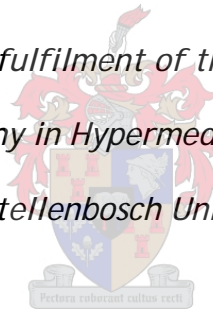# Beyond Buzzwords:
Towards an evaluation framework for
Computer Assisted Language Learning in the
South African FET sector

by

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Thesis presented in partial fulfilment of the requirements for the degree

of Master of Philosophy in Hypermedia for Language Learning

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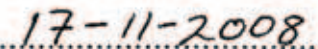
Faculty of Arts and Social Sciences

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Date: March 2009

DECLARATION

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Abstract

The evaluation and selection of software is a complex undertaking best performed by those with applicable specialised skills and knowledge. When it comes to a field like CALL, which draws on the theory and best practice of a variety related disciplines, language teachers in the South African FET sector are unlikely to possess those specialised skills and knowledge beyond language learning content. In an effort to make the evaluation and selection of CALL software a more productive process, the literature pertaining to the components that constitute CALL and the South African FET context was reviewed. Based on this an evaluation framework was developed incorporating all the crucial contextual elements. The choice of a framework as opposed to a checklist was motivated by a need to reflect context at a variety of levels, combined with the flexibility allowing customisation for use in a variety of language learning settings.

Opsomming

Die evalueering en keuse van sagteware is 'n komplekse taak wat uitgerig moet word deur diegene wat gespesialiseerde kennis en vaardighede besit. As dit kom by rekenaar-gesteunde taalverwerwing,wat op die teorie en beste praktyke van 'n verskeidenheid verwante vakgebiede staatmaak, is dit te betwyfel dat taalonderwysers in die Suid-Afrikaanse Voortgesette Onderrig en Opleiding sektor die toepaslike kennis en vaardighede, anders as taal, besit. Die literatuur om die elemente wat rekenaar-gesteunde taalverwerwing en die Suid-Afrikaanse VOO konteks opmaak, is hersien in 'n poging om die evalueering en keuse van rekenaar-gesteunde taalverwerwing sagteware 'n meer produktiewe proses te maak. Gebaseer op dié informasie is 'n evalueeringsraamwerk ontwerp, wat al die kritiese kontekstuele elemente insluit. Die keuse van 'n raamwerk eerder as 'n nagaan- of prioriteitslys was gemotiveer deur die behoefte om konteks op 'n verskeidenheid vlakke te reflekteer, gekombineeer met die buigsaamheid wat aanpassing toelaat vir toepassing in 'n verskeidenheid taalverwerwings situasies.

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List of abbreviations

CALL	Computer Assisted Language Learning
CLT	Communicative Language Teaching
CMS	Course/Content Management System
DoC	Department of Communications
DoE	South African National Department of Education
FET	Further Education and Training
ICT	Information and Communication Technology
IKS	Indigenous Knowledge Systems
LO	Learning Outcome
NCS	National Curriculum Statement
TELI	Technology Enhanced Learning Initiative

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Appendix 1: Software evaluation kits

Chapter 1

Introduction

Introduction

> **BUZZWORD, also buzz word. An informal term for a word that is fashionable and used more to impress than inform … Buzz words are particularly associated with the terminology and jargon of corporate business, government, and the sciences.**
> *Concise Oxford Companion to the English Language* (1998)

The excitement surrounding new developments in theories and technologies often turns technical terms into buzzwords, e.g. interactivity, authentic texts, active learning, and hypermedia. In an interdisciplinary field such as computer assisted language learning (CALL) buzzwords derive from numerous cognate disciplines. This makes it difficult for someone not deeply immersed in the field to stay current. The problem is that teachers tasked with selecting CALL products for use in schools may well not be sufficiently conversant with the origins and hence implications of these terms to know when they are being used more in the sense of jargon, or in less salubrious ways. As Burston (2003:39) points out, "software producers are very much aware of what methodological approaches are in favor (e.g., communicative, learner-centered, constructivist, and experiential) and label their products accordingly, whatever the truth of the matter may be." This concern is echoed by Shaughnessy (2003:251), who maintains that "Commercial ventures producing CALL software share many design practices that call into question their educational validity. The design practices of commercial CALL software companies are incongruent with the goals of foreign language education."

Aim of the project

The aim of this project is to develop a comprehensive Computer Assisted Language Learning (CALL) evaluation framework, based on current theory and best practice, appropriate to the South African Further Education and Training (FET) school context.

Background

South Africa is in the unique situation of having a constitution providing for eleven official languages. This implies that we have incredible cultural wealth, as well as significant challenges for language teaching. As a legacy of the past within the schooling system, indigenous languages were neglected in favour of English and Afrikaans.

Multilingualism and technological literacy are major concerns in South African education today and particularly so in the FET school sector (grades 10-12). The South African Government's Department of Education has (DoE) has published numerous guidelines, policies and other documents to this effect (see Chapter 5 below).

The acquisition of languages has been the subject of much study over the last century. A plethora of language teaching approaches, methods and techniques have been put forward, based largely on ideas about the purpose of learning languages and how languages are learned (Richards and Rogers, 2001). Yet computer assisted language learning has been developing over the last 50 years without a unifying theory in place to guide it. CALL instead draws upon theoretical elements of educational psychology and applied linguistics, as well as human interface design. This has resulted in a phenomenal proliferation of terminology ("buzzwords") that is confusing and the origins of which are often abstruse.

Development of computer aided learning applications, including CALL, has far outstripped efforts at systematic evaluation thereof. Reasons for this situation are numerous (Reeves, 1997):

- Inappropriate measures of effectiveness;
- Assumptions about the efficacy of technology for learning;
- Inaccessibility or inadequate utility of existing evaluations;
- Fallacies within research design;
- Development tools have become accessible to non-specialists.

Technology is seductive and language practitioners have long felt that technology could promote learning. However, "there still exists a significant amount of, frankly, useless programming, useless because it ignores principles of language acquisition ..." (Phillips, 1998:25).

Rationale

In South Africa multilingualism in both students and teachers has been deemed by the national DoE to be important in the attainment of transformative, quality education at all levels, as much for the preservation of linguistic diversity and cultural heritage, as for the improvement of communication within and outside that society. With class sizes being relatively large, there are insufficient human resources to deal with demand in the traditional face-to-face manner, and recourse to CALL applications is a logical step (Thomas, 2003). However, the quality, relevance and effectiveness of the CALL applications must first be established. It should be easy for anyone with low prior knowledge of CALL to make an informed choice when acquiring a product, but one of the problems in making these informed choices is that products are often sealed (literally shrink-wrapped in plastic) providing the prospective purchaser very little information about the product, other than the title, a marketing

gloss and minimum hardware requirements (*Beratungsstelle ...,* 1994).

There are currently very few CALL applications available for South African languages (other than English and Afrikaans) and even fewer produced locally for local audiences, as is evident in a report by Nicky Roberts (2002) entitled *Evaluation of educational software for the African context: Guidelines for educators*. This means that most CALL applications available in South Africa are imported. In a *Mail & Guardian* article ("Language for empowerment ...", 2005), new South African multimedia language tools were described. The fact that these tools had been produced by local academics was lauded, but what was not revealed was that the CALL programme had been based on an authoring shell developed for learning Flemish at the Katholic University Leuven in Belgium (Berg and Pretorius, 2003).

It might be tempting to use a ready-made tool, because it is convenient, but one must choose teaching and learning tools with care and a critical eye. Naturally any programme designed to address a need or problem has embedded in it the authors' understanding of what the problem is (learning objective) and what is required to solve it (content), as well as how this is to be achieved (educational approach). In other words, a tool is not neutral – it is an expression of ideology and philosophy, which are evident in the approaches and methods used in its implementation and application (Bromley, 2005; Kemp, 1992). In addition, particularly with a language product, it is an expression of culture. These points are very seldom made explicit to the potential user. Usually they may be inferred from experience working with the programme, but even then they may be difficult to discern. Nonetheless, they are of particular importance in the educational process. A tool developed twenty years ago for Latin American adults in the USA wishing to acquire English as an additional language will probably have cultural, educational and technical

elements unlikely to fulfil the needs of South African Grade 10 learners. It would be far more appropriate to have locally developed programmes that cater to local needs (Thomas, 2003). It is therefore necessary to have an understanding of what South African education policy, social and technological needs are, and what the implications thereof would be for the evaluation of CALL applications.

The continuous introduction of new and improved technologies presents everyone, especially educators, with significant challenges as they seek to keep current (Syverson & Slatin, 1997). The development of a comprehensive and locally relevant evaluation framework would assist educators in the FET band to make informed choices, by enabling valid comparison amongst various programmes and contributing to the diffusion of knowledge about effective CALL (Multimedia Education Group, 2005).

Research questions

What are the buzzwords associated with CALL, where do they come from and what are the implications thereof for the selection of CALL products in a South African context, with special reference to the FET school sector?

In order to achieve the above stated aim, the following questions will have to be addressed:

1. What is the current state of theory and best practice in CALL? This will be broken down into three sub-questions:

    -   What is the current state of theory and best practice in education?
    -   What is the current state of theory and best practice regarding the use of educational technology?
    -   What is the current state of theory and best practice in language acquisition?

2. What is the current state of the South African FET language learning context?

3. What evaluation tools are available and why do they not satisfy the needs of the South African FET language learning context?

4. What would an evaluation tool appropriate to the South African FET language learning context look like?

Method

As can be seen from the outline below, the literature relating to CALL and its various cognate fields will be examined for the origins of the buzzwords, as well as the theoretical bases of good practices and the implications thereof for development of CALL applications. This involves the fields of educational theory, educational technology and language acquisition. In addition, the South African FET language learning context and its various dimensions will be analysed, in so far as they are pertinent to CALL. Existing tools for the evaluation of educational software will be analysed for strengths and weaknesses in terms of theory and best practice. All of these factors will then be applied in the development of a comprehensive CALL evaluation framework relevant to the South African FET context.

Since this study is primarily theoretical in nature, focusing on critical review and synthesis of particular issues, it is appropriate for it to be literature-based. It is important that the framework developed be based on the established theory and best practice, in an attempt to ensure that the decisions taken in educational contexts based thereon are not arbitrary or uninformed (Cohen, Manion and Morrison, 2000).

Limitations

It is not the intention to provide a detailed history of either educational theory or CALL, but rather to highlight the origins of

currently favoured "buzzwords". The framework developed is intended for the evaluation of multimedia CALL targeting the FET school sector, and may therefore not be entirely applicable to other forms of CALL, targeting other audiences. Evaluation in this instance does not include evaluation of learning; rather it is intended to mean the process of selecting appropriate software for use in the FET language classroom.

Overview of the thesis

Chapter 1: Introduction

This chapter describes the aim of the project, the background to the thesis, the rationale for the thesis and the method used.

Chapter 2: Evolution of educational theory

This chapter highlights the main theories that have evolved over the last century, that have led to the current understanding of teaching and learning.

Chapter 3: Educational technology

The use of technology in education is explored in terms of best practices and theoretical underpinnings. Implications for the evaluation of CALL are extracted.

Chapter 4: CALL approaches and methods

Major features in the development of CALL are highlighted and the most significant design elements are explained.

Chapter 5: The South African Context

The South African language learning environment is analysed from the perspectives of national education policy, cultural factors and the technological context.

Chapter 6: Evaluation of evaluation kits

Available evaluation toolkits are critically analysed in the light of theory. Gaps are determined and supported elements are consolidated. A new, more comprehensive and locally relevant evaluation framework is proposed.

Chapter 7: Conclusion and recommendations

Findings are summarised and recommendations for further development and research are made.

Chapter 2

Evolution of educational theory

Introduction

This chapter traces the origins of current ideas about and approaches to teaching and learning. Educational theory has seen the emergence of three paradigms regarding learning theory over the course of the twentieth century: behaviourism, cognitivism and constructivism. The development of these schools of thought is often described in a linear fashion for the sake of expedience, yet the reality is somewhat more complex and intertwined than that. It is noteworthy to realise that our current thinking is in fact not all that new and its philosophical roots extend at least a thousand years back. Socrates had very modern views on learning; he is attributed with having said, "I cannot teach you anything, I can only make you think." More recently, Kahlil Gibran in *The Prophet* had much to say about teaching and learning that would resonate strongly with modern thinking:

If [the teacher] is indeed wise he does not bid you enter the house of his wisdom, but rather leads you to the threshold of your own mind.

The astronomer may speak to you of his understanding of space, but he cannot give you his understanding.

For the vision of one man lends not its wings to another man.

… so must each one of you be alone … in his understanding of the earth. (Gibran, 1991:76-77)

This has a decidedly constructivist ring to it, yet it was written by a philosopher-poet in 1923.

Although the various schools of thought are laid out separately and in sequential order below for the sake of clarity, it is worth noting that their development did not occur in historical linearity, nor are their boundaries particularly clear-cut in practice. One should also note that, although clothed in the language of science, none of the theories of learning can honestly claim to be anything more than speculative (Reagan, 2003).

From teaching to facilitation of learning

Behaviourism

Behaviourism was a product of the reductionist worldview that predominated during the first half of the twentieth century. Reductionism involved a particular epistemology that maintained that reality existed independently of the human being, and consequently that truth and knowledge similarly existed exterior to the human mind. The associated ontology was based on the notion that only that which was observable could be studied. Pavlov's famous experiments with salivating dogs in the 1890s (Classical Conditioning) typified this empiricist approach and formed the basis of a twentieth century movement in psychology exemplified by the works of Edward Thorndike, John Watson and B.F. Skinner that ultimately resulted in the development of the theory of Operant Conditioning. Since one could not observe directly what was going on in the human mind, one could not study it. It was however possible to observe what was going

in and what the result thereof was (Kelly, 1997), i.e. stimulus and response. Learning was in essence an observable change in behaviour due to a learner making the connection between a particular stimulus, their response to it and the consequence thereof (reinforcement) (Huitt and Hummel, 1997).

In terms of behaviourism the role of the teacher is to provide the appropriate stimulus and reinforcement pairing that would elicit the desired response and change in behaviour in the learner. In addition, the epistemology of an external reality and objective knowledge (derived from Lockean philosophy) supported the view of the human mind as a *tabula rasa* - a blank slate, or indeed the commonly used term of an empty vessel. This justified a transmission model of teaching in which the teacher was the subject expert, the "sage on the stage", in a position to dispense knowledge to the learners. Clearly, this is a teacher-centred approach.

