Chapter 1

Language Pedagogy and Computer-Enhanced Language Learning (CELL)

1.1 Introduction

The purpose of this initial chapter is to provide an overview of the history of changes in approach to second language pedagogy, and to relate these changes to the emerging roles of technology. Various terms used in this work and in second language pedagogy in general will also be discussed and defined here. Clarification of these terms, located within their pedagogical context, will then lead to the proposal of an emerging role for computers in communicative and learner-centred language learning. This role incorporates our current understandings of the nature of individual differences and the strategies that learners use in the learning processes, both when their learning is mediated by computers, and when other resources are included in the learning environment.

1.2 Principles of the thesis being proposed

Designers and users of computer-*assisted* language learning (CALL) software have long been aware of the difficulties inherent in trying to design the means whereby a machine can provide an effective environment for a learner to learn language, when language is so essentially a human tool of communication (Halliday, 1985a; Vygotsky, 1978).

The thesis and software package that will be presented in this work is based on the following five hypotheses derived from various research studies:

1. that interaction and negotiation are important features of communication, and therefore of second language learning (Doughty, 1987);

2. that computers with appropriately-designed software can play a mediating role between second language learners and their sociocultural context (Jonassen, 1992);

3. that software can be designed to facilitate second language learners' interaction with the computer, and negotiation of meaning from texts in this context (Meskill, 1992; Bickel & Truscello, 1996); and

4. that the essential characteristic of such software is that it enables learners to take control of both the content of the learning material, and their approach to making meaning from it (Robinson, 1991; Stevens, 1992); while recognising

5. that not all second language learners, especially in the initial stages of their learning, want, or are able, to take control (Candy, 1987; Robinson, 1991).

This discussion will be essentially exploratory in nature, in that the five hypotheses above are used as the springboard for an examination of the possibilities and pragmatics of developing a second language learning software package that incorporates interaction and negotiation of meaning under strategic control of the learner. Collectively they encompass the position taken here on the nature of language learning, the contemporary role of computers in language learning, the instructional design framework to suit this

role, and the nature of the relationship between learners and computer-based materials as the medium of learning.

The subsequent discussion of the instructional design of the package and the description of its architecture are presented to exemplify the means by which the five hypotheses can be realised. In relation to the first of these hypotheses, the research and literature on the importance and effectiveness of communication and interaction in second language teaching and learning is discussed in this chapter, by way of setting the scene. The respective roles of teachers, learners and computers are examined in this context.

As the focus of this work is on listening and viewing comprehension, Chapter 2 will provide an overview of the literature in this area, including the few studies available on computer-based listening comprehension. Chapter 2 will conclude with the presentation of a graded taxonomy of listening comprehension tasks designed to be implemented in a computer-enhanced language learning environment. The selection and realisation of these tasks is based on the first, second, and third of the hypotheses above.

As a corollary to the second and third hypotheses, learners' successful interaction with texts and tasks depends to a large extent on individual learner differences, including learning styles, and the effectiveness of the strategies learners use to negotiate texts and tasks. A learner who, for example, has a high level of anxiety about working in groups, may prefer to start working alone on tasks on the computer to develop communicative skills (Bickel & Truscello, 1996), before moving with more confidence into pair and group activities. Another learner who is highly visual in preferred sensory mode of

perception may comprehend a reading passage more readily if video or multimedia are used to set the scene (Baltova, 1994; Raphan, 1996).

This, then, forms the basis of the literature reviewed in Chapters 3 and 4. Chapter 3 concludes that learner differences can best be addressed in a CELL (Computer-Enhanced Language Learning) environment by providing a range of text and task types incorporating an awareness of the various features of individual differences which have been identified as contributing to learner success or failure in language learning. In sociocultural terms, by providing such a range in a CELL environment, the computer fulfills the role of tutor or mentor with which the learner negotiates meaning within her or his Zone of Proximal Development (Vygotsky, 1978).

The literature review of learning strategies in Chapter 4 leads to the conceptualisation of a framework for diagrammatically representing the lists of language learning strategies that have been identified, and how they interrelate. This framework is then incorporated into the software package to guide learners in their choice of strategies when working on the tasks and lessons. Learners are also shown diagrammatically which learning strategies are embodied in the successful completion of each of the task types of the listening and viewing comprehension taxonomy. In this way, learners can set their own learning goals for the activity in which they engage, using information provided and structured by the software package. This again exemplifies hypotheses numbers 2. and 3. above, in that the software mediates between learners and their context. Having been shown *by* the program the range of choices available, learners then *use* the program to guide them through their chosen paths.

The rationale behind the fourth principle, concerning learner control, is realised through the background to the instructional design and architecture of the software package as discussed in Chapters 5 and 6. An overview of the issue of learner control, and advantages and disadvantages of this as identified in the literature, is also presented in Chapter 5. This discussion identifies allocation of control of navigation, choice of content, and choice of learning approach to learners as the critical feature in improving the management of flow of control through a CELL package. This issue of allocation of control hinges on an understanding of the influence of individual learner differences on approaches chosen and paths taken, and the language learning strategies that contribute towards successful interaction and communication on the part of learners, with either human or computer interlocutors.

The CELL package which represents the confluence of these principles has thus been designed and implemented on the basis of sound and effective design features derived from current understandings of several discipline areas: the socioculturally mediated nature of second language learning, listening comprehension research, human-computer interaction, instructional design (both computer-based, and more general), interface design, individual differences in language learning, and the role of learning strategies in language learning. In implementation, it provides a rich source of potential data on all of these features for future exploration and examination. The package has been called *MMInteraktif* to indicate the fact that it comprises a multimedia aspect, represented by *MM*, and an interactive focus is expressed by the use of the Indonesian term *Interaktif*.

The purpose of this study then, is to survey and analyse research findings across the broad range of discipline areas that impinge upon the design of learner-centred language

learning software, and to create a prototype software package as a 'proof of concept' exemplifying the positive aspects of these findings. The package thus created can then be used for systematic collection and analysis of data on learner interactions with the various components of package, as well as their perceptions and other affective responses. This information will enrich our understandings of the nature of second language learning with the use of computing technology.

1.3 Definitions proposed

Computer-*Assisted* Language Learning, or 'CALL', is the term generally used to refer to language learning activity that involves the use of computers. Computer-*Enhanced* Language Learning, or 'CELL', on the other hand is a much more specific term in that it describes the role that computers play in the language learning process: as an enhancer of the learning. In other words, language learning could and does occur anyway, regardless of the presence of computers, but the inclusion of such a presence is intended to improve, expand, or enhance the learning in some way. According to this definition, the software package described in this work is designed to enhance learning in the area of listening and viewing comprehension, by incorporating current understandings of second language learning, human-computer interaction and interface design, sociocultural perspectives on language learning, listening comprehension theory, learning styles, and learning strategies. A full discussion of the terms CALL, CELL, the distinction between them, and other terms used to describe language learning mediated by computers is provided in section 1.6.1 dealing with the place of computers in language learning.

1.3.1 Flow of control

The term ‘flow of control’ in this work refers to decisions made with regard to content, navigation and presentation in the design of a software package: whether this control is predominantly held by the teacher/author, by the software, or by the learner. As reflected in the frustration expressed by Wolfe (1993), and Loritz (1995), among others, ‘traditional’ or earlier approaches to the provision of language learning materials using computer software concentrated on ‘drill and practice’ uses of the medium (Flewelling, 1994). Forward-looking communicative or learner-oriented language teachers questioned the quality of much of this software (Dunkel, 1987; Künzel, 1995). In even a cursory review of literature in this area, frequent reference can be found to the term ‘drill and kill’ used to describe the predominantly discrete-point, lock-step, grammar-focussed software developed and used for language learning (Wolfe, 1993; Elling, 1995).

In the software package presented as the realisation of the hypotheses proposed in section 1.2, the learner using the package is allocated the major share of control, with the software package taking on more of the role of resource provider. In this context, the software provides the framework for this allocation of control by structuring and presenting the available language learning resources in a manner that is easy for the learner to navigate, while at the same time providing the information necessary for the learner to make informed decisions about her or his learning path. This approach to the structuring and presentation of the resources is what is referred to as ‘management’ in the title of this work.

In keeping with the principles outlined above, this management is improved by enabling learners to make informed decisions relating to their own learning using the resources contained in, or presented through, the software package. A complete list of technical

terms used in this work, and the meanings assigned to them here is provided in Appendix F.

1.3.2 Multimedia, hypermedia, and interactivity

The terms 'multimedia', 'hypermedia', and 'interactive' appear frequently in the literature on language learning software and elsewhere, often with no explanation of their use or meaning, particularly in relation to a particular piece of software. In addition, advances in the technology have also produced changes in what it is possible to do, which has in turn expanded the scope of all the above terms.

This is particularly true of the terms 'multimedia' and 'hypermedia', which in the past, because of the limitations of technology, were sometimes almost regarded as being synonymous, but are even now evolving to refer to distinct entities. Whereas multimedia in CALL previously referred to the use of a variety of media, including text, computer graphics, and sound, often delivered by a computer-controlled cassette player, it can now include the use of digitised sound, full motion digitised video, and sophisticated animated graphics (Ashworth, 1996). The term 'hypermedia', on the other hand, has also been used to refer to the incorporation of a variety of media, mainly text and graphics, but with links between them, giving rise to the 'hyper' component of the term.

The term was also heavily used by programmers and users of the authoring program *Hypercard* under the Apple Macintosh system (Brunsman *et al.*, 1988; Underwood, 1989). According to Ambron (1988), for example, the term 'hypermedia' grew from the earlier term 'hypertext' (Nelson, 1965) which was used 'to describe the idea of nonlinear reading and writing implemented on a computer system for annotating and connecting

ideas' (Ambron 1988: 5). 'Hypermedia' was then coined to describe systems that extend 'hypertext to include video, audio, and animation in addition to text', but '[...] multimedia, hypermedia, and intermedia refer loosely to the same class of presentations' (1988: 5).

Kahn (1989) however, disagrees, claiming it is important to distinguish between multimedia and hypermedia because, while the former 'simply delivers information in more than one media', the latter 'implies that the computer system supports persistent links among elements in these media' and 'navigation through information by following links is a feature unique to hypermedia systems' (Kahn, 1989: 443-4). Ashworth (1996: 81) supports this distinction based on links, using the term 'multimedia' to refer to 'combinations of sound, video, and other resources', while he reserves the use of 'hypermedia' for 'the linking of all media'. Such complexity in terminology makes it problematic for us to provide an accurate description of *MMInteraktif*, the name given to the software package created as part of this work, since it incorporates both multimedia and hypermedia capabilities.

However, since the advent of the World Wide Web and other graphical multimedia information exchange structures, 'hypermedia' is increasingly coming to refer to the layers of linkages and connections between computer screen displays and parts of screens with other sources of information located elsewhere in the world. These sources may be in the form of text, still images, graphics, animations, or digitised audio or video files, and even collections and libraries of these. For the purposes of simplicity, therefore, 'multimedia', rather than 'hypermedia', or any combination of these, is used here to describe the *MMInteraktif* package.

The term ‘interactive’ is probably the most idiosyncratic and programmer-dependent term of the three, and therefore the most difficult to define with any degree of accuracy or certainty. With reference to computer-controlled videodisc, Hedberg and Perry (1984: 106-107) claim that ‘theories of how people learn must be adjusted to accommodate this alternate mode of interacting with the subject matter’, and this is the basis of the design of *MMInteraktif*. They link the concept of interactivity to that of control in that ‘for instruction to be considered interactive the learner must be actively involved in responding to the instructional material presented’ and ‘the program must engage the learner to participate in the instruction process in a variety of ways’ (1984: 107). They also warn, however, of the dangers of overloading the learner with too much control in the form of too many decisions, which they feel may interfere with achievement.

