Modelling Efficient Reading Strategies

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1. Introduction

Learning a foreign language, particularly English, is a growing social and economic necessity in many countries. This is one of the primary reasons which justifies research into the improvement of second language learning.

This project studies the English reading comprehension strategies of young adults in Catalonia, Spain. However, in our opinion, the project goes beyond the boundaries of second language learning to embrace the strategies of reading comprehension in any language, including the mother tongue. The findings here are a result of probing for internal mental skills used by efficient readers. The strategies that we found the learners used were not restricted to reading in a second language but were used in other learning situations in their daily lives. We can safely assume that these same learners use similar, if not identical, strategies to cope with reading comprehension in their own language.

Apart from the social or economic reasons for doing research into reading comprehension skills there are educational reasons too. Reading is one of the basic pillars on which self-development rests. It is through reading that we begin to extend our learning outside the classroom and so gradually develop the capacity to learn without a teacher. This is the beginning of our independence as learners. It means that if we learn to read efficiently we will be able to continue to learn efficiently. In short, reading efficiently will enable us to learn to learn efficiently.

This concept of autonomous learning through reading links up with our constructivist model of learning. One of the fundamental tenets of this model is that the learner gradually builds up a personal construct of reality. Within the constructivist learning model, then, the teaching process is one of facilitating the construction of a personal world model. However, this also implies acceptance by the learners that they are ultimately responsible for their own learning process, their own model of the world. This is why it is critical that the students take on board the concept that learning is a strategic process, plannable and controllable by themselves and that autonomous learning is not only desirable but necessary. Learning to read efficiently will give continued support to the ongoing effort that this involves.

1.1 Neuro-linguistic Programming

The aim of teaching students to control their own learning process is now also a feasible goal thanks to the tools provided by a new branch of psychology called Neuro-linguistic Programming (Nlp). Nlp was initiated in the '70s by Richard Bandler, a computer expert, and John Grinder, a linguist. They set out to analyse how people who were exceptionally good at doing something achieved what they did. They called this analysis "Modelling".

One of the first people these researchers modelled was Milton Erickson, a psychiatrist who had great success curing his patients. The model they built up by observing Erickson at work deciphers the underlying strategies he was using to achieve his successful cures. Many of these strategies were often used by Erickson in a spontaneous way and Bandler & Grinder's aim was to tease out all of Erickson's strategies precisely and show how they were organised. Their modelling of the psychiatrist's work describes it in such a way that other people have been able to use Erickson's method to improve their own work. In this way the modelling techniques of Neuro-Linguistic Programming (Nlp) provides a set of tools that can allow us to take major steps towards overcoming our own limitations through the modelling of experts. This is the ultimate goal of Modelling.

We get another insight into the Modelling procedure from Robert Dilts who collaborated with Bandler & Grinder and has since published several Modelling studies himself (Dilts 1994) and indeed has just brought out a book on the subject. Dilts describes Modelling in this way :

> "*Modelling is the process of taking a complex event or series of events and breaking it into small enough chunks that it can be repeated in a manageable way. The Nlp modelling process involves finding out about how the brain ("Neuro") is operating by analysing language patterns ("Linguistic") and non-verbal communication. The results of this analysis are then put into step-by-step strategies or programs ("Programming") that may be used to transfer the skill to other people and areas of application.*" (Dilts 1994).

Neuro-linguistic Programming is based on the dynamic interplay between the three essential processes which form its name and by means of which we organise our models of the world. These procedures are worthy of further comment

- *Neuro* is the nervous system. It includes the whole nervous system from the nerve ends to the brain itself. Mind and body are considered to be one system in this model and the Descartian principle of separating them is discarded in favour of a holistic view of learning. Like the body, learning is systemic. Learning takes place not only in the brain but in the system as a whole.

- *Linguistic* refers to the complex communications systems humans have developed, especially language. Chomsky provided a model of language called Transformational Grammar which analyses the superficial structure of a sentence to find the underlying deep

structure which was grammatical in form. John Grinder carried this analysis one step further to link language with the next level down - experience. This is the level at which we give individual meaning to the words. The word “love”, for example, covers a myriad of different individual experiences all crammed into the same four letters. The linguistic component in Nlp helps us unpack this inner experience inscribed in our individual nervous systems. Language and the nervous system are thus interlinked, one influencing and shaping the other. Language is one of the central tools in learning and Neuro-linguistics is about the interconnection between language and the nervous system in human learning.

