# What can Computer Assisted Language Learning Contribute to Foreign Language Pedagogy?

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**ABSTRACT**

The aim of this paper is twofold. On one hand, to shed new light on the uneasy relationship of Computer Assisted Language Learning (CALL) with foreign language (FL) pedagogy in the past and on the other, to explore the possible contribution of CALL to FL pedagogy. The first part of this research starts with a brief description of the first CALL experiences (behaviourist CALL) and continues with a succinct account of the present state of the art (CALL and the communicative environment). The second part of the paper points towards new and challenging directions of CALL: some assertions as to what might constitute the place of " good CALL in a language learning environment.

KEYWORDS: CALL, Computer Assisted Language Learning, Foreign Language Pedagogy, Second Language Teaching, Foreign Language Methodology.

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## I. INTRODUCTION

Since the appearance of language laboratories, technology has always been regarded as a new panacea for language teaching and learning. A new medium was viewed as synonymous with improved language pedagogy and consequently with better and more efficient language teaching and learning.

Nearly forty years ago, the latest technology gadget was the language laboratory, not the computer. However, note the similarities in the claims made:

> **This technology will revolutionise the teaching of foreign languages; it will bring pedagogy up to date with technology.**
>
> **Finally we have a means for true individualised practice: one-on-one, self paced, without need for supervision. Students can practice what they want, whenever they want, for as long as they want.**
>
> **These devices will do all the things the teacher has neither the time nor the inclination to do; at last we can take drill out of the classroom.**
>
> *Underwood* **(1984: 33)**

Many universities, schools and companies rushed to buy these new machines without a clear idea what they were for. Many language lab administrators even knew little about foreign language teaching but were convinced that these machines were going to revolutionise foreign language pedagogy and produce near-native speakers, and the latest language teaching technology became synonymous with the latest language teaching pedagogy.

This mirage continued even after the first Computer Assisted Language Learning (CALL hereafter) experiences, with the belief that what matters most is technology and not pedagogy. Advances in computer hardware and software clearly diminished the regard for, or, even worse, ignored advances in language pedagogy and second language acquisition theories.

It was not until some years later that the foreign language community began to realise that the focus, stress and effort devoted to these technological gadgets was not enough. These technologies simply were not living up to expectations. The design and development of materials and software did not keep pace with the hardware, and worst of all, during these periods of technology fever little effort was devoted to foreign language pedagogy research in the CALL context. Indeed, very little evaluation was done, even on a simple level, as to the effectiveness of the use of technology. Perhaps the risk of discovering that such expensive equipment could not dcliver results militated against carrying out such studies! It was not until the mid 80s that some people among the CALL community began to realise how little foreign language pedagogy was actually considered in the CALL software available in those days.

A related issue is the *efficient* use of language technology, as it requires a combined knowledge of foreign language pedagogy, teaching experience and some computer literacy. Language teachers who have experimented with computers do not have the opportunity (or

desire) to become sophisticated programmers. On the other hand, professional programmers who do have the expertise rarely know much about language teaching. Though publishing houses sometimes get in on the act, the situation is not likely to change much. The production of good (and we stress this adjective!) language software requires considerable investment in instructional design and expensive programming time with no guarantee that educational software will be a sufficiently viable commerciai venture. In the foreseeable future it is unlikely that we will be able to rely on publishers to supply the needs for software except for those areas offering the greatest retums on investment — notably "majority" languages and the lower learning levels.

It was not until the late 80s that CALL researchers put the stress more on language methodology and less on computer skills. As a result we find interesting prototypes with considerable pedagogical improvements, though less user-friendly and computationaily less demanding. This trend, towards the stress on integrating advances in language methodology in the implementation of CALL products, continued until the mid-90s, assisted, of course, by the revolutionary possibilities of integrating text, sound, pictures and videos (multimedia) and the development of sophisticated authoring tools. Unfortunately, it seems that this positive reaction towards prioritising pedagogy over technology is again in great danger, due to the unstoppable expansion of the Intemet. CALL developers have envisaged the huge potential of language teaching/learning via lntemet. However, the possibilities and facilities of human-machine interaction using the Intemet are often less powerful than the ones multimedia products such as CD-ROM or DV-ROM can offer. Does this mean that we are stepping backwards once again?

Thus the moral of this story is straightforward: technology on its own is not the panacea for foreign language pedagogy. Efficient foreign language technology is only possible if it is grounded on sound theoretical foreign language pedagogy.

