

Language learning. At sea in a complex domain: the implications of a theory of cognitive flexibility

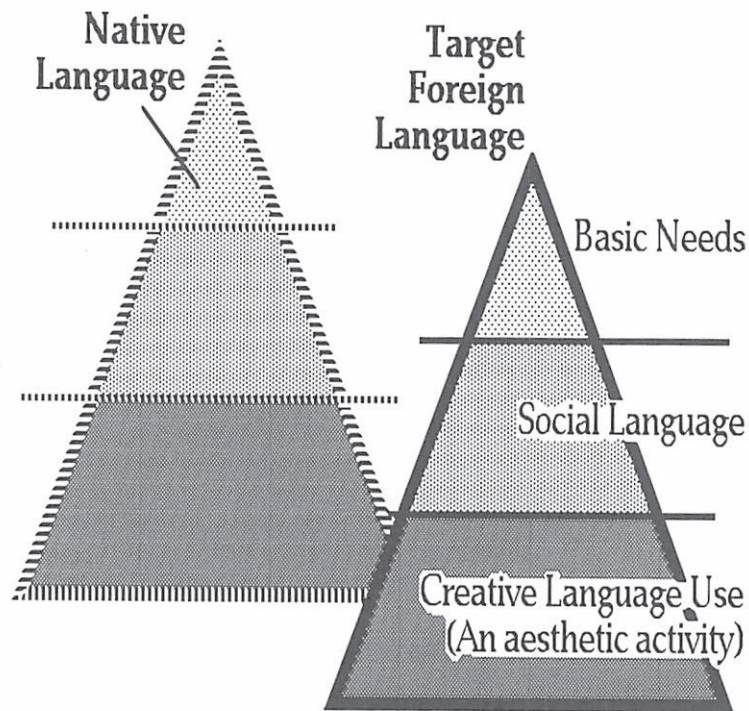
Things should be made as simple
as possible... but not simpler!
Albert Einstein.

Introduction

This paper examines foreign language pedagogy in the light of a theory of Cognitive Flexibility and offers some possible solutions to the problems raised.

«Cognitive flexibility involves the *selective* use of knowledge to *adaptively fit* the needs of understanding and decision making in a particular situation; the potential for maximally adaptive *knowledge assembly* depends on having available as full a representation of complexity to draw upon as possible. [...] the goals of advanced knowledge acquisition in complex and ill-structured domains can best be attained [...] by the development of mental representations that support *cognitive flexibility*.» (Spiro, 1988).

The starting point in all pedagogies is to determine exactly what is being taught. This is far from easy in the case of a language. At the risk of being accused of oversimplification let us look at a diagrammatic representation of what language is.



Types of Language Use

Diagram 1
(Fox, J., et al, 1992).

Essentially language serves three purposes, all of which are inextricably interlinked: the expression of basic needs, social language, and creative and aesthetic language use. In a very real sense the expression of basic needs is an aesthetic activity. Individuals function at different levels of language use. There is a real and rigid relationship of dependence between the 'target language' and a learner's 'native language'.

Perhaps it would be better to represent the types of language use slightly differently. Diagram 2 changes the perspective and adds the further

dimension of competence. Clearly the dependence on the 'native language' still applies.