Programming underlines the way our neurological and language systems form structures which make up our models of the world. Nlp emerged as a field of study around the same time that the personal computer appeared. Indeed one of its founders, Richard Bandler, was a computer expert. Perhaps this is why writings on Nlp often refer to computer imagery to describe the brain. One of the more important implications of Nlp is that we can understand and change our models of the world by re-programming our brains in a similar way we reprogramme computers. This is, of course, only imagery and does not mean to say the brain is a computer. The real significance of the claim is that through Nlp we can understand and modify our internal, subjective, perception of the world in ways which will enhance our lives.

The coming of the information society promoted by computer use has also extended our comprehension of ourselves. Philosophers have debated the question of knowledge and how we know for centuries. Nowadays you can experience the subjectiveness of personal knowledge by logging on to the Internet. It is a world of virtual reality and exists in “cyberspace” like a mirror image of our own internal, personal, virtual, world.

It is this personal, subjective, area of consciousness that Neuro-linguistic Programming studies. In this sense has been succinctly defined as:

“*a methodology for the study of the structure of subjective experience*.”
(Dilts 1994)

In other words, Nlp offers tools which enable each of us to discern how we each construct our individual perception of the world. Once we understand how we perceive we are then able to modify that perception.

Nlp methodology is applied to many disciplines particularly those concerned with caring skills. The first Nlp models resulted from the study of exceptional therapists like Milton Erickson, Virginia Satir, and Fritz Pearls. Perhaps because of this it was first applied to therapy. However, recently it is beginning to be applied in the fields of health, education and business to build models of how exceptional practitioners go about their work. The goal in each case is to use the models derived from these studies to help others improve their practice.

Our aim in this project is to apply the successful insights of Nlp to educational purposes. We believe that Nlp tools will enable us to elicit the strategies of efficient learners and thus build a model of how they learn. The importance of this lies in the fact that we can then apply this model to helping less efficient learners develop more appropriate strategies.

The study at hand concerns reading comprehension and is divided into two phases. We will first use Nlp to model the strategies of excellent readers in a search for a general model of efficient reading. Then we hope to use this new paradigm to help less efficient readers improve.

1.2 The significance of reading comprehension in learning.

> *"Reading is the means by which the world does a large part of its work.... The slightest improvement either in the page or in the method of reading means a great service to the human race"* (Huey, 1908).

The structure of most foreign language learning, indeed most learning in classroom situations, requires a heavy reliance on reading comprehension for input. This is so for a number of reasons. One is the widespread use of textbooks or manuals based on the written word which form the basis for learning. Another reason is traditional teaching methods, passed on in classrooms from generation to generation, which induce the teacher to use reading and writing rather than aural/oral methods to present content. Finally, one of the most influential factors must be the high teacher-student ratio per classroom which makes focusing on the written word more practical than oral communication. All this means that many students have few alternative resources for language input, apart from reading, and that any problem with reading will probably result in poorer learning. In this way the unskilled reader's difficulties will be extended to writing and other abilities such as learning vocabulary, grammar and aural comprehension because they cannot place them within a larger context. This is why one of the most important skills in learning any language, especially a foreign language, is that of being able to read in that language.

Failure to master reading comprehension will have further reaching consequences, too. The unskilled reader will soon begin to think that since it is so difficult to acquire a foundation it is impossible to learn, particularly in a foreign language. This is a serious blow to personal self-esteem and self-confidence. It will mean that learning outside the classroom will be inhibited, principally because the student hasn't mastered the basic tools but also because of lack of self-confidence. Without solid reading comprehension skills it will be difficult for them not just to start learning the language but even more to continue learning.

During my experience teaching English over a period of more than 20 years I have discovered that the student who learns to read efficiently holds an important key to learning to learn the language. Indeed autonomous learning of the language seems to have a solid foundation in reading comprehension. The research work in which I have taken part within the Teacher Development plan of the Catalan Education Department, particularly in the project entitled "Transfer, Strategies and Learning Autonomy" confirms the need for a solid grasp of Reading Comprehension in order to cope with learning a foreign language in a secondary school. The study also showed that efficient readers were able to transfer their reading competence in such a way as to improve their listening skills: *"The Readers confidently transferred to the other skill(Listening) while the Listeners did so to a lesser degree (11 points less)."* ("La Escuela en Acción", March 1994)

At university level too the importance of reading comprehension in English is overtly recognised in Catalonia. This is reflected in the criteria used for correcting the foreign language university entrance exams paper: 60% of the mark is for reading

comprehension. According to the spokesperson for the English exam, Miquel Berga, the large percentage given over to reading comprehension indicates the level of English required by most university faculties: competent reading comprehension.