This paper will try to deal with this issue, reviewing the uneasy relationship of CALL and language pedagogy in the past, exploring the present state of the art and pointing towards possible new and challenging directions of CALL.

## II. BEHAVIOURIST CALL

The history of CALL has been dealt with in detail elsewhere (e.g. Levy 1997 and Davies 1997). But a few details here would be relevant. The first steps of CALL go back to the 60s. It was probably in Stanford University that the first CALL software was developed. Some years later, in 1968, at the University of New York, some software for German was implemented. The first European CALL projects date back to the 70s: the University of Essex (with some Russian programs), the University of Hull, the University of Aberdeen, the University of East Anglia, the University of Surrey and Ealing College of Higher Education. However, the most ambitious CALL project was PLATO (Programmed Logic for Automated Teaching Operations; Chapelle and Jamieson 1984), at the University of Illinois.

The popularity in the 60s of the behaviourist theories of the **American** psychologist B. E. Skinner, helped their proliferation and introduction within linguistics and language pedagogy. In addition, the popularity of Skinner's theories and the **first** "flirtation" with the computer within the teaching environment immediately converged. Behaviourist ideas were taken as the theoretical soil on which to build the computer assisted **learning/teaching** framework. The computer started to be considered not as a technological aid, as we understand it now, but as an alternative to "traditional teacher assisted teaching". This was precisely the starting point of PLATO and explains why PLATO was **also** known as a "totally instructional system". Surpiisingly, this behaviourist view of the computer as a "teaching machine" is what still comes to **some** teachers' mind when they hear or read the acronym CALL. As a consequence, this **misunderstanding** inevitably hinders the expansion of CALL.

**There** was **also** another factor that spoke in favour of using the computer in teaching: the genei-alized opinion as to the failure of the educational system in the United States. This pessimistic context helped the expansion of the expensive PLATO project, as the computer was envisaged as a possible way of improving the **current** educational situation. The PLATO project conccntrated on foreign languages in general, modern and classical.

At this **first** CALL stage, heavily influenced by behaviourist psychology, students accessed a mainframe computer using terminals and just answered **all** the exercises prompted by **the** computer without any teacher intervention. The **learning** process **became** an activity that did not require the direct involvement of a teacher; the computer was enough. This CALL teaching paradigm is known as an "instructional model" (Phillips 1987: 9) or **"wrong-try-again"** model (Underwood 1984: 45).

However, the initial popularity of CALL soon **came** to an end due to two main reasons:

1. The lack of imagination and creativity in designing new and challenging exercises, and
2. The high cost and maintenance of the computers.

## III. CALL AND THE COMMUNICATIVE ENVIRONMENT

An alternative to the instructional model is to use computers with a different goal: "communicative competence", The notion of communicative competence goes beyond **Chomsky's** linguistic competence, since it includes the **learner also** knowing how to use the language appropriately in a social situation. That is, students can understand the essential points of what a native speaker says to **her/him** in a real communicative situation and can respond in such a way that the native speaker interprets the **response** with little or no **effort** and without errors that are so distracting that they interfere with communication (**Terrell** in **Blair** 1982: 161).

This methodological goal requires **some** basic **principles** (Undenvood 1984: 23-27):
1. Meaningful practice rather than mechanical practice.
2. Receptive skills (listening and reading) before productive skills (speaking and

writing).

3. Use of target language (little use of native language).

4. Implicit rather than explicit grammar.

5. Modelling instead of correction.

6. Low-anxiety atmosphere.

Underwood applied the principles of communicative language teaching above to CALL and established a number of premises for "communicative CALL" (1984: 52-54):

1. Activities will focus on acquisition practice (using forms to communicate) rather than learning practice (forms themselves).

2. Grammar will always be implicit (built into the lesson or activity), though explicit grammar explanation will be available on a call-up basis.

3. Activities should require students to take a creative action in the target language (or to produce a response based on comprehension of an utterance) rather than manipulating prefabricated language.

4. Activity feedback will not aim at correcting or evaluating each response: "raise expectations for competence in communication, and lower expectations for structural accuracy" (Terrell 1977: 325).

5. Activity feedback will avoid telling students' incorrect answers just as "wrong": Provide help by means of appropriate and well-formed models or give hints.

6. Activities and instructions should be written in the target language. CALL software should try to communicate with the learner without reverting to the student's mother tongue, though some help or explanations can be made available on a call-up basis.