Pertaining to the provision of structure, Bork (1982) mentions three components to the quality of interaction: type of required response, method of analysis of the response (answer evaluation), and type of (computer) action taken on this (help and feedback). Cohen (1984), on the other hand, has found four areas of learner interactive control, namely: 1) exit from the program, 2) review of content material or directions, 3) access to Help, and 4) change of lesson parameters. The first three of these are navigational interface design points, discussed in detail in Chapter 5, but the last represents a re-emergence of the issue of learner control over the learning process and learner-centredness in instructional design.

In his attempt to resolve the paradox between freedom and interaction, Crockford (1988: 272) defines interactivity as having ‘more to do with taking part than in making

decisions'. By this he means that, while the structural integrity of the story (lesson content) must be maintained, the interactor (learner) should have some freedom of self-expression to interpret the story, much like listeners of stories around a campfire. For Crockford, therefore, there are four major criteria for interactivity (1988: 272):

1. The experience should be safe (and free of technology-induced anxiety);
2. Everyone should win (help should be available to do this at all points);
3. You should care (Crockford's representation of motivation); and
4. The presentation will be tailored to you based on your responses.

As will be outlined in Chapter 5, the first, second and last of these criteria are fulfilled in *MMInteraktif*. The third is more dependent on the content: if the content is interesting for the learner, she or he will continue to participate. It also depends to some extent on Crockford's second criterion, since learners who are achieving and succeeding will continue to participate, as found by Brandl (1994) and discussed in detail in section 5.3.3.3.2.

In an overview of the literature on the relative effectiveness of various modes and media for teaching and learning, Spencer (1991: 20) has found little significant effect for any teaching modes or media, with the exception of the reported superiority of bi-modal (verbal and visual) over uni-modal presentations, and a combination of personalised systems of instruction (PSI) and Bloom's (1978) learning for mastery (LFM). He attributes the success of these modes to the interactive nature of the instruction, by which he means that interactive modes of instruction, including human-computer interactions, are successful because of the crucial opportunities for feedback they

provide. However, he concludes with the reminder that 'what seems to be crucial is the application of technology *in* education rather than the provision of technology *for* education' (Spencer, 1991: 21 – emphasis in original). In other words, language learning should be learner-driven, not technology- or teacher-driven.

Within the context of *MMInteraktif*, interactivity refers to the potential for the learner to make decisions about the content, mode, order, pace, level, and level of self-direction of the presentation of the package. In addition, it can also be taken to mean to capacity the package provides for the learner to interact with, interpret, negotiate, and make meaning from the texts available, whether these are print, audio, audiovisual, or visual texts.

1.4 Background to the paradigm adopted in this chapter

This chapter will provide a preliminary explanation of the perceived need for, and uses of, computer-enhanced language learning today. This explanation will begin with a history of the development of current methods and approaches to second and foreign language teaching and learning, and a consideration of the various influences on these, leading to the proposal of the humanistic-cognitivist approach advocated by this author. This will be followed by a discussion of the various labels that have been attached to language teaching and learning approaches using computers, including the results of a survey of the roles and uses of computers for second language (L2) learning in Australian secondary and tertiary institutions. For the purposes of simplicity, the term 'second language learning' will be used throughout this work to refer to the learning of another language after one's first language (L1), whether within the target culture, or removed from it.

Finally, all these aspects will be brought together to produce a rationale for the teaching of language using computer technology from a 'humanistic cognitivist' perspective. This latter label, which refers to the position taken here on how languages can best be taught, incorporates some elements of each of humanist methodology (Stevick, 1990), cognitive learning theories (McLaughlin, 1987; O'Malley & Chamot, 1990), and sociocultural theories of language learning (Halliday, 1993; Lantolf & Appel, 1994; Wells, 1994). The humanistic aspect is based on a belief in the necessary involvement of the whole person, including affective and sociocultural context, in the language learning process, while the cognitivist aspect derives from the conviction that one of the ways second language learners learn language is through progressive modification of their interlanguages brought about through a process of hypothesis testing, confirmation/disconfirmation and subsequent modification. The sociocultural paradigm provides an interpretative framework within which to anchor the complex interplay of the features both internal and external to the physical body of the learner, mentioned above. It is this paradigm which facilitates the existence of cohesion and complementarity among these disparate perspectives.

Within this paradigm, learners take an active, goal-oriented role, negotiating and interpreting new experience in terms of previous experience and models they have built up, to reformulate their internal models or schemata. A corollary to this view is that if learners are provided with the opportunities to use language and learning strategies in the second language, and some training or explanation in their application, they can develop these strategies through exposure to and experience in the second language (McMeniman, 1994; Perrett, 1995). Such development can take place through a series of steps, called 'scaffolding' (Donato, 1994), in which teachers play a progressively

diminishing role as the involvement and investment of the learner progressively increases. In this way learners become more autonomous and self-directing in their attitudes and approaches to their own learning (Adair-Hauck & Donato, 1994; Rowsell & Libben, 1994), enabling teachers to devote their time and attention to further enhancement of the materials available as resources to learners.

1.5 The mixing of disciplines: A brief background to the current state of methodology in language teaching and learning

According to Richards and Rodgers (1986: 28), the formulation of any language teaching method comprises consideration of three elements: approach, design, and procedure. The **approach** must be based on a theory of language and a theory of the nature of language learning, while **design** includes organisational and sociological features such as syllabus model and roles of the participants. **Procedure** refers to how the other two elements, approach and design, are implemented or realised in the classroom, including resources and teaching strategies. In the context of CALL, these elements have been extensively elaborated by Hubbard (1992), as will be discussed in detail in chapter 5.

1.5.1 An historical view of the sociocultural approach to second language learning

An historical view of language teaching methods over the last one hundred years reveals radical and innovative changes in all three of Richards and Rodgers' elements, with certain features recurring as the influence of research and thinking in related disciplines such as psychology and linguistics has made itself felt. Thus, for example, the direct method, first espoused by Gouin in the latter part of the nineteenth century (Stern, 1983: 78) was reconstituted as the Natural Method by Krashen and Terrell (1983), with more

modern teaching techniques, and a theory on the nature of language based on linguistic research into first and second language acquisition.

Some of the first contact between the field of linguistics and that of language teaching occurred with the adoption of linguistic perspectives on phonetics in the late nineteenth and early twentieth centuries by influential linguists such as Whitney, Jesperson (Fries, 1963), and Sweet (Stern, 1983: 91) and Bloomfield (Fries, 1963). Since the post-World War II period, theories and developments in linguistics and psychology have had a much stronger influence on language teaching. Several influencing factors also emerged as a direct result of World War II, including increased post-war mobility, and realisations which emerged during the War of the complexities of language, machine translation, and artificial intelligence, and the need to be able to communicate with others whose L1 may be different. In fact, Scott *et al.* (1992) identify military priorities, at least in the United States, as the major driving force in the uses to which computers have been put in education since World War II.

Apart from these influences, one of the first general realisations to be accepted was that the spoken form of language as used for communication should be the focus of language teaching. This arose as a result of the vast post-war migration of people and the misunderstandings of language and culture which were seen to have caused the war. In the United States, this then developed under the influence of structural linguistics led by Bloomfield (1942) and Fries (1952), and the behavioural psychology conception of learning as proposed by Skinner (1957), into a theory of language learning as habit formation. The language teaching approach which developed from this was the Audio-Lingual approach of the sixties. In L2 classrooms, this approach took the form of

grammar and substitution drills, relying heavily, as it did, on the stimulus-response principles of behaviourism.

Meanwhile, cognitive approaches to learning were also circulating among language teaching theorists. Principally, Gestalt psychology, with its 'emphasis on innate organizing principles [...] in human perception, cognition, sensorimotor skills, learning, and even in social conduct' (Stern, 1983: 307), had also been opposing behaviourism Fries, 1963). Elements of Gestalt psychology, which succeeded and largely replaced behaviourism, are still evident in more recent manifestations of cognitive theories of learning. As part of his conceptualisation of the role of cognition in learning, Ausubel, for example, emphasised 'meaningful learning' as:

> a clearly articulated and precisely differentiated conscious experience that emerges when potentially meaningful signs, symbols, concepts, or propositions are related to and incorporated within a given individual's cognitive structure [...]
>
> (Ausubel, 1967: 10)

The evolution of schema theory and the pervasiveness of problem-solving and other cognitively-oriented tasks of the eighties and nineties can also be traced back to influences from Gestalt psychology. Some of the most significant influences on more recent teaching methods have come from the psychology of cognitive development of Piaget and Bruner (Bigge, 1976; Stern, 1983), the psychological perspectives on the development and role of language contributed by Vygotsky (1978), his colleagues (Luria, 1976) and followers (Wertsch, 1985), and the different theories on the nature of language developed by Chomsky (1965) and by Halliday (1985).

While the work and thoughts of Piaget and Bruner are well covered in the general education literature, there has recently been a revival of research and exploration of Vygotsky's sociocultural perspective on (first) language development and its applications to second language learning (Lantolf & Appel, 1994). Being both a linguist and a political philosopher, Chomsky has been able to exert considerable influence over a wide range of thinking in diverse fields. It was principally through Chomsky's negative review of Skinner's conceptualisation of language as 'verbal behaviour' (Chomsky, 1959), for example, that the Audio-Lingual Method began to lose its impetus (Stern, 1983).

Chomsky's hypothesis of the mind working in a rule-governed manner, seeking the underlying pattern or system of any stimulus, was formulated as the psycholinguistic theory of Mentalism, which was the forebear of the more recently evolved cognitive theories of learning (O'Malley & Chamot, 1990). Transformational generative grammar, developed by Chomsky, aptly illustrates the rule-governed nature of language with its concentration on syntactic processing as the vehicle for the realisation of meaning. The semantic aspect of language is only incorporated into this theory of language through the delineation of meaning into surface and deep realisations in sentence level structure. However, linguists from other branches of linguistics felt that this theory did not sufficiently account for the full spectrum of what constitutes language.

At the same time that Chomsky was concentrating on the development of his transformational generative grammar, other linguists were looking to aspects of language that might influence the creation and interpretation of language. Hymes (1972), for example, introduced the concept of communicative competence based on social

interaction. In an attempt to remedy the perceived inability of Chomsky's theory to account fully for the influence of social and cultural context on the semantic aspects of language, Halliday (1978, 1985b) developed his systemic functional grammar, which emphasises the way in which the different systems of language interact in the whole context of language, including the social and cultural features.

This latter theory represented the introduction in linguistics of a focus on the sociocultural aspects of language, with emphasis on the way in which social and cultural interaction shapes the realisation of meaning. Almost contemporaneously, other sociolinguistic theories started to emerge (Wilkins, 1976; Stern, 1983: 147) with such approaches to the interpretation and structure of meaning in language as pragmatics (Oller, 1970), discourse analysis (Sinclair & Coulthard, 1975) and speech act theory (Searle, 1969; Hymes, 1972; 1972a; Richards & Schmidt, 1979). These theories attempted to take account of more of the interpersonal, culture-bound and communicative functions and uses of language by focussing on aspects of language other than syntactic, and at levels higher than the sentence.

These developments have been complemented by continuing research by Halliday (1993) and his colleagues and followers (Rothery, 1989; Christie, 1991), as well as by followers of the Vygotskian approach (Lantolf, 1994; Lantolf & Appel, 1994). Taken together, the work of these two theorists (Vygotsky and Halliday) is beginning to clarify our understanding of the interaction among culture, society, and the individual, and the corresponding role of language. While Halliday's work in first language acquisition has been incorporated into second language acquisition research and classroom practice for more than a decade (Brindley, 1985; Butler, 1985; Zhu, 1985; Zhong, 1985), it has only

been in the last few years that researchers and theorists in second language acquisition have discovered the relevance of Vygotsky's work for their field (Frawley & Lantolf, 1985; Lantolf, 1994; Lantolf and Appel, 1994; Donato & McCormick, 1994; Gillette, 1994) and even more recently, that the similarities between the work of these two theorists have been recognised (Wells, 1994).

