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**Volume 10, Number 4 (2024)****ISSN: 2395-0595****Exploring the Evolution of Computer-Assisted Language Learning: Phases, Normalization, and E-Literacy****Entisar Allafi Mohammed**[en.mohammed@zu.edu.ly](mailto:en.mohammed@zu.edu.ly)Zawia University, College of Education, Abi-Isa, English Department, Zawia, Libya

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***Abstract***

This study investigates the development and implementation of Computer-Assisted Language Learning (CALL) in language education, tracing its evolution through structural, cognitive, and socio-cognitive approaches. The paper critically examines the key features of each phase, highlighting the transition from drill-based learning to interactive, communicative, and networked environments. It explores the concept of normalization, where technology becomes an integral yet invisible part of education, and discusses the challenges and opportunities associated with achieving this state. Furthermore, the role of e-literacy in fostering effective communication, research, and content creation in digital environments is analyzed. By addressing theoretical frameworks, practical applications, and the barriers to broader adoption, this paper underscores the potential of CALL to transform language education when aligned with learner needs and technological advancements.

***Keywords:*** CALL, Communicative, Language Education.

## **1. Introduction**

The term Computer-assisted language teaching refers to the strong relationship between computers and their use in the teaching and learning environment. Levy (1997:1) defines Computer Assisted Language Learning (CALL) as “the search for and study of applications of the computer in language teaching and learning”. This paper is trying to demonstrate and critically evaluate the main issues that are aroused out of CALL such as CALL phases, normalization, e-literacy, and computer-based materials. Computer-Assisted Language Teaching (CALT) represents the intersection of technology and pedagogy, emphasizing the use of computers to enhance the teaching and learning processes in language education. It reflects the growing integration of digital tools in educational environments, which has transformed traditional methodologies and introduced innovative ways to support both teachers and learners. Levy (1997:1) provides a foundational definition of Computer-Assisted Language Learning (CALL) as “the search for and study of applications of the computer in language teaching and learning.” This definition underscores CALL’s dual role as both a practical tool and a subject of academic inquiry, aiming to optimize language acquisition through technology.

The use of CALL has evolved significantly over the decades, moving beyond its initial phases of basic drill-and-practice software to encompass advanced, interactive, and integrative applications that address diverse learner needs. With the proliferation of internet access, multimedia resources, and mobile technology, CALL now offers opportunities for individualized learning, collaborative interaction, and access to authentic language materials. This paper seeks to delve into the critical aspects and challenges associated with CALL, including its historical development, categorized into distinct phases such as structural, communicative, and socio-cognitive approaches. It further explores the concept of normalization, a stage where technology becomes seamlessly embedded into everyday teaching practices, and the implications of achieving this integration. Additionally, the paper discusses the importance of e-literacy, highlighting how digital competencies influence the effectiveness of CALL in language education. Finally, the study examines computer-based materials and their potential to enhance learner engagement and outcomes, aiming to provide a comprehensive evaluation of CALL's contributions and limitations in modern language pedagogy.

## 2. CALL Phases

CALL has developed increasingly over the last thirty years or so, this development can be classified in terms of three distinct phases. According to Warschuer and Kern, (2000) these three phases are structural *CALL*, *integrative CALL*, and socio-cognitive *CALL*.

### 2.1 The structural approaches to CALL

The starting phase to call is the structural approaches that developed in the 1960s and 1970s. This phase refers to the earliest computer programs that contain grammar and vocabulary tutorials, drills, and language testing materials, strictly followed by computers as a tutoring model. It assumes that repeated drilling on the same materials is essential for learning (Warshuer and Kern, 2000). That is to say, the computer acts as a means for delivering instructional materials to the learners. This computer software is designed to provide quick positive or negative feedback for the learner. These programs help learner to work individually focusing on their own needs and proceeding at their own pace. Tutorial-based programs are also “allow for focused, conscious, and explicit learning” (Jarvis 2008a:380). In addition, the advantages of using grammar tutorial exercises are that it suitable for some learning styles. That is to say, some learners prefer to learn rules before applying it in communicative settings and some learners feel more secure being able to do activities in which the required answer is clearly defined (Healey, 1999 cited in Levy and Stockwell, 2006). However, these programs might not be enough challenging for both learners and teachers ([Stevens 1989](#)) point out that all CALL software and activities should build on intrinsic motivation and should promote interactivity - both learner-computer and learner-learner. Moreover, these programmes have technical problems as they restrict learners to only one acceptable answer per item (Warshuer and Kern, 2000).