7. CALL activities should be flexible, not based on the principle that every stimulus has one and only response.

8. CALL activities should allow students to explore the subject matter: there is no predetermined material of any sort, but rather an environment in which discoveries can be made.

9. CALL activities should create a context in which using the target language feels natural (on screen: student(s)-machine interaction and off-screen: student(s)-student(s)/teacher-student(s) interaction).

10. CALL software is not an electronic book (CALL activities will aim at doing things books cannot).

11. CALL software should be fun and attractive (try to avoid drill exercises or exams).

The above principles may have been drawn up some twenty years ago, but in their essence they remain sound, even though research has built on them through the years of experience, and not just in language learning (Mayer 2001).

In the following section, we shall try to illustrate some examples of what we think CALL software is, freeing it from the pure instructional model with challenging, innovative exercises and activities.


## IV. COMMUNICATIVE CALL IN ACTION

Before we go on to deal with the issue in depth, some clarification is needed as to our terminology, especially with regard to the use of the word "communicative". Many of us working in the field of the use of computer technology for language learning (here we are deliberately avoiding the term "CALL") over the years will have noticed the shift in approach by practitioners, culminating in the remarkable slump in sales of CD-ROMS a few years ago. The facile answer is to blame the advent of easy access to the Internet for this, and there is a good deal of truth in such an assertion. But, as always, it is rather more complicated than that. Indeed, the Internet induced the expectation that everything could be found if only one looked hard enough, and that it would probably be free to the end user. But this does not wholly explain the growth in interest of the use of the computer as a *communication tool,* rather than as a *tutorial aid* (we will also avoid the emotionally charged term "instructional model" for reasons cited previously).

For whatever reason, using the computer for study items such as web research, email communication, chat rooms, presentations (anecdotal evidence suggests a huge rise in the demand for training courses in the use of the PowerPoint program, for instance), have come close to superseding the use of leaming programs in many institutions. The reasons for this have yet to be researched in full, and it is not the purpose of this article to go into that area, but suffice it to say that one cause may well be a perception that the leaming programs on offer by "tutorial CALL" as it is now often termed, lack pedagogic rigour to a greater or lesser extent. Be that as it may, we wish to make it clear that we are dealing essentially with the use of the computer as the point of interaction for a designed leaming program, albeit acknowledging the overlap between the two approaches and the observed trend towards their convergence in the most recent years.

Thus to sum up this point, we use the term "communicative CALL" to differentiate it from earlier behaviouristic approaches, more in line with the communicative approach we see so readily used in the main classroom.

We could begin deliberation by asking why, if Underwood's principles held good so long ago, we are not seeing a wealth of well-constructed language learning programs available for us today. In our view there are many factors at work, which include, though not exclusively, and in no particular order of priority:

• The lack of interest on the part of publishers in many areas;
• Too much re-invention of wheels in "cottage industries";

• Technological leaps leaving pedagogy in their **wake** (remember Interactive Video, early versions of Windows, and perhaps now Interactive Whiteboards, **all** of which demanded special approaches to design);

• Funding problems —**development** was **often** assisted as a one-off, with no **follow-through** financing, and no re-usability of the results;

• Poor access to good training in instructional design techniques;

• The **lack** of good design and authoring tools;

Most of these issues **have been** discussed elsewhere and we do not need to dwell in depth on them or on their implications (Bannerti et al. 2003; Chapelle 1997; **Dunkel 1991;** Hubbard 1988; Johnson 1999; Ng and Olivier 1987; **Salaberry** 1996; Warschauer 1996, etc.).

Nevertheless we **feel** able to make **some** assertions as to what might constitute the place of good CALL in a language learning environment, and offer these **principles,** which we will spend a little while analysing in **greater** depth:

1. CALL is not an issue **separate from** other language teaching and leaming
2. CALL should put the leamer at the centre of the process
3. CALL exists for learners, not teachers
4. CALL should be adaptive
5. CALL should hamess technology, not **serve** it
6. CALL should engage and **motivate** the leamer
7. CALL should respond to research
8. CALL should be focussed
9. CALL should respond to a perceived need
10. CALL should help learners leam better

## IV.1. CALL is not an issue **separate** from other language teaching and learning

Whilst we can concede that there is a **valid** usage of computer-based technology for independent learning, our main premise is that CALL should be fully integrated with other forms of language teaching and leaming. It should only **replace** elements which research and experience shows as being **valid** components for **sole** use in the computer environment. An example might be that of a **well-designed** program which offers a whole group access to productive language practice which would **otherwise** be impractical in a classroom situation —**such** as voice recording and playback. Another example could be that of textual study for more advanced leamers in which each leamer in a group could be "asking" the program for a different set of study help routines, according to individual need, in **preparation** for a whole **class** activity where such prior study implies a much more productive use of class time in analysing or manipulating the text.

