Computer - Assisted Language Learning (CALL) "Attaching Technology: A Review of Computer-Assisted Language Learning in Applied Linguistics"

by:

Dr. Fathi M.R. Akle

Abstract

The main focus of this reviewed research paper is on the journey of Computer-Assisted Language Learning (CALL), which is a significant branch of applied linguistics. The use of technology in enhancing language learning and teaching process has evolved significantly over the years. Many undergraduate, postgraduate students in EFL programme at universities and some EFL instructors do not have a background knowledge about computer assisted language learning (CALL) and its relation to the development of teaching methods over the time. Thus, this review paper will illuminate this contemporary field. It begins with a detailed exploration of the definitions of Computer-Assisted Language Learning (CALL). Furthermore, the main body of the paper explains the three different stages through which CALL has evolved through, as a response to advances in technology, which lead to changes in language teaching methodologies. Moreover, Computer-Assisted Language Learning (CALL) is associated with other concepts and terms, some of which share similarities with CALL, while others diverge depending on the specific requirements of different pedagogical disciplines. The function of each term started by computer assisted instruction (CAI) and ended by intelligent computer assisted language learning (ICAll.). The benefits of using CALL in language learning has introduced in this

paper as well, for example, including the ability of learners to practice at their own pace, the personalization of learning experiences, and the increased flexibility and accessibility enabled by all technology devices. Finally, the integration of artificial intelligence, the emergence of new computer-based platforms, and the incorporation of ever-more- sophisticated computer capabilities into alternative applications are all contributing factors to the ongoing evolution of CALL. However, improving the alignment between effective teaching and technology remains a rising problem in CALL (Beatty, 2010).

Key words: Computer Assisted Language Learning (CALL)

Introduction

This review paper aims to provide a comprehensive exploration of Computer-Assisted Language Learning (CALL) as a significant and contemporary branch of applied linguistics. CALL refers to the technology utilized in language learning and teaching, highlighting its importance in modern educational practices., as defined by Chapelle (2010):

> CALL refers to a variety of technology uses for language learning including CD-ROMs containing interactive multimedia and other language exercise, electronic reference material such as online dictionaries and grammar checkers, and electronic communication in the target language through email, blogs and wikis (p. 66).

Computer-Assisted Language Learning (CALL) is a relatively new field within applied linguistics that is in the process of defining its focus and goals. CALL involves the use of technology to enhance language learning and teaching, and its

development is ongoing as researchers explore its potential applications and impact on language education. As referred by Beaty (2010:3), computer assisted language learning is "young branch of applied linguistics and is still establishing its directions".

The use of technology encompasses a diverse array of technologies and methodologies that enhance the teaching and learning of foreign languages. Han (2020) defines CALL as the collective term that refers to a wide range of technologies and related approaches to teaching and learning foreign languages. This paper is divided into two main sections. The first section shows the historical development of CALL which is integrated within language learning theories as behaviouristic and communicative learning theories. Such an overview of historical development of CALL helps the EFL instructors to apply the suitable pedagogical and updating teaching methods. The second section focuses on the peripheral terms of CALL which overlap and not overlap with computer assisted language learning. Understanding such division assisted EFL students and instructors to choose the most suitable application for language learning and teaching based on the available facilities in their institutions.

1. The Historical Development of CALL

The historical development of CALL can be categorized in terms of three somewhat distinct phases which will be referred to as (1) behavioristic CALL; (2) communicative CALL; and (3) integrative CALL (Warschauer, 1996).

1. 1. Behaviouristic CALL

The first phase of Computer-Assisted Language Learning (CALL) was based on behaviourist theories of learning. This phase focused on repetitive language drills, which were believed to be beneficial for language acquisition (Taylor, 1989). Computers were ideal for carrying out these drills because they could present the same material repeatedly without getting bored and provide immediate feedback. This allowed students to learn at their own pace and freed up class time for other activities. However, this approach was eventually rejected due to criticisms of behaviourist theories and the introduction of microcomputers, which opened up new possibilities for language learning (Rbdei-Majeed, 2002). As presented by Levy (1997), this phase was characterized by a behaviourist approach to language learning, emphasizing the importance of repetition and practice in language acquisition, therefore it has been criticized for its focus on accuracy over fluency and its lack of attention to meaning and communicative competence.

1.2. Communicative CALL

The communicative CALL phase or era focuses on integrating computers into the communicative approach for language teaching and learning, with an emphasis on using the computer as a medium for communication rather than delivering instructional materials. Communicative CALL programs are designed to create context-rich environments that simulate real-life communication situations, allowing learners to engage in the process of negotiating meaning in the target language. This approach prioritizes student-centred learning, learner interactivity, and autonomy (Warschauer, 1996).