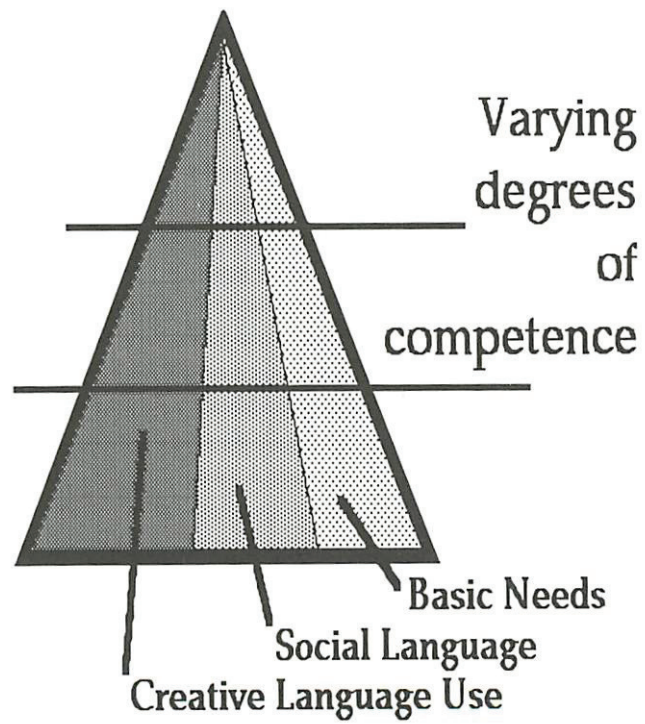


Diagram 2

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At one level, all language serves an aesthetic function. It follows that all language is a unique, one-off utterance, never to be repeated. True language, therefore, cannot be defined or described in terms of patterns or paradigms.

Furthermore, fluency can be defined only in terms of the creative use of language. Consider that the eskimos have over forty words for 'snow'. That is because eskimos perceive subtle differences in snow and feel the need to distinguish between these. In reality, these subtle differences do exist in the meaning of every expression we utter. Even a simple «Hello» has an infinity of meanings, all of which relate to an actual emotional response to a current situation. All language is, therefore, aesthetic; all language use is, therefore, a creative and dynamic activity. In a very real sense we do not know what we 'think' or 'feel' until we 'say' what we mean. This kind of creativity is innate. It would seem to follow that language cannot be 'taught', it can only be 'learned' or acquired by experience.

Learning strategies can be taught. The teacher can guide and provide 'learning opportunities' by widening the learner's experiences and awareness of language.

1. Foreign language pedagogy must have fluency as its ultimate objective, fluency for all

Imagine the scenario where we have a new group of beginner students in an introductory course on, let us say, typing. Speed, accuracy and typing by touch are considered crucial. We have decided that we are only going to teach them to use the letter keys on the keyboard to begin with, ignoring the numbers.

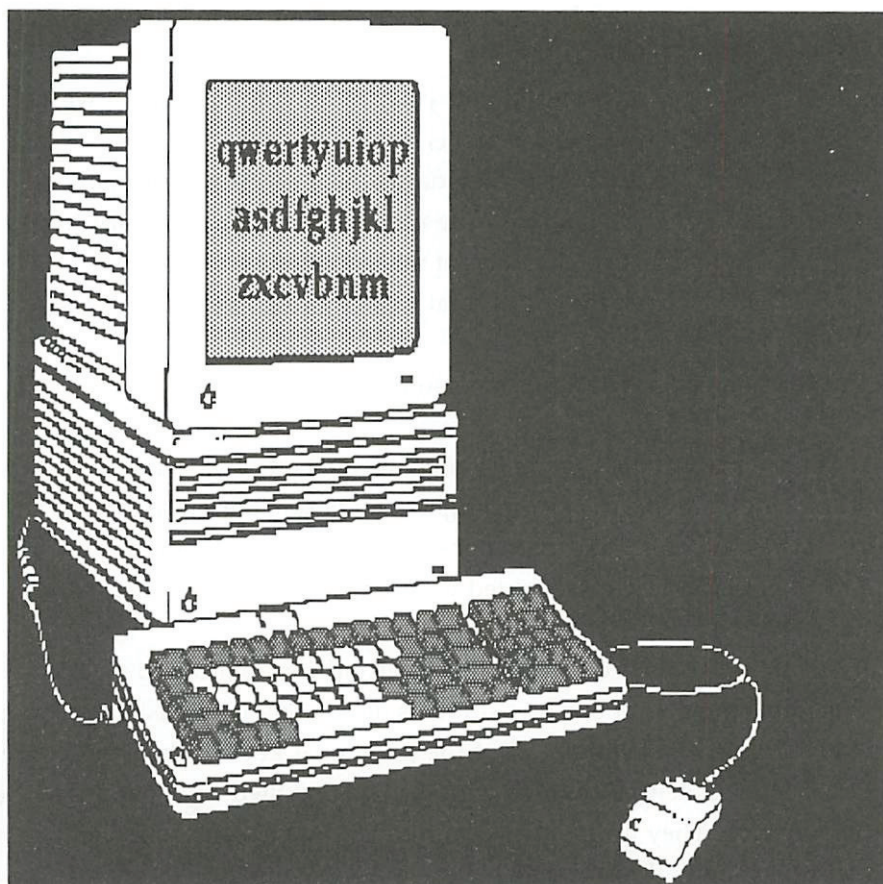


Diagram 3

What happens beyond this point is not our concern.