A particularly strong influence over the last few years on our understanding of the nature of language learning and the inter-relationship between language and learning has come from the recently recognised similarities between and complementarity of the theories of Halliday, the 'linguist with social leanings' (Wells, 1994: 66) and Vygotsky the psychologist. While Halliday, as a linguist, has produced a detailed grammar which incorporates an acknowledgment of the integral part that social interaction plays in language, Vygotsky's contributions were greater in the area of the role of language processing in the development of higher mental processes. Nevertheless, there are distinct similarities between the basic or underlying principles from which these two theorists have worked. Thus, for example, they both use a genetic approach in their theorising, in that they are interested in the development of language as human beings grow and develop as social beings. In addition, they both subscribe to the notion that 'language is a human invention' (Wells, 1994), and both believe that there is a symbiotic relationship between language and culture, and that language is intimately involved in the development of intellect.

As these principles form the basis of the approach to the nature of language and language learning taken in this work, it is necessary to consider these in greater detail here. Furthermore, reasons for adopting these principles are sometimes different for the

two researchers. For Halliday, for example, the ontogenetic approach he takes is motivated by the extrapolations that can be made from such a perspective into an understanding of human language development in general. Vygotsky, on the other hand, does not confine himself to the one (ontogenetic) domain of a genetic approach, but finds a need to explore another three domains: phylogenesis, sociocultural history, and microgenesis, 'in order to provide an adequate account of human mental processes' (Wells, 1994:44). Researchers in the Vygotskian tradition, however, have predominantly investigated development in the ontogenetic and microgenetic domains.

On the second of the areas of similarity mentioned above, language as a human 'invention', Vygotsky and Halliday differ in the emphasis they place on the role of semiotic mediation. Thus Vygotsky, coming as he does from a labour-oriented sociocultural context, stresses the role of language as a 'tool' to transform the relationship between humans and their environment, 'reflecting the state and level of labor activities' (Lantolf & Appel, 1994: 7). At the same time, he has 'little to say about the role that semiotic mediation plays, in every social encounter, in both substantiating the culture and in recreating and modifying it' (Wells, 1994: 47). This can be interpreted in Wells' terms as a focus on intrapersonal meanings, since Vygotskian principles are based on the cognitive and mental processes of individuals.

Halliday, however, locates the reciprocal relationship between language and culture at the centre of his work. For Halliday, therefore, culture is a social reality which is 'itself an edifice of meanings - a social construct ... [of which] language is one of the [constituent] semiotic systems' (1978: 2). Halliday focuses on the co-construction of social reality by the participants jointly agreeing on, or mutually accepting meanings of,

the various signs, gestures, and elements of language. Thus, this difference in orientation between the two researchers can again be traced to Halliday's study of interpersonal meanings, and to Vygotsky's study of the intrapersonal.

As for the relationship between the development of language and the appropriation of culture, Halliday and Vygotsky agree that this emerges as part of the co-construction of meaning between participants in a text, though again, they each take rather different perspectives on how this happens. Vygotsky focuses on word meaning as the 'critical unit for making the bridge between thinking and speech' as he feels that it 'belongs not only to the domain of thought but to the domain of speech' (1978: 47). Halliday, on the other hand, with his deeper emphasis on the early phases of language development, focuses on 'protolanguage' as being the child's first culturally-influenced linguistic expression. From very early on, people who interact with the child, through their responses and interactions, overlay their interpretations of what the child is trying to mean in terms of their own semantic systems. Through these interactions, the child then comes to adopt the linguistic expressions of the protolanguage that have been interpreted as being culturally appropriate. On this principle, Halliday and Vygotsky are in close correspondence: that children learn to use the semiotic tool of language to make connections or co-create meaning with others, and at the same time, by experiencing these interactions, they learn about the organising principles, values, and beliefs of the society in which they live.

While both Halliday and Vygotsky examine and theorise on the relationship between the mental and language development of people as social beings, because of their different fields they focus on different aspects of this relationship. As a linguist, Halliday has a

clearer insight on the earlier stages of development of language, particularly as a creation of the interaction between the young human organism and others with whom she or he interacts. His focus on these 'interorganismic' features of language with the text as his unit of analysis also enhances this insight, articulated as: 'language is the essential condition of knowing, the process by which experience becomes knowledge' (1993: 94). As regards thought processes and mental development, he has little to say, except in his conception of the role of the teacher as a guide and mentor (similar to Vygotsky's conception). For Halliday, the development of thought is seen as being 'the combination of the experiential and the interpersonal that constitutes an act of meaning. All meaning - and hence all learning - is at once both action and reflection' (1993: 101).

Both as a psychologist, and because of his 'intraorganismic' focus on constructs of 'concept' and 'thought', Vygotsky has a more detailed conception than Halliday of the development of 'higher mental functions'. Vygotsky conceived of social speech as consisting of two layers: the communicative, and the egocentric or 'inner speech' (used by children and others to help themselves negotiate meaning in instances of problem resolution). At the time it was proposed, this conception conflicted with the views of the well-known and well-respected educational psychologist, Piaget. Piaget contrasted *social speech*, which he saw as being produced in the presence of others, and other-directed, with *egocentric speech* which he regarded as being unaffected by the presence of others, and inwardly directed. Piaget thus saw the disappearance of egocentric speech as signifying that the child was becoming more cognitively and emotionally mature. Vygotsky, on the other hand, argues that such speech, rather than disappearing, merely goes 'underground' to resurface whenever the individual is faced with a cognitively demanding problem. This conception of inner speech now forms the theoretical basis for

studies on the role of introspection in problem-solving, and the role of 'private speech' among adults engaging in complex cognitive activity in their second language (McCafferty, 1994: 421).

A critical facet of Vygotsky's conception of the development of higher mental processes is realised as the 'Zone of Proximal Development' or ZPD (Vygotsky, 1978: 86). This zone represents the sphere of potential intellectual development within which an individual can develop with the stimulus and intervention of (more skilled) others. It is the interaction with others, such as a teacher, guide, mentor, or even a computer, that triggers the arousal of internal developmental processes. Lantolf and Appel describe it as follows:

> [...] the process of voluntary acting is distributed between two people, one of whom (the adult or expert) already knows how to perform a particular act and one who (the child or novice) does not. Equally important is the fact that speech serves to direct, or mediate, the interactive process that transpires between the two. [...] The difference between what the child, or novice, is capable of when acting alone and what he or she is capable of when acting under the guidance of a more experienced other is referred to as the *zone of proximal development* [...]
>
> (Lantolf & Appel, 1994: 10 - emphasis in original)

Donato (1994) uses the concept of the ZPD to expand the potential of interaction from the 'conduit metaphor' of a message in communication to include, and *emphasise* collaborative meaning making. For Donato, as for us, this metaphor for a communicative event as merely 'the successful sending and receiving of linguistic tokens [...] masks fundamentally important mechanisms of L2 [second language] development' such that 'in the end, the social context is impoverished and undervalued as an arena for truly

collaborative L2 acquisition' (Donato, 1994: 34). Donato then proposes the metaphor of scaffolding as an alternative metaphor to that of the conduit, to exemplify the role of the ZPD in language development. The metaphor of scaffolding is used for the principle that:

> in social interaction a knowledgeable participant can create, by means of speech, supportive conditions in which the novice can participate in, and extend, current skills and knowledge to higher levels of competence
>
> (Donato, 1994: 40)

This concept of the ZPD thus represents a useful metaphor for describing the kinds of interactions and posited outcomes that a successful CELL software package should engender. The relationship between learners and the role of computers, or more particularly, computer software, will be revisited in greater detail in later chapters.

1.5.2 A historical view of teaching and learning approaches

With the emergence of the various linguistic theories and psychological approaches discussed above, changes in thinking among language teachers began to emerge concurrently, producing, in the sixties to the early seventies, the Situational Approach to language teaching. This approach was an attempt to include the influence of situations and contexts on the language used in the language learning and teaching environment. However, the focus of classroom activities in this approach was still very much based on practising basic patterns and structures, with a Situational overlay. O'Neill (1970), for example, provides learners with a short contextualising passage, and then bases a series of structure- or pattern-based drills on this passage. In practice, then, this approach was still essentially grammar-based, deriving its substitution activities from predictions by teachers and coursebook writers of 'typical' utterances and responses that might occur in certain situations. The order of presentation of patterns to be learned was based on the

order used in traditional grammar-based courses, and the drill-like activities were still very similar to the sound-based drills of the Audiolingual Approach. Much of the early software written for language learning also followed this pattern-drill presentation and activity approach.

Subsequently, and in recognition of this deficiency, Wilkins (1974, 1976), and Trim and colleagues (1980a, 1980b), refined and elaborated the social and cultural concepts or notions, the language functions which are used to convey them, and the language through which they are realised, to produce what has become known as the Functional-Notional approach. Looking to the work of British functional linguists such as Firth and Halliday, and American sociolinguists such as Hymes, Gumperz, and Labov (Richards & Rodgers, 1986), proponents of this approach attempted to structure language teaching courses as thematic units based on learners' needs. After some years of implementation in the classroom, teachers embracing the Functional-Notional approach realised that they were increasingly using techniques such as role-play, drama, and simulation in an attempt to create for their students the context for communication - to bring the real world into the classroom. In this way, the Communicative approach to Language Teaching (CLT) was born.

1.5.2.1 Problems in conceptualisation of 'the communicative approach'

The communicative approach has emerged, then, more as a 'design' in Richards and Rodgers' terms (1986: 28) than as an 'approach'. From this perspective, CLT is not really one approach, but rather is descriptive of certain features or basic premises of several approaches, embodying as it does the principles of participants' roles from

Richards and Rodgers' 'Design' element, and the organisation/classroom implementation aspects such as teaching strategies from their 'Procedure' element.

Classroom tasks with identifiable communicative features can appear in a variety of syllabus models, based on various views and beliefs about the nature of language and the nature of language learning. Games or activities with an element of fun or information exchange, for example, have been identified as typical of CLT. However, such activities are often introduced into classrooms for their 'fun element', as part of a lesson on a discrete point of grammar, or to encourage learners to say something, without a clearly defined purpose for the activity in the learning cycle. Unfortunately, because of the confusion mentioned by Nunan (1989: 12) over how to introduce and plan language teaching and learning based on *processes* rather than linguistic items or outcomes, all too frequently communicatively-oriented classroom tasks are not based on any clear beliefs about the nature of language and language learning (Crawford & Hoven, 1994).

As Nunan (1989: 12) comments, 'a great deal has been written and said about CLT, and it is something of a misnomer to talk about "the communicative approach" as there is a family of approaches, each member of which claims to be "communicative" (in fact, it is difficult to find approaches which claim not to be communicative!)'. One source of confusion in understanding the nature of 'the communicative approach' has been the fact that teachers in, for example, both grammar-based and Functional-Notional syllabuses, have incorporated communicative tasks of various kinds into their classroom teaching. Another source of confusion, as Nunan intimates, is the change in focus in syllabus design that has occurred, from the *lists of structures* of the seventies, to the *learning*

processes of the eighties onwards. Nunan describes the difference as distinguishing between 'learning that' and 'knowing how' respectively (1989: 12).

However, with so much written and said about CLT, it should be possible to determine at least some of the critical features or principles that identify classroom practices, syllabus models, or teaching approaches as being communicative. Breen (1984: 52-3) suggests that a communicative syllabus is one in which learners' capacity for communication is central, with classroom activities designed to develop this capacity. Littlewood (1981: 6) lists four skills that he regards as requiring consideration in CLT: competence in manipulating the linguistic system, the ability to map the linguistic system on to the communicative system of language, facility in using communication skills and strategies, and awareness of the social context and implications language used - in other words, the semiotic system.

