The History and the Current Status of Computer-Assisted Language Learning

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ABSTRACT

Researchers and practitioners of Computer-Assisted Language Learning (CALL) must have a thorough understanding of the field and its history for successful implementation of technology in ESL learning. This paper attempts to trace the history of CALL over the past six decades and discusses its current status. The awareness of various paradigms of CALL will enable ESL teachers and researchers to improve their classroom practices.

Keywords: CALL; History of CALL.

Computer-Assisted Language Learning (CALL) is a broad, well developed and diversifying field (Motteram 2013a, 177). Researchers have defined CALL in various ways. Each definition reveals some characteristics of the field. A well-accepted broad definition of CALL is "the search for and study of applications of the computer in language teaching and learning" (Levy 1997, 1; Amaral 2011, 365). This definition admits the multidisciplinary nature of CALL. Psychology, Instructional Technology, Artificial Intelligence, Human-Computer Interaction, Computational Linguistics, Applied Linguistics, and Second Language Acquisition are some of the key areas that have contributed to the advancement of CALL. These areas have contributed not only "their specific body of knowledge" but also "their methodological paradigms to undertake scientific investigation" (Amaral 2011, 371).

Beatty offers another definition which accommodates the changing nature of CALL: "any process in which a learner uses a computer and, as a result, improves his or her language" (2003, p.7). Hubbard raises two questions about this definition: "What do we mean by 'computer'? And what do we mean by 'improve'?" (2009, p.1). He himself provides answers to these questions and his answers highlight the varying nature of CALL. According to him, computer "does not include simply the canonical desktop and laptop devices" but also "the networks connecting them, peripheral devices associated with them and a number of other technological innovations such as PDAs (personal digital assistants), mp3 players, mobile phones, electronic whiteboards and even DVD players, which have a computer of sorts embedded in them" (2009, pp.1–2). To the second question, Hubbard identifies learning efficiency, learning effectiveness, access, convenience, motivation, and institutional efficiency as areas that CALL attempts to improve (2009, p.2). Hence, CALL may involve any technological device to improve any of the areas mentioned above.

This "complex, dynamic and quickly changing" (Hubbard 2009, 1) nature of CALL makes it "both exciting and frustrating as a field of research and practice" (Hubbard 2009, 1).

Egbert's definition of CALL recognises the context and the method of using computer technologies in learning a language. According to him, CALL means "learners learning language in any context with, through, and around computer technologies" (2005, p.4). The context or environment of learning a language may vary from classrooms, to computer centres, language labs, homes, cafes and similar public places, the Web and Mobile computing (Hubbard, 2014).

Though the phrase Computer Assisted Language Learning implies that the field is all about learning a language using computers, it encompasses all areas associated with the use of computers in language learning, teaching and testing. So, a vast array of areas such as Material Development, Learner Training, Language Testing, Assessment, Evaluation and Teacher Training comes under CALL. The definitions and descriptions of CALL mentioned above bring out the following characteristics of the field. CALL is a multidisciplinary field; it is complex, dynamic and quickly changing; it involves various contexts and methods; and it encompasses various activities associated with learning a language using computers.

History of CALL

Using computers in language learning dates back to the early 1960s when prestigious universities used mainframe computers for language learning (Motteram, 2013b, p.5;

Levy, 1997; Davies et al., 2012). Since then, CALL has developed into "a symbiotic relationship between the development of technology and pedagogy" (Gorjian, Hayati, and Pourkhoni, 2013, p.35; Stockwell, 2007, p.118). By the early 1980s, using computers in language learning has become a widespread practice throughout America and Europe. It was at this moment that CALL emerged as a distinct field as CALL-themed conferences and professional organisations accompanied the advent of the personal computer in the 1980s. Many researchers have hitherto attempted to trace out the evolution of CALL and have proposed different typologies of CALL (Levy, 1997, pp.13–46; Sanders, 1995, pp.6–14; Graham, 1997, pp.27–48; Davies, 2012; Butler-Pascoe, 2011, pp.17–27; Delcloque, 2000; Warschauer, 1996; Warschauer and Healey, 1998, pp.57–58; Kern, Ware, and Warschauer, 2008, pp.281–282; Bax, 2003, pp.14–19; Warschauer, 2004, pp.20–21).

Of all typologies proposed by researchers, two stand unique: one by Warschauer (1996, 2000, and 2004) and the other by Bax (2003). Both typologies divide the history of CALL based on phases rather than approaches. Warschauer's typology is based on the three phases in the history of CALL, such as Structural CALL, Communicative CALL and Integrative CALL. But Bax reassessed the history of CALL and proposed a new typology in terms of three different approaches to CALL, such as Restricted CALL, Open CALL and Integrated CALL. Since Warschauer's typology is chronologically divided, this paper takes it into account in tracing the history of CALL over the past six decades.

