve presentations followed by comprehension questions--some also include full or partial dictations. One type of presentation specific to CALL is the *punctuated* presentation, in which the flow is interrupted at intervals to ask questions along the way.

Speaking

In terms of *direct* practice of speaking, recent developments on the web have allowed for voice chat sites which make it possible for learners and teachers to interact through the Internet in distance education courses. Asynchronous speaking practice is possible through Internet voice mail, or simply attaching sound files to email. There are also programs which allow some limited conversation simulation that gives something of the experience through the use of speech recognition software. Most programs simply rely on voice recording, with the learner simply recording a line from a dialogue and then comparing it with the native sample. It has been suggested by many practitioners that using text-based chat supports the development of speaking **s**kills indirectly due to the synchronous and informal nature of chat.

Reading

Most reading instruction on disk and the web has involved the use of meaning technologies, such as hypertext glossaries, translations, and notes (on grammar, usage, culture).

Here are some other ways CALL can be used to support reading

- Just using the web: teachers give students tasks that require finding, comprehending and sometimes consolidating information on the web.
- Educational sites with EFL or adult literacy support.
- Text reconstruction activities, such as Storyboard, cloze exercises, and jigsaw readings
- Timed or paced readings to develop speed.
- Multimedia reading, such as voice enhanced texts and dynamically illustrated material
- Dedicated reading computers.

Writing

Writing was revolutionized for everyone with word processing, and the addition of spell checkers has been quite helpful. Grammar and style checkers are much less useful to date, and using a thesaurus can be counterproductive if students aren't trained in their limitations.

Some other ways computers enhance writing instruction include the following.

- Use of email for fluency development
- Online writing tutorials (e.g., using programmed prompts)
- Blank screen (where the monitor is turned off and students type in their ideas without being distracted) and other production techniques

- Publication opportunities (both paper and web) as motivators
- Collaborative writing tasks
- Writing support practice (e.g., CALL activities with fill-ins for structured writing)

Writing is also perhaps the most common skill to be taught as a course through distance education using the Internet.

Grammar

Grammar practice was perhaps the earliest use of CALL. Today grammar work is largely focused on the following:

- Workbook-style exercises (on disk and online).
- Grammar test prep materials.
- CD-ROMs accompanying grammar textbooks.
- Online courses and references.
- Hypertext-linked grammar notes accompanying readings.

Pronunciation

Pronunciation work is generally of three types.

- Listen, repeat/record, and compare. This option shows up in many multimedia programs and is analogous to the tape-based **language** lab technique in the audio-lingual method. However, the instantaneous response of digitized speech (no rewinding needed) makes the computer a more effective instrument for this.
- Visualization: wave form, pitch contour, spectrogram. The first and last are of questionable value. Wave forms are easy for a computer to produce, but they only clearly show the bands of intensity across time. This is most helpful in teaching rhythm. Spectrograms are most useful if they have high detail, which they generally don't on CALL software, and they require training in phonetics to interpret them. However, visualization of pitch contour has been found to be quite helpful for some students in recognizing and producing both the patterns and ranges of intonation.
- ASR (automatic speech recognition) scoring. Here, the computer uses speech recognition software to grade accuracy. This can be useful, but there are a lot of technical problems--microphone quality, sound card quality, and background noise are all variables that can negatively affect the score, leading even native speakers to score as non-natives. There are a number of commercial CD-ROMs for teaching pronunciation. These are generally superior to the text and tape alternatives.

Vocabulary

Vocabulary activities have been around since the early days of CALL in the form of electronic flashcards (linking L2 word to L1 translation or L2 word to L2 definition). Other common CALL implementations for vocabulary include the following.

- Hypertext dictionaries/glossaries
- Talking dictionaries: Longman, Oxford, and Newbury House have learner's dictionaries with CD-ROMs

- Concordance programs: these programs look for words in collections of texts, or corpora, and return examples of the word in the immediate context it occurs in
- Picture dictionaries/vocabulary building activities; note, you can use Google's image search as a picture dictionary if you know the word but aren't sure what it means.

Apart from the above mentioned, there are a number of ways in which CALL can be applied in EFL, depending on contexts as well as individual efforts.

