

COMPUTER-ASSISTED LANGUAGE LEARNING

Context and Conceptualization

MICHAEL LEVY

CLARENDON



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Context and Conceptualization

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To my mother and father

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Preface

In writing this book, I have been motivated by three major concerns. Firstly, I have felt a strong desire to understand, and to some extent to circumscribe Computer-Assisted Language Learning (CALL) for the purposes of teaching it. For the last six years I have been coordinating a Master's degree in CALL, first at Bond University and now at the University of Queensland. Under the guidance of my colleagues Professor Andrew Lian and Professor Roland Sussex, I have had to determine the subjects that might go into such a Master's degree, then decide upon their content and appropriate assessment procedures. I have also been required to undertake research supervision at Master's and Ph.D. level. As a result, I need to have an idea of what constitutes CALL, what forces drive it forward, and what needs to be done by students who want to study it.

Secondly, I believe the CALL community needs to build upon what has gone before, rather than be led purely by the capabilities of the latest technological innovation. With the almost monthly appearance of new hardware and software there can be a tendency for those interested in CALL materials development simply to pick up the latest machine or technological option and get to work on a project. If the technology has not been widely distributed, it is rather too easy to impress. Moreover, past work and valuable experience can be ignored or overlooked. It is usual, when commencing research in other fields, to review and extend the work of others, but with CALL the approach can sometimes be a little more cavalier. Over the last three decades, a substantial number of CALL programs have been created. The concepts and principles underpinning the best of these programs do not necessarily become obsolete when the computer that is used to run them is retired. In fact, the valuable knowledge and experience that has accumulated through this work needs to be absorbed and used to inform new projects in the future.

Thirdly, I have been motivated by a desire to understand better the relationship between theory and application. In this, I have been particularly influenced by the collection of papers in Carroll's book

Designing Interaction published in 1991, which looked closely and profoundly at the relationship between psychological theory (basic science) and the practice of Human-Computer Interaction (HCI) design. To me, there are many parallels between the situation described in HCI, and the one prevailing in CALL. Like HCI, CALL authors seek to apply theory in the actual construction of programs, and much remains to be understood about this process. Theory and application in CALL provided the conference theme at the second Canadian CALL Conference in 1993, highlighting the interest in this issue. The union between theory and application is not as strong as it might be in CALL, and for this and other reasons I believe it is worth exploring further.

In addressing these three concerns, descriptive work has, I believe, a crucial role to play at this point in the evolution of CALL. Sufficient work in CALL has now been accomplished to warrant a description, and an assessment of the work completed so far. A description of CALL materials and projects can provide a sense of the whole, a feeling for the scope of CALL, and it can help identify key issues and themes. Some issues or topics may only be of a temporary concern, while others may continue to assert their influence over an extended period of time.

A sense of the whole is imperative because in my view CALL practitioners and researchers have not really assimilated the work that has been done, nor appreciated its relevance for current work, a point also made by Last (1989: 14). Researchers have increasingly narrow specializations, and it is easy to lose sight of the broader picture. Moreover, CALL is interdisciplinary, and as such we need to be aware of developments in related disciplines. Other fields such as instructional design, artificial intelligence, and psychology will undoubtedly also have contributions to make. This is particularly important, I feel, because CALL abounds with one-off projects that are often not described in relation to other similar CALL projects, nor set in the broader context. A description can provide an appreciation of what has been achieved so far, and provide a sensible platform for a discussion of possible directions in the future.

Attempting to situate CALL in relation to such fields and disciplines involves a certain degree of risk. Many boundaries are crossed that in many cases segregate knowledge, and the people and publications that represent it. As a result there is a danger of being accused of superficial treatment of the subjects that are held to

contribute to the topic under examination. Nevertheless, for the reasons above, I feel it is worth this risk. Thus, rather than looking at CALL through the lens of a particular theory, field, or discipline from the outside, I am looking at CALL from within, and trying to make sense of it as a body of knowledge in its own right. By describing what people do when they do CALL, and thereby better understanding the processes of CALL materials development and use, I feel we will gain important insights into how CALL practice relates to the various theories and practices that are presently competing with each other to drive CALL forward.