However, despite the importance of reading in educational circles there is a school of opinion which says that the 21st. century will be one dominated by audiovisual technologies and that reading will get progressively less important. Yet this view does not coincide with the present technological evolution. For example, according to many surveys e-mail is the most used of the new information technologies. However, it is clear that this form of communication involves reading and writing and indeed has promoted letter-writing and reading on a grand scale. Even the more recent version of e-mail using HTML, which allows the incorporation of images and sound, basically relies on the written word for communication. Internet websites are another new phenomenon linked to new information technologies and they incorporate images and sounds to attract attention but, similarly to e-mail, messages are always written in words and read by surfers. The Chat software in vogue among adolescents also depends completely on reading and writing for communication. Even video-conference programs, although they are primarily visual and oral have a whiteboard for sending sketches and written messages. New technologies, then, tend to include pictures and sound to help communication but they don't eliminate the need to read and write. In fact the opposite is true, Information Technology has produced a reading and writing boom. As Juan Luis Cebrián, previously editor-in-chief of the Spanish daily "El Pais", has written in a recent book on the future of Internet:

> "*De modo que nos anuncian el fin del libro y del alfabeto a manos de un proceso que, por el momento, no hace sino producir toneladas de papel y cientos de nuevos libros, y cuyas máximas prestaciones se realizan gracias a la manipulación de algo muy parecido a una máquina de escribir.*". (Cebrián 1998)
>
> (Translation: *So that they forecast the end of the book and of literacy through a process which, for the moment, has produced little other than tons of paper and hundreds of books, and whose greatest benefits are achieved thanks to the manipulation of something very like a typewriter*.)

In spite of this manifest importance of reading comprehension, however, we find a multitude of different levels of comprehension in high school classes. There are students who have learned the strategies necessary to reading efficiently and who are able to deal with most texts self-confidently. There are pupils who have learned to "survive" in their reading tasks and are able to understand texts more or less but do not have the knowledge to improve their reading skills. Finally there pupils who have serious problems in understanding a written text even in their own language. The conclusions of a five-year study conducted in Faculty of Psychology Reading Laboratory in Girona University are eloquent on this matter: 1 in 4 Catalan schoolgoers of 15 years of age have a low level of reading comprehension (Vanguardia newspaper 16 Feb., 1997). This kind of result is applicable in most developed countries. These students will have a basic learning difficulty, not only in language learning but in many other subjects. In this sense if we can improve the strategies learners use for reading comprehension then we will improve their general learning skills.

1.3 The search for a reading comprehension paradigm

In language learning during the past thirty years more and more attention has been directed to the objective of learning autonomy. The aim is to equip students to take responsibility for their own learning and develop skills which will enable them to continue to learn. This approach to learning has meant that research has tried to redress the balance in learning between the content and the process. Equal attention is now also being given to the mechanisms of learning, the question of **how** to learn, as well as to what to learn.

To study the learning processes researchers began investigating the strategic processes students use to assimilate learning content. This incorporation of research conclusions into the learning process is usually expressed in the concept of "learning strategies". However, the definition of the term **strategy** may vary from author to author. Nisbet, for example, calls them "*integrated sequences of procedures selected with a purpose in view"*(Nisbet 1966) while Duffy describes them as "*algorithmic secrets*"(Duffy 1982).

To avoid confusion we should like to set out here our use of the word "strategy" within this project. An analogy with the computer may make the concept more comprehensible. Within our computer what is important to us is the information, the content we have put there. This content may be in the form of texts, pictures or sounds. It may even be a combination of these which form a website or a game. However there is other important information in the computer which remains invisible to our eyes. This is the software programs which enable the machine to process the information we put into it. The information in the programme is independent of the content and the same programme is used for many different types of content. The secret of the software programme lies in the sequence that they execute to process the information. This sequence is what differentiates an efficient from an inefficient programme.