1. Structural CALL

The first phase in the history of CALL, labelled earlier as 'Behaviouristic CALL' and later as 'Structural CALL' by Warschauer (Warschauer, 1996, p.5; Warschauer and Healey, 1998, p.59; Lee, 2000; Fotos and Browne, 2004, p.5; Warschauer, 2004, p.20), was envisaged in the 1960s and executed in the 1970s and the 1980s. CALL, in this phase, was considered a subset of the broad, all-embracing field of Computer-Assisted Instruction (CAI). The psychological principles of Skinner (1957) provided a strong footing for Structural CALL. Skinner's operant-conditioning model of linguistic behaviour, which leaned excessively on positive reinforcement, developed a structure for the learning process providing feedback, repeated reinforcement, branching and self-pacing (Butler-Pascoe, 2011, p.17). This model of CALL involved repetitive language drills such as "dialogues and pattern drills designed to condition learners to produce automatic, correct responses to language stimuli" (Kern and Warschauer, 2000, p.3). These exercises were easy to program on the computer because of their "systematic and routine character" and "their lack of open-endedness" (Kenning and Kenning, 1990, p.53; Taylor and Gitsaki, 2004, p.132). They also stressed imitating the correct linguistic structure, reflecting the strong influence of the school of behaviorism (Ozkan, 2011, p.12).

Structural CALL viewed computer as a mechanical tutor (Warschauer, 1996, p.3; Warschauer and Healey, 1998, p.57; Ahmed 2004, p.24; Gündüz, 2005, p.198) "ideal for carrying out repeated drills since the machine does not get bored with presenting the same material and . . . can provide immediate non-judgemental feedback" (Warschauer, 1996, p.3; Pim, 2013, p.36). Founded on this notion, many CALL tutoring systems were designed for the large mainframe computers which were prevalent at that time. One such best-known tutorial system was the PLATO (Programmed Logic for Automated Teaching Operations) introduced at the University of Illinois, USA (Butler-Pascoe, 2011, p.17; Egbert et al., 2011, p.17). The PLATO system ran on its own special hardware containing a central computer and terminals (Warschauer, 1996, p.3; Warschauer and Healey, 1998, p.57). Based on the grammar-translation method (Butler-Pascoe, 2011, p.17), it included vocabulary drills, brief grammar explanations and drills, and direct translation tests at various intervals (Warschauer, 1996, p.3; Warschauer and Healey, 1998, p.57). The PLATO was not an exclusive CALL venture but a "monumental effort that produced significant material in a wide range of academic disciplines, including foreign language, that continued for years and was eventually used in institutions across the country" (Sanders, 1995, p. 9).

2. Communicative CALL

The late 1980s and the early 1990s witnessed Structural CALL being challenged by two significant factors: first, the rejection of behaviouristic approaches to language learning at both theoretical and pedagogical levels; and secondly, the greater prospects bestowed on language learning by the introduction of personal computers (Warschauer and Healey, 1998, p.57; Warschauer, 1996, p.6; Lee, 2000; Gündüz, 2005, p.199). Meanwhile, a

crucial paradigm shift occurred in second language teaching that resulted in Communicative Language Teaching (CLT) (Egbert et al., 2011, p.21), which emphasised the functional use of language and attempted to foster learners' communicative competence. Against this backdrop, "a demand for interactive and communicative uses of the computer for language teaching" evolved in the second language teaching scene (Egbert et al., 2011, p.22). Hence, this phase of CALL is referred to as Communicative CALL by researchers (Warschauer, 1996, p.4; Warschauer and Healey, 1998, p.57; Warschauer, 2004, p.20; Fotos and Browne, 2004, p.5; Ahmed, 2004, p.24).

Proponents of Communicative CALL downplayed the drill and practice method of Structural CALL as it did not promote authentic communication. Rather, they accentuated an intense focus on the *use* of language forms than on the forms themselves, the implicit teaching of grammar, encouraging learners to produce original utterances instead of manipulating prefabricated language forms, and ultimately using the target language predominantly (John, 1984, p.52; Warschauer and Healey, 1998, p.57; Lee, 2000; Warschauer, 1996, p.5). All these ideas were originally proposed by Underwood, one of the chief advocates of Communicative CALL, in his seminal work (1984). Other pioneering contributions of this phase include the ones by (Higgins and Johns, 1984) and Ahmad et al. (1985),. Many key professional organisations, such as the Computer Assisted Language Instruction Consortium (CALICO) in the United States and the European Association for Computer Assisted Language Learning (EuroCALL) in Europe were established during this period.