The most obvious buzzwords derived from behaviourist approaches to teaching that are relevant to CALL are *reinforcement*, *feedback* and *drill and practice*.

- reinforcement — negative or positive; punishment or reward.
- feedback (consequence in its most simplistic interpretation) — the closer to the learning event the better ("immediacy effect");
- application in computer terms is the drill and practice form of exercise, but this is limited in terms of the kind of learning it elicits (Deubel, 2003).

Cognitivism

There were theorists, such as Jean Piaget, who deemed behaviourism an insufficient explanation of learning. It did not account for a variety of factors, including the observation that children and adults

appeared to learn in different ways. It was largely due to Piaget's work on the intellectual development of children that the focus of enquiry in psychology shifted from the stimulus-response relationship itself to the way in which responses were generated by the individual (Gross 1985). In other words, the "black box" of the human mind was being cracked open. The focus of study was revised to include the impact of previously ignored factors such as memory, motivation, emotion and attention on learning. These factors came to be known as mediational processes, as they mediated between stimulus and response (Gross, 1985). This led to the evolution of cognitivism and to the establishment of the information processing model of the human mind.

Cognitivists found the analogy of a computer processor useful in describing the internal workings of the human mind (McLeod, 2007).

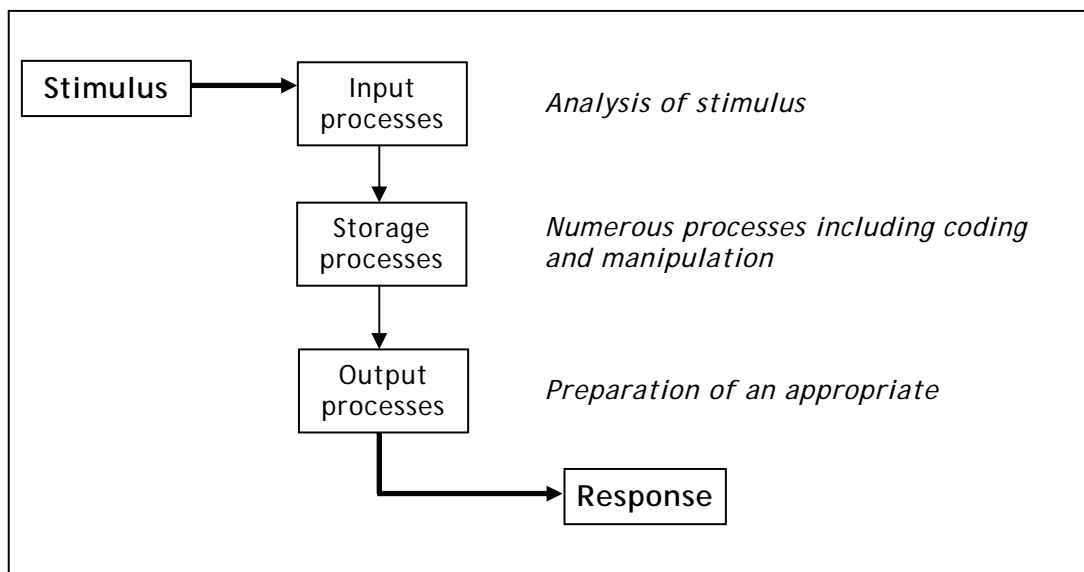

Figure 2.1: The Information Processing System. Adapted from McLeod 2007.

Although cognitivists differed from behaviourists in terms of their appreciation of the role of the human mind in learning, it is important to note that they still shared essentially the same epistemology of reality and knowledge as existing external to the human mind. The focus of teaching was thus still on knowledge

transfer, but with the emphasis on organising information to suit human capacity for processing it (Molnar, 1997). This is exemplified in the work of theorists such as Gagné, who concentrated on establishing conditions under which learning would best take place.

Some of the key concepts associated with the cognitivist approach are *schema*, *information processing model*, *cognitive load* and *dual coding*.

A schema (plural: schemata) is a type of mental framework used to understand and organise information in long term memory, to problem solve and to retrieve information from memory. It is a concept central to many cognitive theories.

George Miller's studies of human memory culminated in the development of the information processing framework (Miller, 1956). Integral to this was the notion that only 5-9 (seven plus or minus two) "chunks" of information could be stored in short-term memory at any given time. A chunk is any meaningful unit and can refer to any kind of data: numbers, faces, etc. In order to work with this limitation of short term memory, the idea of chunking information was developed.

In the 1980s Sweller (1988) built on Miller's research in short term memory and the concept of schemata as organising structures in long term memory in order to develop cognitive load theory. In terms of this theory, the load on short term (working) memory should be kept low to allow for the acquisition of schemata in long term memory.

Dual coding theory was developed by Paivio (1986) and extends the idea of information processing, postulating that human cognition comprises of two specialised cognitive subsystems. One subsystem or channel is dedicated to language processing, whilst the other deals with non-verbal information. Cognitive processing (and hence

learning) is thought to be enhanced by presenting information in both formats.

Constructivism

Constructivism is a very broad theoretical framework in philosophy that has found application in education and there are many, quite diverse perspectives including radical constructivism and social constructivism. Constructivism builds on some of the key concepts developed in cognitivism, but represents a paradigm shift in terms of epistemology. It was a theory of knowledge first and then a theory of learning (Reagan, 2003). On the epistemological level, according to constructivists, although reality does exist independently from the human being in a physical sense, each individual's experience of reality would differ somewhat, meaning that no objective truth exists. Each individual constructs his or her own interpretation of reality based on experience and "truth" is socially negotiated.

This has significant implications for the understanding of learning, foremost of which would be that learning is about constructing meaning within a particular context, not about acquiring stores of decontextualised knowledge. This runs contrary to all transmission based approaches to teaching. In fact, one could view constructivism as the first theory of learning, rather than teaching. Indeed, constructivism does not have an associated model for teaching, but rather focuses on the facilitation of learning. This represents a significant shift in focus in education from the teacher to the learner, hence the term "learner-centred" has come into vogue.

Constructivism is currently the dominant paradigm in educational theory, but it is complex and sometimes poorly interpreted, leading Reagan (2003: 120) to caution against the indiscriminate use of the term, as it has "taken on the force of a slogan in many educational

circles — a slogan that ... has become so commonplace as to inhibit rather than promote clear thinking about teaching and learning".

Part of the problem, no doubt, arises from the plethora of buzzwords associated with constructivism, many of which are closely related or overlap. For example, there are those that deal with contextualised (i.e. based in the real world) learning: *anchored instruction*, *authentic learning*, *case-based learning*, *situated learning*, *problem-based learning*. Those that address individual construction of meaning include *active learning*, *learner autonomy*, and *discovery learning*. There is yet another set of terms that refer to the social aspects of constructivist learning, including *communities of practice*, *collaborative learning*, *cognitive apprenticeship* and the *zone of proximal development*. Doolittle (1999) very succinctly summarises the main requirements for a constructivist learning environment:

1. Learning should take place in authentic and real-world environments
2. Learning should involve social negotiation and mediation
3. Content and skills should be made relevant to the learner
4. Content and skills should be understood within the framework of the learner's prior knowledge
5. Students should be assessed formatively, serving to inform future learning experiences
6. Students should be encouraged to become self-regulatory, self-mediated and self-aware
7. Teachers serve primarily as guides and facilitators of learning, not instructors
8. Teachers should provide for and encourage multiple perspectives and representations of content

Implications

To reiterate: constructivism is the currently favoured learning paradigm. Although the broad educational paradigms described above may appear to be mutually exclusive at a philosophical level, in practice they often operate in a complementary sense. Indeed, Cronje (2006) has argued for an attempt to be made to integrate constructivist and instructivist approaches.

There are some instances where the type of learning required in a particular situation may be more effectively achieved using behaviourist principles rather than constructivist principles. An example would be something that is strongly procedural, requiring great accuracy, like first aid procedures. The reaction should almost be automated, e.g.: If the casualty is bleeding use the **RED** procedure - apply p**R**essure to the wound; **E**levate the part of the body that is bleeding; make the casualty lie **D**own. The opportunity to allow first aiders to construct their own understanding of the vascular system and how best to deal with blood loss due to injury in an authentic context using discovery learning is neither advisable nor practical.

In other words, learning goals that feature low on Bloom's taxonomy of the cognitive domain, may probably be adequately achieved using behaviourist approaches. The higher the learning goal is on the taxonomy, the more complex it becomes and would thus require application of cognitive/constructivist principles.

Chapter 3

Educational Technology

Introduction

Computers have achieved their place in education through the fortuitous convergence of a variety of factors, or developmental streams: progress in our ideas about knowledge and about how people learn, changes in society, and technological advances. Since the first item has been addressed in the previous chapter, the latter two factors are explored here and their implications for sound educational programming and an evaluation framework are captured.

Society

The Second World War was a pivotal point in shaping the nature of society today. Major advances were made during the war in communications technology as well as transport, marking the beginnings of the global village. The post-war bipolar world spurred an information explosion as the two power blocs sought to outdo each other in various research and development spheres, including the arms race and the space race, giving us such innovations as the ballpoint pen, satellites and communication networks that ultimately allowed the Internet to become a reality. The pace of change in all aspects of life accelerated beyond anything known before, making lifelong learning an imperative. This was the inception of the information society and the knowledge economy. All of these factors contributed to the perceived need for computers in education: for access to information, research, teaching, communication and learning.

Technology

Computers have been in classrooms since the 1950s and, despite predictions to the contrary, it would seem that "after changes upon changes, we are more or less the same" (Simon and Garfunkel, 1970). The introduction of computers has not brought about the dramatic changes in teaching and learning — let alone the revolution — that had been anticipated (Open Learning Technology Corporation, 1996; Berg, 2000).

This could in part be accounted for by the fact that early computer assisted instruction had been put forward as something of a panacea and could not live up to expectations (Benyon, Stone and Woodroffe, 1997). Some of the reasons given for this include:

- Lack of support from many in education
- Technical problems
- Poor software
- High cost.

The question is: why computers?
The development of computers and hypermedia fed into developments in learning theory. Some suggested that a hypermedia environment lent itself to cognitive-constructivist approaches to teaching (Kozma in Cronje, 1995).

Learning theory	Technology	Rationale for using computers
Behaviourism	Mainframe	computer is a good drillmaster; tireless tutor
Cognitivism	PC	computer system replicates the way our brains/minds process information

Constructivism	Internet/ hypermedia	computer networks allow us to construct knowledge in a natural manner by means of the hypertext principle, in the social context of online communication and possibilities of collaboration

Figure 3.1 Relationship between learning theory, technology and rationale

Exponential growth of the Internet and associated hypermedia certainly allowed for a concurrent development in educational applications, but one must bear in mind that the developments in hypermedia were not driven specifically by educational needs. These advances were originally conceived for business or even military use – the fact that they could find application in educational contexts was perhaps accidental or serendipitous at best.

One must ask to what extent the one perhaps influenced the development of the other. Was necessity the mother of invention, or was invention the mother of necessity (Molnar, 1997)? In other words, the nature of applications of technology in educational settings has been determined by what the technology has had to offer, rather than being driven by educational imperatives.

After all the initial fascination with the bells and whistles of technology had worn off, there was a general realisation that technology makes bad pedagogy even worse (Creed, 1998; Phillips, 1998; Bromley, n.d.). Phillips (1998) is adamant that a sound pedagogical basis must be in place for the application of technology to succeed and reiterates that "we must not let the media limit our approaches; technology without pedagogy is nothing" (1998: 35).

Numerous tools such as Blackboard, WebCT, LotusNotes, ToolBook Instructor, etc. were developed to take advantage of the advances in ICT for educational purposes. But upon closer inspection, especially

in their earlier incarnations, these tools appeared to be replicating the basics of conventional face-to-face classroom teaching and textbooks, without actually bringing a fresh approach to teaching. It is as if the developers of these tools merely isolated the major elements of classroom teaching and created electronic equivalents in the manner of "the sum of the parts must equal the whole". This attitude is characteristic of the adoption of new technologies in education: the potential benefits are recognized and lauded as revolutionary, but implementation does not reflect this, or result in new practice. In fact, this approach misses the point that classroom teaching is much more than the sum of its parts; and this potentially results in products that are even less effective or meaningful than classroom-based teaching. These course management systems (CMS) even go so far as to undermine the very hypertext principle upon which the Internet is founded: they do not make provision for linking directly from anywhere in a CMS course to anywhere else within that same course[1].

Hypertext and hypermedia

Hypertext and hypermedia are both based on the same principle of non-linearity. The primary advantage of educational hypermedia applications is the potential of appealing to a variety of senses in an interactive way that approximates the way people learn. The emphasis is on the word "potential". If the hypermedia is not structured in en educationally meaningful way, then there will not be any gains (Benyon et al., 1997). To put it another way, "just because these kinds of interchanges may now be electronically delivered with beeps and animation for feedback does not render them more useful if the pedagogical basis is not sound" (Phillips, 1998:27).

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[1] In order to make a hypertext link, a destination URL is required. Once pages are uploaded to a CMS, URLs are assigned by the server, and become "invisible" or at the very least obscure to the user and developer of course materials.

Cognitive load

In terms of cognitive load theory, the load on short term (working) memory should be minimized to allow for the acquisition of schemata in long term memory. In terms of hypermedia applications, this has been interpreted in a number of ways, including chunking and simplification of content. Particularly in the case of educational hypermedia applications, however, this should not be interpreted as providing no challenge for the learner. Grace-Martin (2001) argues that

- there is an optimal level of cognitive load that is largely dependent on the learner's prior knowledge of the content;
- cognitive load should be directed at educational content and activities rather than on interface elements (layout, navigation, etc.).

In other words, a learner with greater prior knowledge of content can accept a higher cognitive load than one with lesser prior knowledge. Regardless of the cognitive load placed on the learner, the bulk of load should be on the educational aspects rather than "learning the tool".