We may be able to provide apparently good and convincing reasons for this decision in answer to their objections. E.g.:

- in your present occupation these are the only keys you will be required to use;
- we need you to be able to type as fast and as accurately as you can using only these keys;

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- we do not have the financial or material resources to take you beyond this point at this stage;
- assessment is incremental and you are only at level one – we want you to do the best you can at this level;
- we want to set a minimum standard which everyone can attain;
- you are not equipped with the manual dexterity necessary to cope with more than the letter keys at this point in time;
- you do not have the intellectual capacity to go beyond this stage at this point in time;
- you yourself have set the limits to your objectives.

We then realize that the most effective method of working within the limits of this objective is to place the right hand next to the left so that the keys «asdfghjk» are covered, no space between the hands. Because our learning and teaching objectives are restricted we can justifiably alter our strategies to be more effective within these limitations.

All of our students do well at this level and we are pleased.

A small number of our best students decide that they wish to go on to the next level. They will add all of the additional keys to their repertoire. They are immediately confronted with the fact that their right hand is in the wrong position. They must either compromise on a less efficient method, in which case they will never achieve their full potential or they must now unlearn some of the skills they have acquired up to this point and start over again.

We now realize that we have made some important mistakes in our approach to teaching at the elementary stage. If we want any of our students to progress beyond the minimum acceptable standard then we must revise our practice. In the above example it is not very difficult to identify just where the problem lies and how we can overcome it.

Put in another way we could liken our learning objectives in any discipline to an exploratory journey. We can only go on foot. Our aim is to get from *home* to the *town*.