Howatt (1984: 279) in the context of teaching English as a Second Language (ESL) identifies 'strong' and 'weak' versions of CLT, where the strong version entails 'using English to learn it' with no formal instruction on linguistic features, while the weak version characteristically attempts to integrate 'opportunities to use English for ... communicative purposes ... into a wider program of language teaching'. This wider program would include some formal instruction on the linguistics features of the language. However, just as there is confusion about the concept of 'communicative' at the level of 'Approach', there is also confusion at the level of classroom implementation. What classroom activities, learner groupings, and allocation of planning and control, for example, need to be in place for a classroom to identified as 'communicative'?

As Howatt also comments, the weak version of CLT, including formal grammar instruction, is the one that has been most widely practised. Nevertheless, because of pervasive confusion about what a CLT syllabus might look like (Yalden, 1983), classroom implementation of CLT is still very inconsistent. Researchers such as Spada (1987) and McKay (1994), for example, have shown that a focus on communicative teaching activities does not necessarily lead to a greater increase in language proficiency among learners in a CLT class than among learners in a grammar-based class. In the conclusion to a report on her study, McKay (1994: 30) comments that 'a highly meaning-focussed class does not give students the learning advantage that the "strong" version of the communicative approach might have led some of us to believe'.

However, the characteristic classroom activities of the strongly communicative class in her study include 'a lot of time participating in whole-class communicative activities (for example games, talking around real objects) in which the teacher encouraged participation and meaning-exchange above accuracy' (McKay, 1994: 10). There is little indication in this study of the principles teachers in the study consciously embrace regarding the nature of language or of language learning. It may well be the case that, with the increasing eclecticism among teachers towards choice of materials and classroom activities, they may be losing sight of the importance of having a clear, goal-directed view of the nature of language and of language learning. It may not be sufficient to have a 'communicative' focus at the level of classroom activity. Rather, it is both possible and necessary to have a clear and mutually-compatible set of principles (rather than a unitary 'approach') at all levels of the teaching and learning interface, including some general beliefs about the nature of language, language learning, interaction types, classroom organisation, and individual learner differences. The discussion of these

principles will be revisited when we turn, in Chapter 5, to an analysis of the features of a learner-centred interface for the multimedia package developed here.

Along these lines, Perrett (1995) stresses the importance of considering not just the sociolinguistic, but also the psycholinguistic, research findings on second language acquisition and how these relate to CLT. She makes the point that the concentration on learning a language to communicate arose predominantly from a sociolinguistic perspective and applies mainly, or most obviously, to second language, as distinct from foreign language, teaching and learning contexts. It can be assumed that the need to communicate is generally more critical for learners trying to survive in an environment where the language they are learning is the one spoken by the majority of those around them. However, since the Council of Europe deliberations mentioned above (Trim, 1980a; 1980b), it has been acknowledged that learners' needs and goals in *foreign* language learning contexts are also better focussed on communication.

Despite these sociolinguistic origins, Perrett argues that there are also strong psycholinguistic reasons why this focus on communication should be extended to foreign language teaching. Firstly, the acquisition order of morphemes studies of Dulay and Burt (1973), Meisel *et al.* (1981), Pienemann (1984), Yoshioka and Doi (1988), and Pienemann *et al.* (1988), show that there is typically a fixed emergence order for steps in the acquisition of grammatical morphemes in a second language. Moreover, progress from one step to the next requires target language input which is meaningful for learners, while at the same time containing grammatical material that is slightly ahead of their current level of competence.

The second important contribution that psycholinguistic research has to offer CLT involves the studies of learner input and output, or negotiated interaction (Long, 1983a; Swain, 1985; Pica 1988). In terms of CLT, this body of research implies that communicative tasks and learner groupings such as those described by Johnson (1982) and Prabhu (1987), enable learners to progress actively from one step to the next in the stages of language acquisition - a critical potential not shared with instructional approaches restricted to formal linguistic presentation and manipulation.

In her examination of the various models of language learning on which CALL software programs are based, Doughty (1991) also advocates the application of negotiated interaction models. However, as discussed in section 1.5.1, a sociocultural approach offers us a more appropriate model for the active learning process, and the roles of both knowledge of language form and communicative skills and strategies in this. The application of this model to our computer-enhanced language learning software design will be elaborated in Chapter 5.

1.5.2.2 Interaction, learner groupings, and task type

Evidence from classroom research into whether instruction makes a difference in language learning, and the kind of instruction that makes the most difference (Pica and Doughty, 1985; Long, 1990), together with introspection on the part of language teachers, has provided proponents of CLT with clear theories on the nature of language and the nature of language learning to support and expand our understanding of what it means to teach communicatively, and what components contribute to this. These theories, as will be illustrated below, include an emphasis on the importance of negotiation and interaction in their conceptualisation of both the nature of language, and the processes involved in second language acquisition.

The pervasive principle in the evolution of language teaching approaches in the seventies and eighties was that the primary purpose of language was communication, and therefore the practical applications and uses of language needed to be explicitly taught in the classroom. This principle, together with increasing mobility between countries, particularly in Europe, and the need, expressed world-wide, for increased understanding between countries for the purpose of trade and business, produced a proliferation of courses in language for specific purposes for adults, with emphasis on functional fluency in a language, rather than the previous focus on accuracy in form.

Unfortunately, all too often programs of this nature and activities designed for them remained contrived, lacking the reality and practical usefulness which was the original driving principle in their creation. Courses were designed, for example, to teach the language of such fields as business, engineering, and medicine, ostensibly to allow professionals in these fields to participate in conferences, read journals, and otherwise

interact with their colleagues, partners, or competitors in other countries. Such courses were labelled 'language for specific purposes', the most common of which was English for Specific Purposes (ESP).

A rift appeared between two schools of thought with relation to the language for specific purposes approach. On the one hand, supporters of the approach (Hutchinson and Waters, 1987) felt that in order for adult learners to take full advantage of the learning strategies, background knowledge, and cognitive maturity developed in the first language (L1), such second language, (L2) teaching programs needed to focus on the similarities between the L1 and L2 in subject matter, field, lexis and strategies, by teaching learners the language appropriate to their purposes. Opponents, however, maintained that, without a sound background in 'general language', learners would not have the linguistic tools to generate new language in novel situations. They claimed that by restricting learners' exposure in this way, learners' production would be limited to the language models in which they had been trained, and to the lexis of their particular field of study. This conflict is still to be adequately resolved, though considerable evidence is accumulating that goal direction and orientation are important for learners. When they perceive that what they are learning is necessary to their needs and purposes, there is higher motivation, greater transfer of learning from the classroom to outside, and increased interest and application on the part of learners (Oxford & Shearin, 1994; Dörnyei, 1994; Gardner & Tremblay, 1994; Gillette, 1994; Dickinson, 1995). These factors strengthen the argument for goal-directed language learning, which is often based on learners' perceptions of job or travel opportunities and the language they require for these.

As with the Functional-Notional approach, the Communicative approach was not without its detractors (Swan, 1985 a; b). Similar criticisms were levelled at both approaches, often with justification from the classroom pedagogy side. These criticisms were also remarkably similar to those that had previously been levelled at the Situational Approach. For example, the lists of possible language items to be used to realise various functions were too stylised, and there was too much context-dependent variation possible in compiling these lists. Learners were also not acquiring the ability to extrapolate from what was practised *in* the classroom to the world *outside* the classroom, and waves of the grammar-translation approach continued intermittently to appear in course designs and syllabuses. More effort was then put into designing tasks and classroom learning environments that would give learners the need and incentive to communicate in real and meaningful ways (Lian and Mestre, 1985).

Another solution has been to concentrate on developing a range of problem-solving and information-gap tasks, which are, in their conception, somewhat reminiscent of the principles of Gestalt psychology and cognitive psychology approaches (Grellet, 1981; Ur, 1984; Johnson and Morrow, 1981; Savignon, 1983; Prabhu, 1987). In such tasks, in order to solve a problem, come to an arrangement, or proceed to the next stage of a task, learners need to share information and ideas and negotiate meaning among themselves. These tasks put learners into the situation where they can become familiar with useful patterns of language use, and learn to use these patterns appropriately. In a self-access, multimedia CELL context, such tasks based on authentic language material provide learners with a rich source of language models, delivered within a private, self-paced environment.

As a reaction to the on-going sense of frustration on the part of teachers and learners at their lack of progress in language learning, a number of new perspectives to this problem are now being investigated and realised in classrooms. Some of these include studies based on psycholinguistic approaches to the nature of language learning as mentioned by Perrett above, as well as examinations of the changing roles of teachers and learners that different learner groupings and task types entail.

Recently, a considerable number of research studies have been published on the kinds of tasks (Duff, 1986; Doughty & Pica, 1986), learner groupings (Long and Porter, 1984; Pica and Doughty, 1985; Pica, 1988; Long, 1989), organisation (Long, 1976/1990; Long and Sato, 1983; Gass and Varonis, 1985; Wong-Fillmore, 1985; Ellis, 1985), stimulus (Temple, 1986; Crawford, 1989; Hoven, 1990), outcomes (Long, 1992; Pica, 1992; Pica *et al*. 1993) and preparation (Di Pietro, 1987; Crawford, 1990; Nunan, 1990; Pica *et al*.. 1993) which produce the best interaction, level of communication, and negotiation of meaning among learners. While the aspects of stimulus and preparation will be discussed in the next chapter, a closer examination of the other aspects of task variation mentioned above is informative for this discussion of the history of and background to teaching and learning approaches. This will subsequently assist in the choice of good task types in chapters 3, 5, and 6, in terms of communicative elements, and opportunities they provide for second language acquisition.

Two decades ago, in discussing the inadequacies perceived in the Situational presentation of grammar material to enhance learners' ability to communicate in the L2, Long (1976/1990) classified typical learner-teacher classroom interactions as comprising: teacher stimulus - student response - teacher evaluation of student response. In a

comment reflecting aspects of the Vygotskian principles discussed earlier, Long labelled classroom interactions typified by such sequences as the 'classroom foreign language learning socialization package' (Long, 1976/1990: 309), and advocated the introduction of group work and simulation tasks to help address what he saw as the negative characteristics of this package.

The three advantages which Long saw in group work were for learners to experience increased opportunity to engage in:

1. productive, extended conversation turns (compared to the single utterances typical of classes previously);
2. exploratory talk or talking to learn, that is, increased quality of talk, including a release from the necessity to produce accurate utterances ; and
3. an increased range of speaker and interlocutor roles.

The last of these advantages led him to propose the use of role-play, simulation, and problem-solving tasks to maximise the range of registers and genres which his learners had the opportunity to explore.

If we are to achieve a good perspective on CELL task design, we need to take into account the findings of the studies mentioned above. From these, several features can be identified among the various aspects of the classroom implementation of tasks which contribute positively to second language acquisition. With regard to the nature of the tasks themselves, the following have been found:

- problem-solving (closed/convergent) tasks produce more questions in total, more questions per subject, and more confirmation checks and referential questions in total than debate (open/divergent) tasks (Duff, 1986; Long, 1989);
- information exchange (closed/convergent) tasks produce more comprehension and confirmation checks, clarification requests, repairs, preventive moves, reactions, and self/other repetition (Doughty & Pica, 1986);
- modifying language input of tasks is better done through interaction and negotiation than by pre-modification to decrease complexity and increase quantity and redundancy (Pica *et al.*, 1986; Pica *et al.*, 1987; Ross *et al.* 1991);
- negotiation of input and output on tasks seems greatest on larger semantic units, with little negotiation occurring in relation to syntactic elements such as time and aspect (Ashton, 1986);
- 2-way ('jigsaw') tasks produce more and better negotiation work than 1-way tasks (Long, 1980; Doughty & Pica, 1986; Pica *et al.*, 1989; Long, 1992);
- decontextualised tasks produce more negotiation than contextualised ones (Snow, 1989; Long, 1992)
- 'There-and-then' (temporally and spatially removed) tasks produce more negotiation than 'Here-and-now' (local in time and place) tasks (Snow, 1989; Long, 1992); and
- more negotiation occurs when a feedback option is provided than when it is not (Loschky & Bley-Vroman, 1990; Tomasello & Herron, 1988, 1989).