There are, of course, **major** implications **here** other than the creation of good CALL

routines, and they cannot be (though sadly often are) **ignored**. We refer to the need for the creation of new methodologies of teaching, new classroom organisation, **and** the on-going staff training which **all** this implies. Much has **been** said of this need elsewhere (**Davies 2003a** and **2003b**) and it **is** not the main thrust of this work. However, we can point to attempts to carry out such training on a large scale which **have** yet to meet with **massive** success, even when large sums of money **have been** spent, as in the huge, Lottery-funded scheme in the UK (NOF — **New** Opportunities Fund[1]—, **Office** for Standards in Education — Ofsted[2]). **Davies** deals with the training issue more fully in an earlier volume of this journal (**Davies**, 2002) and there are, of course, **some** excellent initiatives which are re-dressing the situation, notably the ICT4LT initiative[3]. But even this excellent work **does** not fully address the question which most interests **here**, as the focus **is** on the application of technology and how it might be achieved. What concerns us more **is** the effect or otherwise on pedagogy and how to identify good practice in the use of ICT to that **end**.

When it **is** posited that in the not too distant future every child in **some** countries may **have** access to a computer in their individual work desks, critics often dismiss this as unrealistic. But one has only to look back to see where we were just, say, five years ago, to appreciate how quickly advances come upon us. Computer-equipped desks, university **residences** fully connected to Intranets and Internet, wireless PC devices at low cost —**this** is not a distant **pipe**-dream. However, training in the way we will use these facilities is **currently** inadequate in most **areas**. For **instance**, in **the** school environment, a move away from the "classic" use of **pre**-booked Information Technology (IT, hereafter) suites of computers, towards dedicated language **classrooms** with access to a good number of **PCs**, requires a whole new way of thinking about the role of the **teacher/facilitator, whilst** in higher education, the integration of language centre use with face-to-face teaching is only just beginning to achieve positive results.

Unfortunately, there still are occasionally those who see the use of the computer as a means of efficiency, even to the extent of replacing teachers. Even with a growing realisation that this is not what using learning technology is about, such attitudes will always be hard to refute. The true costs of using technology are high, and represent no saving in terms of finance. The real issue **is** whether or not technology contributes to higher **quality** learning. Updating software and hardware is far more expensive than buying the **latest** text books.

The other **side** of the coin **is** that CALL cannot ignore advances in the field of classroom teaching. Although in **some** cases it can be said that CALL has pre-empted many changes in methodology, there are **also** cases where we see indifferent techniques which would never be tolerated in a classroom situation (**e.g.** Jarvela, 2001, Rodriquez 2001, Rosler 2000 and Wilhelm 2001). One has but to look at the recent initiatives in the UK school situation for Key Stage 3 age groups (11 to 14 year olds) to see the changes that are happening in classroom pedagogy (Student Support —DfES[4]). Thus we might cite as one **example** the use of "assessment for learning" which **is** opposed to "assessment of learning". Best practice in CALL **does** indeed use assessment for learning when it **provides** meaningful help and feedback for the learner, but less

helpful is the plethora of exercises we see in which the user is told he or she has received a score of 6 out of 10 with no further indication of what they should do about it, and so on. Some help in this area is to be found on the lCT4LT web site mentioned earlier, though even here there is not the clear distinction between these categories of assessment. Another interesting avenue which CALL might explore is the concept of "reflective learning" in which the student is encouraged to consider not only *what* they have learnt, but *how* they learnt it, in order to make them more efficient learners in the future.

## IV.2. CALL should put the learner at the centre of the process

However far one wishes to go down the road of a constructivist approach to language learning, it is clear from research into cognitive learning theories, that students learn best and most efficiently when they feel "engaged" with the learning process and the material, and feel in control over their progress (Cantos 1993; Chun and Plass 1996; Levy 1997; Mayer 1997; Yu and Michaels 1998). This is clearly connected with the sense of progression they should receive, and this will be dealt with later. Of course, complete freedom to navigate through complex learning routines could be a recipe for disaster, but some unobtrusive "scaffolding" in the form of carefully designed levels of help, conditional branching and feedback, all as transparent as possible, undoubtedly assists the language learner to feel a sense of progress.