Communicative CALL corresponded to cognitive theories which regarded learning as "a process of discovery, expression, and development" (Warschauer and Healey, 1998, p.57) and as "a cognitive process where learners actively generate and transform knowledge" (Ozkan, 2011, p.12). Its main concern was not what learners did on the computer but what they did with each other while working on the computer (Gündüz 2005, p.199). Through such interaction, according to Warschauer (2000), "learners can develop language as an internal mental system" (p.65). Thus, during this phase, the computer was viewed as a stimulus whose intention was not to have learners discover the right answer but to foster discussion, writing, and analytical and critical thinking (Warschauer, 1996, p.5). Software developed during this Communicative CALL phase offered skill practice but in non-drill format. Programs such as text reconstruction, paced reading and language games were some examples. In these programs, computers possessed the right answers but the process of discovering the answers involved a reasonable amount of learner choice, control and interaction (Warschauer, 1996, p.5). Another model of computer as a tool was also popular during this phase. In this model, computer though not developed specifically for language learning, were utilized to make learners understand language (Warschauer, 1996, p.5). Examples of computer as tool include word processors, spelling and grammar checkers, and concordances.

3. Integrative CALL

By the turn of the 1990s, many educators realised that Communicative CALL had failed to live up to its potential since computers were used in a disconnected manner and thereby made contributions to marginal rather than to central elements of the language teaching process (Kenning and Kenning, 1990, p.90; Warschauer, 1996, p.5). Critics of Communicative CALL found that teaching compartmentalised skills or structures was not beneficial. Along with other educators, they attempted to develop models that integrated various aspects of the language learning process.

Many language teachers, at this juncture, relocated their stance from a cognitive approach to a more socio-cognitive approach, which placed greater emphasis on language use in authentic social contexts (Warschauer and Healey, 1998, p.58). Consequently, language learning was viewed as "a process of apprenticeship or socialization into particular discourse communities" (Warschauer and Meskill, 2000, p.306). Language learners need to be given maximum opportunity for authentic social interaction, not only comprehensible input but also practice in the kinds of communication they will later engage in outside the classroom. This can be achieved through student collaboration on authentic tasks and projects while simultaneously learning both content and language. As a result, task-based, project-based, and content-based approaches to language learning came to be proposed. All these approaches sought to assemble learners in authentic environments and to integrate their learning and use of various language skills. This led to a new perspective on technology and language learning, which was named Integrative CALL (Warschauer, 1996, p.6; Warschauer and Healey, 1998, p.58), a perspective which seeks to integrate language skills as well as technology more fully into the language learning process. For Kern and Warschauer, this change stems from both theoretical and technological developments: "Theoretically, there has been the broader emphasis on meaningful interaction in authentic discourse communities. Technologically, there has been the development of computer networking, which allows the computer to be used as a vehicle for interactive human communication" (Kern and Warschauer, 2000, p.11). Thus, the second generation web launched in the first decade of the 21st century had integrative capabilities perfectly matched to the new era of integrative approaches to language teaching (Butler-Pascoe, 2011, p.24).

In an integrative approach, learners learn to use an array of technological tools in an ongoing process of language learning and use, rather than visit the computer lab once a week for isolated exercises (Warschauer and Healey, 1998, p.58). With a wide range of powerful web tools, learners are engaged in collaborative learning, interacting with authentic audiences that fosters their comprehension and production (Butler-Pascoe, 2011, p.24). In other words, learners have the opportunity to interact not just with the tutor computer but also with "their peers, teachers and other people all around the world" (Ozkan, 2011, p.13).

Table 1 : The Three Phases of CALL

Phase	Structural CALL	Communicative CALL	Integrative CALL
Duration	1970s – 1980s	1980s – 1990s	21st Century
Technology	Mainframe Computers	Personal Computers	Multimedia and Internet
English Teaching Paradigm	Grammar - Translation & Audio-Lingual	Communicative Language Teaching	Content-Based, ESP/EAP
View of Language	Structural (a formal structural system)	Cognitive (a mentally constructed system)	Socio-cognitive (developed in social interaction)
Principal Use of Computers	Drill and repetitive practice exercises	Text reconstruction, gap filling, speed reading, simulation, vocabulary games	Authentic Discourse
Principal Objective	Accuracy	Fluency	Agency
Computer	Mechanical tutor	Stimulus for talk	Tool for communication
Teacher	No role	Coordinator / planner	Facilitator
Learner	Passive recipient of language	Communicator	Active, Autonomous and Creative