According to Levy and Stockwell (2006) computer tutorials programmes analyse and assess students’ performance on a question and provide feedback on it. There are two types of CALL the tutor which are simple and complex tutors, the former gives only right or wrong feedback to specific types of activities such as true/false, multiple-choice and gap filling exercises, which frequently accompany online receptive skills exercises (reading and listening). The latter is considered to be more sophisticated as it can diagnose and correct errors. CALL software programmes that aim to achieve this task are referred to as ‘intelligent language tutoring systems’ (ILTS).

The appositve point for ILTS feedback among the more straightforward feedback provided by CALL programs is that more sophisticated error analysis feedback can be gained. ILTS also demands highly computational expertise as well as subject-domain expertise to design appropriate activities for the learners. Additionally, providing learners with authentic, relevant, and updated tasks might be time-consuming (Toole and Heift, 2002). One of the most developed of these programs was the 'PLATO' system which emerged in the 1960s and includes vocabulary drills, explanations of grammar rules and drills, and some translation tests ([Ahmad et. al, 1985](#)). There are many other computer programs available online, that function as a tutor in teaching and learning English. For instance, one such example of a tutorial-based CBM that specifically concentrates on the needs of NNS is *Using English for Academic Purposes* (Jarvis, 2008b). The Uefap program is useful for all students who are studying English or other subjects through the medium of English. On the home page, left-hand side there is a uefap menu that contains the main four academic skills, vocabulary, and materials which provide more information about the topics included in the writing or reading skills and also links to other learning websites for more exercise. There is also an accuracy section that is useful for productive skills (speaking and listening). This program can be useful for follow-up activities and self-study. Another example of CALL the tutor is the *hangman* program; this program is designed mainly to learn vocabulary. Learners need to choose a category from the hangman menu such as colors, flowers, clothing, and weather. There is a hint provided which is how many letters the missing word has. Once the student answers, the feedback will be either *Bravo* or a *hangman*. This program can be used individually or collaboratively.

## **2.2 The integrative CALL**

The second period of CALL was based on the communicative approach to teaching which became very famous in the 1970s and 1980s. Advocators of this approach felt that the drill and practice programs of the previous phase did not allow enough authentic communication to be of much value (Warshuer, 1996).

Moreover, this phase aims to focus on the learners, as learners can construct new knowledge through the exploration of the 'microworlds' which provide them with the opportunity to solve problems and test hypotheses. The computer in this phase is seen as a provider of tools and resources to the learners and learners can decide what to do with these in a simulated environment (Warshuer and Kern, 2000).

Computer applications in this phase incorporate videos, Sounds, and graphics which contain a sense of realism and therefore enhance the learners' interest. Moreover, some of these programs allow learners to create their video albums (Warshuer and Kern, 2000). This paradigm has used computers in three ways; first, as the "knower-of-the-right-answer" (Taylor & Perez 1989:3) cited in (Warshuer, 1996) thus this shows an extension of the computer as a tutor model. But not in the drill and practice format - the process of finding the right answer involves a fair amount of student selection, control, and interaction. One good example of this model is *Introductory English Grammar and Vocabulary with Color Key* software. It is a software application designed to help beginner English learners acquire and remember basic grammatical rules and vocabulary in English. The program concentrates on teaching basic grammatical issues by enhancing the parts of speech, each of which has been given a specific color to prompt learners to notice the word order of these grammatical structures. Secondly, the computer is used to simulate discussion, and writing and develop learners' critical thinking. Such programs may not be designed specifically for learning purposes such as computer games. To give an example, the 'sim city' game, is a very motivating game as it takes the user out of the learning and teaching environment. The player is the controller of the city, and everything acts according to his/her actions and decisions. After the game teachers could ask students about what are the values, responsibilities, and consequences of their choices and decisions about building and controlling the city.