The decision to write a book in this area was not an easy one. As I near completion of this manuscript in February 1996, I know that it will be at least one year before the book is published. Other forms of publishing such as electronic publishing are certainly quicker, and facilitate the dissemination of knowledge and information most effectively. Nevertheless, I feel a book is an appropriate forum for a broad-ranging exploration and description of CALL. Moreover, if CALL is worthy of being considered a field in its own right, then I believe it should contain some invariant qualities, issues that remain pertinent to the theorist and the practitioner over time, notwithstanding the pace with which technology continues to develop.

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In my work over the last twelve years, I have been fortunate to be able to discuss aspects of CALL with a variety of people, especially in the United Kingdom, North America, and Australia.

In particular, I would like to thank Andrew Lian. Having a profound understanding of the processes of language teaching and learning, and a firm grasp of the strengths and limitations of technology, Andrew Lian has been able to provide expert advice and comment on many occasions.

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1. Introduction

Computer-Assisted Language Learning (CALL) may be defined as 'the search for and study of applications of the computer in language teaching and learning'. The name is a fairly recent one: the existence of CALL in the academic literature has been recognizable for about the last thirty years. The subject is interdisciplinary in nature, and it has evolved out of early efforts to find ways of using the computer for teaching or for instructional purposes across a wide variety of subject areas, with the weight of knowledge and breadth of application in language learning ultimately resulting in a more specialized field of study.

CALL has been made possible by the invention and subsequent development of the computer. As a result, the nature of CALL at any particular time is, to a large degree, a reflection of the level of development of the technology. In the early days, when developers had access only to large mainframe computers, they needed to know a machine language to program the computer, and they tended towards numerical applications because such computations were more directly compatible with the workings of the computer. In more recent times, computers have become smaller, faster, and easier for the non-specialist to use. Developments in 'user-friendly' human-computer interfaces and higher-level languages and authoring systems insulate the developer from the lower-level workings of the computer, allowing comparatively complex applications to be written with relative ease.

The speed with which technology has developed since the invention of the computer has been both extraordinary and surprisingly sustained. For educators, the rapid and continuing introduction of new technology into education has outpaced the ability of teachers and developers to evaluate it properly. No sooner do we come to terms with one machine and develop some CALL materials for it than another, 'better' machine arrives to replace it. Nevertheless, it would be irresponsible to be led purely by the latest technological breakthrough. Somehow, we must try and make sense of what is going on, in spite of the rate of change, and invent reliable and cost-effective mechanisms for dealing with it.

2 Introduction

Set against this background of a rapid, continually evolving technology, there are conceptual and practical problems that all newcomers to CALL encounter in one way or another. For all those who wish to create new CALL materials, either privately or commercially, independently or as a member of a team, even a cursory glance at contemporary CALL activity shows that there are a multitude of approaches.¹ Points of departure range dramatically from top-down approaches centred perhaps upon a theory of language or language learning, or a curriculum specification, while others might develop CALL materials from the bottom up, perhaps by using the computer to address a particular classroom problem. Other points of departure might include a learning strategy, a macroskill, computer conferencing, or an exploration of aspects of the technology itself. Once the point of departure has been clarified, there are immediately practical issues to consider—for example, the selection of the hardware and software development tools for the project. *HyperCard*, *Authorware*, *ToolBook*, *CALIS*, *C*, and *Visual Basic*, or a mark-up language to enable publishing on the World Wide Web such as the Hypertext or Virtual Reality Mark-up Languages (HTML and VRML), are just a handful of the many options now available.²

Given that the way in which CALL is conceptualized can be largely determined by the hardware and software that is used, this initial design choice is a most important one, and it can have a sweeping influence on what is ultimately created. This is a consequence of the development process, where the strengths and limitations of the development environment variously shape and constrain the CALL materials that are produced. The software then has to reach the students and be used on a regular basis. Here there is a twofold problem: on the one hand the equipment might have been superseded by the end of the project; on the other hand, the intended student group might not be able to get access to the materials because the cost of the equipment is prohibitive. If textbook materials prove themselves they may be used for years with good effect; if CALL materials are effective then often they are discarded when the next model of computer comes along—and for no other reason. In the twentieth century, it takes a special kind of courage to continue to use a particular technology once it is considered to be outmoded, even if that technology is more than adequate for the task at hand.