Interactivity

Interactivity is a term that is used with great enthusiasm, but little attention is given to what type or level of interactivity is implied. There often appears to be little regard for what interactivity means, or should be. A case in point is Neo and Neo (2004) who sing the praises of "interactive multimedia learning" without ever specifying what they mean by "interactive", despite the fact that there is little consensus in the literature regarding the definition. For the most part, definitions focus on communication between user and computer, as well as the notion of feedback. One must also bear in

mind that multimedia is not necessarily interactive; rather interactivity results from the design of the application (Sims, 1997).

Various authors regard interactivity as of pivotal importance (Ohl, 2001; Neo and Neo, 2004, Sims, 1997). Kennedy, Petrovic and Keppel (1998) maintain that it is precisely the interactive capacity of hypermedia that promotes deep processing and thus improved learning. In order for that to be so the nature of the interactivity "has to be more than just software that you click on to bring up a different pop-up or text-menu. 'Interactive' has to mean more than point and click — it should be involving and personal" (Dickinson in Sims, 1997). Dickinson goes on to say that interactivity is what makes a multimedia tool "a more appropriate tool than a book or a video or a set of crayons."

There are several competing taxonomies of interactivity. Rhodes and Azbell (in Sims, 1997) describe three levels of increasing interactivity based on the central concept of learner control.

Reactive	Little learner control of content structure with program directed options and feedback
Coactive	Learner control of sequence pace and style
Proactive	Learner controls both structure and content

Figure 3.2 Rhodes and Azbell taxonomy of interactivity.

Jonassen's (in Sims, 1997) model describes the nature of interactivity in terms of five dimensions:

- Modality of learner's response
- Nature of the task
- Level of processing
- Type of program
- Level of intelligence in design

Schwier and Misanchuk (in Sims, 1997) developed a taxonomy of interactivity measured on three dimensions, each of which involved increasing levels of interactivity:

		Increasing interactivity →				
Dimensions	Levels	reactive		proactive		mutual
	Functions	confirmation	pacing	navigation	inquiry	elaboration
	Transactions	keyboard	touch screen		mouse	voice

Figure 3.3 Schwier and Misanchuk taxonomy of interactivity.

The underlying implication with all of these models is that better instruction involves a more sophisticated level of interactivity. Ultimately though, the learning value of interactivity is embodied in how meaningful and engaging it is to the user (Sims, 1997).

Navigation

Navigation within hypermedia systems is one of the most crucial and challenging design elements. It is not to be confused with structure of content, although it is to some extent a reflection of structure. In a traditional sense (nautical, aviational) navigation is about finding position and plotting a course. In hypermedia applications it is better understood as a means for the user to establish a relationship with the structure. The user needs to know where they are in relation to the rest of the structure; what the other elements of the structure are; and how they can move from where they are to where they want to be.

When it comes to the design of navigation in educational hypermedia in particular, there are two important considerations: cognitive load and individual differences. As seen above, keeping cognitive load low

is important to facilitate learning. The implications for the design of navigation are that

- it should be as intuitive as possible, reducing the time taken to learn how to get around;
- the overall navigation system should be kept consistent throughout the application, so that re-learning doesn't have to occur.

In terms of individual differences amongst users, there are three main points to bear in mind:

1. not all users are equally technologically competent, so navigation should be kept as simple as possible;
2. different users will have different goals in using the application;
3. users have a variety of learning styles and strategies that should be accommodated in the navigation possibilities.

Underlying the design of any hypermedia navigation system is the designer's conception of how important user control is. In terms of a constructivist perspective, learners should have as much control as possible. However, research has shown that apparently random non-linear navigation can engender anxiety and thus inhibit learning potential (Campbell, 1999). The level of learner control should be matched with the technological competence of the learners.

Media usage

Richard Mayer (2001) did extensive empirical research on the use of multimedia in learning, examining the circumstances under which learning is facilitated. His research was largely based on cognitive-constructivist theory. This research resulted in the development of

seven research-based principles for the design of multimedia (Mayer, 2001: 184):

1. Multimedia Principle: students learn better from words and pictures than from words alone

2. Spatial Contiguity Principle: students learn better when corresponding words and pictures are presented near rather than far from each other on the page or screen

3. Temporal Contiguity Principle: Students learn better when corresponding words and pictures are presented simultaneously rather than successively.

4. Coherence Principle: Students learn better when extraneous words, pictures, tunes, and sounds are excluded rather than included.

5. Modality Principle: Students learn better from animation and narration than from animation and on-screen text.

6. Redundancy Principle: Students learn better from animation and narration than from animation, narration, and on-screen text.

7. Individual Differences Principle: Design effects are stronger for low-knowledge learners than for high-knowledge learners and for high-spatial learners rather than for low-spatial learners.

Dissonance between theory and practice

Kennedy, Petrovic and Keppell (1998: 411) make the claim that "too often multimedia developers do not assure congruence between learning objectives and instruction (and also congruence with assessment)". For example, a particular CALL application may make claims to be driven by communicative language learning principles, but it makes extensive use of drill and practice exercises. Drill and practice relates to mastery learning, which is based on a behaviourist approach to learning, which in turn is antithetical to the making of meaning (central to the communicative approach to language

learning). Despite theories of learning having advanced considerably, multiple choice type exercises are still a frequently encountered form of assessment in hypermedia environments, partly due to the relative ease with which they can be created from a technological perspective.

Mioduser, Nachmias, Oren and Lahav (1999) also note this dissonance between theory and practice:

> Many, if not most, applications of online learning continue to reuse development processes and teaching strategies from traditional forms of teaching and learning. People are not aware of what can be done with the new medium and fall back on what they know. The result is usually a transition period during which practitioners' replicate known models by means of the new technology (1999:754).

As is evidenced by a survey of 436 web-based learning environments conducted by Mioduser *et al.* (1999), most educational hypermedia or multimedia offerings are not drawing on the pedagogical approaches at present favoured by researchers. This might be the case because of the challenges in applying constructivist principles in formal education settings, or because of educators' embedded beliefs and principles.

Constructivist learning in its most essential sense is driven by individual needs or goals, meaning that motivation is intrinsic. In a structured traditional educational setting the most immediate goals are those of the teacher in covering the prescribed curriculum. Constructivist learning may well occur, but there are outcomes to be satisfied that dictate both content and time constraints. True constructivist learning is something of a hit-and-miss affair, as the learner explores and gradually constructs meaning in collaboration

with others — something that does not fit into most formal educational contexts.

Richards and Rogers (2001) note that teaching practices reveal the underlying belief system that a teacher subscribes to regarding human nature, society, the nature of learning and so forth. According to Clark and Peterson (in Richards and Rogers, 2001), the most unyielding of these beliefs about teaching and learning stem from the teacher's own schooling experience and are little influenced by subsequent teacher development.

Implications

According to the above research the main implications for evaluation of educational technology are not entirely clear-cut. There are very few prescriptions as to what "good" educational programmes would look like, or how they should function. Almost everything is dependent on the nature of the learning outcomes, together with the characteristics of the target learners. It follows, therefore, that these elements of the context in which it is to be used will determine whether a particular educational technology application is appropriate or not.

Chapter 4

CALL approaches, methods and design

Introduction

This chapter gives an outline of the development of CALL approaches and methods, as well as accompanying technological progress. Thereafter certain important design features of CALL are explained.

CALL theory shares much with applied linguistics and educational psychology. Not surprisingly, therefore, CALL approaches and methods have evolved in concert with these fields of enquiry. As the purpose for learning languages changed over time, so did second or foreign language acquisition approaches and methods.

Approaches to language teaching

"Central to an approach or method in language teaching is a view of the nature of language, and this shapes teaching goals, the type of syllabus that is adopted, and the emphasis given in classroom teaching" (Richards and Rodgers, 2001: 132). Prior to the middle of the twentieth century, the dominant language teaching approach was grammar-translation, which focussed on accurate use of grammatical structures and forms for the purpose of reading and writing. As the focus in purpose or goals of language acquisition changed from reading and writing to speaking and listening, so too the methods of teaching changed. Richards and Rogers (2001) give a thorough exposition of the shifts in thinking that took place via the Reform Movement in the late nineteenth and early twentieth centuries in response to this change.

The audiolingual method and the situational method arose at roughly the same time and had significant similarities, but while the former was developed in the United States, the latter was favoured in the United Kingdom. Both methods posited language as speech, specified an order in which language skills were to be introduced and focussed on accuracy of grammar and sentence structures. Language could be learned by accurate imitation and habit formation, which was taught using drill and practice techniques (Richards and Rodgers, 2001).

Noam Chomsky's work in linguistics effectively brought an end to the popularity of these approaches, as he pointed out that language was not learned by rote memorisation, but rather generated through complex processes in the human mind involving underlying knowledge of abstract rules (Richards and Rodgers, 2001). This caused a paradigm shift in language teaching and signalled the start of a quest to find alternative approaches and methods that Richards and Rodgers (2001) describe as the methods era, which was most dynamic from the 1960s to the 1980s. Methods such as Total Physical Response, The Silent Way, Suggestopedia and Whole Language experienced brief periods of popularity, but did not succeed in revolutionising language teaching.

The communicative language teaching (CLT) approach eventually became widely accepted and currently enjoys dominance. It differs significantly from preceding approaches in that the goal of language learning is viewed as the competence to use the target language effectively and appropriately (Richards and Rodgers, 2001). There are several important principles to note:
- Language is not memorised, but rather created by an individual.
- Fluency and acceptable use are more important than accuracy.

- Language is there to be used for communication with other people.

The 1990s saw a move away from methods and ushered in the so-called "post-methods era", that focussed on alternative ways of understanding the nature of language teaching. In a post-methods era, there must still be something driving the teaching of languages. Richards and Rogers (2001) maintain that this is characterised by an eclectic flexibility and adaptation or customisation of existing approaches and methods for particular circumstances. Some of the more important trends in the post-methods era include the following:

- Language learning as a social phenomenon
- Language as culture
- Integrative language teaching

Evolution of CALL

Trying to define the evolution of CALL as a discipline in chronological terms is rather superficial and ultimately of very little import, as it denies the richness and complexity of the debates surrounding CALL. It is a task that has proven difficult to achieve precisely because there is no particular stage-by-stage evolution of CALL demonstrating the rise and subsequent *extinction* of one approach/method followed by another and so forth.

Bax (2003) makes a cogent argument that attempts of this nature, such as those by Warschauer (1996), are fundamentally questionable. Imposing this type of view on the development of CALL is to some extent misleading. The fact that the origin of a particular method or approach preceded the development of another does not necessarily imply that it is replaced, or has become obsolete. With CALL it would

appear that, in many instances, newer methods and approaches have supplemented, rather than supplanted, previous ones. For example, drill and practice exercises are closely associated with the audio-lingual approach, but are still widely used today. Instead the focus should be on trying to distinguish the different types of CALL and the appropriate circumstances in which to utilise each type. Different types of language learning objectives demand different methods and approaches. For example, the acquisition of vocabulary could be achieved through rote memorisation, using drill-and-practice techniques; the ability to effectively communicate original sentences in real contexts would require a much more elaborate approach, including interaction with authentic materials and exposure to the culture of the target language.

Not surprisingly, the changing nature of CALL has been determined by the prevailing approach to language teaching and the opportunities offered by the concomitant state of development of computer technologies. CALL has its origins in the era of the mainframe computer (1960s and 1970s), when applications such as PLATO (Programmed Logic for Automatic Teaching Operations) and TICCIT (Time-Shared Interactive Computer Controlled Information Television) were developed. During this period, the dominant theory of learning was Skinner's behaviourist operant conditioning and the approach to language teaching was audiolingualism. The type of CALL that this engendered was essentially text-based drill and practice exercises (cloze, multiple choice, etc.), aimed at mastery of language forms and structures. It was extremely teacher centred. Warschauer (1996) terms this the "behaviouristic" phase of CALL. Bax (2003) categorises this as "restricted" CALL.

The 1980s saw the rise of the personal computer and the subsequent wider distribution of CALL. Software authoring tools were developed, e.g. Hypercard, Authorware and ToolBook, which allowed non-

programmers to start developing CALL applications. Most of the applications were organised in the format of electronic books (as the name ToolBook suggests). At the same time user interfaces became more sophisticated, allowing for the inclusion of multimedia elements and the expansion of activity types. However, drill and practice exercises were still very common, probably because templates for these were included in authoring software, which made them an easy option to include. The model was ultimately still very teacher centred, with users limited to "paging" through predetermined paths in the content.

The development of the Internet and the World Wide Web brought about significant new opportunities for CALL to adopt a more communicative approach. The possibilities of hypertext and hypermedia addressed the need for more learner centred and socio-culturally oriented methods, as well as providing for authentic materials, as required by CLT and the shift to constructivist understandings of learning. This corresponds to Warschauer's (1996) "integrative" stage of CALL development, and Bax's (2003) "open" category of CALL.

Language learning as a social and cultural phenomenon

Current theory emphasises the fact that language is a social phenomenon, which implies that language is acquired through social interaction (Adair-Hauck, Willingham-McLain and Youngs, 1999). If this is indeed accepted as being true, then "standalone" language learning programmes (which can be purchased in book stores) can surely not be acceptable. Adair-Hauck et al (1999) argue that if the multimedia package includes communication and co-operative activities that assist learners working in their zones of proximal development, then it can fulfil the same role as a teacher or more

capable peers. But it is often in the nature of these standalone products that they are used by individuals in isolation, where there are no other known learners and no opportunities for communication. If they were to be used in class settings, some of these drawbacks could be overcome. The current state of hypermedia based CALL does allow the potential incorporation of sociolinguistic authenticity through making use of available technologies such as e-mail, discussion forums, chat, online newspapers, etc.

Closely related to the social aspect of language, is that of culture. Petersen and Coltrane (2003) define culture as an "integrated pattern of human behaviour that includes thoughts, communications, languages, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviours". Language is thus not only a part of culture, it is also a vehicle for the expression and transmission of culture. It is therefore essential that culture is incorporated into language teaching. Petersen and Coltrane (2003) outline instructional strategies for teaching language and culture:

- Authentic materials
- Proverbs
- Role play
- Culture capsules
- Students as cultural resources
- Ethnographic studies
- Literature
- Film

Integrative CALL

Warschauer (2004) updated and expanded his earlier (1996) description of the phases of CALL, elaborating particularly on the current phase: integrative CALL[2].