With reference to computer-enhanced listening and viewing comprehension, it would seem, therefore, that tasks need to be designed to incorporate some elements of negotiation of the texts (probably in the form of feedback and assistance available as part

of the software package), and that the texts need to be authentic and decontextualised. In addition, feedback needs to be provided, and there should be elements of problem-solving and induction involved in the task demands. Within a CELL environment, these criteria should therefore be met, in order to provide tasks that promote the processes of negotiation, and that encourage learners to develop negotiation skills with the activities and facilities of the CELL software package.

1.5.2.3 Examining the nature of the concept 'task' and exploring a task-based pedagogy

The term 'task' is used in this work to refer to the range of goal-oriented language learning activities in which learners participate in a classroom context. These might be *designed* for language learning at the micro-level of pronunciation discrimination between two sounds in the classroom, or *emerge* at the macro-level of a task comprising numerous sub-tasks, and involving several learners in both in- and out-of-class work over an extended period of time. Tasks then, are coherent wholes, which may or may not be designed or structured by teachers, and are not necessarily linear in progression or presentation. The term 'task' is used throughout this work to refer to the broad range of learning- and goal-oriented activity in which learners participate. It is only Chapters 5 and 6 that a distinction will be made between tasks as defined above, and lesson sequences which are essentially a series of tasks designed to be worked through in a linear sequence. There are, however, a variety of other uses and interpretations which need to be investigated to provide background to this use of the term.

Long, for example, defines 'task' as:

> A piece of work undertaken for oneself or for others, freely or for some reward. Thus, examples of tasks include painting a fence, dressing a child, filling out a form, buying a pair of shoes, making an airline reservation, borrowing a library book, taking a driving test, typing a letter, weighing a patient, sorting letters, taking a hotel reservation, writing a cheque, finding a street destination and helping someone across a road. In other words, by 'task' is meant the hundred and one things people do in everyday life, at work, at play, and in between.
>
> (Long, 1985: 89)

Breen, on the other hand, takes a much more classroom-oriented stance in defining language learning tasks as:

> [...] any structured language learning endeavour which has a particular objective, appropriate content, a specified working procedure, and a range of outcomes for those who undertake the task. 'Task' is therefore assumed to refer to a range of workplans which have the overall purpose of facilitating language learning - from the simple and brief exercise type, to more complex and lengthy activities such as group problem-solving or simulations and decision making.
>
> (Breen, 1987: 23)

Krahnke, meanwhile, attempts to use the concept of task to make the connection between the worlds within and outside the classroom, and to decouple 'task' from instruction. For him:

> ... the defining characteristic of task-based content is that it uses activities that the learners have to do for non-instructional purposes outside of the classroom as opportunities for language learning. Tasks are distinct from other activities to the degree that they have non-instructional purposes.
>
> (Krahnke, 1987: 57)

Nunan (1989: 11) tries to include a specifically communicative focus to his definition of task as 'a piece of meaning-focused work involving learners in comprehending, producing and/or interacting in the target language, and that tasks are analysed or categorised according to their goals, input data, activities, settings and roles'. This

definition also clearly identifies the principle of interaction as a critical aspect of the nature of language learning on which it is based. However, while it does incorporate elements of communicative or meaning-focused interaction, it is not clear how Nunan conceptualises learners' negotiation of meaning, or their participation in structuring the sociocultural context. His focus here is more on pieces of language, albeit as part of exchanges, rather than on the ontogenetic processes of language development.

Candlin and Murphy attempt to address the issues of the need for more inclusion of the role of learners, and of the sociocultural context of learning, by defining 'tasks' as:

> […] one of a set of differentiated, sequenceable, problem-posing activities involving learner and teachers in some joint selection from a range of varied cognitive and communicative procedures applied to existing and new knowledge in the collective exploration and pursuance of foreseen or emergent goals within a social milieu.
>
> (Candlin & Murphy, 1987: 10)

After a comprehensive study of tasks, their pedagogical and methodological bases, and their underlying theories of the nature of language, Kumaravadivelu (1993) has managed to synthesise the various interpretations of the concept of task by relating them to specific methodological approaches. On this basis, he has separated pedagogic uses from communicative and other uses of tasks to identify a hierarchy of classroom procedures in which:

> learning-centred *pedagogic tasks* include some of the characteristics of learner-centred *communicative activities* which in turn include some of the characteristics of language-centred *structural exercises*. In other words, from a learning/teaching point of view, *tasks* have a broader and more comprehensive scope than *activities* which in turn have a broader and more comprehensive scope than *exercises*.

(Kumaravadivelu, 1993: 80 - italics in original)

As a result, Kumaravadivelu advocates a learning-centred, task-based pedagogy for language teaching and learning on the grounds that it provides a comprehensiveness that other pedagogies do not. This approach then entails that the design of tasks :

> has to take into consideration minimally, the following psycholinguistic principles: language learning is a developmental process; it is a decision-making process; it is a process of negotiation; it is not linear and additive; it is primarily incidental; it is largely a subconscious activity; and it is a meaning-focused activity
>
> (Kumaravadivelu, 1993: 81)

He then locates this pedagogy within the context of what he terms a 'classroom interactional rationale' for a task-based pedagogy to incorporate the joint teacher/learner negotiation of the emerging syllabus. While the restriction of the definition of task proposed by Kumaravadivelu above is not adopted in this work, it is illuminating in the formulation of a task-based pedagogy within the CELL environment discussed later, in Chapters 5 and 6.

1.5.2.4 The concept of learner-centredness

Central to the development of a CELL software package that allocates more 'flow of control' through the materials to the learners (see section 1.3.1) is an understanding of what is meant by learner-centredness. Some of the predominant factors effecting changes in approach and methodology over the last quarter century have been a stronger focus on the learner as an individual (Stevick, 1976, 1981; Ellis, 1985; Skehan, 1989), a corresponding shift from a focus on teaching to a focus on learners and learning

(Kumaravadivelu, 1993; Gremmo & Riley, 1995; Little, 1995; Cotterall, 1995), consideration of differences in learning styles (Wenden and Rubin, 1987; Willing, 1989; Griffiths & Sheen, 1992; Oxford & Ehrman, 1993; Felder, 1995), learning strategies (Wenden & Rubin, 1987; Wenden, 1995; O'Malley & Chamot, 1990; Oxford, 1990, 1993), and the various manifestations of humanism (Gattegno, 1972; Curran, 1976; Lozanov, 1979; Asher, 1981; Crawford and Trojer, 1983; Underhill, 1989; Stevick, 1990). While many of these issues relating to individual differences, learning styles and learning strategies will be discussed in detail in Chapters 3 and 4, some background to the general concept of learner-centredness and its place in the development of more humanistic teaching and learning approaches is crucial to these more detailed aspects.

In his tracing of the evolution of learner-centredness in language teaching, Nunan (1988) explains the earlier separation of language teaching from mainstream educational theory and research as being founded on the belief that language learning was fundamentally different from other kinds of learning, being, as it was, disproportionately influenced by theoretical linguistics. It has only been since the advent of the relatively new perception of language as being a means of communication which emerged in the eighties that the domination of linguistic theory has waned, as discussed above in sections 1.5.1 and 1.5.2, and we have seen a convergence of language teaching and learning with other fields of educational endeavour. This evolution has produced tensions between those teachers strongly influenced by linguistic theory, who view language as a body of content to be learnt about, and those teachers who view language as a means of communication to achieve things in their lives outside the classroom. The contrast has thus arisen between form- and content-centred language teachers, and learner- and learning-centred teachers.

The principles of proponents of the latter group include a view of learning a language as being essentially 'a process of acquiring skills' or communicative processes (Nunan, 1988: 21), and believe that these processes are necessary to participate in life outside the classroom. They also hold that not even a native speaker can ever fully master a language, and that, for all these reasons, classroom language learning should focus on providing learners with opportunities to model, practise, and acquire those skills and processes commensurate with their needs. This focus on learners' needs has become central to the philosophy of learner-centredness, as has the principle of developing learners' understanding of their own language learning styles and processes (Brindley, 1984; Willing, 1985; Nunan, 1988).

A corollary to the focus on learners' communicative needs is the need for authenticity in texts used as models and input in classroom learning. This is based on the argument that in order for learners to acquire language as it is used, models must be provided of such language (Crawford, 1990). However, this argument has lead to much disagreement when it comes to the question of how to provide learners with a means of gaining access to the meanings and interpretations of authentic texts, which, as will be discussed in the next chapter with regard to audio texts, are typically fast, complex, and rather different from the traditional linguistically graded and controlled texts of language coursebooks. These characteristics of authentic texts have necessitated a move away from grading of difficulty for learners on the basis of *text* features, to a grading of the *tasks* used to provide access to textual meaning (Nunan, 1993). Again, this will be discussed in more detail in the following chapter.

The resulting learner-centredness in classrooms and curricula has added a new dimension to communicative language teaching. Learners are no longer seen as subjects of a process or vessels to be filled, but rather as active participants in the learning process, in both the design and implementation stages. Learners are consulted on their perceived needs and weaknesses, and various questionnaires and observation and monitoring techniques have been developed to keep in touch with learners' progress and achievement, as well as their reactions. Humanistic and sociocultural approaches address the affective side of learning and the interpersonal aspects of the language classroom, emphasising feelings, social relations, responsibility, intellect and self-actualisation (Stevick, 1990:23-4). This view of the learner entails mutual responsibility between learners and teachers in the learning process.

While teachers take more cognisance of the learner as a whole person, including both affective and cognitive aspects, they still expect learners to respond by attempting to realise their full potential, including taking responsibility for their own learning, contributing to decision-making, negotiating contexts and resources more congenial to their own learning styles, developing autonomy, and investing all their resources. However, as Stevick (1990: 7), citing Maley (1983) and Brumfit (1985a, b), points out, humanism is often embraced by teachers with something akin to religious zeal, to the exclusion and rejection of other perspectives on the teaching-learning issue.

In addition, as Scovel (Stevick, 1990: 25) comments, the emphasis in humanism on self-actualisation is more highly valued in so-called ‘Western’ culture than in other major cultures of the world. As various researchers have found (Nakhoul, 1993; LoCastro, 1994) in the context of teaching English as a second or foreign language, teachers are

then faced with numerous cultural, ethical, and pedagogic difficulties in attempts to re-educate their learners on the value of individual learning and self-actualisation, much less implement a learning program based on these principles.

Thus, while this approach sounds appealing intellectually, student reaction can vary from instant cooperation and acceptance, which is not quite compatible with all the principles of humanism mentioned above, to scorn and complete rejection (Kumaravadivelu, 1991; Nakhoul, 1993; Cotterall, 1995). Implementation of these principles therefore requires a great deal of care, patience, and perspicacity on the part of teachers. Learners need to be encouraged to see the benefits of cooperating with such an approach, and convinced of its value. Teachers also need to be prepared to deal with initial learner antagonism and active non-cooperation by devising methods of sensitising learners to the advantages and accustoming them to appropriate techniques and strategies (Moskowitz, 1978; Hallgarten, 1988; Wajnryb, 1988; Murphy, 1993).

In a CELL environment, learner resistance can be addressed by providing learners with exposure to awareness-raising activities across all parts of their language learning program, including in the CELL software. In the initial stages, highly structured (teacher-centred) materials need to be available to cater for the needs of those learners with a strong dependence on teacher direction. However, to cater for differentially rapid development in the direction of autonomy, it is also necessary to provide the means whereby learners can take more control if they feel capable. This can be achieved by writing into the design of a CELL software package several levels of entry, or several modes of interaction based on varying levels of learner control. Details of such a package will be provided in Chapters 5 and 6.