The difficulty with this lies in the need for careful design work. It is very difficult always to have this in the forefront of the designer's mind, but impossible when the vital step of creating a full instructional design document is omitted, which unfortunately happens all too often. It is only when considerable thought is given to the steps the end user will or might take, that we begin to see how to put together meaningful sequences of activities to enable student progression.

The other important step which is often neglected is the trialling of prototype material with students before finalising the programs. The authors of this work have much experience of designers and programmers who do not believe this step to be necessary. Some form of "designer arrogance" seems to take over at this point. In reality, experience shows that we can never be sure how a learner as end user will react to what we offer them. There is so little research into this field with anything like sufficient numbers of subjects, that it is difficult to make hard and fast rules. Adequate research is essential (see section IV.7. below). When prototypes are trialled, and the trials monitored, even with just a few learners, the results are often surprising.

## IV.3. CALL exists for learners, not teachers

Here, we are basically discussing the role of assessment. We have already mentioned the question of assessment *for* learning, and this, in our view, is still a major gap in the design of much of the material we see on offer today.

Assessment is of course part of the complex issue of feedback, which is dealt with in greater detail shortly. But to judge from many CALL programs one sees, this is often the only

feedback considered necessary. But it is necessary to take a step back and to analyse a slightly different issue **which·we feel** is at the root of the problem. Anecdotally, the authors of this paper often question designers and creators of CALL, and challenge them to explain the difference between an activity, an exercise, and a test. It is **unfortunately** not too often that one receives a satisfactory response. Indeed, it is **often all** too clear that the need to differentiate has not **entered** into the instructional design process (if in fact there was one). Leamers wish to explore, find out, test hypotheses against models, refine and **repeat.** But this should not mean a never-ending battery of tests. They need exploration activities or expositions, examples, models. They **also** then need to **have** "safe" environments in which they can make mistakes at will — and this is a key example of where CALL has a major role, since there is often **reluctance** on the **part** of leamers to "take risks" in a classroom situation in front of mentors and peers, whereas the "safe" environment of a good CALL routine **allows** them to do so. **This** should be an exercise **environment,** with appropriate feedback, iterative revision loops if required, with sconng an option (at the request of the leamer? — though this is hardly ever **seen).** Tests, of course, **have** their place, and leamers wish to know how they are progressing. But what we too often see is that they are given an exercise for which they receive nothing more than an often inappropriate noise and a score of, say, 6/10. **In** what way **does** this help the end user? If it compared their score with an earlier one for the same test type, it might be of **some** validity. If one asks students what they **feel** about receiving a 60% rating for a test, they will most often be well pleased. But if the test was well designed, it means that they **have** failed almost half of the items.

If tests are to be incorporated, they must be specific to the exploitation of a leaming objective or **outcome,** and must be of use to the end user. If they are to be progressive in **difficulty,** the leamer must know this and benefit from that fact.

We might ask why this situation has developed. In our view, a major factor has **been** the inadequacy of most authoring systems, many of which favour the creation of discrete exercises and activities, and with which it is **difficult** or impossible to link **these** activities into **meaningful,** coherent, and progressive sequences, with branches and iterative loops. But it **also** has to be said that poor examples are often **seen** when the most sophisticated **tools have been** used, so it has to be put **down** once more to inadequacy at the pedagogic design stage.

**Finally,** a word of warning. Just as in the older, more "traditional" type of classroom situation, tests were often designed and used for the benefit of teachers (to establish rankings or progress), so the temptation has to be for the same to apply to CALL routines. For this reason, for **instance,** when the MALTED[5] (Multimedia Authoring for Language Tutors and Educational Development) authoring tool recently created a Leaming Management System to track and monitor student usage, including scoring, it was designed to give feedback to the end user as well as the tutor. An interesting new initiative, the OASIS **project[6] aims** to use ICT to bring in whole school communities and those beyond, into the loop.

## IV.4. CALL should be adaptive

A complaint frequently heard from language tutors is that the materials on offer are difficult to use in their own individual learning situations, and are impossible to adapt or tailor for their own students' needs. Leaving aside the classic "not invented **here**" syndrome, it is clear that good CALL should be adaptive, capable of being individualised, and not "one **size** fits all". A curious paradox occurs to us — if this is the complaint, then **it does** show that there is considerable awareness of one of the major and essential advantages of CALL —**its ability** to be used by **learners** at their **own** rate of progress and pace. But whereas tutors can adapt and select from text books and other materials in the classroom situation, they find it much **harder** to do the same with computer based materials.