The emphasis of CALL software under this approach is on natural communication, supported by multimedia materials such as audio, video, and graphics. CALL software enables the delivery of authentic materials and the creation of real communicative situations, which can be challenging to replicate in traditional classrooms. Examples of using computers for communication include language games, electronic mail, bulletin boards, and chat-rooms (Rbdei-Majeed, 2002). Developers of CALL software in the communicative CALL phase have embraced the idea that language learning involves communication and interaction. Programs are utilized to simulate an authentic environment where language usage is natural, relevant, and meaningful (Bax, 2003).

1.3. Integrative CALL

Integrative CALL refers to the use of technology to integrate language learning with content knowledge and is becoming increasingly popular in language teaching (Levy, 2009). This approach emphasizes the use of authentic materials and tasks that promote meaningful communication in a variety of contexts, as well as intercultural competence. Integrative CALL also enhances learner autonomy and the development of critical thinking skills, as learners engage in more self-directed and collaborative learning experiences. The use of multimedia and online resources offers learners the opportunity to access authentic language use and gain valuable cultural knowledge through various media forms (Chapelle & Hegelheimer, 2004).

Integrative CALL operates on three main principles (Chapelle,2003): (a) the technological aspect, encompassing the necessary hardware and software for

effective material delivery; (b) the pedagogical aspect, involving the development of a pedagogical model based on pedagogic and psycholinguistic principles; and (c) the content aspect, focusing on creating content that meets the needs of language learners. Integrative CALL can be used as a supplement, complement, or even an alternative to a traditional classroom language instruction. Integrative CALL relies on multimedia, hypertext, and hypermedia, which permit enhanced interactivity and more natural language use. Multimedia technology is exemplified today by the CD-ROM, which allows various media (text, graphics, sound, animation, and video) to be accessed on a single machine. Integrative CALL is different from behavioristic CALL in that it incorporates a communicative approach toward language teaching and reflects the learner-centered practices of current pedagogy. Integrative CALL can support projects, examinations, case studies, decision-making tasks, and other language activities in communicative mode, which was a recent trend in language teaching (Rbdei-Majeed, 2002).

2. The peripheral terms of CALL

Computer assisted language learning intersects with several terms, and differs from others, these terms can be presented as follows:

2.1. Computer-Aided Instruction (CAI)

CAI refers to virtually any sort of computer application in instructional settings comprising of drill and practice, simulations, instructional exercises, supplementary exercises, instructional management, database development, programming, composing using word processors, and other different applications

(Cotton, 2001). Arnold (2000) argues that CAI is a diverse and rapidly expanding spectrum of computer technologies that assist the teaching and learning process. It uses a blend of graphs, texts, sounds and videos for learning process (Aduwa-Ogiegbaen. & Iyamu,, 2005).

2.2. Computer-Assisted Learning (CAL)

Computer-Assisted Learning is a form of technology-based education that uses computer software and related tools to help students learn various subjects involving languages. It provides interactive, multimedia resources in the teaching and learning process. The software may include educational games, simulations, multimedia activities, and interactive quizzes. Using CAI helps teachers to make learning more engaging and interactive for students and to improve their educational outcomes (Poole & Sky-McIlvain, 2009). Moreover, Hubbard (2006) defines Computer-Assisted Instruction (CAI) as "the use of computer technology to deliver instruction in a specific domain" (p. 313). Applications that fall under this category allow students to interact with computer technology, typically through simulations, games, and drills. CAI is often used interchangeably with Computer-Assisted Language Learning (CALL), although CALL is more specific to language learning. CAI has been used in language learning since the early 1960s (Chapelle, 2001, p. 33), and CALL software has been expanded to include intelligent learning environments, virtual reality, and online resources that enhance learners' language skills (Lai & Zhao, 2006, p. 4). Furthermore, CAL promotes active engagement by allowing learners to interact with educational content through various multimedia elements, including text, images, audio, and video. This interactivity is essential for maintaining student interest

and enhancing comprehension (Star Knowledge, 2024). One of the significant advantages of CAL is its ability to provide real-time feedback. Students can receive instant responses to their answers, enabling them to understand their mistakes and improve their performance promptly (Dev.co, 2024). Furthermore, CAL can be utilized in various educational settings, from traditional classrooms to online platforms. Its flexibility makes it suitable for learners with different needs, including those with learning disabilities (Aika, 2021).

2.3. Computer-Assisted Language Instruction (CALI)

CALI is often considered synonymous with CALL, but it specifically emphasizes instructional methods rather than broader learning applications. According to Levy (1997), CALI involves the exploration and study of computer applications in language teaching and learning, highlighting its role in structured educational environments. The term CALI was more commonly used in the early days of computer-assisted education, but it has gradually been overshadowed by CALL, which reflects a more student-centred approach to language learning (Davies & Higgins, 1982). Conversely, CALI was often associated with more traditional, drill-and-practice programs that were more teacher-directed (Levy, 1997). CALI programs often incorporate interactive elements that engage students actively, allowing them to manipulate language input and receive immediate feedback (Beatty, 2010). Moreover, CALI utilizes multimedia resources—such as video, audio, and animations—to create a rich learning environment that caters to various learning styles (Star Knowledge, 2024). The interactive nature of CALI keeps students motivated and involved in their learning process (Golonka et al., 2014).