Stage	1970s-1980s: Structural CALL	1980s-1990s: Communicative CALL	21st Century: Integrative CALL
Technology	Mainframe	PCs	Multimedia and Internet
Teaching paradigm	Grammar-translation and audiolingual	Communicative language teaching	Content based
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 Practice	Communicative exercises	Authentic Discourse
Principal Objective	Accuracy	Fluency	Agency

Figure 4.1: The Three Stages of CALL (Based on Warschauer, 2004)

The most notable advance in Warschauer's model is that the principle objective of CALL in the integrative phase is agency, which goes beyond the competence and fluency of the communicative phase:

> The purpose of studying [language] thus becomes not just to acquire it as an internal system, but to be able to use [language] to have a real impact on the world. (Warshauer, 2004:12).

Interestingly, Warschauer sees these stages not as mutually exclusive, but rather as additive: accuracy + fluency + agency.

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[2] Not to be confused with Bax's (2003) "integrated" CALL, which he maintains does not yet exist, as CALL technology has not yet become embedded or "normalised" in everyday practice.

Implications for CALL evaluation

The currently favoured approach in language teaching is communicative, with the primary objective being able to communicate effectively in the cultural context of a particular language. This means that language cannot be learned out of context, which has significant implications for the kinds of teaching strategies and materials used. Perhaps the two points that enjoy the most prominence in the literature are social communication and authenticity of materials.

Chapter 5

The South African Context

Introduction

One might well ask why it has been deemed necessary to develop a CALL evaluation framework specifically for the South African context. The short answer would be that South Africa is different to the rest of the world. The long answer explains what these differences are and what their implications might be for CALL. To this end, this chapter examines the education policy, cultural and technological contexts in South Africa that underlie the motivation for a new CALL evaluation framework.

Educational Policy environment

The transformative drive with regard to the education system post-1994 has resulted in a proliferation of legislation, policy, regulatory and other documents being produced over a relatively short space of time. The changes have been far-reaching and frequent with the result that the public sector education policy, legislative and regulatory environment have become alarmingly complex, especially to the uninitiated. Nonetheless, policy, defined as "a plan or course of action, as of a government, political party, or business, intended to influence and determine decisions, actions, and other matters" that is meant to embody "prudence, shrewdness, or sagacity in practical matters" (Dictionary.com, 2004), has an impact, positive or otherwise, on the daily lives of people. In the context of this thesis, a variety of national policies have placed huge, one could say

unrealistic, pressures on teachers[3]. This will become apparent as the relevant texts are discussed below.

Outcomes-based education (OBE)

Strangely, at a time when the generally accepted approach to education was moving towards constructivist theories, South Africa chose to go in a different direction: OBE has at least some of its roots in behaviourism and the notion of mastery learning. It also has associated with it an extensive and complex jargon. Jansen (1998:323) criticises OBE for this very reason, citing a convincing example:

> For [a teacher] to understand the concept of 'outcomes' requires understanding of competencies, unit standards, learning programmes, curriculum, assessment criteria, range statements, equivalence, articulation, bands, levels, phases, curriculum frameworks and their relationship to the South African Qualifications Authority (SAQA), the National Qualifications framework (NQF), National Standards Bodies (NSBs), Standards Generating Bodies (SGBs) and Education and Training Qualification Agencies (ETQAs), reconciliation of the 12 SAQA fields with the eight learning areas with the eight phases and the fields of study, and on and on.

Multilingualism

In its *Learning programme guidelines: Languages* the National Department of Education (DoE) explains that the drive towards multilingualism in South Africa is motivated primarily by the desire to overcome the prejudices of the past, as multilingualism "breaks down boundaries and recognises and respects different languages and cultures" (DoE, 2007:8). The teaching of language is regarded as

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[3] At the time of writing, there were more than 160 Acts, Bills, Green and White papers, regulations, policies and guidelines published on the National Department of Education website.

critical to the achievement of, and thus has to be informed by, the principles of the National Curriculum Statement, articulated as:

- Social transformation
- Outcomes-based education
- High knowledge and high skills
- Integration and applied competence
- Progression
- Articulation and portability
- Human rights, inclusivity and environmental and social justice
- Valuing indigenous knowledge systems
- Credibility, quality and efficiency (DoE, 2007:8).

The use of ICTs in the teaching of languages is encouraged and considered important to prepare learners for "international cross-cultural interaction which is increasingly required for success in academic, vocational or personal life" (DoE, 2007:9).

The emphasis on using an outcomes based education approach is directly connected with the adoption of a communicative language teaching approach. The DoE assumes that OBE methodologies would come naturally to language teachers, making the sweeping generalisation that "communicative language teaching and a text-based approach are familiar to teachers and are the embodiment of an outcomes-based education approach" (DoE, 2007:9). No evidence is given to support this claim. The DoE (2007:10) goes on to then stipulate which classroom practices are commensurate with communicative language teaching:

- Language skills should be taught in an integrated manner reflecting usage in real life.
- Learners should be given ample opportunities to use language in class: to listen and speak and to read or view and write language.

- Learners should use language for communication of real feelings, ideas and information for real purposes.
- Use of authentic texts
- The focus is on the effective communication of meaning rather than on correct grammar and form.
- Language structures should be taught in context.
- "Learners should be relaxed and enjoy what they do" so as to prevent fear of making mistakes hindering language acquisition.

These stipulations raise some issues, such as:
- To whose "real life" do they refer — the learners', the teacher's, or that seen on television? These may all be quite different, although equally authentic.
- At what point does ignoring the use of incorrect structures give way to recognition that incorrect usage can radically impair effective communication of meaning?

According to the NCS all languages may be taken on one of three levels:
- Home language
- First additional language
- Second additional language

In the FET sector, there are four Learning Outcomes (LOs) applicable to each of the above language levels:

LO 1: Listening and Speaking	The learner is able to listen and speak for a variety of purposes, audiences and contexts.
LO 2: Reading and Viewing	The learner is able to read and view for understanding and to evaluate critically and respond to a wide range of texts.
LO 3: Writing and Presenting	The learner is able to write and present for a wide range of purposes and audiences using conventions and formats appropriate to diverse contexts.

LO 4: Language	The learner is able to use language structures and conventions appropriately and effectively.

Figure 5.1 Language Learning Outcomes for FET

These outcomes have to be assessed according to the *Subject Assessment Guidelines: Languages* (DoE, 2008) — a document that runs to 72 pages of specifications for each of the levels and learning outcomes, covering all aspects of assessment from number of assessments to the forms that assessment should take and the rubrics to be used in assessment. The DoE is clearly intent on controlling all aspects of language curriculum development and implementation.

ICTs in education

The most significant documents in terms of national policy initiatives regarding ICTs and education are the *Technology Enhanced Learning Initiative* (TELI) discussion document (DoE, 1996), the *Strategy for Information and Communication Technology in Education* (DoE & DoC, 2001) and the *Draft White Paper on e-Education* (DoE, 2003).

The TELI document recognised the need for the integration of ICTs into the schooling sector and sought to provide guidelines for implementation of ICTs in schools, mapping out four stages of technology adoption and integration. As the urgency of the matter became greater in light of the rapidly accelerating global adoption of ICTs, the DoE and the Department of Communication attempted to expedite matters with the publication of a joint policy document, the *Strategy for Information and Communication Technology in Education* (DoE & DoC, 2001). Although the document recognised the challenges regarding access to technologies in South Africa, it set up very ambitious outcomes, the most relevant ones of which are listed below (DoE & DoC, 2001:21-22):

- All schools will possess a means of telecommunication (landline or cellphone)

- Schools will have access to Internet-linked computing facilities for learner and educator use.
- At the end of the Foundation Phase, all learners will have used computers in the acquisition and enhancement of their numeracy and language skills.
- Learners and educators will have basic competence in the use of word processing, spreadsheet, flat database, e-mail and web browser applications.
- Learners and educators will have used a host of user-machine interfaces, including keyboards, touchpads and other devices.
- Educational software will comply with the Curriculum 2005 assessment standards.

No timelines were set, and so, seven years down the line and viewed with the benefit of hindsight, many of these seem aspirational to the point of being entirely unrealistic.

For the purposes of this thesis, one of the key statements in the document is the following (DoE & DoC, 2001:25-25):

> ... the Department will develop and set out design and assessment standards for educational software. These will serve as guidelines for those seeking to publish software for purchase by departments in much the same way as currently applies to text and other material.

This has found expression in the form of an educational software profile for the FET published by the Western Cape Education Department (WCED, 2007).

The White Paper on e-Education (DoE, 2003) sought to elaborate on the DoE strategies for use of ICTs in education, one of the most important of which was ICT professional development for management, teaching and learning. It recognised that most of the teachers in the education system would not have grown up with the currently available technologies and would thus need extensive and

urgent development. The technological competence of teachers was acknowledged as one of the major constraints on the adoption of ICTs in education.

Cultural environment

With 11 official languages, a South African audience is guaranteed to be multilingual and multicultural. This might seem like stating the obvious, but the implications are important. Firstly, imagery, both verbal and visual, becomes complex to manage in the development of multimedia. Secondly, differing knowledge systems come into play.

Imagery

As illustration of cultural differences inherent in visual symbols, one could consider colour. One of the most telling examples would be the colour of death and mourning. In western cultures it is black, whereas in Eastern cultures it is white. In some rural areas of South Africa people display various coloured cloths outside homes to indicate the availability of particular produce for trade: red means meat; white means milk. On the other hand, a white cloth in western/ European culture means surrender; a red cloth means danger.

Images have the potential to carry significant culturally determined symbolism. Hence images used, for example, as navigational icons on a computer screen may not be universally understood in a multicultural setting. Depictions of people in a software program should, as far as possible, reflect the diversity of the South African population. This is often an issue with CALL software generated for non-South African audiences. In addition, images and other content should be free from racial or gender bias.

Indigenous Knowledge Systems (IKS)

A definition of IKS is given in Seepe (2001):

> Indigenous Knowledge Systems (IKS) refer to intricate knowledge systems acquired over generations by communities as they interact with the environment. It *(sic)* encompasses technology, social, economic, philosophical, learning and governance systems.

Dr Catherine Odora Hoppers, well known as an advocate of IKS in South Africa, maintains that IKS is

> discipline-based but within a holistic, interdisciplinary frame of reference, with its own protocol of how the knowledge can be learned. Its promotion is at once a restoration of dignity to communities, and part of a development strategy for enterprises and capacity building inside communities (2004:8).

Seepe (2001) agrees when he says that IKS holds promise for democratising knowledge generation. Furthermore, poor educational performance in many African countries can be ascribed, at least in part, to the lack of recognition of the role that culture plays in learning. This practice runs counter to some of the major tenets of constructivist approaches to teaching, which include taking context into account and building on a learner's existing knowledge.

Making use of indigenous knowledge systems could significantly enhance learning, as indicated in a series of case studies published by the World Bank (2005). Findings included

- Using traditional figures of authority (Souleymane and Mai Manga in World Bank, 2005).
- Using storytelling: often including singing and gestures with audience participation (Marecik and Friedberg in World Bank, 2005).
- Using mother tongue for teaching

- Combining elements of Western and traditional approaches (Pela in World Bank, 2005)

They also recommend building on existing knowledge and educational systems to enhance acceptance of new technologies. The integration of indigenous knowledge helps bridge the gap between formal and informal knowledge. "The introduction of new concepts should use approaches that are based on or are compatible to existing systems." (Marecik, Ole-Lengisugi and Ole-Ikayo in World Bank, 2005).

Technological environment

Although computers have been introduced into some advantaged schools since the 1980s, the formal drive to integrate ICTs into South African education started with the *Technology Enhanced Learning Initiative* in 1996 (DoE, 1996).

The Human Sciences Research Council commissioned a very interesting and somewhat disturbing report detailing access to ICTs in secondary schools in South Africa (Howie, Muller and Paterson, 2005). Major findings of that report are as follow:
- There were 35.3 students per computer in senior secondary schools;
- 15% of these computers were multimedia capable;
- 60% of senior secondary schools with computers had access to the Internet/e-mail;
- but only 20% of these schools used the Internet and e-mail for educational purposes;
- 7% of students in senior secondary school had access to software for foreign languages;
- 15% of students in senior secondary school had access to software for their main language;

- 22% of software was regarded as incompatible with the curriculum;
- 8% of software was deemed culturally incompatible;
- 31% of respondents cited lack of information about software as an obstacle to achieving ICT-related objectives.

According to Eshet-Alkalai, (2004) digital literacy is a survival skill in the hypermedia world. It is defined as a suite of technological, cognitive and sociological skills that permit users of digital media to derive maximum benefit from these digital environments. There are five types of digital literacy involved:

1. Photo-visual literacy: decoding and understanding visual messages
2. Reproduction literacy: creation of new meaningful material from existing ones
3. Information literacy: ability to evaluate and assess information
4. Branching literacy: learning from large quantities of non-linear materials
5. Socio-emotional literacy: ability to take advantage of digital communication for collaborative construction of knowledge.

These literacies should be seen as closely interrelated.

Given the low exposure levels of South African senior secondary school learners to ICTs as seen above, it is doubtful that many would have had the opportunity to practice and gain fluency in these digital literacies.

Howie *et al* (2005) also indicated that, although 60% of senior secondary schools had set the goal of training all teachers in the use of ICTs, only 7% had achieved that target. Less than 40% of school Technology Co-ordinators rated themselves as adequately prepared to support instructional use of ICTs. This would seem to indicate that

teaching and support staff are mostly underprepared for the integration of ICTs into teaching practice.

Implications for CALL evaluation

The above discussion implies that the evaluation of CALL software needs to account for the following:

1. Adherence to education policy dictates with regard to:
   a. Underlying educational philosophy: OBE, CCFOs
   b. Curriculum requirements: NCS, LOs
   c. Approach to language learning, i.e. communicative approach
2. Learning and curriculum design should incorporate elements of indigenous knowledge systems
3. The use of images and colour should demonstrate sensitivity to cultural diversity as found in South Africa
4. The use of images and language should demonstrate sensitivity to issues of race and gender equity
5. The technological requirements of the CALL application should match the available technological resources in the intended learning context
6. Affordability
7. Digital literacy of students
8. Technological ability of teachers

This just serves to emphasise the centrality of context as an organising theme for the design and hence evaluation of CALL applications.