Statement of the Problem

In this study the investigator is concerned about the effect of computers in English language teaching. The question posed is, "Does Computer assisted Learning improve the students' achievement?" This prompted the investigator to develop the statement as follows: *"CALL and Students' Achievement: an Educational Study".*

Justification of the Choice of the Problem

The advantages of computer-assisted learning may be universally accepted, but how effective it can be in the actual teaching-learning process is yet to be explained, it is thus crucial that we consider our position, prepare ourselves for the impact of the computer and absorb its implications for curriculum renewal and methodological change. CALL may not be a new phenomenon for the advanced countries, but the possibilities of CALL in the Indian context, where technological infrastructure is comparatively limited in nature, has to be analyzed further.

The choice can be further justified when we consider the rapid technological advancement that revolutionized the information and communication systems. As an emerging language teacher the investigator is bound to accept the challenges posed by computer and to make teaching of English more lively and integrated. This necessitates a study about the effectiveness of CALL for students' achievement in English.

Objectives of the Study

The investigator carried out the study with the following objectives:

(a) To ascertain the achievement of students taught through CALL and NON-CALL
(b) To study the effectiveness of CALL and NON-CALL in the achievement of gifted students
(c) To study the effectiveness of CALL and NON-CALL in the achievement of non-gifted students.
(d) To ascertain the achievement of boys and girls taught through CALL.
(e) To ascertain the motivation of students taught through CALL and NON-CALL.

Hypotheses

Based on the objectives, the investigator formulated the following hypotheses:

(a) There is no significant difference in the achievement of students taught through CALL and NON-CALL.

(b) There is no significant difference in the achievement of the gifted students taught through CALL and NON-CALL.
(c) There is no significant difference in the achievement of the non-gifted students taught through CALL and NON-CALL.
(d) There is no significant difference in achievement of boys and girls taught through CALL.
(e) There is no significant difference of motivation between the students taught through CALL and NON-CALL.

Tools of the Study

To carry out any type of research investigation data are gathered and using which hypothesis may be tested. The investigator used the following tools:

- Achievement test
- Interview
- Observation

Preparation of CALL Material

Preparation of course-specific material is an important aspect of this study. The material should be capable of providing the learner autonomous learning

Administration of Test

In order to identify effects which were due to the medium in which the materials were presented, an activity was chosen which existed in both computerized and non-computerized form. So the investigator selected lessons in grammar, regarding the usages of pronouns and adjectives, based on the middle school level. It was based on both the behavioural as well as cognitive approaches. Sufficient care was taken to give multimedia effect to the CALL material as a result it could give maximum autonomy of learning.

The effect of differences among the subjects using the materials was minimized by matching students according to language level, according to their experience with computing, and, informally according to their personality.

Finally, in order to minimize differences due to order in which the tasks were performed in two different media, two tasks were selected. Group A did the first task in CALL form, with Group B doing the same task in non-CALL form. The situation was then reversed for the second task with Group B doing it in CALL form, and Group A doing it in non- CALL form.

A one hour test was administered after completing the specific course designed. Same test was given to those students who studied through CALL and to those who studied through conventional methods. Thus each student took two tests of the same level but differed in their mode of study in both the occasions. The investigator tried to give the same testing conditions in both the cases.

Sample of the Study

As the study required experimental teaching with computer, the investigator had to select students who are familiar with basic computer knowledge. A sample of 12 students was taken from the class 7 of AUP School Trippanachi, Malappuram, Kerala, India. The reason for the selection of this particular group was that they were familiar with basic computer applications. Further, they were students who chose English as their medium of instruction. The selection of the subjects was made on the basis of a selection test, with equal weightage being given to both to their knowledge of English and Computer. Then the selected students were divided into two groups.

Statistical Tools Used

For the analysis of data, the investigator used the following statistical methods.

- Mean
- Standard Deviation
- 't' Test

Analysis and Interpretation

Each objective of the present study has been stated by the investigator, followed by its corresponding hypothesis. The analysis of the obtained results and interpretation for a particular hypothesis has been presented along with its result. As the present study is experimental in nature, some of the interpretations are based on the qualitative data obtained by the investigator's observation and interview with the subjects.

Objectives

The objectives of the study have been specified as follows:

Objective No.1

To ascertain the achievement of students taught through CALL and NON-CALL

Hypothesis No.1

There is no significant difference in the achievement of students taught through CALL and NON-CALL.