Within this volatile environment, a substantial number of CALL materials have been produced, especially over the last ten to fifteen years, and, judging by the number of projects described in the CALL journals and at conferences, there is no sign that this interest is about to diminish. Yet it has to be said that CALL remains a peripheral interest in the language teaching community as a whole, still largely the domain of the CALL enthusiast, and there is scant evidence to suggest that CALL has really been absorbed into mainstream thinking, education, and practice.

Of the CALL materials that have been produced, there has been much criticism, most especially directed at the software produced by language teachers. In the 1980s particularly, the inferior quality of CALL materials was blamed on inexperienced language teacher-authors who may not have known how to make appropriate use of the medium (Hofmeister and Maggs 1984: 1-19; Weible 1988: 67). As a result, questions have arisen concerning the most appropriate role of the language teacher in CALL materials production (Smith 1988: 3; Last 1989: 34). Whilst on the one hand leading writers on CALL appear to want language teachers to be involved in CALL (e.g. Farrington 1989: 70; Sussex 1991: 21), at the same time, somewhat paradoxically, language teachers who have become CALL authors have received much unfavourable criticism. In this debate, it should not be forgotten that were it not for the ambitious pioneering efforts of language teachers in CALL, the whole endeavour might not have got off the ground. Arguably, within the field of computers and education, especially within humanities computing, it is teachers in the area of English as a Foreign Language (EFL) and foreign languages more generally that have been in the vanguard. For all the false starts and incomplete realizations of CALL, the 1980s were a highly creative decade. More recently, concerns have appeared to move away from the question of the role of the language teacher in CALL materials development, though concerns are still expressed about the status of CALL. In this respect, Kohn suggests that current CALL is lacking because of poor linguistic modelling, insufficient deployment of natural language processing techniques, an emphasis on special-purpose rather than general-purpose technology, and a neglect of the 'human' dimension of CALL (Kohn 1994: 32).

Although many of these criticisms may well be justified, a lack of guidelines or standards for the current generation of CALL materi-

als has meant that CALL authors, be they language teachers or otherwise, have no reliable conceptual framework, or yardstick by which to measure their work (Smith 1988: 5; Last 1989: 35). Emerging most strongly in a review of the literature on CALL materials is the lack of a generally accepted theoretical framework that authors can use to guide their work. The absence of 'a standard for the industry', a 'generally agreed set of criteria for the present generation of CALL', or 'guiding principles' is noted by Smith (1988: 3), Last (1989: 35), and Ng and Olivier (1987: 1).

It appears that a clear, general theoretical framework has not emerged for a number of reasons. There is some anecdotal evidence to suggest that materials developers fall into two broad bands in their approach to their work. As early as 1977, for example, in computer-assisted learning Kemmis *et al.* (1977: 391) observed that many developers rely on their intuition as teachers rather than on research on learning. He referred to development being practitioner-led, not research-based. A similar division is noticeable in the field of artificial intelligence, where Ginsberg (1988) maintains that the field is divided between those who are primarily interested in solving problems by formulating theory (formalists), and those who prefer to solve problems by writing programs (proceduralists). A perception of this division has remained and more recently in 1995 it was reiterated in slightly different terms at two CALL Conferences. First, in a keynote address at the EUROCALL Conference in Valencia, McCarty spoke of the path of engineering versus the path of science in CALL (McCarty 1993, 1995), and secondly, at the CALL Conference in Exeter, Sussex, quite independently, contrasted Engineering CALL with Empirical CALL (Sussex 1995). Such divisions are worthy of further investigation and reflection.

Where theory has been used as a point of departure, theoretical sources that have been proposed and used have been diverse, not surprisingly perhaps given the range of CALL activities and the evolving nature of the field. Theories emanating from psychology, especially cognitive psychology and Second Language Acquisition (SLA), are a frequent point of departure (Schneider and Bennion 1984; Doughty 1991; Liou 1994). The theories utilized from psychology are usually drawn from a restricted set thought to be amenable to the CALL context generally. For instance, Doughty (1991) limits her focus to comprehension-based models of SLA because of their suitability for the CALL environment. Other theoretical bases include theories of language (e.g. Demaizière 1991;