Chapter 6

Evaluation of CALL evaluation

Introduction

In this chapter numerous freely available CALL evaluation frameworks and kits are analysed with regard to the dimensions that they do and don't cover. These dimensions are compared and contrasted with each other, as well as with the theory and best practice as outlined in Chapters 2, 3 and 4. A more comprehensive evaluation framework is then proposed that includes elements relevant to the South African context, as derived from Chapter 5.

Evaluating software

Evaluating or selecting software is perhaps more complex than selecting other educational resources such as textbooks. Firstly, text is a ubiquitous and familiar medium that would not require specialised skills or knowledge, other than content knowledge, of the teacher doing the selecting. Hypermedia CALL software on the other hand is still a relatively unfamiliar medium in the South African schooling context; even when teachers may have experience of using such software, they would seldom have the wide range of specialised skills and knowledge required to evaluate such software.

Secondly, text is a linear medium, whereas software seldom is. In fact, one of the great advantages of hypermedia environments is precisely their capacity for branching, or non-linearity. This makes it extremely difficult to get a good overview of a software product without extensive exploration, which would take a great deal of time. Thirdly, and compounding the last point, is the fact that

hypermedia software can offer far more complex functionality and interactivity than a textbook, with a commensurate increase in potential for problems.

A question of quality

Alley and Jansak (in Deubel, 2003) maintain that quality cannot be designed or evaluated according to any single checklist, and indeed that quality (so to speak) is in the eye of the beholder:

> Quality expresses itself... through the viewpoints, values, and needs of the course consumer... (Alley and Jansak, 2001: 3)

Anyone who has read *Zen and the Art of Motorcycle Maintenance* (Pirsig 1974), or who has encountered the work of Plato[4] will know the difficulty inherent in defining concepts such as quality or beauty, even though we recognise them in the world around us when we see them - hence the popular adage paraphrased above. Philosophical debates aside, one can assume for the purposes of this thesis that elements of quality in CALL can be determined from CALL research outcomes and experience. It has utility value to suggest that high quality CALL applications would be more likely to satisfy the target user and lead to user success in terms of the stated goals of the programme, than would low quality programmes.

Since there is not a great deal of literature on software evaluation that deals specifically with hypermedia CALL, pertinent research from related areas, will be applied as appropriate.

Smith and Sal (2000) based their investigation into standards for web-based ESL courses on criteria from Sandery (in Smith and Sal, 2000):

1. A clearly defined syllabus and teaching approach

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[4] Plato recorded the dialogues of Socrates in which Socrates would engage someone professing pedantic views on a topic such as beauty or virtue and, by means of asking pointed questions, get the person to contradict themselves.

2. The range and levels of learning materials offered

3. Evidence of instruments for student assessment

4. The ability to access a teacher when required

5. The quality of teaching materials, including the design of teaching materials, adequate variety and sufficient workload for the type of programme offered

6. The existence of any form of face-to-face teaching

7. The nature of help available for students (not only for ways to learn, but also what to do with the task in hand)

8. Value for money, which included educationally effective materials and an adequate quantity of materials

9. An indication of the length of the course

Not surprisingly, standalone multimedia CALL programmes do not meet all of the above criteria. By the very nature of standalone programmes, points 4 and 6 relating to communication possibilities are omitted. One must therefore ask whether standalone multimedia CALL is actually appropriate in a language learning environment that emphasises communicative competence in authentic contexts. In order to enrich the learning process in accordance with our knowledge of best practice and demands of the education policy environment, social and communicative opportunities would have to be included.

In addition, few commercially available programmes make their teaching approach explicit (Burston, 2003) and often claim to be suitable for unrealistically broad audiences.

Evaluating what?

In the context of this thesis evaluation is used in the sense of making a judgement of suitability before purchase or implementation. Most of the evaluation kits do not address this issue directly.

Thus, perhaps the best answer to the foregoing question would be "fit" and "fitness". "Fit" refers to how well a CALL application fits within the South African contexts of language policy , teaching (OBE, CCFOs) and learning (IKS). "Fitness" refers to its potential to accomplish its goals and fulfil the needs of the South African learner. The former would cover elements such as broad instructional design, underlying language pedagogy, content, goals and practical aspects (e.g. cost, minimum technological requirements). The latter would cover functionality, user interface design and usability.

Existing evaluation kits

The evaluation kits selected for analysis in this chapter are freely available on the Internet.[5] The most significant reason for this choice is precisely that they are relatively easy to access and might well be the first port of call for those seeking a "quick fix" (rather than spending a great deal of time wading through the literature) to evaluate a particular tool before purchase or implementation.

The kits selected represent a progression from most specific to least specific with regard to CALL. When viewing Table 6.1, it quickly becomes apparent that, although there are some areas of agreement, there appear to be even more areas of disparity amongst the various evaluation kits. Note that only one of the documents makes specific reference to an approach to language instruction.

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[5] For ease of reading they have been included verbatim in Appendix I.

Figure 6.1 Comparison of evaluation kits/frameworks

i	ii	iii	iv	v	vi	vii
Goals	Intended users	Methodology	Functionality	Ease of use	Instructional design	Content
Content	Content	Approach to Language Instruction	Media Content	Navigation	Cosmetic design	Functionality
Documentation/ Supplementary Material	Program goals	Design	Quality of linguistic/cultural content	Cognitive load	Program functionality	Interface
Didactic / Educational / Ethical Form	Scope	Procedure	Relevance	Mapping		Implementation
Medial / Programme Technical / Ergonomical Form	Documentation		Outcomes	Screen design		Overall impact
	Customisation			Knowledge space compatibility		
	Installation/ operation			Information presentation		
	Hardware requirements			Media integration		
	Media			Aesthetics		
	Feedback			Overall functionality		
	Evaluation/tests					
	Special features					
	Developer / Distributor					
	Price					

Why a framework and not a checklist?

> *framework* - noun
> a set of assumptions, concepts, values, and practices that constitutes a way of viewing reality;
> a hypothetical description of a complex entity or process;
> a basic conceptual structure. (Dictionary.com)
>
> *checklist* – noun
>
> a list of items, as names or tasks, for comparison, verification, or other checking purposes. (Dictionary.com)

As can be seen from the above definitions, a framework is a tool for dealing with complexity. A checklist, on the other hand, is useful for comparisons (as of CALL applications), but it remains a list, as it does not speak to the relationship between elements on the list. Some researchers have tried to address this by adding weightings or rating scales, e.g. the User Interface Rating Form, or the ICT4LT Evaluation Forms (see Appendix I).

Robb and Susser (2000) conducted a study regarding the sources of information affecting selection of educational software and the effectiveness of these sources. Most respondents relied on actually using a demonstration version of the software (81%), or on the advertised features (66%); only 25% of respondents indicated the use of checklists. When the selection methods were related to success of implementation, checklists and advertised features proved to be far less effective predictors of success (50% and 61% respectively) than using a demonstration version (71%), or recommendations of colleagues (78%).

A framework is more flexible than a checklist and potentially has a longer lifespan, because it operates on fundamental categories rather than specifics, which makes it easy to adjust should changes take

place. Frameworks can be used to generate checklists specific to particular contexts. Frameworks have structure that allows for a description of the relationships between elements within the framework. A framework can be used to predefine needs before seeking out software. This is a more efficient process than delving into masses of software without a clear idea of what is required. A checklist may reveal that a particular package is a "good", but it may not reveal whether the package will prove useful in a specific language learning context.

The notion of context is a recurring theme in the software evaluation literature, e.g. "actual software selection can only be made on the basis of teachers' own local assessment, relative to their own particular curricular needs" (Burston, 2003:35). The curriculum needs referred to do not exist in a vacuum. In a broad sense they are often determined by national educational policies, strategies and imperatives. In a narrower sense, they are constrained by the resources available in a particular school. In a specific sense, they are a function of the dynamics of a particular teaching and learning context: the teacher's interpretation of learning (relating to teaching philosophy and strategies) and language acquisition theory, combined with student characteristics (age, gender, technological literacy, first language, prior knowledge of target language, learning style).

Probably the most well known CALL evaluation framework is that elaborated by Philip Hubbard (1988): the integrated framework for CALL courseware evaluation.
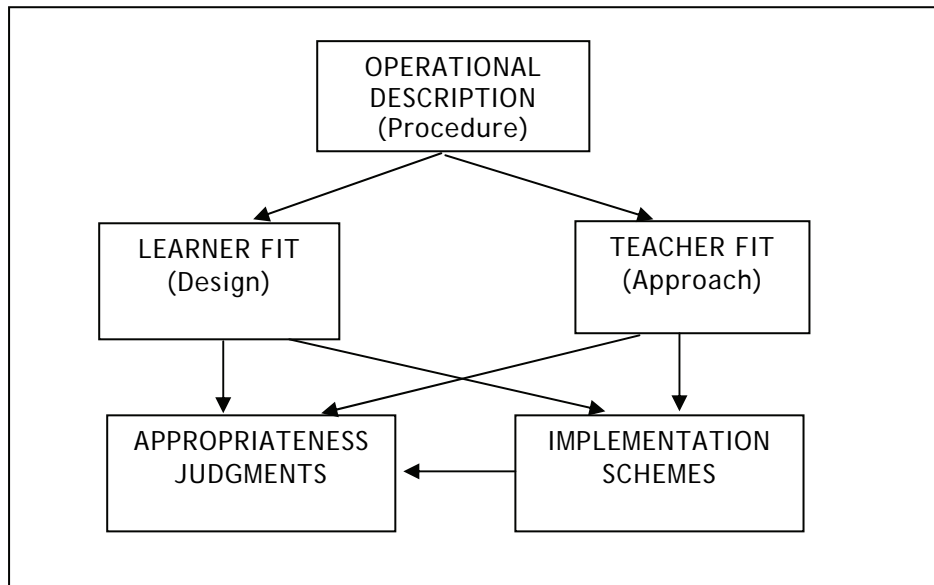
Figure 6.2 Core elements of Hubbard's Integrated Framework for CALL

Hubbard bases the uppermost three elements of the framework on an interpretation of the Richards and Rogers (2001) framework for the analysis of language teaching methods, indicated by the terms in parentheses, namely: method = approach+procedure+design.

Hubbard's approach is not at all prescriptive and has the benefit of allowing the context to emerge from the framework. In the case of this thesis, a great deal of the context is already defined: South African FET language learning. The DoE has made many prescriptions (as seen in Chapter 5) regarding the teaching of languages in the FET, which have far-reaching consequences, all the way into the individual classroom. Context perforce becomes the central organising theme for the proposed framework.

Proposed evaluation framework

The proposed evaluation framework has two defining features: it is context based and cascading in nature.

Context based

There are several contexts and contextual categories to be taken into account:

A. **Macro context: National policies and legislation**

    a. Constitution: non-discriminatory on race, gender, religious/political grounds.

    b. DoE: OBE; NCS

B. **Meso context: School**

    a. ICT policies and strategies (access to computers; firewalls)

    b. Budget

    c. Infrastructure (access to electricity supply; access to Internet);

    d. ICT resources (number of computers for teaching and learning purposes; adequate computer hardware specifications; local networks; maintained computer laboratories; data storage; data security)

    e. Human resources (technological support: computer technicians, IT specialists).

C. **Micro context: Class/Subject**

    a. Subject: 1st Language; 1st additional language; 2nd additional language; curriculum outcomes; level; assessment practices.

    b. Teacher: computer literacy level; teaching philosophy; perceived role for CALL software

    c. Students: computer literacy level; prior knowledge; L1; learning styles; IKS; number of students per computer

    d. Integration with existing materials and approaches

Cascading

The framework is cascading in two senses: it is hierarchical and there is unidirectional flow of influence from higher levels to the lower levels. The framework can be seen as a series of hurdles to be

passed, from the more general (and fundamental) to the more specific (and more variable). For example, if the software evaluation fails on the macro level, e.g. it does not comply with the demands of OBE or the NCS, or if it is discriminatory in that it is representative of a particular racial or gender grouping, the CALL software will not be suitable. This is regardless of whether it meets requirements at lower levels of the framework, e.g. the hardware requirements are met; it falls within budget; it matches the teacher's teaching philosophy, etc. If however the CALL software succeeds at the macro level, the evaluation process cascades to the next level and so on.

The **technology context** operates across all the other contexts; within this context there are also fundamental/critical and more variable aspects. For example, a CALL application may suit all of the macro, meso and micro context requirements, but if there are critical functional elements of the programme that do not work, e.g. broken links, the CALL application would not be considered suitable.
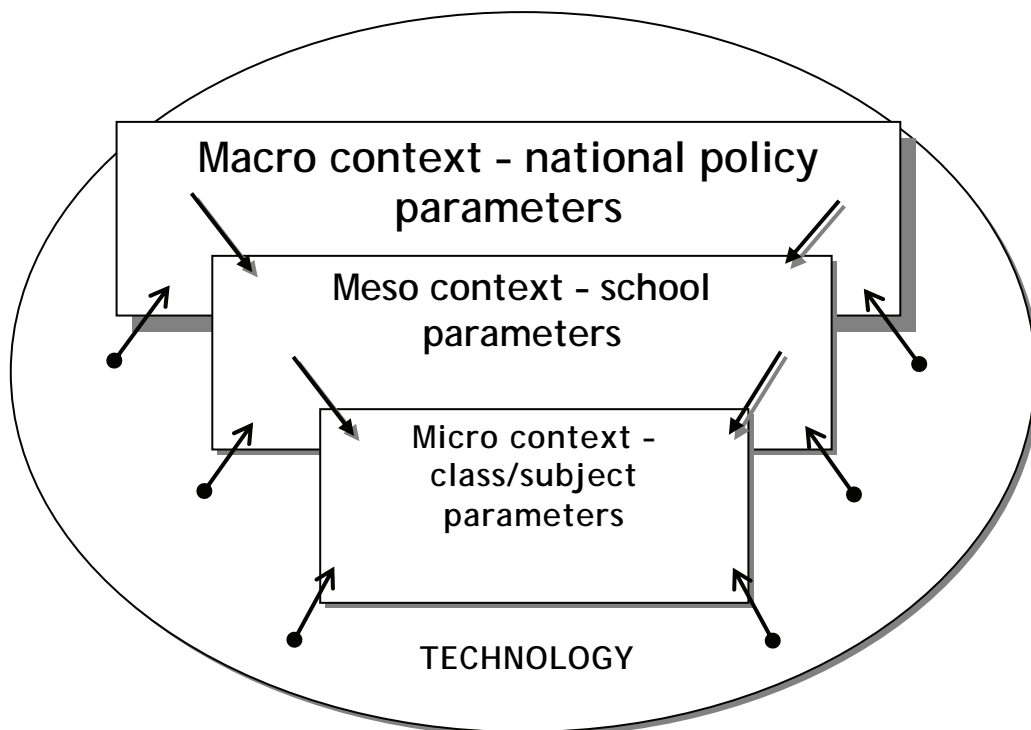

Figure 6.3 Proposed context-based, cascading evaluation framework.