Nevertheless, it does seem that the principles of humanism are supported by research findings. Schumann and Schumann (1977), Bailey (1980), and Ellis and Rathbone (1987), for example, in the area of learners' affective states, have identified a range of affective factors that do influence what is learnt, how it is learnt, and how well it is learnt. Some of these factors include anxiety, motivation, orientation, and beliefs. The relative effects of these factors will be discussed in detail in Chapter 3. In addition, the identification of learners' initial states (Willing, 1985; Wenden, 1987; Oxford, 1990, 1995), the strategies appropriate for particular learners (Wenden & Rubin, 1987; O'Malley & Chamot, 1990; Oxford, 1990), and learning programs which develop these (Scarcella & Oxford, 1992; Chamot & O'Malley, 1994; Wenden, 1991), have become a burgeoning area of research in recent times. These will be dealt with in greater detail in Chapter 4.

Thus it seems that these days it is increasingly common for a syllabus to follow the principles of a variety of what were previously called approaches, eclectically adopting those that suit the syllabus designer's theory of the nature of language and the nature of language learning - and even these may be derived from more than one source. A language teacher may use some of the organising principles or philosophy of language for communication, while realising these at the procedural or classroom implementation level, using a variety of different techniques at different levels. In section 1.5.2.5 this discussion will be extended to the combination of learner-centred and humanist principles, relevant aspects of a cognitive theory of language learning, other elements of the interaction and negotiation models, and the sociocultural view of language learning as progressive enculturation.

1.5.2.5 A humanistic cognitivist perspective

Hutchinson and Waters (1987: 128 - 130) provide a list of principles necessary to learner-centred methodology which seem to reflect the necessary conditions of a humanistic cognitivist perspective on the language learning/teaching process. These principles include viewing language learning as an active, decision-making process in which learners build developmentally on existing knowledge. In this process, the learners' interest, emotions, and conceptual/cognitive capacities are all activated, in addition to their linguistic capacities. In contrast to previous views of language learning, Hutchinson and Waters see the process not as being systematic but rather as being an internal systemisation of the language that learners take in. Thus learners incorporate into their own internally created system the language to which they are exposed.

This interpretation of the learning process is also reflected and refined in the sociocultural theory of Vygotsky (1978). In such a sociocultural paradigm, learners are socialised into 'a community of language learning practice' (Donato & McCormick, 1994: 453) wherein language and language learning strategies are progressively internalised through the mediation of symbols, of which language is the most important. A learner-centred approach therefore relies heavily on humanistic and social, and to a lesser extent cognitive, approaches to language learning. One branch of humanistic methodology which seems conveniently to unite humanistic, sociocultural, and cognitive intuitions and experience about how languages are learnt is the Structuro-Global Audio-Visual (SGAV) approach.

Though a certain rigidity in classroom technique (Stern, 1983) is evident in the European manifestation of SGAV, a more flexible approach in interpretation is taken in the version as practised in Australia (Crawford and Trojer, 1983). SGAV methodology has sometimes being mistakenly likened to or confused with Audio-lingualism. However, the two approaches differ fundamentally in both origin and derivation. While SGAV is based on Gestalt psychology and the developmental cognitive psychology of Piaget, Audio-lingualism, as mentioned earlier, is grounded in a structuralist theory of the nature of language and on a behaviourist theory of psychology. In addition, proponents of SGAV methodology embrace many of the principles of a sociocultural paradigm, including the emphasis on goal direction, mediation, and scaffolded learning.

Apart from its derivation from Gestalt and cognitive developmental psychology, other attractive features of SGAV include its position on the nature of language learning. This is principally that whole language, including the paralinguistic, kinesic, and sociocultural features, should be learnt by whole people, including not just the cognitive domain but also the affective. Thus, interactive language activities are stressed in the SGAV approach (Lian and Joy, 1981) as being a means by which learners can be exposed to and interact with language through an activation of various channels of perception (audio, visual, kinesic). Learners then restructure their existing language systems as they 'seek to integrate newly perceived information' (Crawford and Clemens, 1985: 32). This integration means that learners evolve individual linguistic and paralinguistic systems, or interlanguages, which are composite but coherent for those learners, while differing from the original input.

Because learners are so involved in constructing their own meaning from the language around them, the next logical step is to assist learners in developing autonomy and self-direction. This is also consistent with one of the characteristics of humanistic and sociocultural approaches, in encouraging learners to take responsibility for their own learning. In order to achieve this, SGAV techniques frequently focus on the recycling of input in alternative situations, to encourage inductive reasoning about the way the grammar and other features of the language operate. For this reason, SGAV activities or tasks typically involve the use of authentic audio, visual, and interactive drama materials, to facilitate a focus on the whole language including linguistic, paralinguistic and prosodic features, by engaging various channels of perception. Thus, through a combination of multi-channelled perception, focus on analysis of the features of whole language, and hypothesis testing, confirmation/disconfirmation and modification, learners are able to develop less teacher-dependent and more autonomous approaches to their own language learning.

The CELL software package described in this work implements many of these SGAV principles through the incorporation of multimedia and text features, the graphical design of the interface, the instructional implementation of tasks and lessons, the provision for practice in intonation, and the focus on the paralinguistic as well as the linguistic systems of language. The learning orientation of the package comprises awareness-raising to do with the uses and value of various learning strategies which is provided as part of the introduction to the package, as well as being integrated into the tasks. As we will again take up in Chapters 4, 5, and 6, learner self-direction and self-management is promoted through this awareness-raising and practice.

1.6 Language learning methodology and CALL

Though a relative newcomer on the language learning scene, Computer Aided Language Learning (CALL) reflects some of the waves of change in teacher and institutional attitudes discussed in relation to language teaching methodology in general. Teaching seems to be one profession which is particularly vulnerable to what has been called the 'bandwagon phenomenon'. For a variety of reasons peripheral to the current discussion, teachers often seem to be overly willing to accept and implement the theories of experts from outside of their field, without sufficient consideration of the effects and impact of such action. Stories surface in the literature of second language acquisition relating some disastrous results of this wholesale adoption (Beebe, 1989). From the point of view of proponents of the use of computers in language learning, it is important that teachers are properly aware of the advantages of computers in the learning process. In order to achieve this, software needs to be available that demonstrates and exploits these advantages (Higgins & Johns, 1984; Vincent, 1985).

The history of technology in language learning has repeatedly suffered from misconceptions as regards its role and usefulness. Various new kinds or configurations of equipment have been introduced to teachers as the solution to a range of perennial classroom or language learning problems. Too often, however, these claims have been unfounded or exaggerated. For example, as long ago as 1949 (Ahmad *et al.*, 1985: 41), it was anticipated that reliable, automatic machine translation from one language to another would be a reality in a few short years - a claim that even now has still not been realised. Not surprisingly, then, language teachers, who are now often more reticent and cynical, and more frequently adopt an 'eclectic approach' when new theories come along, have reacted with caution to the concept of machines assisting them in their work.

Faced with the additional fear that such machines might actually *replace* them, teachers have had an extra dimension added to the need for caution. In spite of this, there have been numerous language teachers who have ventured into the area with varying degrees of success and effect. On the other hand there have also been several people with a background in computing who have crossed into the field of language teaching with computers, again with mixed success.

A review of the language learning software available reveals a wide variety of CALL activities, ranging from drills, reinforcement, gap-filling, matching, cloze, simulations, translations and text reconstruction, to more creative writing and inbuilt choice type activities such as the mazes or adventure games possible in Hypercard for the Macintosh. From this list it can be seen that several theories of the nature of language learning are represented in the kinds of activities available, leading to the conclusion that 'eclecticism' has infiltrated the CALL area as well. However, because of the development time involved, the design of language learning activities necessarily lags behind the emergence of new technology. As a result, the kinds of CALL software activities available to teachers and learners are often modelled on earlier teaching approaches that are no longer in daily use (Higgins, 1995).

Thus, in the list above, there are drill and reinforcement activities modelled on the principles of Audio-lingualism and behaviourism, gap-filling and cloze based on Gestalt psychology and Mentalism, and mazes and adventure games reflecting cognitive and humanistic influences. This next section will bring together the humanistic cognitivist approach to language learning with the technology that is now available by outlining some perceptions of the place of technology in language learning. This will be done

through a comparison of the beliefs and understandings inherent in the various terms used to refer to the involvement of computers in language teaching and learning, by referring to a recent Australian survey of the perceptions of teachers using computers for language teaching, and by reviewing some of the issues and dilemmas of using technology in language learning.

1.6.1 Terms and definitions reflecting the place of computers in learning

As with some other disciplines, particularly in the sciences, there is a proliferation of acronyms and terms in the literature referring to the use of computers in learning, and thus there are bound to be some acronyms which different people use to refer to different things. The acronym CALI is a case in point, referring as it can to either Computer Assisted/Aided Language Instruction or Computer Assisted/Aided Language Interaction. Some terms are used in the broader education sense, such as CAL (Computer Assisted Learning), CBL (Computer Based Learning), CBI (Computer Based Instruction), CBE (Computer Based Education), CAI (Computer Assisted/Aided Instruction - Otto, 1980), CML (Computer Managed Learning), and CMI (Computer Managed Instruction - Otto, 1980). The view of the role of computers in learning as embodied by these terms is mainly computer as 'manager' of the learning process. In other words, the pedagogy embodied in the software tends to be 'machine-driven', rather than learner-driven (Garrett 1987: 170), or, more appropriately, learning-driven (Kumaravadivelu, 1993).

In the more specific area of computers in language learning there is almost as large a number of acronyms, each reflecting the users' perception of the role or place of technology in language learning. Thus we find older terms such as CALT (Computer Assisted Language Teaching), CALI (Computer Assisted Language Instruction), and

CAFLI (Computer Assisted Foreign Language Instruction) representing the teacher-centredness of language learning at the time, with the more recent acronyms, CALL (Computer-Assisted/Aided Language Learning) and CELL (Computer-Enhanced Language Learning) reflecting the trend toward more learner-centred approaches.