The third model involves using computers as a tool or a workhorse, and this type does not present any materials for the learners but encourage them to use the language. For examples, concordances, word-processors, spelling and grammar checkers (Warshuer, 1996). With computer tools the role of technology is described as an "enabling" device. Therefore, it helps learners to access and search database such as monolingual and bilingual dictionaries and archives. Besides that, it also provides access to communication software and facilitates its use such as e-mails (Levy and Stockwell 2006). The word processor is a good example of tool-based programs, as it continues to play a major role on many courses. One might expect that its popularity is determined by issues of pedagogy and the integration of word-processed writing tasks into the writing syllabus (Jarvis, 2004). Word processor helps learners to develop their writing skills and improve their handwriting. However, since the word processor is provided by grammar and spelling checkers which are used to correct learners' mistakes, it could be also considered to have a tutor role (Jarvis, 2008a)

Communicative CALL plays a vital role in language learning. However, some scholars felt that CALL was “still failing to live up to its potential”. Critics argued that the computer was being used in an unplanned and disconnected fashion and thus "finds itself making a greater contribution to marginal rather than to central elements" of the language teaching process. Kenning and Kenning, (1990) cited in Warschauer and Kern (2000: 10). Moreover, computer activities create a tutor and pupil model, in which the computer acts as a teacher and the learner acts as a student keep the teacher away from what the learner is doing individually and autonomously outside the classroom. It creates a situation in which a student has two language teachers at a time one in the classroom and one in the computer. Such a situation can hence compromise the collaborative nature of classroom learning (Crook, 1994 cited in Warschauer and Kern 2000)

These critiques of CALL fit together with a broader evaluation of the communicative approach to language teaching. No longer satisfied with teaching skills or structures in a compartmentalized way (even if taught communicatively), several educators were searching for ways to teach in a more integrative approach, for example using task- or project-based approaches. The challenge for Proponents of CALL was to develop models that could help integrate the various aspects of the language learning process. Fortunately, the developments of computer technology were providing the opportunities to do just that (Warschauer, 1996).

### **2.3 Socio-cognitive Approaches to CALL**

CALL played a different role in this phase according to Egbert (2005: 3) “CALL expanded its program by using the Internet as a medium to help native and non-native users of language to interact with each other”. This phase involves a shift from learners’ interaction with computers to interaction with other humans using the computer. This approach is based on theoretical and technological developments. Theoretically, it focuses on meaningful interaction in authentic discourse communities. Technologically, the computer network is seen as a vehicle for human communication interactive (Warschauer and Kern 2000). Computers play a mediational role that facilitates the way people interact with the world. For instance, word processors facilitate the invention, revision, and editing of writing, and allow for quick and more accurate reforming of the text. ‘Storyboard’ is a program that allows learners to manipulate texts in many ways, allowing them to reconstruct their original text and also to develop their construction of language.

Another example is the concordances such as ‘Micro-concord’ which is considered to be a good tool in helping learners to utilize language with greater lexical and meaning appropriateness (Warschauer and Kern 2000). Computer networking in the language classroom is based on two technological and social developments; computer-mediated communication (CMC) and secondly, globally linked hypertext. According to Levy and Stockwell (2006: 24), Computer-Mediated Communication (CMC) refers to “communication between humans that is mediated by technology”. CMC has become well-known since the 1980s. This communication can be asynchronous (not simultaneous) through tools such as electronic mail, chat, mobile technologies, and video conferencing which allows each participant to create messages at their time and pace, or it can be synchronous "real-time", using programs such as [MOOs](#) and Eudora Light. MOOs stand for “Multi-user domain, Object Oriented”. It can be a good example that can be used in the classrooms, as it engages students’ interests and provides a social environment that makes learning more authentic. Teachers, and often students, can design a virtual world that is suitable to their needs and desires, especially in writing-intensive courses, a huge part of the usefulness of MOOs is that they are text-based. There are also authoring programs that can be used as a web page at the same time. For example, the [TexToys](#) program allows teachers to create on-screen learning activities. Then teachers can deliver these exercises to the students as interactive web pages, and can also be uploaded to hotpotatoes.net. Students can also try out some exercises from the TexToys tutorial that include different grammar drills and text reconstruction.