Mean, SD, SEM, t-value etc. of the students taught through CALL and NON-CALL methods

Group	No	Mean	Pooled SD	SEM	Calcul. t-value	Tabula. t-value	D.f	LS	Ho R/A
CALL	12	18.58							
			3.88	18.58	2.10	2.07	22	0.05	A
NON-CALL	12	15.25							

TABLE 3

Interpretation-1

The table 4.1 shows that value of ***t*** calculated is higher than ***t*** tabulated value. Therefore the null hypothesis is rejected. There is a significant difference in the achievement of the students taught through CALL and NON-CALL methods (Figure 1).

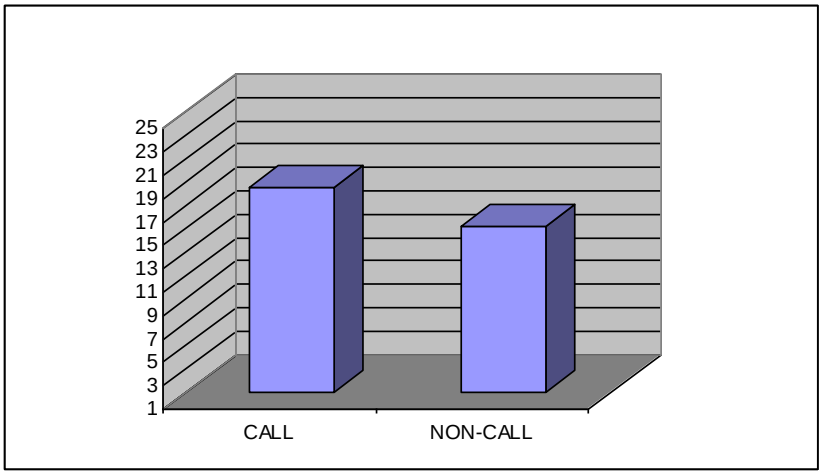

FIGURE 1

Objective No.2

To study the effectiveness of CALL and NON-CALL in the achievement of gifted students.

Hypothesis No.2

There is no significant difference in the achievement of the gifted students taught through CALL and NON-CALL.

Mean, SD, SEM, t-value etc. of the gifted students taught through CALL and NON-CALL methods

Group	No	Mean	Pooled SD	SEM	Calcul. t-value	Tabula. t-value	D.f	LS	Ho R/A
CALL	03	22							
			1.91	1.56	-0.21	2.78	4	0.05	A
NON-CALL	03	22.33							

TABLE 4

Interpretation-2

The table 4.2 shows that value of ***t*** calculated is quite smaller than the ***t*** tabulated value. Therefore the null hypothesis is accepted. There is no significant difference in the achievement of the gifted students taught through CALL and NON-CALL methods (Figure 2).

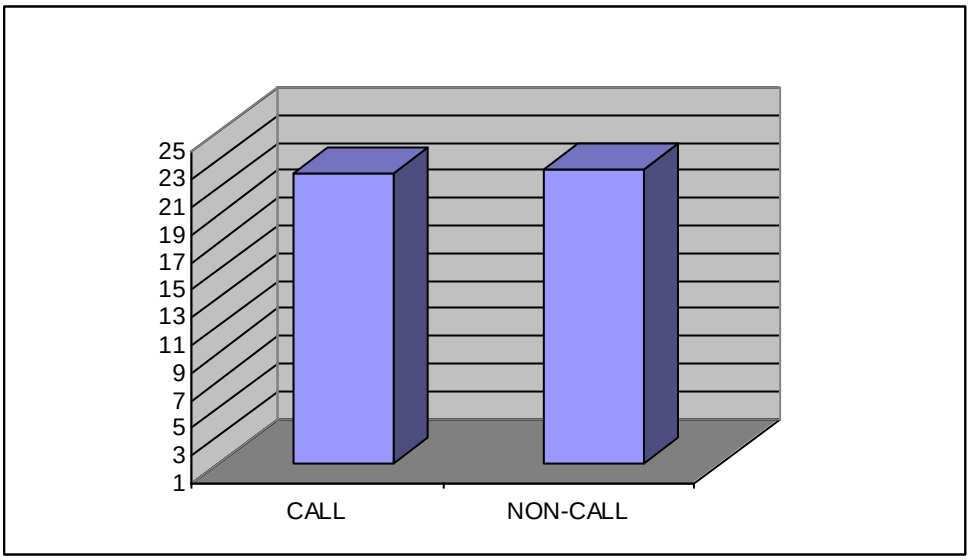

FIGURE 2

Objective No 3

To study the effectiveness of CALL and NON-CALL in the achievement of non-gifted students.