Current Status of CALL

According to Warschauer (1996, 2000, and 2004), the three phases of CALL do not fall into a linear timeline. As each new phase emerges, the previous phases too continue to coexist. The commencement of a new phase "does not necessarily entail rejecting the programs and methods of a previous phase; rather the old is subsumed within the new. In addition, the phases do not gain prominence in one full swoop, but like all innovations, gain acceptance slowly and unevenly" (Warschauer, 1996). The following table summarises the three phases of CALL based on Warschauer's typology (Warschauer, 1996; Warschauer, 2000, p.64; Warschauer, 2004, p.11; Taylor and Gitsaki, 2004, p.134).

Over the past few decades, CALL has transformed "from being a niche field practised by a few early adopters, to being

mainstream" (Motteram, 2013c, p.6). The main drive behind this transformation is that many digital technologies have moved to the centre of daily life in many parts of the world. Their speedy adoption has expanded the means by which one connects to and communicates with the others. They have changed the sources from which people gather information. They also play important roles in many facets of life: education, work, recreation, etc. Thus, these digital technologies have become "normalised" to the extent that they are invisible, hardly even recognised as technology, taken for granted in everyday life (Bax 2003, 23). As a result, CALL has moved from the peripheral interest of the language teaching community to mainstream thinking, education and practice.

Due to the diversity of digital technologies, CALL has evolved to represent a set of various divisions such as Computer-Mediated Communication, Blended Learning, Virtual Worlds, Gamification, etc. Further, the field has many sub-divisions such as CALL for ESP (English for Specific Purposes), CALL for EAP (English for Academic Purposes), CALL for young learners, and so on. Thus CALL is no longer a single, unified subject.

CALL has remained predominantly a practice-oriented field. Here, practice informs research and development of new technologies. All CALL studies have showed "practitioners using their own networks, knowledge and resources rather than turning to classroom research for new ideas" (Stanley, 2013, p.54). The field had been the same even in the past. Many researchers have confirmed this notion. In 1977, Kemmis et

al. stated, "CALL is practitioner-led as opposed to research-based" (Kemmis, Atkin and Wright, 1977, p.6). Levy (1977) also shared a similar view: "many developers rely on their intuition as teachers rather than research on learning" (Levy, 1997, p.4).

CALL is an established and recognised but also quickly evolving academic field (EuroCALL, 2010; Motteram, 2013c, p.5). Zhang and Barber in 2008 asserted that CALL is "maturing and heading toward a better balance between technology and thinking" (Zhang and Barber, 2008, p.xviii). They also acknowledge that technology is developing faster than our thinking processes which, in turn, is driving forward. In such a race, CALL practitioners and researchers have learnt "to recognize and deal more effectively with the dissonance between the speed of technological development and the speed of our thinking" (Zhang and Barber, 2008, p.xviii). As a result, today more and more technologies have been integrated into classrooms "physically and pedagogically rather than being an add-on" (Kern, 2013, p.92). More importantly, the computer is now seen and used as a tool to accomplish certain tasks or to communicate.

Numerous teachers' associations across the world are aspiring to keep up with the pace of technological developments. There have emerged many technology-specialised professional associations. Wikipedia lists as many as twelve such associations: APACALL, AsiaCALL, AULC, CALICO, EUROCALL, IALLT, IATEFL, JALTCALL, IndiaCALL, LET, PacCALL, and WorldCALL (Wikipedia contributors, 2014). There are also a number of journals

exclusively dedicated to the field of technology and language learning: *CALICO*, *CALL*, *International Journal of Computer Assisted Language Learning and Teaching*, *Language Learning and Technology*, *ReCALL* and *Journal of Technology for ELT*. Journals that have a more general focus on education also include articles about CALL. Recently, there has been a growth of articles in journals that address very specific domains of CALL, such as CALL for young learners (Macaro, Handley and Walter, 2012), social media in language learning, digital games, mobile learning, virtual worlds, and so on.

All these factors make it clear that "we are now at a time in human development where digital technologies are making an increasingly significant contribution to language learning in many parts of the world" (Motteram, 2013b, p.177). Therefore, CALL can now be defined as "the full integration of technology into language learning with its three elements of theory, pedagogy, and technology playing an equally important role" (Garrett, 2009, p.730; Quoted in Kern, 2013, p.92).

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