An example of a more variable technology element could be a CALL application that works perfectly, but requires access to the Internet for full functionality. If the school does not have access to the Internet, the application would not be suitable.

The recommended approach to application of the framework would be to clarify contextual demands first at each level, followed by matching potential CALL applications to those demands. It may be that due to the nature of the various contexts, inputs from more than one person (stakeholder) would be required to generate a comprehensive evaluation report. An individual language teacher may not have sufficiently detailed knowledge of the relevant macro-level legislation. An appropriate stakeholder for this information could be the relevant regional Education Department curriculum developer. The school principal and the school IT coordinator (if the school should be fortunate enough to have one) would be the logical source for meso-level information. It is assumed that the individual language teacher, possibly in collaboration with the subject head, would be in the best position to report on the micro-level.

Each stakeholder would report on the demands of their particular context level and the extent to which the application under review answered those demands and corresponding technological requirements. In this way a far more thorough and holistic view of the application could be achieved than by using a checklist. Although the initial reporting process would necessitate a greater investment of time and energy than a checklist, its comprehensive and integrated nature would hopefully lessen the possibility of the implementation failing.

Chapter 7

Conclusion and recommendations

The evaluation and selection of software is a complex undertaking best performed by those with applicable specialised skills and knowledge. When it comes to a field like CALL, which draws on the theory and best practice of a variety of related disciplines, language teachers in the South African FET sector are unlikely to possess those specialised skills and knowledge beyond language content.

In an effort to make the evaluation and selection of CALL software a more productive process, the literature pertaining to the components that constitute CALL and the South African FET context was reviewed. Based on this I have attempted to develop a framework incorporating all the crucial contextual elements. The choice of a framework as opposed to a checklist was motivated by a need to reflect context at a variety of levels, combined with the flexibility allowing customisation for use in a variety of language learning settings. In addition, it obviates the need for any individual performing an evaluation to possess skills or knowledge beyond their domain or context.

Recommendations

1. Make the framework available in a variety of formats – print and digital for ease of access by language teachers.
2. For added value develop the framework into an interactive, online framework for ease of access and use.

3. Use the evaluation framework as the starting point or brief for commissioning the development of locally relevant CALL applications.

Further research

The framework should be applied and evaluated within the FET sector. Possible areas for investigation could include:

- ease of use;
- applicability;
- predictive capacity;
- efficacy.

It might also be useful to investigate whether the framework would be applicable to the evaluation of educational software other than CALL and outside of the FET sector.

It would be advisable to get the involvement and co-operation of the DoE in this research, such that results could be made available to all stakeholders, especially the teachers and other decision makers in schools.

The wide-ranging nature of this literature-based study has had the unanticipated consequence of highlighting some of the ambiguities and tensions between theory, policy and practice in language education in South Africa. Although the proposed framework attempts to allow for the integration of theory, policy and practice, it is possible that application thereof may well serve to call attention to the above-mentioned tensions even further. One can only hope that this might then prompt steps to be taken towards resolving these tensions.

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Appendix I: Software evaluation kits

i) "Beratungstelle für Neue Technologien des Landesinstituts für Schule und Weiterbildung Nordrhein-Westfalens" 1994
[English summary by Antoinette van der Merwe]

CRITERIA FOR LANGUAGE INSTRUCTION MULTIMEDIA SOFTWARE

General specifications for interactive instructional media
Interactive media should:

1. challenge active and hands-on oriented learning
2. support experience oriented teaching
3. support science oriented teaching by building on experience orientation
4. support a future directed teaching
5. be self reflexive (self evaluating) as a result of growing complexity.

Further specific specifications/ expectations
A) Goals / Content

- The programme presupposes that the computer is used as a working and thinking tool, i.e. not only learning through the computer but also with the computer, e.g. text processing, research, data processing, for problem solving, to handle complexity and flexibility.
- Skills are emphasised even in programmes that are aimed at grammar.
- Optimal use is made of the multimedia/hypermedia potential for a visual, lively, emotional, communication-cognitive presentation of inter cultural aspects.
- The units enable both explicit learning (conscious and goal oriented process) as well as implicit learning (ideal side-effect), and exercise the multi-sensory and auto didactic knowledge and skills acquisition.
- The programme fulfils the user's content expectations and needs, and leads interactively to an increase of knowledge and skills.
- The programme supplies the necessary integrated, interdisciplinary training and information that is needed in the information society to ensure the appropriateness and dynamics of varying task needs.

B) Documentation/ Supplementary Material

- The material is understandable and adequate to correctly install, start, copy and work with the programme in the most economical way. It gives

information about error messages and clearly explains help, commands, functions and options. Error lists, worksheets, tests etc. can be printed.

- Programmes which develop hearing-seeing-understanding and speaking should contain extra video material.

- An overview of the learning content and goals, a justification of the material choice and the methods used, should be included.

C) Didactic / Educational / Ethical Form

- Form must correspond with the demands of modern foreign language teaching (especially the communicative-cognitive, i.e. inter cultural orientation).

- The programmes should, as far as possible, use the advantages of computer assisted teaching to ensure the individualisation of the learning process, even in a relatively closed programme.

- The programme should utilise a user friendly presentation to avoid the "lost-in-Hypertext-feeling".

- The programme should have a dictionary, a spell checker, grammatical help options, meaningful help that could be chosen to master assignments, and adequate answer processing (that also accepts synonyms) and correction systems.

- The programme should have a variety of communication assignments and exercise forms, although a specific standard of exercise forms is recommended to guarantee user friendliness.

- The programme should use up to date, authentic, situation bound, correct language material which is normally used by mother tongue speakers.

- The multimedia context contributes to semantics.

- The learning tempo is determined by the teacher.

- Learning reports are useful.

- Half open programmes, explained by the teacher with his/her own language material, should be presented with closed programmes.

- Teachers can decide whether they want to present the working instructions, exercise instructions, grammatical explanations etc. in the foreign or the mother tongue.

- The teacher can, in the ideal case, decide on the entry level, the extent of the learning steps and the difficulty.

- The technical possibilities of the hardware (Hypertext, written and spoken language, sound, graphics, animation, photo/video) are used to enable a multi-sensory experience (where both the left and right brain hemispheres

are targeted); the specific objective of the programme determines which one is used.

- Thorough evaluation and on the basis of the evaluation content, didactic and form adaptations are made to ensure the best results.

D) Medial / Programme Technical / Ergonomical Form

- The programme integrates and harmonises the communication channels with synergy effect. Especially when it comes to the speaking-image-film-sound relationship and the correct graphic-text relationship.
- Image and sound quality of the highest standard.
- The programme starts by itself.
- The programme does not crash when a random key combination (which was not anticipated by the programmer) is entered.
- Adequate saving possibility for the input of the student.
- It is possible to exit the programme at any stage.
- The overview, ergonomic screen builds up quickly. The organisation of Help, go back etc. is according to the standard form at the same place (pull-down, pop-up menus). Colours and graphic design correspond with the didactic function and do not only serve as effect. The menu contains the standardised icons and makes the assignment easier.
- Thought processes and screen pages correspond as far as possible.

ii) Invitational Symposium on Assessing and Advancing Technology Options in Language Learning (AATOLL), 1998. *Checklist: Evaluative criteria for computer-delivered language learning systems.* National Foreign Language Resource Centre. Honolulu: University of Hawai'i, Second Language teaching and Curriculum Centre. http://nflrc.hawaii.edu/Networks/NW31/NW31t.pdf Accessed 24-08-2005.

General description of the program

Name/version

Intended users

age

- children
- high school
- college
- learners with special interests (tourists, businessmen, etc.)

ability level

- beginning
- intermediate
- advanced

Intended use

- self-instruction
- textbook/classroom supplement
- combination of above

Content

- content likely to be of interest to intended users
- instructional units logically sequenced
- lessons build on material presented earlier

Program goals

- goals and objectives of the program clearly described
- program capable of meeting the stated goals

Scope

number of lessons or instructional units

equivalence in terms of hours, semesters, years of instruction

Documentation

- discussion of program's goals, design, and contents
- tutorial on program's operation
- demonstration lesson included
- lesson plans for use in a course or guidance for individual use
- research results on effectiveness of the program available
- information about independent reviews of the program

Customization

- choices depending on user level

- users can customize the operation of the program

- variety of options to support different types of learners

Installation/operation

- installation instructions clear

- program easy to install/uninstall

How often does the system crash?

Is there a particular action that causes regular crashes?

Hardware requirements

type of computer

version of operating system

memory (RAM)

disk space

CD-ROM drive/DVD-ROM drive

speakers

microphone

monitor

sound card/video card

network/browser requirements

other

Media

- graphics, video and audio help users to concentrate on content

- text easy to read

- audio clear

- colors and graphics crisp and clear

- video runs smoothly

- hypertext links work well

- animation serves a pedagogical purpose

Feedback

- users receive quick feedback to responses

- level of feedback language appropriate for intended users

availability of feedback (e.g., item-by-item, logical content break, end-of-unit or session,

learner-controlled)

type of feedback is available

- indication as to whether response is correct or incorrect

- invitation to try again

- hint leading to correct response

- explanation as to why a particular response is incorrect
- a "give-up" option
- directions to relevant part of program for review
- intelligent feedback depending on learner response history

Evaluation/tests

- frequency of the tests
- type of scores is made available to users
- explanation of test scores
- cumulative log of scores to track progress
- recommendations for remedial action given
- tests and/or test scores can be printed out

Special features:

- speech recognition
- system requires initial training

What do users need to do to train the system?

How frequently does the system recognize a range of native speech?

How does the system react to nonnative speech?

How extensively is speech recognition/processing utilized in each unit of the program?

function of speech recognition/processing in this program

- voice navigation
- pronunciation instruction
- speaking practice

Developer/distributor

name

street address

telephone

fax

e-mail

URL

Price

individual

institutional

- users likely to get their money's worth

Checklist for listening software

Listening input

audio

- conditions against which the audio is played authentic
- tempo of the sound track natural
- variety of voices and dialects
- sound track supported by video or graphics

listening passages

- passages authentic
- topics of interest to intended users
- variety of topics
- users can choose among several passages on the same topic
- variety of genres
- passages of an appropriate length for intended users
- vocabulary appropriate for the intended level
- syntax appropriate for the intended level

Listening activities

pre-listening activities

- program adapts to different levels of users' prior knowledge
- pre-listening activities that activate prior knowledge

listening activities

- listening activities emphasize comprehension of the passage
- listening activities authentic
- variety of listening activities
- users have a choice of listening activities
- activities motivate learners to keep listening

post-listening activities

- post-listening activities based on selected features of passages
- features selected for special attention well chosen
- post-listening activities promote acquisition of vocabulary

Listening strategy instruction

- explanation about the benefits of using listening strategies
- systematic practice in the use of listening strategies
- users can see that certain tasks are more easily accomplished when strategies are used
- choice of listening strategies depending on learning style
- feedback on the effectiveness of strategy use

Listening tools

links to the written version of passage

- the whole passage
- sentence-by-sentence
- phrase-by-phrase

- word-by-word

spoken glosses

- monolingual
- bilingual
- hint-type

written glosses

- monolingual
- bilingual
- hint-type

visual glosses

- images
- graphics
- videos

additional resources available

- online talking dictionary
- online written dictionary
- online reference grammar
- background information
- cultural notes

Listening interface

- ease of navigation
- navigation between audio, activities, glosses, and tools simple
- navigation between screens fast

playback control

- users can control the speed of audio playback

playback can be stopped

- after each phrase
- after each sentence

timing

- enough time to complete activities

archiving

- users' work can be saved
- users' work can be printed out

Checklist for reading software

Reading input

How authentic is the appearance of the passage?

- layout

- fonts
- illustrations
- colors

content of the reading passages

- reading passages authentic
- topics of interest to intended users
- variety of topics
- topics not likely to become outdated
- variety of genres
- users can choose among several passages on the same topic
- length appropriate for intended users
- vocabulary appropriate for intended users
- syntax appropriate for intended users

Reading activities

pre-reading activities

- program adapts to different levels of users' prior knowledge
- pre-reading activities that activate prior knowledge

reading activities

- reading activities emphasize comprehension of the passage
- reading activities authentic
- variety of reading activities
- users have a choice of reading activities
- activities motivate learners to keep reading

post-reading activities

- post-reading activities based on selected features of the passages
- features selected for special attention well chosen
- post-listening activities promote acquisition of vocabulary

Reading strategy instruction

- explanation about the benefits of using reading strategies
- systematic practice in the use of reading strategies
- users can see that certain tasks are more easily accomplished with strategy use
- choice of reading strategies depending on learning style
- feedback on the effectiveness of strategy use

Reading tools

links available to the spoken version of the passage

- the whole passage
- sentence-by-sentence
- phrase-by-phrase

- word-by-word

written glosses available

- monolingual
- bilingual
- hint-type

spoken glosses available

- monolingual
- bilingual
- hint-type

visual glosses available

- images
- graphics
- videos

additional resources available

- topical glossaries
- background information
- cultural information
- online dictionary
- online reference grammar

Reading interface

ease of navigation

- navigation between text, activities, glosses, and tools simple
- navigation between screens fast

appearance of the text

- texts preserve their original format
- texts presented in a variety of fonts and typefaces
- fonts and typefaces attractive and easy to read
- illustrations and graphics aid in text comprehension

glosses

- equal access to different types of glosses
- glossed items marked unobtrusively
- glosses cover up text or make it disappear
- different types of glosses can be customized by users

timing

- enough time to complete activities

archiving

- users' work can be saved
- users' work can be printed out

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Checklist for speaking software

Speaking input

general qualities of the input

- authenticity
- situational appropriateness
- cultural appropriateness
- interest to intended users

topics

- topics of interest to intended users
- variety of topics
- topics logically sequenced
- users have a choice of topics

vocabulary

- vocabulary appropriate for the intended level
- vocabulary organized into well-defined thematic units
- program focuses users' attention on specific vocabulary
- vocabulary recycled throughout the program

grammar

- grammar appropriate for the intended level
- presentation of grammar logically sequenced
- program focuses users' attention on specific structures
- grammar recycled throughout the program
- grammatical explanations clear

Speaking activities

- speaking activities simulate real-world interactions
- activities challenging and fun
- activities progress from mechanical drills to open-ended responses
- activities require integration of linguistic, sociolinguistic, and pragmatic skills
- speaking activities contextualized
- variety of activities
- users have a choice of activities

What is the quality of the speaking prompts?