2.4. Computer-Assisted Language Teaching (CALT)

As technology evolved, CALT emerged as a distinct discipline, addressing specific needs in language teaching and assessment (Pathan, 2012). CALL but with emphasis on the teacher is an approach in which computer technology is used as an aid to presentation, reinforcement, and assessment of material to be learned, usually including a substantial interactive element (ibid,1997). Furthermore, CALT promotes active engagement by allowing learners to interact with educational content through various multimedia elements, including text, audio, video, and animations. This interactivity is crucial for maintaining student interest and enhancing comprehension (Star Knowledge, 2024). CALT utilizes multimedia resources to create a rich learning environment that caters to various learning styles. This includes the use of videos, audio clips, and interactive simulations that enhance the language learning experience (Aika, 2021).

2.5. Computer Assisted Language Testing (CAT)

Computer assisted language testing refers to the use of computer in testing and evaluating the students' competence and performances. According to Noijons (1994), CALT is "an integrated procedure in which language performance is elicited and assessed with the help of a computer" (P.38). The integration of technology into language testing has evolved significantly since the late 1980s, with advancements in natural language processing (NLP) and web-based testing platforms creating new opportunities for assessing language proficiency globally (Suvorov & Hegelheimer, 2013). This evolution has led to the development of computer-adaptive testing (CAT), which adjusts the difficulty of test items based on the test taker's responses, providing a more personalized assessment experience (Pathan, 2012).

2.6. Computer-Adaptive Testing (CAT)

Computer adaptive testing is designed to match the knowledge and skills of each test taker by adapting the difficulty level of each item based on the candidate's responses, thereby delivering optimized content throughout the exam (Thompson, 2023). Computer Adapted Test (CAT) is an innovative testing practice that selects and presents items in a sequence based on the test taker's response to each item and adapts to the individual's level of ability, making the assessment process more responsive to individual skill levels (Larson & Madsen, 1985). Since then, CAT has gained traction in various fields, particularly in language assessment, where it allows for more accurate measurement of proficiency (Pathan, 2012). Further explanation presented by (ibid,1985), CAT systems select questions based on the test taker's ability. If a student answers correctly, subsequent questions become more challenging; if they answer incorrectly, easier questions are presented. This dynamic adjustment helps maintain an appropriate level of challenge throughout the assessment.

2.7. Computer-Assisted Teaching (CAT)

Computer assisted teaching refers to the integration of technology into the teaching process, allowing for a more dynamic and engaging learning experience, CAT use the computer-based tools and resources to assist language educators in the delivery of instruction and the development of language skills in learners (Butler-Pascoe and Wozencraft 2010). Furthermore, CAT Facilitates a flexible learning environment that can extend beyond physical classrooms. Students can

access materials from anywhere with an internet connection, promoting self-directed learning (Golonka et al., 2014).

2.8. Computer Based Training (CBT)

It naturally relates to plans considered for training with narrow, short-term instructional purposes, but it can also broadly refer to any form of training. CBT is a process of teaching and learning executed through computer software applications, where students are trained by the computer (Redfield et al., 2009). CBT allows learners to progress through training materials at their own pace. This flexibility accommodates different learning styles and schedules, making it easier for individuals to balance training with other responsibilities (Alavi & Leidner, 2001). Many certification programs utilize CBT to prepare candidates for exams. These programs often include practice tests and interactive modules that mimic the exam environment, helping learners become familiar with the format and types of questions they will encounter, CBT systems often provide instant feedback on assessments and activities, allowing learners to identify areas for improvement quickly. This immediate reinforcement helps solidify learning and encourages on-going engagement with the material (Redfield et al., 2009).

2.9. Computer-mediated communication (CMC)

Computer-mediated communication is "an umbrella term that encompasses various forms of human communication through networked computers, which can be synchronous or asynchronous and involve one-to-one, one-to-many, or many-to-many exchanges of text, audio, and/or video messages" (Walther & Parks, 2002: 529). This means CMC refers to a situation in which computer-based

discussion may take place but without necessarily involving learning. Furthermore, Computer-Mediated Communication (CMC) can be defined as the "exchange of messages between people through an electronic medium" (Hrastinski & Keller, 2007, p. 61). Unlike face-to-face communication, CMC often lacks nonverbal cues such as body language and facial expressions. This can lead to misunderstandings but also allows for more focused textual interactions (Redfield et al., 2009).