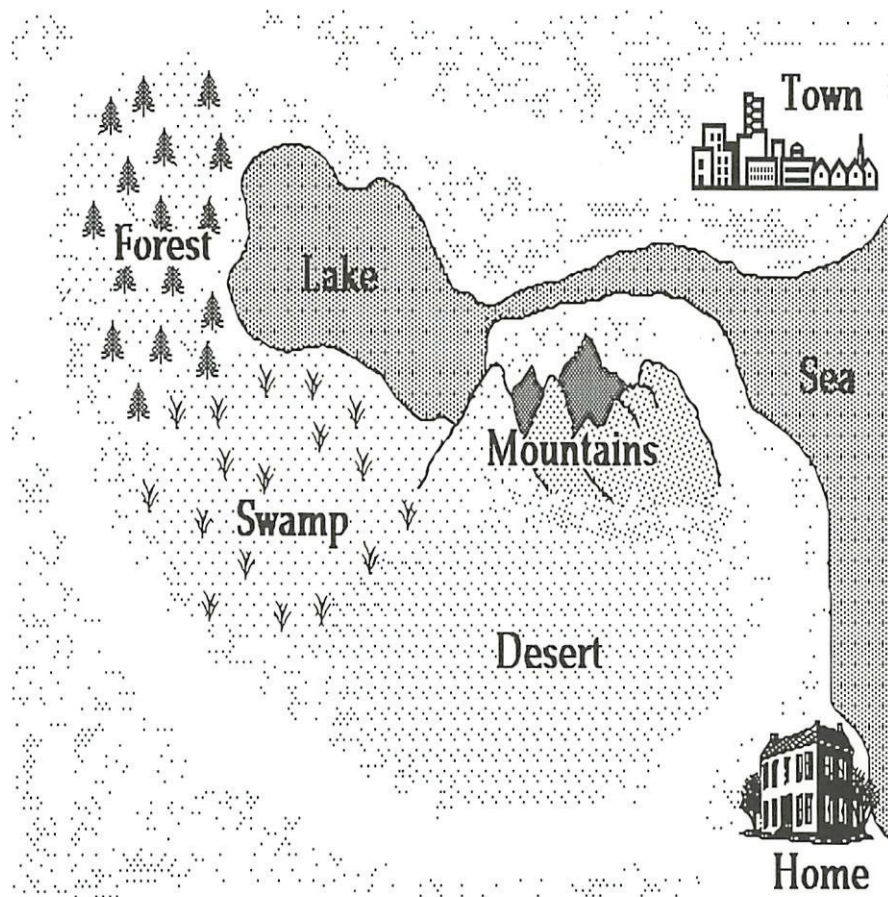


Diagram 4

We have only a limited time and one of our party has twisted an ankle. We decide that we should try to get as near to the town as possible in the time available, and so we travel by the most direct route. After all, we can see the spires of the town in the far distance.

We set off, arrive at the shore and can go no further. Obstacles block our path no matter which way we turn.

We must re-trace our steps in order to reach our original objective.

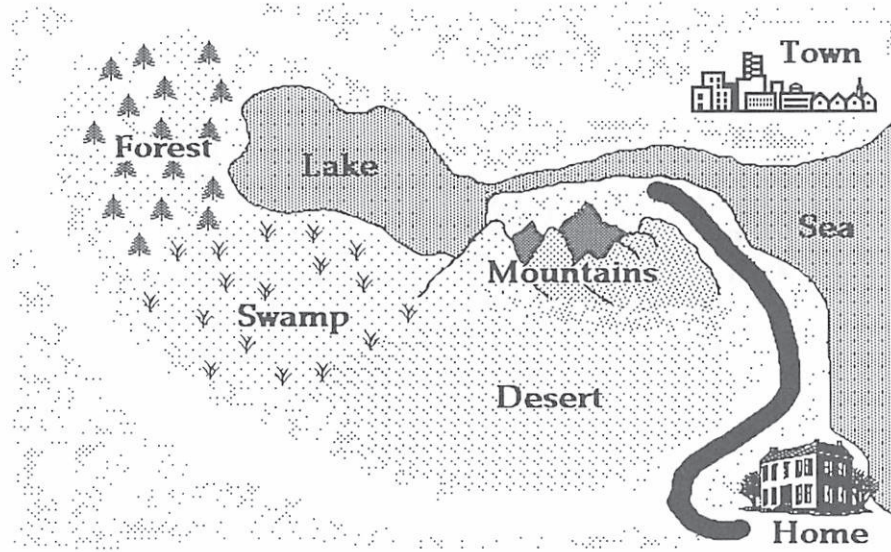


Diagram 5

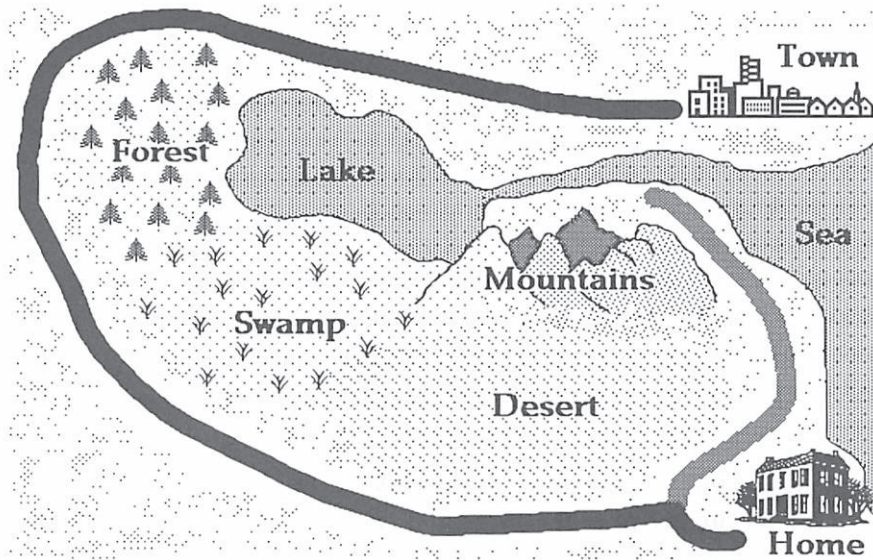


Diagram 6

Typing is not a highly complex domain, nor is path finding. Foreign language teaching and learning are. The analogies described above apply. Surely we would hope that all of our students will one day be fluent in a foreign language.