So the advice has to be that programs should not be **"set** in stone". But this is easier said than achieved. This has to be a good argument for the use of authoring tools. Even if tutors do not consider themselves as developers, and do not wish to **write** major programs, nevertheless, many would welcome the opportunity to **write** simple adaptations — text files with adapted feedback, re-ordering of materials, and so on. Many authoring systems do not allow for this, however. But even if programming is in the hands of others, **it** is possible for us to design routines in a modular way so as to assist the process of **incorporation** into a wider **curriculum**. With more modem authoring tools, such as Hot Potatoes[7] or MALTED, feedback is easy to adapt. But even in circumstances such as MALTED, **it** takes a conscious decision **at** the instructional design stage to place **all** such adaptable feedback into externally held text files, **rather** than embedded in screen displays or graphics, however elegant they may appear.

## IV.5. CALL should harness technology, not **serve** it

We will not **dwell** too long on this point, as **it** has **been** made many times before, but it is essential that the CALL design be made from the standpoint of pedagogy, not technology. Mayer (2001) has shown that what may seem obvious from common sense is not always true in pedagogic **terms.** We can apply this to situations in which it may seem advantageous to place more items on the screen, **because** we are giving the user more help, more choice, and so on. In fact, we may just be delivering **sensory** overload. It is **also** not uncommon to see activities within CALL routines which would be better **carried** out with pencil and paper, or in the classroom, not the computer suite. Technically, **it** may be possible to use complex video sequences, when pedagogically a series of stills may work better, allowing the user time to reflect as they make inputs — it **all** depends on the activity, which is another reason for putting more effort into the **instructional** design stage.

## IV.6. CALL should engage and **motivate** the learner

An effective CALL program should engage and **motivate** the learner by providing a rich experience, enhanced by appropriate feedback. The word "engage" is used advisedly. Not only do we imply that the learner should **have** a feeling of "control", (however spurious, and whatever

the **level** of "scaffolding" involved), but that the end user should be engaging with the content, and the content should, wherever possible, **replace** the on-screen metalanguage. This requires expansion.

Much has **been** wntten about feedback and this article will not attempt to repeat what we **have** written on other occasions (Bangs 2002,2003; **Heift** 2003; **Pujola** 1998). But we do wish to draw attention to the general **principles** of feedback as they might be applied in cases of best practice. Apart from the point made earlier concerning the need for it to be adaptive, feedback should, wherever possible, be "intrinsic".This implies that the input of the learner should result **in some form** of interactivity on the screen or via the loudspeakers, which will, at the most basic level, **indicate** to the user the success or otherwise of that input. This is deemed to be intrinsic in that it **does** not depend on the system or its metalanguage making a pronouncement on the user's performance, like **some** *Deus ex machina,* but instead relies on the user seeing for **him/herself** what has happened. To give an example, let us imagine a simple situation in which the learner has to **listen** to a telephone answering machine message asking **him/her** to make **some** purchases. In the virtual shop, presented with options, in the form of multiple choice, matching etc., the learner makes an input. **Here** is a (non-exhaustive) **list** of possible feedback types:

> *Receives a negative noise and has to try again*
> *Receives a message saying "Wrong, try again"*
> *Receives a message saying "No, they wanted rice, notpastu. Try again"*
> *Is given a graphical or video image in which the result of the choice is obvious — mother*
> *who is cross, or strange meal on theplate, etc., plus opportunityto make differentchoice.*

It should be clear which of the above is the most intrinsic. Not only will the learner **have** realised for **him/herself** what the results of the choice were, but they **have** done so without the need for an "**external** force" to **tell** them so. This form of engagement with the material is more closely related with the real-life experience of learning a language *in situ* in the **target** country. We would **also** go one stage **further,** and advocate the use of a technique little **seen** — addressing the learner directly, rather than as a third party proxy agent.

**All** of these feedback techniques should be allied to the provision of appropriate, unobtrusive scaffolding, such as access to linguistic or cultural explanations, or remedia1 loops. Then we begin to see a rich environment, often approaching a task-based scenario, which aids the sense of engagement and in turn motivates the leamer and **helps provide** a sense of progression. It has to be asked why we do not see such seemingly obvious elements used more often. In our view one of the problems has **been** the **preponderance** of authoring systems which allow for the creation of discrete activities rather than pedagogically coherent sequences.