Hypothesis No 3

There is no significant difference in the achievement of the non-gifted students taught through CALL and NON-CALL

Mean, SD, SEM, t-value etc. of the non-gifted students taught through CALL and NON-CALL methods

Group	No	Mean	Pooled SD	SEM	Calcul. t-value	Tabula. t-value	D.f	LS	Ho R/A
CALL	09	17.78							
			2.85	1.341	3.064	2.12	16	0.05	A
NON-CALL	09	13.67							

TABLE 5

Interpretation-3

Table 4.3 shows that value of ***t*** calculated is quite higher than ***t*** tabulated. Therefore the null hypothesis is rejected. There is a significant difference in the achievement of the non-gifted students taught through CALL and NON-CALL methods (Figure 3).

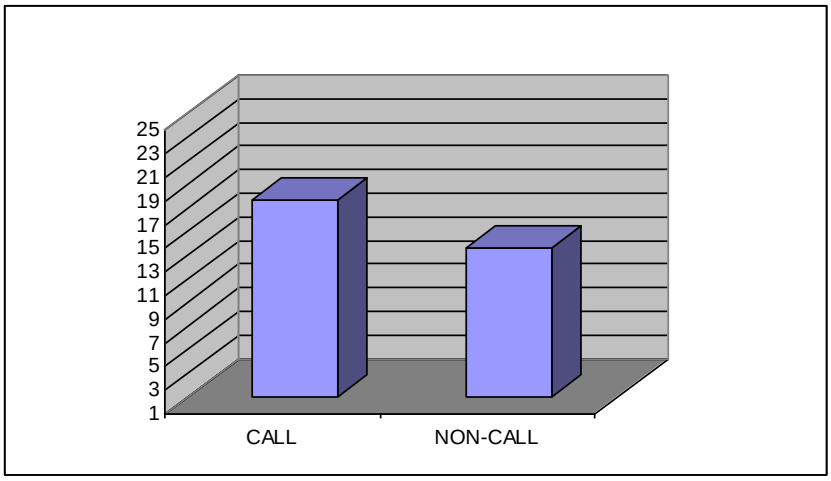

FIGURE 3

Objective No 4

To ascertain the achievement of boys and girls taught through CALL.

Hypothesis No 4

There is no significant difference in achievement of boys and girls taught through CALL.

Mean, SD, SEM, t-value etc. of the boys and the girls taught through CALL

Group	No	Mean	Pooled SD	SEM	Calcul. t-value	Tabula. t-value	D.f	LS	Ho R/A
Boys	04	18.75							
			2.945	1.803	0.139	2.23	10	0.05	A
Girls	08	18.5							

TABLE 6

Interpretation -4

The table 4.4 shows that value of ***t*** calculated is quite smaller than ***t*** tabulated value. Therefore the null hypothesis is accepted. There is no significant difference in the achievement of boys and girls taught through CALL (Figure 4).

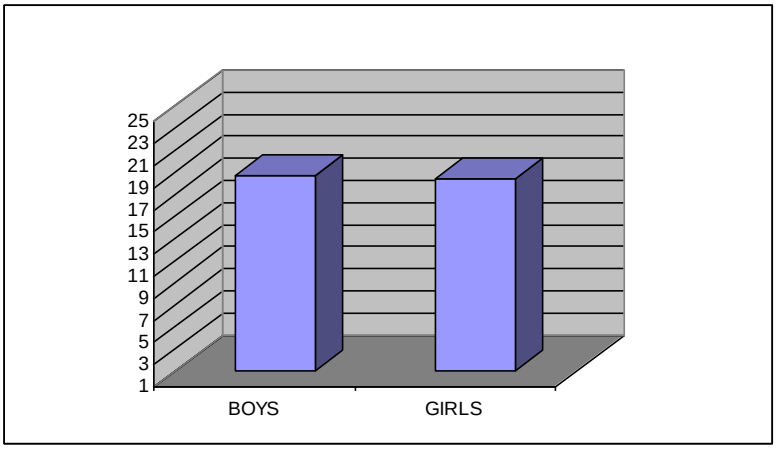

FIGURE 4

Objective No 5

To ascertain the motivation of students taught through CALL and NON-CALL.