2.10. Computer –Mediated Instruction (CMI)

Computer mediated instruction refers to the use of technology in language teaching and instruction tasks more than learning tasks. As presented by DiStefano et al., (2004), CMI refers to the use of computers and related technologies to facilitate and enhance the teaching and learning process, in CMI, computers serve as tools to create, deliver, and manage instructional content. This includes the use of authoring tools, web-based platforms, multimedia resources, and interactive exercises to support and enrich the learning experience. CMI has been applied across a wide range of subjects including mathematics, science, history, language arts, music, and social studies. Its versatility allows educators to design tailored instructional materials that meet the needs of different learners (Gungadeen, 2015). CMI allows for the individualization of instruction by adapting content to the needs and progress of each learner. Although researchers agree that CMI has the potential to contribute immensely in education, they realise that the success of CMI is dependent on the way the technology is utilised, such as how teachers use the technology to design learning and how it influences

their practices, (Li and Ma, 2010; Lei, 2010; Raines and Clark 2011; Drijvers 2012; Cheung and Slavin, 2013).

2.11. Technology-Enhanced Language Learning (TELL)

Technology-Enhanced Language Learning refers to any technology used in the classroom such as videos, tape recorders, or even entire listening labs. It refers to the use of computer technology, including hardware, software, and the internet to enhance the teaching and learning of languages. TELL is not a teaching method but an approach that can be used alongside a teaching method to help teach. It deals with the impact of technology on teaching and learning a second language (Kranthi, 2017). TELL utilises various multimedia elements, such as videos, audio recordings, and interactive software, to create immersive learning environments. This multimedia approach caters to different learning styles and helps students engage with language content more effectively (Lee, 2011). Moreover, Technology-Enhanced Language Learning (TELL) refers to language learning environments that incorporate digital technology and online resources to support language acquisition, including language apps, online courses, digital media, interactive whiteboards, and videoconferencing tools (Zhou and Wei, 2018). TELL has become an increasingly popular method for language learning, offering learners the opportunity to practice language skills in authentic contexts and engage with content in active ways.

2.12. Web-Enhanced Language Learning (WELL)

Raguseo and Bassani (2008) defined WELL as the enhancement and integration of online tools, digital resources, and Internet skills into traditional foreign language instruction, to promote language learning strategies and learner interactivity. This means WELL refers to CALL which focuses on the WWW as the medium for instruction. Furthermore, Web-Enhanced Language Learning, refers to the use of technology, particularly web-based tools and resources, to support and enhance language learning. This may include online resources for practicing grammar and vocabulary, interactive exercises, multimedia content, and communication tools for connecting with other language learners and native speakers (Raguseo & Bassani,2008).

2.13. Intelligent Computer-Assisted Language Learning (ICALL)

It refers to the use of artificial intelligence and natural language processing techniques to enhance computer-assisted language learning (CALL) systems, (Amaral & Meurers, 2011).ICALL describes software programs that attempt to customize feedback features that cater to individual learners' input. The main advantages of ICALL highlighted in (ibid) article is its ability to offer personalized learning experiences. By adapting to each learner's proficiency level and learning style, ICALL systems can provide tailored exercises and feedback, which can significantly improve student engagement and motivation. Furthermore, ICALL systems utilize sophisticated algorithms to analyse learner input, detecting errors in grammar, syntax, and vocabulary usage. This immediate corrective feedback helps learners understand their mistakes and encourages them to improve their language skills actively.

Libyan colleges and universities have been gradually introducing the principles of computer-assisted language learning (CALL) into their English as a Foreign Language (EFL) programs. Learning through a device in these organizations enhances students' engagement and makes it possible to deliver diverse, personalized lessons according to student learning styles and needs. For second language learning to be effective, there is a need for engaging interventions associated with language use; CALL can make this easy for the user by providing interactive practices, instantaneous feedbacks and real-life content. Additionally, with the widespread adoption of CALL in Libyan educational institutions, the students acquire language proficiency that prepares them for the global job market where information technology is indispensable. This method eventually improves foreign language teaching all over Libya by creating a more effective learning environment and increasing motivation.

Conclusion

Finally, the historical development of CALL) can be categorized into three distinct phases: behaviouristic, communicative, and integrative. Each phase has its strengths and limitations, and the development of CALL has been shaped by advances in technology, changes in language teaching methodologies, and the needs of language learners. The nature of CALL is continuously changing because of improvements in computer literacy among learners, advances in computer hardware and software, the proliferation of new computer-based platforms, and the integration of increasingly complex computer functions into other appliances. However, in CALL, creating a better fit between good pedagogy

and technology continues to be a growing challenge (Beatty, 2010:206). CALL has been a discipline that embraces multiple perspectives, including second language acquisition (SLA) theories, linguistic theories, learning theories from psychology, and human-computer interaction (HCI) theories.

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