## IV.7. CALL should respond to research

One is almost tempted to say "what **research?**"[8]. This is perhaps **unfair,** as there are many

labouring valiantly in this field. However, there is extremely little empirical field research in the efficacy of CALL programs from which one can draw design conclusions. One of the reasons for this, in turn, is the paucity of data from program users. Researchers such as Heift (2003) are, however, beginning to generate significant amounts of analysable data from which it will be possible to draw design conclusions based on what learners actually do in front of the screen and what actually works for most of them. Even excellent researchers such as Mayer (2001) base conclusions on slender numbers of observed subjects. There is awareness, though, of the need for more research in this area (Davies 2001 and the EuroCall statement').

CALL designers and developers must keep abreast of this newer form of research, and apply the lessons as and when they are made available. It is also very advisable to look, sometimes, beyond the world of language learning to consider what is happening in other subject disciplines.

## IV.8. CALL should be focussed

CALL time is precious. Most learners work best on CALL routines in short bursts. It is therefore axiomatic that activities should be clearly focussed, and designed around desired learning outcomes. Each activity should be relevant to the learning point under consideration. This may seem obvious, but how often have we all seen activities in which users are required to undertake unrealistic tasks? We refer to situations such as being asked to type in responses to make up a dialogue, rather than record an audio input. There are many similar instances.

It is also quite common to see a confusion of learning objectives. Whilst a carefully considered instructional design would avoid this, there are nevertheless many examples of learners being asked to type in responses (with all the "fuzzy matching" problems this brings in its wake), when the objective is not to practise or test spelling. So why not use a drag and drop to select the appropriate words instead? It is invariably better to separate out tasks to bring a clear focus on the point of the learning outcome. With careful design this can be done without sacrificing richness of language or cultural milieu.

Mayer has shown (2001) that the use of simple screens aids the cognitive learning process, and that more does not mean better. Whilst screens should be graphically interesting in order to motivate, they should never be "cluttered" as this leads to distraction. The old *KISS* principle ("Keep it Simple, Stupid") applies to graphic design as well as planning the interactions.

## IV.9. CALL should respond to a perceived need

Good CALL routines have always been designed to respond to a specific need with the end user in mind. Whether this is on the basis of needs analysis research undertaken or on the basis of experience at local level, there is no substitute for designing a program which answers a specific need. The way this should be attempted is to start at a level above the full instructional design (this is often called the "pedagogic design"). At this level the developer should ask firstly why

the computer should or might be used in this case, how the routine will link to other parts of the **teaching/learning** situation, and what the **outcomes** might be. It should always be remembered that it is at this stage that one might wish to reject an idea, as one **realises** that the computer is not a suitable place to develop the proposed activity.

But if there is a **desire** to proceed, and even if one is dealing with an activity quite limited in scope, the next step must be to proceed to an instructional design document. It is not the aim of this article to **provide** detail on such a process, and there are many ways of achieving it, but the design document itself will include, *inter alia*: an itemisation of the learning outcomes; the sequence of interactions **desired** to support the outcomes; the types and levels of feedback proposed; use of existing or new **remedial** help routines; and so on. Only at the end of this process should it itemise the content resources required (or "assets"). **All** too often, creators begin from the assets and work "backwards", with less than desirable results. Of course there are occasions when the availability of assets **acquired** in **some** way or other can be put to good use — but, we stress, only when a detailed instructional design plan is made.

## IV.lO. CALL should help learners learn better

The final **observation in** our list is one of the more **difficult** to achieve. **Current** cognitive learning theories stress the advantages of encouraging the learner to reflect on the process as well as the **outcome** of any learning activity. There **is** no reason why CALL should be any different in this respect. It is not easy or even desirable, to be too prescnptive in this sense, but what can be recommended is that, on quitting a routine, or before moving to new sections or modules, the learner might be encouraged to step back for a bnef moment and question not only **his/her** performance, but **also** the way in which this was achieved. Just as an example, it might be an idea to **illustrate** how they used help routines to understand the **nature** of the exercise before, and at what point in the process they accessed them. To do this **also** implies the use of a tracking system and **some** quite sophisticated programming, but we **make** no apologies for including something we **feel** should be in future CALL routines.

## V. ACHIEVING GOOD PRACTICE

So how **does** one achieve what we **have** outlined as being acceptable practice? Clearly, there are no universal truths in this **area,** nor is it any form of exact science. One of the major problems confronting us is that we are often reduced to using common sense, anecdotal **evidence,** or sheer experience, as the basis for **important** pedagogic decisions, in the light of not enough **solid** research. One thing we could urge from the start, as a *sine qua non* of any piece of software development, is the trialling of prototypes with typical target learners. Our experience is that this almost always **throws** up **surprise** results which will lead to adaptation of the program, providing the development process allows for iterative loops. We need to know better what works!