- examples for the activities to be performed

responses allowed

- only one
- more than one

Speaking strategy instruction

- program explains why the use of communication strategies can be helpful
- systematic practice in the use of communication strategies
- users can see that a task is more easily accomplished when a particular

communication strategy is used

- choice of communication strategies depending on learning style
- feedback on effectiveness of strategy use

Speaking tools

online tools are available

- reference grammar
- monolingual dictionary
- bilingual dictionary
- talking dictionary
- thesaurus
- sociolinguistic and cultural notes

Speech interface

- speech interface user-friendly

speech recognition (SR)

- pedagogical goals of the program could be achieved without SR

tasks associated with SR

- creating a sentence with audio and/or visual cues
- conversing with the system (conversation changes depending on response)

Feedback from SR

- Is the feedback from SR correlated with how well something was said
- feedback relies only on learners' own assessment
- users can record and compare their responses with correct models

SR program provides feedback on accuracy

- in responses chosen from a closed set
- in open-ended responses

archiving

- users' work can be recorded and saved

Checklist for writing software

Input for writing activities

input provided in order to contextualize writing tasks

- written texts
- listening passages
- videos
- input at the appropriate level of difficulty

- variety of input
- users have a choice of type of input

Writing activities

- writing tasks have counterparts in the real world
- tasks at the appropriate level of difficulty
- tasks culturally appropriate
- writing prompts clearly and concisely worded

writing prompts specify

- an audience
- a function
- a motivation for writing
- choice of writing tasks

Writing strategy instruction

- explanation of he benefits of using writing strategies
- program offers systematic practice in the use of writing strategies
- users can see that certain writing tasks are more easily accomplished when strategies are used
- choice of writing strategies depending on learning style
- feedback on the effectiveness of strategy use

Writing tools

macro-aides available

- online templates for brainstorming writing tasks
- online templates for organizing the writing tasks
- online samples for imitation

micro-aides available

- online bilingual dictionary
- online thesaurus
- online grammar reference

editing aides available

- online spell checker
- online grammar checker

Writing interface

- enough time given for task completion
- program can save successive drafts of users' work
- users' work can be printed out
- program can keep track of user queries
- program includes a network component for group work or peer editing

Checklist for vocabulary learning software

Input for vocabulary learning

basis for the choice of vocabulary included in the program

- frequency
- association with a particular topic or topics
- association with a particular textbook

vocabulary appropriate for the intended users in terms of

- level of difficulty
- interest
- usefulness

Vocabulary learning activities

- activities challenging and fun
- users have choice of difficulty level
- activities relate new vocabulary to vocabulary previously introduced
- users have a choice of activities

vocabulary learning activities offered

- repetition of the word
- recognition/matching activities pairing the word with its native language equivalent
- pairing the word with its target language synonym
- pairing the word with its target language antonym
- finding the related word in a list
- pairing the word with a picture
- pairing a word with a video
- listening to the word being pronounced and finding it in a list

production activities

- giving the target language equivalent for a native language word
- finding the right word to describe a picture
- finding a target language synonym for a word
- finding a target language antonym for a word
- putting a word in the appropriate semantic group
- producing derivationally related words (e.g., noun from a verb)
- using the word in a sentence
- games

Vocabulary learning strategy instruction

- explanation of different kinds of mnemonic strategies
- explanation of why the use of certain strategies can improve retention of vocabulary
- systematic practice in the use of mnemonic strategies

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- users can see that a task is more easily accomplished when a mnemonic strategy is used
- users offered a choice of mnemonic strategies depending on their learning style
- feedback on whether the use of a particular mnemonic strategy was effective or not

Vocabulary learning tools

- vocabulary search engine

glosses provided

- monolingual
- bilingual
- hint-type
- examples of usage
- visual
- audio
- video

Vocabulary learning interface

vocabulary search engine

glosses provided

- monolingual
- bilingual
- hint-type
- examples of usage
- visual
- audio
- video

Checklist for software to teach pronunciation

Pronunciation input

words presented

- in citation form only
- in different contexts
- suprasegmental features included in the program
- intonation included in the program
- native-speaker models include a variety of voices and dialects

Pronunciation activities

- activities well-sequenced
- activities challenging and fun

- activities progress from easier to more complex
- users have control over selection of activities
- opportunities to review the material

tasks associated with the use of speech recognition

- reading one word at a time
- filling in a blank in a sentence
- reading from a selection of several words
- reading one sentence at a time
- reading from a selection of 2-5 sentences
- reading from a selection of 6 or more sentences
- creating a sentence with audio and/or visual cues

Pronunciation interface

speech recognition system reaction to nonnative speech

- recognizes despite mistakes
- asks for repetition
- does not recognize
- recognition system robust to various disfluencies
- recognition system sensitive to ambient noise

feedback recognition system provides

- correlates with how well something was said
- relies only on learners' own assessment
- users can record and compare their responses with correct models

mistakes in learner responses are marked and displayed

- accuracy of vowels and consonants
- accuracy of speech rhythm and timing
- accuracy of intonation contours

method by which visual pronunciation feedback presented

- speaker's face
- vocal tract
- spectrum information
- speech waveforms

Checklist for software to teach script

Script input

basis for selection of characters

- frequency
- topic association
- textbook association

- information about the history of the writing system
- general description of the writing system and its distinguishing features

Script learning activities

characters (or symbols) practiced

- in isolation
- in combinations
- in meaningful sequences
- from the more simple to the more complex
- characters (or symbols) presented earlier are recycled throughout the program
- variety of activities
- users have control over choice of activities

Script strategy instruction

- program explains what techniques are helpful in learning to write the target language script
- program provides systematic practice in the use of these techniques

Script learning tools

- characters (or symbols) linked to their pronunciation

links to glosses

- monolingual
- bilingual
- images
- video

Script learning interface

- program shows stroke order of the characters or symbols
- animation of how characters or symbols are written
- search engine

iii) http://www.owlnet.rice.edu/~ling417/guide.html

Software Evaluation Guide

Consider these questions before choosing a software program as a tool for your language learning or instruction. Not all of these features will apply to your needs, but this checklist may help you determine how useful your software can be to you.

Based on "A methodological framework for CALL courseware development" by Philip Hubbard, copyright 1992.

Your Software's Methodology
- **What are the objectives of the software?**

  - **What does the program claim to help learners achieve?** What features does the program offer that will make learning easier (adequate "help" options, clear instructions, helpful feedback, option to correct mistakes)
  - **How does the program help instructors?** Does the software offer exercises that are supplementary to the kinds of things being taught in class already? Does it provide information that the instructor is unable to/lacks time to provide? Does it free up class time for new information by providing extra practice outside class hours?

- **How easy-to-use is the software?**

  Is there an instruction manual? Can the program and lessons be opened quickly and easily? Can the learner move from lesson to lesson easily while saving previous work? Can the learner quit from any point in the program/save previous work? Are program functions self-explanatory or based on a set of rules or instructions?

- **How does the software evaluate the learner's responses?**

  Will the learner receive informative feedback for their responses? Does the software judge responses in a way that fits with the

learner's/instructor's standards for appropriate feedback? (See Procedure)

Your Software's Approach to Language Instruction

- **What linguistic assumptions does the software make?** Do the authors base their program on a structural/functional/interactional approach to language?
- **Does the software approach language learning as different from other types of learning?** Does it take into account internal processes in learning, or observe a distinction between mechanistic and analytical thought processes?
- **Does the software support a particular method of language teaching (the Direct Approach, the Audio-Lingual Method, the Natural Approach, etc.)?**
- **What platforms is the software available for (MS-DOS, Macintosh, Windows, Windows '95, UNIX, other)?**

Your Software's Design

- **Does the software offer exercises geared toward or adjustable for any of these learner variables:**

age	field-dependent/-independent reasoning
sex	deductive/inductive reasoning
native language	visual-graphic, visual-textual learning
interests	auditory, kinaesthetic learning
specific learning needs	introverted vs. extroverted learners
tolerance of ambiguity	

- **How do the authors arrange the syllabus of exercises?** Are exercises grouped according to notional/functional purposes or according to related skills and subskills? Are the exercises designed and arranged on a progressing scale of difficulty?
- **Does the program integrate information into the exercises about culture/literature/daily situations that may accompany the language?**
- **Does the program focus on different learning styles in the exercises, such as recognition, recall, comprehension,**

experiential learning (learning by doing), and constructive understanding (using computer as a tool to discover new information)?

o **What linguistic levels are the exercises concerned with?** Does the program focus on objective discourse/text, syntax, lexis, morphology, graphology/phonology, or a combination of any of these? Will concentrating on any of these levels improve the learner's understanding, spoken or written skills?

o **Does the program offer exercises that can be worked on by a pair or a group of students as well as an individual?** How well do the exercises lend themselves to class discussion or competition?

o **How does the program keep track of students' scores/make them available to the instructor?** Does it record the number of attempts in addition to the number of correct/incorrect answers? Does it keep track of total time spent on an exercise? Does it calculate students' average scores, chart their progress, etc.?

o **Are color, graphics, or sound necessary or important to the efficiency of the exercises?** Is the program available in a network format? Can the learner save completed exercises while using the program/after quitting the program?

Your Software's Procedure

o **What types of activities does the software offer?**
Does it provide a range of exercises such as:

games	text construction
quizzes	text reconstruction
simulation	problem solving
tutorial	drill-and-practice
exploratory activities	

o **Which of these activities will help your learners acquire certain skills and/or suit their interests and needs?**

o **How does the software present these activities?** For example, text reconstruction can be presented in the form of a cloze, a storyboard, jigsaw reading, etc. What kinds of input are expected from the student (speech, text) and what kind of information do they receive (graphics, audio, text)?

- Does the software anticipate learner responses by offering information on commonly -made mistakes, frequent misspellings, etc.? Does it accept misspelled answers as correct if close to the ideal answer?
- Does the software offer a selection of possible correct responses (where appropriate)? Does the software provide feedback for both correct and incorrect answers? Does it "flag" errors, such as by highlighting a particular part of a response that is incorrect? Does it specify different levels of errors, such as the difference between a syntactic error and an incorrect word choice? Does it allow students to repeat exercises (correct mistakes) indefinitely?
- How much control does it allow learners and/or instructors over the content of the lessons? Is it possible to modify lessons or add customized lessons to the syllabus?

iv) ICT4LT Project: Evaluation Forms*

http://www.ict4lt.org/en/evalform.doc Accessed 15-09-2005.

1. Software Evaluation Form

Title of ICT resource and/or source:		
Criterion	Rating	Comments
Functionality		
Ease of getting started	*****	
Ease of navigation	*****	
Flexibility of use	*****	
Range of functions appropriate to purpose and content	*****	
Level of student interaction	*****	
Media Content		
Appropriate mix of text, images, sound, video	*****	
Quality of linguistic/cultural content		
Grammar	*****	
Thematic vocabulary	*****	
Cultural insights	*****	
Functions	*****	
Strategy training	*****	
Accuracy of language used	*****	
Insights into language learning skills	*****	
Relevance		
Relevance to scheme of work	*****	
Relevance to national / regional / departmental programmes of study: e.g. National Curriculum in UK	*****	
Relevance to National Curriculum Attainment Targets (UK) - or similar requirements in other countries	*****	
Outcomes		
Clarity of the anticipated learning outcomes	*****	

Ability of software to raise standard of student achievement beyond that expected from alternative resources	*****	
Efficient use of student time	*****	
Efficient use of teacher preparation time (if relevant)	*****	
Questions	**Answers**	
1. Based on the ratings above, and on your professional judgement, please comment on the strengths and weaknesses of the software in terms of your departmental scheme of work.		
2. Please list up to 5 opportunities for the integrated use of the software within your department, or give your reasons if no integration is possible		

2. Website/Web Page Evaluation Form

URL of WWW page/site:		
Criterion	**Rating**	**Comments**
Functionality		
Clarity of overview of content	*****	
Ease of navigation	*****	
Number of links to other sites (***** = a lot)	*****	
Extent to which links are valuable additions or potential distractions	*****	
Media Content and Layout		
Appropriate mix of text, images, sound and video	*****	
Layout appropriate for intended age group	*****	
Quality and Relevance of Linguistic/Cultural content		
Accuracy of language	*****	
Range of vocabulary	*****	

Cultural insights	*****	
Appropriateness of level of language for planned task	*****	
Relevance of themes/topics to target age group	*****	
Relevance to national / regional / departmental programmes of study: e.g. National Curriculum in UK	*****	
Relevance to National Curriculum Attainment Targets (UK) - or similar requirements in other countries	*****	
Relevance of content to scheme of work	*****	
Insights into language learning skills	*****	
Exploitation and Outcomes		
Usefulness of site/page for provision of texts for off-line computer-based or paper-based tasks concerned with grammar	*****	
Usefulness of site/page for provision of texts for off-line computer-based or paper-based tasks concerned with development of topic-based vocabulary	*****	
Usefulness of site/page for provision of texts for off-line computer-based or paper-based tasks concerned with functions	*****	
Usefulness of site/page for provision of texts for off-line computer-based or paper-based tasks concerned with strategy training	*****	
Amount of time required to turn source text into useful activity (***** = not a lot)	*****	
Value of student on-line access against connect charges (***** = good value)	*****	

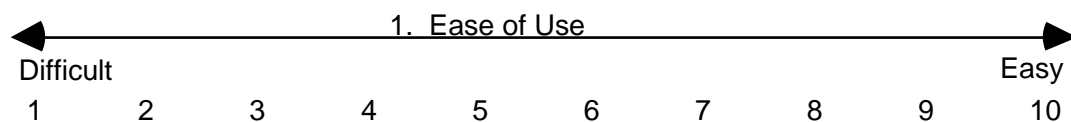|		
Usefulness of page/site for raising cultural awareness	*****	
Ease of differentiating content of site/page for younger or older learners and for learners of different abilities	*****	
Questions	Answers	
1. Based on the ratings above, and on your professional judgement, is use of the page and/or aspects of the site likely to raise student achievement beyond that expected from use of alternative media? If so, why?		
2. Please list up to 5 opportunities for the integrated use of the page/site within your department, or give your reasons if no integration is possible		

v) User Interface Rating Form

Instructions:

1. The "User Interface Rating Form" should be used by experienced interactive multimedia designers or users to rate the interface of a new program or one under development.
2. The ten criteria used in the "User Interface Rating Form" are explained in detail at the end of the instrument itself.
3. Some criteria may not be relevant in every IMM program.
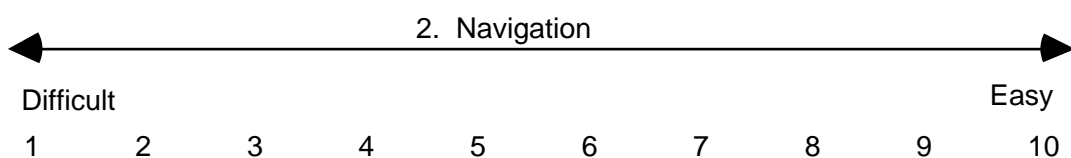
User Interface Rating Tool for Interactive Multimedia
© 1993 Thomas C. Reeves, Ph.D. & Stephen W. Harmon, Ed.D.