Hypothesis No 5

There is no significant difference of motivation between the students taught through CALL and NON-CALL

Interpretation-5

This interpretation is based on the qualitative data obtained by the investigator through observation and interview. It was observed that students spent more time while studying through CALL as they were motivated by the autonomy of provided by the CALL exercises. Thus the null hypothesis is rejected. There is a significant difference of motivation between the students taught through CALL and NON-CALL.

Findings

The findings, which are based on the interpretations of the analysed data, are as follow:

1. It was found that CALL could significantly enhance the achievement of students in their course of study. The learning through CALL mode outperformed the learning through NON-CALL.
2. The higher gifted students were not much influenced by CALL to enhance achievement. They achieved higher results irrespective of the mode of study.
3. The non-gifted students were the beneficiaries of CALL. It was found that they performed significantly better through CALL method.
4. It was found that there was no significant difference in the achievement of boys and girls taught through CALL.
5. Students were motivated by the autonomy given by CALL. The students who studied through CALL spent considerably longer duration for study compared to their NON-CALL counterparts. Further, all the students liked their experience with CALL.

Discussion

The findings of the study throw light into the important role that computers can play in English language teaching.

Firstly, CALL has been proved as an effective method for students' achievement. This confirms the earlier findings in this field. It is interesting to note that CALL does not underestimate the role of teacher. The teacher has to do a lot of ground work behind the curtain in the preparation of appropriate materials, using appropriate media.

Secondly, the performance of the gifted students does not depend upon the methods of teaching. They have the capacity to grasp the concepts in both the methods. This does not mean that they did not like CALL. All the students tend to like CALL as compared to the conventional methods. But as far as academic achievement is concerned, superior students do not benefit much from CALL.

Thirdly, the non-gifted students get much benefit by CALL approaches. It is because the computer can repeat the same procedures without fatigue. So the students get the chance to be thorough with the materials through repeated exercises. So they tend to spend much time, taking advantage of the autonomy provided by CALL. This is a significant advantage of CALL for the average students as contrasted to the case of the higher achieving students, who do not require repeated exercises to understand the basic concepts.

Fourthly, gender is not a barrier in acquiring efficiency in technology enhanced learning. It matters whether the subjects are familiar with the basic computer applications. Thus there is no significant difference among boys and girls who worked on CALL with regard to the academic achievement.

Lastly, autonomy enhanced by CALL fosters much relaxation to the students. Contrary to the traditional classrooms, students tend to spend more time with computer. It happens because they enjoy the state of being stimulated by multimedia programmes. It was also observed that, even though CALL gives autonomy of learning, the students used to seek the help of the teacher for the proper functioning of the learning.

Conclusions

Based on the findings of the study the investigator arrived at the following conclusions:

1. CALL can significantly enhance the students' achievement in English language learning as compared to the conventional methods.
2. CALL may not be a significant determiner for the achievement of the gifted students.
3. Non-gifted students are much benefited by learning through CALL.
4. There is no significant difference in the achievement of boys and girls taught through CALL.
5. Students are more motivated by the autonomy enhanced by CALL as compared to the conventional methods.

Recommendations for Future Research

As stated earlier, the present has been a pilot investigation, which has many limitations and problems. It is the moral obligation of the investigator to recommend the following suggestions for future research in this field.

1. The sample of the study is not adequate enough to arrive at broader generalizations regarding the topic. This happened because of the limited resources available to the investigator. There was time constraint for the investigator to experiment with larger population. Therefore, the investigator would like to suggest the future researchers to ensure the findings of the study with more experiments.

2. In this study, the investigator made special arrangements to study the effectiveness of CALL in English language teaching. It would be desirable if future researchers focus on how CALL can be implemented in the actual teaching-learning situations. So, the possibilities of CALL in larger classroom set ups have to be studied in detail.

3. Technology is an ever-changing phenomenon. So the researchers in this field are obliged to focus on the latest possible extends of technology. While conducting research, it is crucial to find the suitable environment which can provide satisfactory infrastructural facilities.

4. The investigator studied only the area of teaching grammar through CALL. Other areas in teaching of English have to be studied in the context of CALL.

5. In the present study, the investigator used self-made CALL materials which could serve the purpose of a pilot study. The researchers can utilize the available resources in the market, but they have to verify the appropriateness and authenticity of such materials before putting them into practice.

6. Researches should focus on how well CALL can be designed for the academic achievement of students of different social, linguistic and educational levels.

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