Interestingly, and for the first time, language learners can communicate directly, easily, and suitably with other learners or speakers of the target language at any time and from anywhere, from school, work, or home. Moreover, it allows people all around the world to have a synchronized conversation by typing at their keyboards. It also allows one-to-many communication. For example, it allows a teacher or student to share ideas and messages with the whole class or one classmate, or an international discussion list of hundreds or thousands of people from different places. Computer-Mediated Communication allows users to share long messages and documents, but formatted or unformatted which helps to facilitate collaborative writing. Using the World Wide Web (WWW) helps to search for plenty of files around the world within a few minutes to find and access authentic materials such as graphics, sounds, video, newspaper and magazines, articles, radio broadcasts, short videos, movie reviews, exactly serve the learner own interests.



They can also use the Web to publish their writings or multimedia materials to share with the whole class or with the general public (Warschauer, 1996). In his article, he gave an example of Mexican students of English who use the World Wide Web not only to write homework for the teacher but also they search the internet to find some articles, and then read these articles carefully. After that, they try to compose a similar one and send it to their teacher online as a first draft. The teacher gives them feedback with criticism and more interestingly the teacher also creates an electronic link to his comments and a page of suitable linguistic and technical illustrations, so that additional information and help can be provided by clicking a mouse.

### **3. Normalization of CALL (Bax, 2003)**

Bax (2003) criticized Warschauer's three approaches to CALL. He suggested that the names and dates of these phases have significant differences in some publications. "The stages ...do not fall into neatly contained timelines". Bax modified these three stages and gave them new names, restricted CALL, open CALL, and integrated CALL and normalization. For this assignment, the focus will be on the last phase which includes normalization. According to Bax (2003:23) normalization can be defined as the "stage when the technology becomes invisible, hardly even recognized as a technology" It refers to the stage when technology can be fully integrated into education, this concept is related to any kind of technology innovation. Normalization is seen as an 'end goal of CALL'. Other types of technologies such as a pen and a book are now fully normalized to the degree that we hardly recognize them as technology (Bax, 2003). CALL will reach this position when computers have a very different shape and size, and when each student will use a computer every day. Also, CALL will be normalized when teachers will integrate computers as a main part of each lesson. Most importantly, "when computers are treated as always secondary to learning itself when the needs of learners will be carefully analyzed first of all, and then the computer used to serve those needs" (Bax,2003: 24).

As Bax (2003) points out in order to achieve a state of normalisation, a number of elements needs to be taken into account such as, when CALL is regarded by most teachers and learners in a similar way as other technological tools that form part of our daily lives will it be considered something normal and no longer regarded with fear and awe and expected to deliver more than it can realistically accomplish.



However, undoubtedly a few normalisation tasks are already approached such as sending electronic assignment copies to tutors and writing homework using the word processor. Collins and Wende, (2002: 7), for example, point out that "ICT [information and communication technology] use, in terms of email, word processing, PowerPoint, and the Web, has become standard as part of the teaching and learning process". Normalization is there but it is difficult to achieve easily and applying it will be very expensive, not only in terms of money but also in terms of teachers' and learners' points of view. Bax and Chambers (2006) completed a qualitative study in which they aimed to investigate how CALL is currently used at two institutions and to understand the reasons why it is not used more extensively. Participants in this study were teachers. The findings showed that some factors seemed to be impeding normalization. For instance, lack of time as the participants reported that they do not have enough time to prepare for using computers in their teaching. Another point is that location and access since teachers reported that the computer laboratories are five minutes away from the institution, or because the system of booking and accessing computer rooms is a complicated process. According to Bax and Chambers (2006:470) "For normalization to take place, CALL facilities will ideally not be separated from 'normal' teaching space". Another teacher claims that there is not enough space to walk around computers and see what each learner is working on. "For normalization to occur, the classroom will ideally be organized to allow for an easy move from CALL activities to non-CALL activities" (Bax and Chambers 2006: 470). Worries and misunderstandings were also factors in impeding normalization; some teachers were apprehensive about using computers, feeling that learners might know more about technology than they do. Therefore, the digital divide issue also needs to be taken into account when applying normalization, the differences between those with good computer skills and others who know only a little about it. One noteworthy misconception included the view that CALL necessarily means placing learners in front of computers for the whole lesson with no role for the teacher. Unwillingness to change was another factor as some old teachers refused the idea of incorporating the CALL into their syllabus.