Instructions: For each of ten user interface dimensions illustrated below, rate the program you have reviewed on a one to ten scale by circling the appropriate number under the dimension. (Accompanying this tool are definitions for each of the ten user interface dimensions.) Please add any comments that may help to clarify or explain your rating. If a specific dimension does not seem appropriate to the interactive program you are reviewing, do not circle any numbers on the scale for that dimension and add a brief comment to explain your response.

◄———————————— 1. Ease of Use ————————————►

Difficult   Easy

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Comments:

◄———————————— 2. Navigation ————————————►

Difficult   Easy

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Comments:

3. Cognitive Load

Unmanageable ←——————————————————————→ Manageable

1	2	3	4	5	6	7	8	9	10

Comments:

4. Mapping

None ←——————————————————————→ Powerful

1	2	3	4	5	6	7	8	9	10

Comments:

5. Screen Design

Violates Principles ←——————————————————————→ Follows Principles

1	2	3	4	5	6	7	8	9	10

Comments:

6. Knowledge Space Compatibility

Incompatible ←——————————————————————→ Compatible

1	2	3	4	5	6	7	8	9	10

Comments:

7. Information Presentation

Obtuse ←――――――――――――――――――――――――――→ Clear

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Comments:

8. Media Integration

Uncoordinated ←――――――――――――――――――→ Coordinated

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Comments:

9. Aesthetics

Displeasing ←――――――――――――――――――→ Pleasing

Comments:

10. Overall Functionality

Dysfunctional ←――――――――――――――――→ Functional

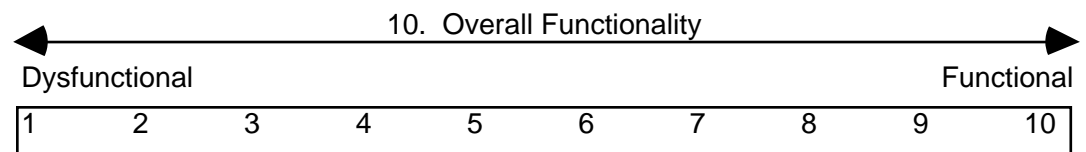| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
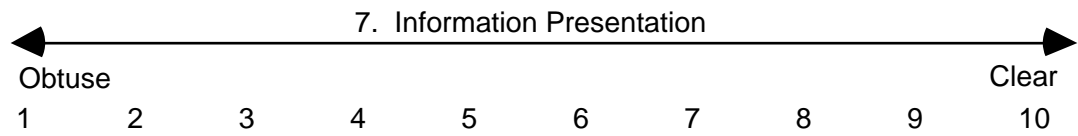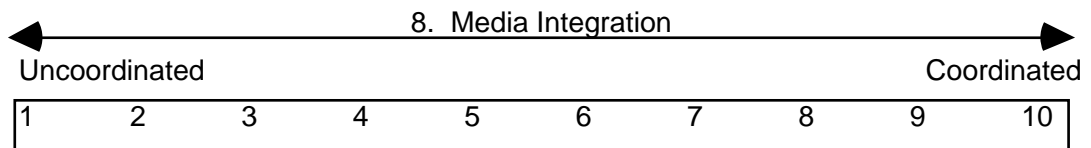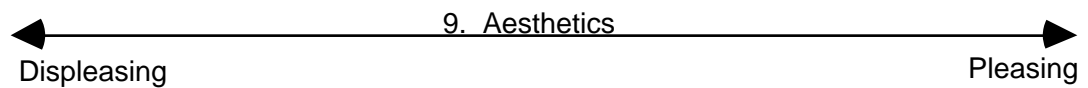
Comments:

Please add other comments related to the user interface of this program below:

vi) Expert Review Checklist

EXPERT REVIEW FORM

EXPERT REVIEW CHECK LIST FOR INTERACTIVE MULTIMEDIA

REVIEWER: Dr. Lynn Knowitall   DUE DATE:
June 10, 1994

Please circle your rating and write comments on each aspect of the interactive multimedia (IMM) package. 1 represents the lowest and most negative impression on the scale, 3 represents an adequate impression, and 5 represents the highest and most positive impression. Choose N/A if the item is not appropriate or not applicable to this course. Use additional paper for comments.

NA=Not applicable   1=Strongly disagree   2=Disagree   3=Neither agree/nor disagree   4=Agree   5=Strongly agree

AREA 1 - INSTRUCTIONAL DESIGN REVIEW

1. This IMM provides learners with a N/A   1   2   3   4   5
clear knowledge of the program objectives.

2. The instructional interactions in this IMM   N/A   1   2   3   4
5
are appropriate for the objectives.

3. The instructional design of this IMM isN/A   1   2   3   4   5
based on sound learning theory and principles.

4. The feedback in this IMM is clear. N/A   1   2   3   4   5

5. The pace of this IMM is appropriate.N/A   1   2   3   4   5

6. The difficulty level of this IMM is appropriate.   N/A   1   2   3   4
5

AREA 2 - COSMETIC DESIGN REVIEW

7. The screen design of this IMM follows sound principles. N/A   1   2   3   4
5

8. Color is appropriately used in this IMM.   N/A   1   2   3   4
5

9. The screen displays are easy to understand.   N/A   1   2   3   4
5

AREA 3 - PROGRAM FUNCTIONALITY REVIEW

10. This IMM operated flawlessly.   N/A   1   2   3   4
5

vii) CIDOC Multimedia Working Group - Multimedia Evaluation Criteria

http://www.archimuse.com/papers/cidoc/cidoc.mmwg.eval.crit.html
Accessed 15-09-2005.

Revised Draft, J. Trant, Chair, CIDOC Multimedia Working Group
Nuremberg, Germany
September 8-10,1997

The CIDOC Multimedia Working Group spent its meeting discussing the characteristics that make good museum multimedia. After an initial brainstorming session, in the first meeting, these were expressed in a series of questions that could be asked during the evaluation of a multimedia product [Kiosk, CD-ROM or Web site].

These are organised into the following sections:

- Content
- Functionality
- Interface
- Implementation
- Overall Impact

The second meeting was spent applying the questions to a number of examples on CD or on the Web. Our final meeting was spent discussing the products and revising the questions. While the questions can apply to both Web and CD delivery formats, there are still many barriers to the delivery of true multimedia over the Web.

The group found these criteria valuable for structuring their analysis of multimedia products. The target user for these questions is a knowledgeable reviewer or designer of museum multimedia. The comments of colleagues not at the meeting are now being solicited to ensure that all concerns are reflected. The format of the questions and the manner of their expression still needs further refinement.

The group plans to repeat this experiment in Melbourne, at the 1998 ICOM meeting, and discuss the merit of developing an evaluation questionnaire that is more formal in nature. Between now and then, members of CIDOC are encouraged to apply these criteria to multimedia that they are creating or reviewing, and share their findings with the CIDOC disiscussion list [note: list offline January 2005; please send us your comments directly.]

J. Trant
Chair Multimedia Working Group
and
Members at the Nuremburg CIDOC Meeting

Museum Multimedia Evaluation Criteria	Content	Functionality	Interface	Implementation	Overall Impact

CONTENT

1. Is the content compelling and original?

2. How varied are the modalities of the content?

> 2.1. Does it include text, speech, music, still image, motion image, games, tests, free text input, drawing input, speech input, sound input, image capture, multimedia authoring input, other?

> 2.2. Are the modalities chosen appropriate to the content?

3. Is the content appropriate to the chosen delivery format? How well does the medium fit the message?

4. Is the content presented in an understandable way, appropriate to where and how the multimedia is delivered?

5. Is the presentation consistent? Clear?

6. Are the user's perspectives and characteristics considered? Does the presentation vary by user's:

> 6.1. expertise?

> 6.2. degree of interest?

> 6.3. prior-knowledge?

> 6.4. age?

> 6.5. prior pathways or system use history?

> 6.6. context of use?

7. Are the objects represented:

> 7.1. Accurately?

> 7.2. "Truthfully"

> 7.3. Responsibly

> 7.4. Sensitively

8. Is the source of all content readily available?

> 8.1. Is fact distinguished from editorial?

> 8.2. Is the voice always completely authoritative or does it admit of question, doubt and uncertainty?

9. Is full information given about museum objects?

> 9.1. Dates?

9.2. Physical descriptions

10. Is there a fixed point of reference in the color of reproductions? Is there metadata given about the reproduction process?

11. Does the multimedia attract the visitor to the real thing?

12. How rich & appropriate are the links? How extensive? How useful?

13. Does the context and meaning of the object come through?

13.1. Can we display context in time? In space? with respect to other objects?

14. Is the multimedia culturally sensitive?

14.1. Does it reflect the reality that different users have different degrees of prior cultural knowledge of the content?

14.2. Is it multilingual?

15. Have the rights to use the materials been cleared?

15.1. Is they explicitly acknowledged?

FUNCTIONALITY

1. How interactive is the system?

1.1. Does it only give pre-defined choices?

1.2. Does it take input from the user in the form of search parameters, but provide a fixed choice of pre-defined categories?

1.3. Does it respond to user input, and use user input to reconfigure choices given?

1.4. Does it have segments which the user authors and/or which user can save and build on?

2. Can the user search? Do the search criteria match the user's criteria?

2.1. Is the search tolerant of missing or unknown values?

2.2. Does it give accurate results despite missing values?

3. Can the user print all or parts of the information found?

4. Is the user provided with tools or methods to interact with the content?

4.1. How many?

4.2. What kinds?

4.3. Are they relevant to the nature of the content?

4.4. Are the tools appropriate and engaging?

5. Are the functions of the system described in any way?

5.1. Is this clear and consistent?

5.2. Are all functions represented?

6. Can the user do things that are not possible with the real thing, such as see it in a different light, hear it played or deconstruct/reconstruct it?

7. Does the multimedia record a history of user interaction?

7.1. Can the system use this in session based feedback?

7.2. Can the system use this to vary the information presented to reflect user history/interest?

7.3. Can the user tell where he as already been?

8. Is there a way for users to comment?

8.1. Are user comments incorporated in any way?

9. Can the content be updated?

10. How well is knowledge of the multimedia's existence reported?

10.1. Is it widely available?

10.2. Is it reported to general indexes of available multimedia?

10.3. Can the Web site be found? Does it report metadata?

10.4. How is the fixed format multimedia distributed?

INTERFACE

1. Is the structure of the system apparent?

1.1. Is it intuitive?

1.2. is it consistent

1.3. predictable?

2. Are the methods given to objects explicit or easily learned?

3. Is the visual grammar obvious or easily learned?

3.1. Are the icons understandable?

4. Is the delivery of information time sensitive?

4.1. Are the chunks of acceptable length?

4.2. User-determined size?

5. Is the overall design appropriate and pleasing?

5.1. Fonts?

5.2. Colors?

5.3. Use of screen space?

5.4. Is the shape of the screen respected?

6. Is the implementation of the overall design in each section well executed?

7. Can the user alter the presentation of the information?

7.1. Size of the window?

7.2. The language?

7.3. The categories of information displayed?

7.4. The layout of the screen?

8. Are the navigation paths useable?

8.1. Are they consistently structured?

8.2. Do they respond to user interests?

9. Is a navigational map given?

9.1. Does it help orient the user to the content presented?

9.2. Does it help the user understand the functions given?

9.3. Is it accurate and complete?

10. Is "Help" given?

10.1. Is it relevant?

10.2. Is it context sensitive?

10.3. Does it provide the assistance needed?

11. Can you stop the presentation when you want?

11.1. If you resume after you stop, do you have to start over?

12. Can you exit when you want?

13. For a CD-ROM, is the packaging appealing and appropriate?

13.1. Is there an orientation brochure included?

IMPLEMENTATION

1. Does it work?

1.1. Are there broken links?

1.2. Dead-ends?

2. Does it work across platforms?

2.1. With different browsers?

3. Does it require specific environment to run?

3.1. Are there particular dependencies on hardware or software?

3.2. Are specific configurations required?

3.3. Does a Web site require particular Plug-ins?

4. Does it install easily?

4.1. Does it change existing system parameters?

4.2. Is it clear what parameters are altered in installation?

4.3. Does it have an uninstall program?

5. Is the architecture extensible?

      5.1. Is the meta-design explicit?

6. How migratable is the content?

      6.1. Can it be re-used? Can it be archived?

      6.2. Is the system logic machine-independent?

7. Is the implementation upgradable?