Fluency, **the** ultimate objective, must be our ultimate objective **at all times and for all learners.**

2. Methodologies employed both in the didactic and in the learning processes at all levels must be compatible with this objective

It is not necessarily a bad thing to set limited targets **in the short term.** Quite the reverse. All good teaching methodologies and learning strategies are based on a series of attainable targets. But both teacher and learner must always focus clearly on the ultimate objective in determining the validity of their methodologies and strategies, however far short of the final mark their short term targets may fall.

It is only by maintaining such a focus that crucial obstacles can be foreseen. In this way, appropriate strategies for overcoming them can be determined and implemented in advance. Remediation can thus be reduced to an absolute minimum.

In the case of our typing course we must be prepared to accept that beginners will not achieve such a high standard at the end of their introductory course than might be achieved were we to forget our ultimate objective. They will inevitably be slower and less accurate because a higher degree of dexterity and competence will be required for success, even at a basic level. Learners will be made immediately aware of the complexity of the task ahead of them. This need not be presented as daunting but it must be presented realistically. There is no sense in pretending that mount Everest is only 500 metres high if we intend to climb it. We must simply plan our ascent, recognize the scale of the undertaking ahead, know our limitations and strengths and make sure that we have all of the necessary resources and support.

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From the outset, learners must be equipped with an 'appropriate cognitive repertoire for the processing of complexity'.

3. Teaching methodologies or learning strategies that seek to reduce or to limit final objectives or scope on the grounds of complexity, difficulty or short term need create obstacles to the ultimate achievement of fluency

The kind of 'honesty' described above is essential if learning is to be effective. The student who is unaware of the complexity or extent of the task ahead cannot plan effectively or develop appropriate strategies for learning or for the acquisition of the relevant skills. This applies both to short term targets and to longer term or ultimate objectives.

To modify objectives or reduce important aspects of complexity in an attempt to accelerate the initial stages of learning is to be dishonest to the long term detriment of effective learning at more advanced levels.

I refer now to significant research carried out at the Center for the Study of Reading, University of Illinois, by Rand J. Spiro, *et al.* (Technical Report No. 441, October, 1988, University of Illinois at Urbana-Champaign. Published in the *Tenth Annual Conference of the Cognitive Science Society*). This is a disturbing paper and must lead us to question many traditionally held practices, especially in the field of language pedagogy. It points clearly to the 'pervasive role of oversimplification in the development of misconceptions'. It terms the 'tendency to reduce important aspects of complexity' the '*reductive bias*' and identifies several different forms of this tendency, all of which can be seen in one shape or another in current language teaching practice.

4. Examples of such practices abound and share a common tendency towards oversimplification. This impedes effective learning at more advanced levels

How often do we hear the phrase «I am only going to Spain on holiday and just want enough to get by». It is common practice to talk about 'language audits' or avoidance of the use of the subjunctive or of formal forms of address, etc. Many commercially available course materials are designed for limited application of language, e.g. courses for the hotel trade, shopkeepers, etc., and are based on a 'behavioural' view of what language is.

There is an over-emphasis on 'doing', rather than on 'experiencing'. The only way to come to terms with complexity is to experience it. The learner cannot do this if the bulk of his or her effort is spent in learning how to manipulate a mere sub-set of the language efficiently.

Language is often inadequately represented as a series of unrelated grammatical or logical structures. While it is generally acknowledged that such representations can be helpful in a general way, they are only an aid to effective language learning when they are viewed in the context of an awareness of the irregularities of the structure, the many exceptions to the rule, and more especially of the relationships between the components. We must recognize and teach that *grammar* is only an attempt to represent language. To state that language follows grammatical rules is to say that it is static. This is not the case. Language is essentially dynamic in nature.

The structure of language tends to be presented as an imposed abstraction to be applied like a mathematical formula in hitherto unfamiliar situations or contexts. The conventional 'grammar' lesson 'teaches' rather than draws from the student's own experience.