#### **4. E-literacy**

According to Shetzer and Warschauer (2000:173), “electronic literacy framework considers how people use computers to interpret and express meaning”. Thus “electronic literacy involves what has been called information literacy -the ability to find, organize, and make use of information -but electronic literacy is broader in that it also encompasses how to read and write in a new medium”. Teaching and learning computer skills is crucial to students' future success. The purpose of using the Internet is not only to learn English but also to be able to function efficiently on the Internet with the use of English. Since about 85 % of stored information on the world is in English. Here are some examples of classroom implications of the e-literacy framework which are adapted from (Shetzer and Warschauer, 2000) in which electronic literacy skills are divided into three overlapping areas; communication, construction, and research. It is important to teach students how to communicate effectively via computers, like many dominant tools, CMC is difficult to master and, if used inadequately it can result in as much harm as good. For example, teachers can ask their students to participate in collaborative tasks with people in different places to achieve a shared goal. This can encourage students’ speech acts and conversational strategies; learners will also be engaged in authentic interaction through email or other communication tools. Another example is having students create a web page and websites individually or collaboratively by using an effective combination of texts and other media in hypertext format. Similarly, students can express themselves through the use of videos and graphics, and they can publish their work on an accessible web page. Therefore, they can get feedback and have discussions with others who share the same interests. Students can also practice finding information on the web and use it for their research, but before doing so they need to know how to use particular search tools such as search engines and web indices. Moreover, they need to evaluate and analyse the value of the information. Research tasks can be considered as activities themselves, as they involve developing of reading and writing skills in an electronic environment. Jarvis and Pastuska (2008c) completed a study about the importance of having e-literacy skills for students. The research aimed to test the relationship between reading in English on the WWW and the level of classifying computer skills. Warschauer et. al. (2000:172) stated that "although reading and writing online are closely related to reading and writing in print, the two literacy contexts are also sufficiently different to demand theoretical and practical attention."

The sample of the study is non-native speakers of English who are divided into two groups those with high levels of computer skills and those with low levels of computer skills. The results of the study revealed and proved that the way non-native students read English on the WWW is correlated with the level with which they classify their computer skills. According to Jarvis and Pastuska (2008c), “The data seems to confirm the view that hypertext reading behavior of WWW users are different between LLCs and HLCs, the former being more inclined to explore hypertext and the latter, with more goal-directed behavior, tending to be more efficient, effective and thus successful”. A suggestion made by the researchers is to integrate EL reading skills into a range of classroom-based work so that the computer is not seen as separate.

## **5. Conclusion**

Computers have undeniably revolutionized the field of language teaching, providing tools and opportunities that were previously unimaginable. Their role has expanded from simple drill-and-practice programs in the early days of CALL to sophisticated, interactive platforms that foster collaborative learning and authentic communication. In this paper, the evolution of CALL has been explored through its distinct phases: structural, communicative, and socio-cognitive approaches. Each phase represents a milestone in the integration of technology into language education, reflecting both advancements in digital tools and shifts in pedagogical strategies.