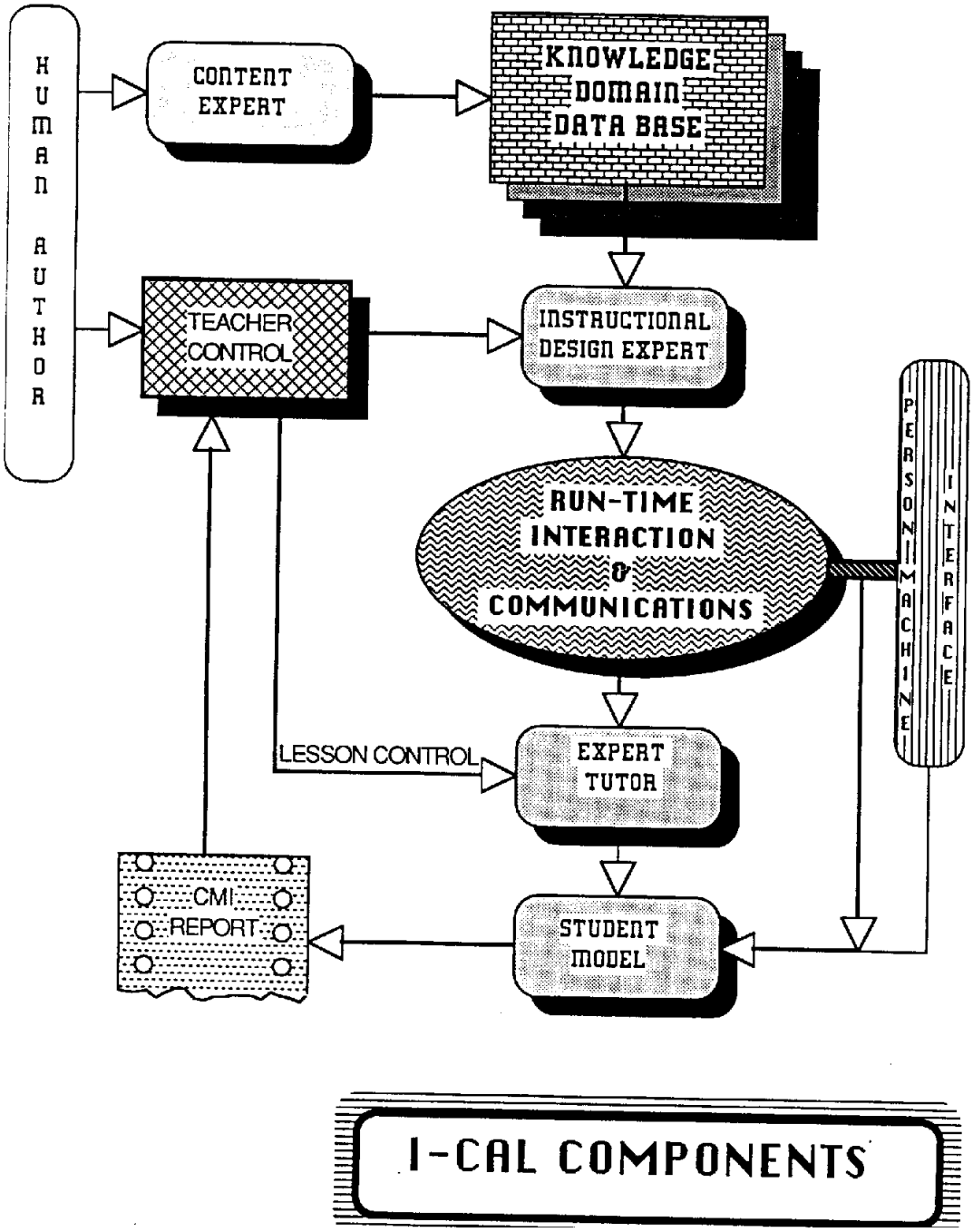
Another group of acronyms in this general field reflect their orientation towards the incorporation of 'intelligent' question provision and answer evaluation through the medium of computer software. These include terms such as I-CALI (Intelligent-Computer-Assisted Language Instruction - Nagata, 1993), ICALL (Intelligent Computer-Assisted Language Learning - Bull, 1994; Oxford, 1994), and FLITS (Foreign Language Intelligent Tutoring System - Swartz, 1990). Intelligence in a CALL context, as Lian (1992: 67) describes it, 'typically [...] is thought of as synonymous with the implementation of highly complex programs which simulate human intelligence or which perform tasks that would require intelligence if performed by human beings'. However, he goes on to say that 'although such devices may actually become available some day, we are still a long way from seeing them in our supermarkets or even in our university computer and/or language learning centres' (Lian, 1992: 67).

This still remains true of the current situation. The concept of intelligent language learning systems incorporating human-like artificial intelligence (AI), natural language parsing (NLP) and generation for learner input, automated speech processing for verbal learner input, and an Expert Tutor System (ETS) embodying all the best, adaptive characteristics of an experienced language teacher, is an extremely attractive idea. However, developments in both software and hardware are still far from achieving this in any effective way. Exciting developments have emerged to address various aspects of

this ideal, such as the speech processing algorithms of Bernstein (1995), and the negotiated student modelling of Bull (1994) and Bull & Smith (1995). Other large projects have addressed the issues of student modelling (EXCALIBUR: Webb, 1986, 1989) and coherence among the various components of an Intelligent Educational System (IES) (Craske *et al.*, 1989). Nevertheless, the complexity of factors involved, as illustrated in Figure 1.1 below, continues to impede our best efforts towards the realisation of an intelligent language learning system (Barrett, 1990: 4).

Figure 1.1 **Components of an I-CALL System**

(Barrett, 1990:4)



Starting from the argument that the ability of stand-alone, intelligent computer-assisted language learning (ICALL) systems to adapt to students' requirements is minimal, Nys (1989) concludes by elaborating on techniques to apply human common sense to the

usage of other forms of CALL with learners. While recognising that even the contents of the modules which form the basic architecture of ICALL (such as student model, pedagogical module, and subject domain knowledge base) are controversial, the major objection Nys sees in the construction of an ICALL system is the fundamental hypothesis that 'all the observed properties of intelligent beings can be represented in terms of rule-governed manipulation of physical symbols' (1989: 46). He therefore advocates the restriction of computer use to that of tools and urges the intelligent (human) construction and use of CALL. Towards this end, he cites Winograd and Flores: 'computers are wonderful devices for the rule-governed manipulation of formal representations, and there are many areas of human endeavor in which such manipulations are crucial. In applying computers appropriately to systematic domains, we develop effective tools' (1986: 174, 175).

The key here, as expressed by many authors in the area of CALL (Burston, 1990; Weible, 1987), are the words 'appropriately' and 'tools'. The use of computers in general, and in CALL in particular, needs to be restricted to those areas where such technology can be usefully employed as a tool, and not to replace other activities which are better performed without the aid of computers, such as learner-learner interactions.

From the viewpoint of a designer of intelligent tutoring systems, Webb (1988: 257) lists three deficiencies of the test-and-branch style of general computer-aided learning which have led to the development of ITS: poor student evaluation; restrictively rigid interaction modes; and lack of modularisation of conceptually different components of the system. However, with a learning rather than teaching or tutoring approach to

CELL, it is now possible to address these deficiencies without necessarily turning to ITS, with all the deficiencies and complexities inherent there.

Thus, for example, instead of trying to design an intelligent tutoring system which progressively builds up a model of the learner's capabilities in a certain, fairly narrow area of language competence, it is possible to design a complete exploratory environment which allows the learner to choose and identify those areas of competence which he or she needs to further develop. In other words, rather than aiming to 'move the learner through the material' (Swartz, 1990: 1), learners can move themselves, and at the same time choose when and how often they make their moves. In this way, the shift evident in mainstream second language teaching and learning from teacher-driven pedagogy to learner- or learning-driven can also be implemented in a CELL environment.

In their advocacy of the role of exploration-based learning (EBL) in the computer-based development of expertise, Cox and Cumming (1989: 4 - 5) base their conception on scaffolding in an 'apprenticeship model'. This conception is, in fact, very similar to scaffolding in the Vygotskian model discussed in section 1.5.1, of a novice learner interacting with an expert tutor who plays a progressively diminishing role as the learner gains in expertise and ability to self-monitor. On the basis of a review of literature in the area, Cox and Cumming claim several advantages for EBL. These include the potential for EBL: to improve delayed recall and transfer to new problems (Kamouri, Kamouri & Smith, 1886; Cronbach & Snow, 1981); to promote the development of metacognitive skills such as reasoning by analogy (Kamouri *et al.*, 1986); to promote the development of mental models (Sanderson, 1989); and to encourage reflection and modification of

strategy use (Anzai & Simon, 1979; Foss, 1987). The exploratory learning approach incorporated into the design of the software discussed in the current work is therefore well-grounded in the cognitive psychology literature .

More recently in the field of computers and language learning, language learning software is being increasingly seen as having a major role to play in second language acquisition research. Considerable quantities of data can be collected by computer software on a range of factors contributing to both the process of learning or acquiring a second language and computer-based learning. The general term used to refer to the incorporation of computers and software in the field of second language teaching, assessment, and research is CAAL (Computer Applications in Applied Linguistics - Chapelle, 1995). This term is meant to encompass the teaching and learning uses of computers in language learning, the various uses of computers for language learning assessment, and also those approaches to second language acquisition research which either incorporate computers for data collection, or use language learning software as the vehicle or medium of the research questions.

As mentioned in the introduction, the acronym, CELL is most appropriate for our use in the remainder of this work, as it seems most closely to resemble the model of the interaction between teaching and learning proposed for the role of computers in the language learning process. As Lian describes it :

> Computer-Enhanced language Learning is simply language-learning made better through the use of computers. No judgement is made as to the kind of programs or materials used. On the other hand, Computer-Aided (or Assisted) Learning appears,

> these days at least, to imply interaction between learners and programs conceived primarily as lessons.
>
> (Lian, 1991a: 8)

In the software package described in Chapters 5 and 6, this definition of Lian's has been expanded to incorporate a CALL or computer-aided component through the addition of the Lesson Sequences layer to the package. However, this author feels that this addition *does* make the learning better, by providing an access point to more exploratory uses of the software for those learners who are not yet at a point in the development of their learning skills to benefit from the more self-directed, exploratory components. Thus, rather than detracting from the enhancement factor, this addition provides a 'value-added' factor.

1.6.2 Elaboration of the concepts embodied in CELL

Seen in this light, Computer-Enhanced Language Learning embodies the principle of taking the weight of responsibility for learning away from the teacher and allocating it to the learner. Emphasis is also placed on the 'enhancement' role of computers in the learning process. The use of this term implies that computers actually improve the way learners can learn by providing them with a degree of autonomy, the facility for self-direction, and the power to control such things as the speed, rate, timing (convenience), order and choice of topics in the learning process. This view is consistent with the outcome of the discussions of the 1988 joint FIPLV/EUROCENTRES seminar (1991). The group of experts present reported on computers in language learning as they relate to motivation, group and individual learning, types and techniques of learning, implications for teacher initial and in-service training, and research and development.

Broadly speaking, the major advantages for computers were seen to be the freedom they provided for learners to work at their own pace and level, and the immediate and personalised feedback that they could supply. In terms of group dynamics, computers enabled learners to pool their knowledge in more effective ways and enhanced the kind of peer correction and language repair work done. Humanist principles were most evident in the discussion of types and techniques of learning, where CELL 'brings the real world into the classroom', 'makes learning more relevant', 'develops the learners' sense of responsibility', 'develops non-linear learning', 'develops co-operative learning', 'helps reduce the need for a meta-language', and 'changes the role of the teacher' (FIPLV/EUROCENTRES Seminar, 1991: 14 - 16).

However, a sustainable change to humanist principles is not possible in the classroom unless there is a simultaneous metamorphosis in the learning environment as a whole. In their proposal advocating such a curriculum-wide change, Scott *et al.* (1992: 230) mention that 'using computers as a medium of communication rather than trying to program the machines to teach students or getting students to program the machines, is a recent concept'. They conceptualise this change in approach from teacher- or machine-driven pedagogy to learner- or learning-driven pedagogy in Figure 1.2 below, where the left-hand side represents the former and the right-hand side represents the latter.

As is clear from Figure 1.2, Scott *et al.* view the modern role of computers in general learning very much from a sociocultural perspective. The have perceived the opportunity for a socialising role for computers, as mediators in the learning process, and that this learning therefore can comprise the dynamic co-construction of social and cultural understandings, in addition to traditional content. For this reason, they term their

conception of this role for computers a 'cultural constructivist' perspective (Scott *et al.*, 1992: 191):

Figure 1.2 **The relationship between pedagogy and computers in learning**
(Scott *et al.* 1992: 231)

A. Educator Pedagogical Assumptions	
Transmission Orientation	Interactive/Experiential Orientation
Language:	
Decomposed	Whole
Learning:	
Hierarchical internalization from simple to complex	Joint interactive construction through critical inquiry within the zone of proximal development
B. Educator Social Assumptions	
Social Control Orientation	Social Transformation Orientation
Curricular topics:	
Neutralized with respect to societal power relations	Relevant to societal power relations
Student Outcomes:	
Compliant/Uncritical	Empowered/Critical

It can be seen, therefore, that CELL has come a long way since Pressey's apparatus (1926) offered learners a piece of candy as positive reinforcement for reaching a certain pre-set threshold, or since the early days of mainframe computers and the promises of machine translation (Weizenbaum, 1984). Computers can offer many facilities and services to language teachers and learners, ranging from word-processing with associated concordances, on-line dictionaries and thesauruses, artificial intelligence in the form of expert tutors, literary and linguistic text analysers, speech synthesisers and analysers, interactive audio, video and laserdisc, to interactive digital audio (IDA - Lian, 1985; 1987), CD-ROM, digital video, and networked computer classrooms. However,

serious consideration must be given to the place of computers in language classrooms and programmes, and the role they are to play in relation to the roles of teachers and learners. The next section will be devoted to a discussion of the issues involved in using computers in language classes.