The learning of vocabulary lists and verb paradigms out of the context of language use is a very common practice. Most teachers will insist on the regular use of vocabulary books. Certainly, words must be understood but it is much more important to understand them in context. It is an essential feature of real language that each new context creates an entirely new meaning

for every word. To learn meanings out of context effectively blinkers the learner to the true meaning of what is being said.

There is often over-emphasis on technical competence rather than on the creative and communicative use of language. Insistence on the 'correct' application of grammatical rules suggests that it is imperative that all language follow a single, rigid schema. This is patently not so. Language is continually on the move, changing, adapting. It can only find its own 'correct' level through extensive use and experimentation. Technical competence is a very advanced skill and presupposes a high level of linguistic maturity and awareness.

A topic based or situational («behavioural») approach to the presentation of language limits the appreciation of the power and depth of meaning of individual components. There is a tendency to learn vocabulary in translation mode and with rigidly applied, single, glossary-controlled meanings.

Current assessment procedures in schools and colleges are based on a view of language as four discrete skills: Speaking, Listening, Reading and Writing. This compartmentalisation of language is narrow and artificial and does not reflect the complex interconnections between skills. It also seems to imply that other, equally important language skills, for example interpersonal skills, intuition, etc., do not exist. Again, in schools, it is often the case that exposure to language and language practice revolves primarily around the first and second persons singular. Other persons are avoided assiduously.

Course books hold back on sections of grammar that are traditionally considered to be 'more difficult', e.g. the past tenses, the subjunctive mood, and so on. In fact, there is nothing intrinsically more complicated about any past tense than there is about the present, or the future, or the subjunctive mood. By holding back in an attempt to shelter the tender learner from complexity we actually create a mystique of difficulty which becomes progressively more acute. More seriously, this commonly applied approach imposes on the learner a pre-determined and false vision of the structure of language, prevents the formation of a personal view through active discovery and impedes the development of appropriate learning skills and strategies.

5. The application of a Cognitive Flexibility Theory suggests strategies that may offer solutions in the language learning domain

«Where the problem is so often a presumption of simplicity and regularity, the remedy is to take special measures to *demonstrate complexities and irregularities.*» The implication here for language teachers is two-fold. On the one hand the components and structures of language must be presented fully and on the other, exposure should be to authentic language in real use. A student's awareness of the components and structures should come directly from his or her own experience of the language in real use. Simulated language is not real language, although the imagination can help us to approximate real language use in simulations. Students should see simulations very much as 'practice' and should be made aware of the difference between this and real language use.

Specifically, the teacher should avoid the temptation to reduce objectives for whatever reason. Elements that might traditionally have been considered too difficult at earlier stages are appropriate and should be used.

The very flexibility of language is its strength. We must, therefore, ensure that students are confronted with this flexibility in the language they experience and use.

They should grow in awareness of the structure of language from their exposure to the language itself, deducing and discovering from an authentic experience.

Ideally the acquisition of vocabulary should arise from the contextualisation of real needs on the part of the learner. The more passive skills of extended reading and listening are crucial to this process. Learned in contexts, vocabulary can be assimilated painlessly.

By encouraging experimentation and a spirit of initiative and adventure and by ignoring mistakes as such, the teacher will move the learner on to a more involved and communicative use of language. The learner must be helped to realise that one can be fluent in a language without being technically faultless.

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Exposure to large amounts of authentic language in a wide variety of contexts, styles, levels, media, etc., is important. Equally vital is authentic exposure to the culture, character and people of the target country. This is not always easy to achieve.

Assessment is part of the learning process. Essentially it should review progress towards stated objectives. Assessment tools need to be devised which do not compartmentalise language into discrete skills and which demand a demonstration of a much wider range of complementary and interdependent skills operating together in authentic language use. This represents a major challenge for language teachers and examination boards. At elementary and intermediate levels the passive skills essential to the learning process, e.g. listening and reading are at least as important as speaking.

The problem of *differentiation* in foreign language teaching relates directly to the level of maturity attained by the learner in his or her native language. To take any advantage of the experiences to which s/he is exposed, the language used should be not only authentic but appropriate and relevant to the individual in question. This immediately raises enormous difficulties both in terms of the underlying pedagogy and of the practical management of resources.