The paper also highlighted examples of Computer-Mediated Communication (CMC), demonstrating how technology can serve multiple roles in the classroom, as a tutor delivering targeted instruction, as a tool enabling learners to create and analyze language, and as a medium facilitating meaningful interactions. These examples illustrate the potential of CALL to support diverse learning objectives, catering to individual needs while fostering engagement and collaboration. Furthermore, the discussion on e-literacy underscored the importance of equipping learners with the digital skills necessary to navigate and leverage online resources effectively. As the world becomes increasingly interconnected, these skills are not only critical for language learning but also for broader academic and professional success.

Finally, the concept of normalization was examined, presenting a vision of the future where technology is seamlessly integrated into language teaching, becoming as natural and unobtrusive as traditional tools like books and pens. However, achieving this state requires addressing challenges such as teacher training, accessibility, and infrastructure development. In conclusion, while computers have made significant strides in enhancing language education, the journey is ongoing. By understanding the phases of CALL, embracing e-literacy, and working toward normalization, educators can continue to harness the potential of technology to enrich the language learning experience. This paper serves as a reminder that technology is not an end in itself but a means to empower learners and transform educational practices.

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## References

1. Ahmad K., Corbett G., Rogers M., & Sussex R. (1985) *Computers, language learning and language teaching*, Cambridge: Cambridge University Press.
1. Bax S. (2003) "CALL - past, present and future", *System* 31, 1: 13-28.
2. Bax S. & Chambers A. (2006) "Making CALL work: towards normalisation", *System* 34, 4: 465-479.
3. Collins, B., and Wende, M. (2002). *Models of technology and change in higher education: An international comparative survey on the current and future use of ICT in higher education*. Center for Higher Education Policy studies. [online].
4. Egbert, J. (2005). *CALL Essentials: principles and practice in CALL classrooms*. Alexandria: TESOL, Inc.
5. Jarvis, H. (2004): Investigating the Classroom Applications of Computers on EFL Courses at Higher Education Institutions in the UK. *Journal of English for Academic Purposes* 3 (2004) 111–137.
6. Jarvis, H. (2008). 'Computers and independent study: practices and perceptions of students.' In P. Torres and R. Marriot, (eds), *Handbook of Research on E-Learning Methodologies for Language Acquisition*. PA: Information Science Reference. pp. 367-386.
7. Jarvis, H. (2008). 'Resource centres and self-study: issues in computer assisted language learning.' In E. O'Doherty, (ed.) *The Fourth Education in a Changing Environment Conference Book 2007*. Informing Science Press. pp. 137-154.
8. Jarvis, H. and Pastuszka, L. (2008). 'Electronic literacy, reading skills and non-native speakers: issues for EAP.' *CALL-EJ Online*. Vol. 10. No. 1.
9. Levy, M. (1997). *Computer-Assisted Language Learning*. New York: Oxford University Press.
10. Levy, M. and Stockwell, G. (2006). *CALL Dimensions*. NJ: Lawrence Erlbaum Associates.
11. Stevens V. (ed.) (1989) "A direction for CALL: from behavioristic to humanistic courseware". In Pennington M. (ed.), *Teaching languages with computers: the state of the art*, La Jolla, CA: Athelstan: 31-43.
12. Shetzer, H. and Warschauer, M. (2000). An electronic literacy approach to network-based language teaching. In M. Warschauer and R. Kern (Eds.), *Network-based language teaching: concepts and practice*. Cambridge: Cambridge University Press, 171-185.

13. Toole, J and Heift, T (2002) 'The Tutor Assistant: An Authoring Tool for an Intelligent Language Tutoring System', *Computer Assisted Language Learning*, 15: 4, 373 — 386
14. Warschauer M. (1996) "Computer Assisted Language Learning: an Introduction". In Fotos S. (ed.) *Multimedia Language Teaching*, Tokyo: Logos International. Available at: <http://www.ict4lt.org/en/warschauer.htm>
15. Warschauer, M. and Kern, R.G. (2000): *Network-based Language Teaching: Concept and Practice*. New York: Cambridge University Press.
16. Warschauer, M. Shetzer, H. and Meloni,C. (2000). *Internet for English teaching*. Alexandria: TESOL, Inc