1.6.3 Considerations in the use of computer technology in language classrooms: issues & dilemmas

As Underwood (1984) points out, there are numerous similarities between the claims made for language laboratories of the sixties and those made for computer technology in the eighties. The use of technology such as language laboratories in language learning has intermittently fallen into disrepute among language teachers. Reasons for this phenomenon range from a general mistrust of anything new or different, to a lack of understanding of how to use the technology on the part of both teachers and learners, and the lack of sound pedagogy underlying the associated exercises, drills, materials, or tasks which have appeared with the technology. Holmes and Kidd (1982: 503), and again Davies and Higgins (1985: 1-2), observe that teachers have been too often disappointed with the results that technology has delivered, and it is this point, together with scepticism about new gadgets, as well as a lack of training in how to incorporate such technology into their teaching programmes, that has kept teachers from using it.

Weible (1988: 73) provides a good reason for the disappointment in results in the fact that there is a considerable time lapse between the emergence of technology into the market place and the point when teachers and materials designers can get educational packages on to the market. This lapse means that teaching methodology that is going out of vogue when the technology emerges is all too frequently the very methodology that

drives the development of 'new' software to accompany and exploit the technology. The question then arises of how to overcome this seemingly unavoidable lapse. One solution could be to do a thorough analysis of the advantages of the medium and the particular uniqueness that any new technological development has over previous technology. As Weible (1988) and Ariew (1988) both insist, when considered together, the special advantages of CALL over other media, and a visionary exploitation of these in a peculiar CALL manner, must produce more readily acceptable and useable materials. This should be the aim of thoughtfully designed CELL materials.

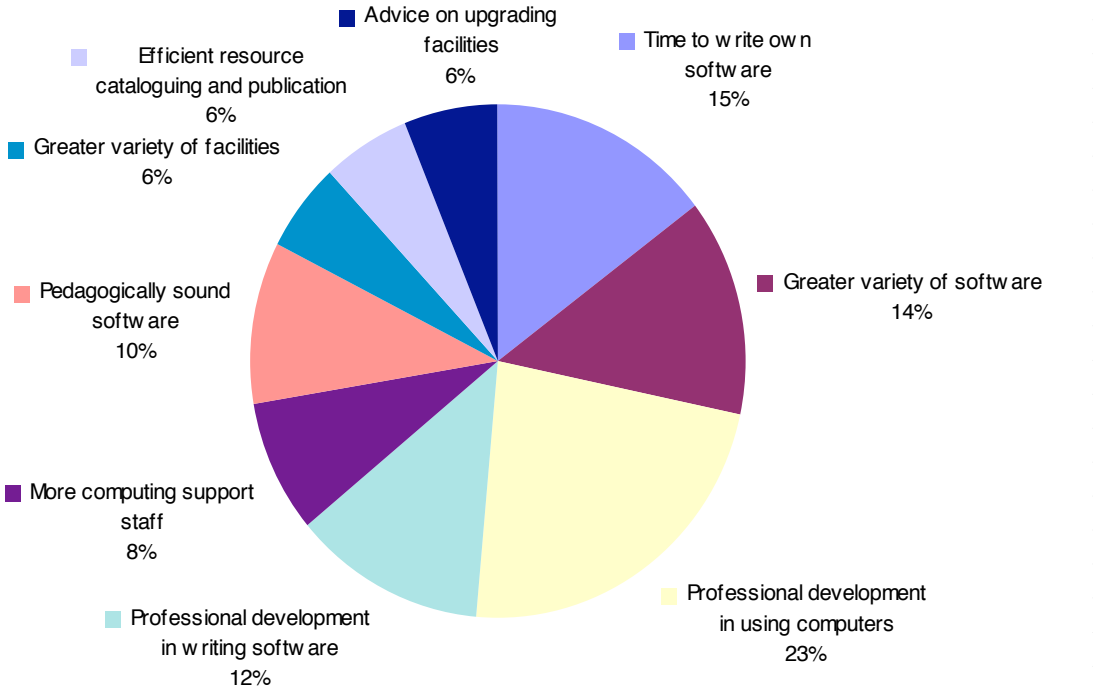
In tandem with these comments, Curtin and Shinall (1988: 264-5) point out that teachers are often excited about the emergence of new technology and can see the possibilities for it in their classes, but when the materials developed fall short of their vision, they lose interest and become critical of the medium in general. If teachers themselves had the training and preparation to develop their own materials, this problem could feasibly be avoided, but this would entail the kind of investment in teacher pre- and in-service training that the FIPLV delegates (1991: 21-27) and Curtin and Shinall (ibid.: 262-273) advocate – a suggestion that will still be a long time in the realisation.

Various writers have provided lists and categories of the advantages of computers over other media (Wyatt, 1988: 89-90; Stevens *et al.*, 1986: xi-xv; Weible, 1988: 74), even to the extent of Johnson's (1985) 'usual benefits list' (Dalgish, 1987), all of which include the individualisation of instruction, a very humanistic characteristic. There does seem to be a difference of opinion, however, over the extent to which computers can encourage collaborative learning (Wyatt, 1988) and provide flexible learning paths (Weible, 1988). As technology advances further, fewer of these differences will be voiced because

technology is already outstripping its critics. The level of interactivity that was previously not possible has become fairly readily available in the form of interactive video and digitised audio (IDA – Lian, 1985, 1987). Indeed, Lian's list of five categories for the role of computers in language learning provides an exciting insight into the possibilities now available: as a teacher and/or manager of learning, as a resource, as a tool, as an instrument for communication, and as a manager of users (in a computer network sense, rather than the more traditional sense of programmed learning).

Computers in classrooms can therefore have a very different role to play from the technology of the language laboratories of the past. By taking on board more humanistic principles and shedding the rigidity of behaviourist approaches and associated programmed learning, we can greatly expand the scenarios for the use of computers in language learning. Thus, in sharp contrast to the criticisms levelled at language laboratories both with and without computer technology mentioned by Davies and Higgins (1985: 35-36), students can choose either to correct themselves or be corrected by the computer, the teacher, or peers; utterances need not be fabricated, though they must still be pre-recorded for computer retrieval (Lian, 1984); communication is possible either between two or more learners at the same terminal or in an interactive sense between learner and video and/or audio (Doughty, 1991; Chang and Smith, 1991); learners can actively participate in the delivery of the lessons (Meskill, 1991; Rowe, 1991), their interpretation of meaning during the activity, and the choices they make, and flexibility is limited mainly by the foresight of the designers of the learning packages (Bright, Verano and Cubero, 1991; Garrigues, 1991).

Figure 1.3 **Survey of Computer-related Needs of Australian Second Language Teachers** (Source original)



The problem for educational institutions of the relatively high cost of hardware and peripherals remains, however. To some extent this difficulty can be circumvented by providing teachers with the training necessary to develop their own materials for their own contexts and with their own budgets in mind. Indeed, in a recent survey conducted by this author of second language teachers throughout Australia, and across all levels of educational provision, the greatest need nominated was for more professional development on the use of computers in language teaching (23%). (See also Appendix G for details of this survey.) Also ranked highly was the design of pedagogically sound software that suited their perceptions of how languages are learnt (see Figure 1.3 above). This improvement in design could be implemented either by teachers themselves (12%),

or by other software providers (14%). 15% of respondents indicated the need for more time to write their own software. Taken together, these responses illustrate the strong needs and desires of teachers to develop skills in the design and appropriate use of their own software.

1.7 Summary and Conclusion: The place of CELL in a language learning programme

Thus, increasingly, computers have come to be seen more as tools in the language teaching/learning process – tools for teachers to use in their teaching, and equally tools for learners to use when they have something specific they wish to work on by themselves, at their own pace. This brings us back to the questions of how technology can be integrated into a language learning programme, and how software should be designed in order best to suit the place technology has in the teaching and learning programme. As mentioned previously, computerised technology should be seen as a range of resources in the learning process, in much the same way as books, but with the added interactive or cooperative learning dimension.

Because human communication is an essentially human activity, computers merely provide a private means of practice of certain aspects of language and communication. Computers could not, and indeed should not take the place of teachers, but their uses as outlined above should be exploited in ways most suitable to their capabilities and limitations. It is therefore inappropriate for teachers to make the mistake of allocating to computers roles or tasks that could be better implemented using other media or in face-to-face arrangements with other students or with teachers. Earlier learning packages that were designed along the lines of grammar translation books and audio-lingual tapes with

their ‘assumptions about the order in which tasks are to be undertaken and the time which should be spent’ (Higgins and Johns, 1984: 86) can now be replaced by software packages that take more cognisance of the advantages of computers over other media. As Vincent puts it:

> The first reaction of many language teachers to early programs was one of justifiable dismay. People seemed to be using the most modern technology for the most archaic kinds of materials – drills, quizzes and "closed" exercises. Teachers committed to more creative approaches to language teaching were disinclined to join the computer brigade, but it is precisely these teachers who should become involved in CALL.
>
> (Vincent, 1985: 81)

Taken together, the observations above of Higgins and Johns, and of Vincent, re-emphasise the importance of the role of teachers in incorporating computers into language teaching and learning. It is those teachers who are sophisticated and creative users of classrooms who can also become sophisticated and creative users of software. The comments above also direct us to the path we should be taking in the design of current and future CELL software packages. The emphasis should be on providing learners with more control over their rate of progress, order of activities, topics to choose, and skills to be practised, while at the same time embedding this within a structure which helps learners develop the strategies necessary to make informed decisions about their learning paths.

Teachers will then have more time available to take a more active role in an advisory or consultative role, with learners only coming to teachers when they need the kind of help which cannot be provided by the system, or when they come across something which

they cannot solve by themselves. This is indeed how most teachers who responded to the survey mentioned in the section 1.6.3 (see also Appendix G), designated the roles they felt teachers should be playing in CELL classrooms. Through the adoption of these roles, learner autonomy can be encouraged, leading to increased transferal of skills learnt or practised in the classroom or computer laboratory to the world outside the classroom (Nakhoul, 1993). Thus, continuing and self-directed learning can be promoted through practice in the classroom, by fostering skills such as problem-solving, and by developing higher mental processes or metacognitive strategies, such as inferencing and predicting.

The focus in the following chapters will be on the research bases for incorporating listening skills, language skills, and general learning strategies into a multimedia software package, designed predominantly for single-user, self-access, exploratory learning contexts. The philosophical and pedagogical approach taken is based on the humanistic, cognitive, and sociocultural principles introduced in this chapter. The framework for the development of listening and viewing skills will be realised through the delineation, in Chapter 2, of a detailed taxonomy of common listening comprehension tasks and a discussion of the features which contribute to the perception of their ease or difficulty. This will include an outline of the current state of theory in listening comprehension, leading to the new taxonomy of listening comprehension tasks which categorises them according to difficulty pertaining to features of the task, the text, and the context.

Chapter 3 will provide an overview of the broad area of individual differences in language learning, and the link between these and learner achievement on listening comprehension tasks, and with second language learning activities involving computers. This will lead on to the elaboration in Chapter 4 of the impact of learning styles and

learning strategies on CELL instructional design. Included in Chapter 4 is a review of the literature relating to general learning strategies, language learning strategies, their involvement in CALL, and the inter-relationship between language learning strategies, Vygotsky's higher mental processes, and CELL.

Chapter 5 will discuss the implementation of these tasks in a CELL environment. This discussion will focus on the design of learner-centred tasks, and a learner-centred management and navigation interface, to show that language learning using computers can be humanistic and pedagogically sound. The feedback mechanisms built into these computerised listening comprehension tasks, the pedagogic rationale behind their design, and some historical background to their use will also be discussed in this chapter. In Chapter 6 the architecture of the software package will be described and illustrated, including step-by-step navigation through the three layers of the package, and the help and feedback mechanisms. Chapter 7 will summarise the implementation of the design of the multimedia software package, and map features of the design on to areas of further development and research which have been identified in the literature as being relevant, useful and necessary to the language teaching profession.