6. Technologies, particularly hypermedia systems, can play a significant role in the delivery of appropriate and effective strategies

It is principally in the areas of *differentiation* and wide exposure to authentic materials that currently available technologies have much to offer. Tape recorder and video have proved their worth by bringing attractively presented and authentic language into the classroom. While these media are perhaps more compelling than a book, for example, they do not necessarily address the problems in full. Computer controlled systems based on hypermedia environments could take solutions a stage further. It is currently possible to deliver very large amounts of attractive learning materials that are both

relevant and appropriate to the individual learner, regardless of his or her particular needs. Furthermore, it is possible to manage this delivery efficiently, monitor, map and assess progress through the materials, provide feedback for the learner or teacher, and so on. By largely taking over the resources management role, the computer releases the teacher to interact in more effective work in the target language with the student.

Most of the issues raised in **Section 5** can be addressed. Hypermedia systems can ensure:

- a more natural demonstration of complexity and irregularity;
- multiple representations of flexible structures in real use;
- a wider exposure to authentic language, including those elements traditionally regarded as difficult;
- a more intuitive grasp of meaning in context;
- a clearer understanding of the relationships and connections between words and lexical components;
- that structures and meanings are studied, analysed and compared in a wide range of contexts using hypertext links;
- that the learner is active and motivated;
- that there is differentiated and appropriate help and feedback available to the learner and teacher at all times.

Some guidelines for the development of appropriate types of computer controlled and HyperMedia software are listed in **Appendix 1**.

7. A parting thought:

«Misconceptions bolster each other and combine to form seductively entrenched *networks of misconception*.» (Spiro, 1988).

In the current climate of practice and resource provision it seems unlikely that many of our language students will attain an acceptable level of fluency.

APPENDIX 1

As far as possible, the software environment should:

- i) provide software devices that attempt to identify the learner's starting point in terms of levels of 'fluency', 'mastery' and language awareness of native language and thereby ascertain an appropriate entry point;
- ii) focus primarily on the learning of strategies to enable the student to develop appropriate techniques and skills for language learning;
- iii) build a software shell that would incorporate a series of progressive and structured tasks (based on a comprehensive library of 'authentic' resource materials – see iv below) in an integrated approach to the skills of reading, listening and writing, as well as generating stimuli for further follow-up work in all skill areas including group and oral work;
- iv) provide a library containing a wide range of background resource materials in a variety of digitised media to support the processes of assimilation, the development of mastery and extension into fluency (through the completion of related tasks – see iii above);
- v) encourage the development of language awareness;
- vi) construct individualized pathways through the tasks;
- vii) offer comprehensive feedback, progress analysis and guidance towards self-appraisal;
- viii) give responsibility to the learner, promote active learning and learner autonomy;
- ix) provide a rich environment and therefore expose the learner to a wide language experience;
- x) provide a dictionary and user dictionary, reference section and notebook as well as a private work area which can be detached (saved separately) and/or printed, and kept by the student as a record of work;

- xi) provide a 'user-friendly' and stimulating environment with a comprehensive technical help system and give on-line training in database strategies, navigation, target setting, etc.;
- xii) provide useful cultural back-up information both in the target and the source language;
- xiii) free the teacher from routine tasks which detract from the more important role as facilitator, adviser, oral partner, language expert;
- xiv) give value and purpose to student work by encouraging quality, display, sharing, exchange, group work, correspondence, etc.;
- xv) allow for add-on of existing or further good materials, either by project developers or by individual users, and provide the software tools to facilitate this process;
- xvi) incorporate existing software solutions where appropriate and possible;
- xvii) include built-in analysis of user work patterns for evaluation and future development of the software, further research and the preparation of information for a final report;
- xviii) justify software implementations by reference to relevant research;
- xix) provide comprehensive documentation, reports, recommendations on how the shell might be transported to other language environments, and make concrete proposals for future/extended implementations, publication, distribution, development and research;
- xx) be affordable and have clearly identifiable advantages over more conventional materials.

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