However, we cannot stand by and **wait** for an appropnate **level** of information to **arrive**

— we **have** to carry on producing sound software. So in spite of the ***caveats*** mentioned throughout this work, there are a few obvious needs to be addressed.

Firstly, we would postulate a need for greater levels of training in design and creation of multimedia CALL. Not everyone will want to be a designer, let alone a programmer, but it is our considered opinion that better instructional design techniques will **have** multiple **benefits**. Pedagogy will be placed in the driving seat, and language tutors will be less dependent on technologists, who, in **turn,** will better understand what is required as they will **have** a better **articulated** brief from which to work.

Secondly, there is undoubtedly a need for better and easier tools. The trade-off between complexity and ease of use is always a **difficult** compromise, and will be handled differently by different systems. For **instance,** whilst Hot Potatoes can be used with virtually no training in its use, MALTED requires a degree of training to exploit its complex systems to the full. These are undoubted advances (we **have** not yet mentioned either that they are supplied at virtually no cost to the developer). More research and development remains to be done in this area.

**Thirdly,** there is the enormous cohort of tutors who wish to use good CALL, but will need training in how to choose, apply, and integrate CALL into their **curriculum,** be it in school, higher education or company training. The experience in the United Kingdom of the "New Opportunities Fund" (NOF) training initiative tells us that this is a huge, expensive issue which has no easy solution (British Educational Communications and Technology Agency —BecTa[10]—, Ofsted[11], Leaming School Programme —LSP[12]—, etc). Nor is this training to be considered as a "**one-off**" item. On-going initiatives like ICT4LT **have** had a great impact and **have** an enormous role to play, but more still needs to be done. There will be changes in the way technology is applied in universities, schools and elsewhere, and which we **cannot** even begin to predict (**e.g.** Bruess 2003 and Strickland 1989). Such changes may **well** lead to enforced changes in classroom organisation and methodology, and we must be prepared for this (see **also** Programme for Teacher Education, Technology and Change —PLUTO[13]).

Fourthly, collaborative development is a must. Re-invention of the wheel is to be avoided if at **all** possible. We must **have** sound systems for re-using assets, **freely** available to **all**. MALTED is about to make an impact in this area, but it has to be spread more widely. Outside the world of language leaming, the storage of leaming objects to be retrieved via an **industry-**wide recognised system of **metadata** is already a fact, though this seems largely to **have** passed the CALL world by. The implications are considerable **in** terms of abandoning ideas of **Intellectual** Property **Rights, and** the challenge to publishers is obvious. But without this we do not see a way **forward** to achieving best practice across a wide range of languages, levels and special purposes.

Designs should aim at being independent of the functionality of the authoring or programming system involved. Content (assets) should wherever be possible be held in standard formats **outside** and not embedded in the programs. This will **clearly** aid the sharing of routines, and their potential adaptation to new languages, situations, or levels of target leamers. **The**

designs should, if at all possible, also be made independent of the technology platform. This is becoming easier with the stability of the World Wide Web standards, and although there are emerging new formats here, most are backwardly compatible — the various .xml standards, for instance.

None of this will happen overnight. Nor can the right conditions be created by any one body. Some of the issues we have raised will only be solved at governmental or state level. For others there are clearly immediate, micro-level solutions. What we can do is to hold on to recognised principles, monitor new pedagogic developments, and lobby, through organisations such as Calico, EuroCall and WorldCall, etc., for the best interests of CALL on behalf of developers, practitioners and learners the world over.

**NOTES:**

1. www.nof.org.uk

2. www.ofsted.gov.uk

3. www.ict4lt.org

4. www.dfes.gov.uk

5. www.malted.com

6. oasis.cnice.mecd.es/

7. web.uvic.ca/hrd/halfbaked/

8. See Carol Chapelle's 1997 paper "CALL in the Year 2000: Still in Search of Research Paradigms?" Language Leaming and Technology, 1:1, **19-43.**

9. Joint EUROCALL/CALICO/IALLT Joint Policy Statement — http://www.eurocall-languages.org/research/research_policy.htm

10. www.becta.org.uk

11. www.ofsted.gov.uk

12. www.lsp.open.ac.uk

13. www.hsh.no/lu/pluto/www/

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