In a similar way we can understand the brain as an image of a bio-computer: the strategies we use to process incoming information are our software programmes. There are efficient and inefficient strategies for dealing with this information. Our search here is for the most efficient strategies for coping with reading comprehension.

There have been many studies aimed at discovering the strategies which support language learning. Most of these studies work with general learning strategies and many seem to concur in defining three levels of strategies: metacognitive, cognitive and social/affective.

Metacognitive strategies refer to how we think about learning tasks, how we plan and monitor our learning and how we use self-evaluation to continue learning. The term *metacognition* was invented by Flavell who described it in these terms:

> "*when I realise that I am having difficulty in learning something, I have entered into metacognition.*"(Flavell 1976).

Metacognition is the level of learning where the student monitors how they are learning. It is the stage at which intuition or unconscious strategies become conscious so

that the student can reflect on how they are performing the task. Metacognition allows the efficient learner to improve on the strategies used for a particular exercise but, more than that, it enables them to learn about their own learning, in other words, to learn how to learn.

As an illustration take what happens when you are enjoying a novel in your own language and you come across a word you don't know the meaning of. You would probably assign it a temporary, contextual meaning and read on. Were the word to pop up time and time again, enough to spoil your understanding of the storyline, you might ask someone else or consult a dictionary. It is not probable that you would reach for a dictionary on the first occasion. Guessing meaning from the context is an example of a metacognitive reading strategy. It is so ingrained in native language readers that they probably don't notice they are doing it.

Cognitive strategies, on the other hand, are those we use in individual learning tasks and entail manipulation or transformation of learning materials. They involve conscious activity on the part of the learner. The knowledge acquired at the cognitive level is so conscious that it can be described verbally by the learner. This is the procedure used in many classrooms where vocabulary is memorized or the student is exposed to the rules for grammar then they are asked to write a composition. The student in this case has the words, and the rules to string them together, but usually performs inadequately at this stage because knowledge by itself is insufficient for skilled performance. The students knows how to perform but is not yet skilled enough. However, through repeated practice, the learner will assimilate this knowledge and it will become second nature. The student can now use their skills at the unconscious, metacognitive level, because they know how they know. In Nlp this learning process is charted in the following way:

Unconscious Competence - Unconscious Incompetence - Conscious Incompetence - Conscious Competence - Unconscious Competence

A glance at the diagram will show that the conscious incompetence stage of the learning process is the most critical because there is a notable reduction of performance due to self-consciousness and trial and error. However if the learner maintains their effort and continues to believe in their own capabilities they will master the new skill and it will become unconsciously easy to perform

Drivers will be able to understand this learning model by remembering how they learned to drive a car:

-Non-drivers tend to believe driving is easy because they see others do it with such ease (Unconscious Competence)

-Then the non-driver gets behind the wheel and, helped by the instructor, manages to declutch and move off. It certainly seems easy enough to steer but the learner doesn't know that the hardest part is still to come.
(Unconscious Incompetence)
-Now the neophyte driver will experience the most difficulty driving skill: coordination. They must maintain their right foot pressing the accelerator while their left foot lets up the clutch, one hand guiding the steering-wheel and the other on the gear stick, not to mention

listening to the advice of a nervous instructor. They think that they will never master all this. (Conscious Incompetence)

-Gradually the student driver will remind themselves of what to do, predict possible problems and their solution before they occur, remember how to coordinate their feet and hands, keep their eyes glued to the road and drive rigidly, but smoothly and safely. (Conscious Competence)

-After much practice the L-driver will assimilate the complex coordination between feet, hands and eye and will take to the road without a second thought.(Unconscious Competence)

Another glimpse at the diagram will also tell us that both cognitive and metacognitive strategies are necessary for the learning process. It is at the most critical point of conscious incompetence (when the confused learner driver cannot get his feet, hands and eyes to coordinate) that they will need to recall metacognitive strategies to help themselves push forward to successful learning. The car driver who is learning to drive a bus or a lorry could make good use of metacognition by way of recalling success at car driving and how they mastered it.

That might be an appropriate moment for metacognitive strategies but the general problem of metacognition is just that: when is it useful? Flavell pointed towards an answer in his description of the word: it is useful at moments of difficulty when learning becomes arduous. This is when we hope to apply it: to help learners in difficulty.

Finally, social/affective strategies include co-operative learning and self-talk. Helping yourself through self-esteem and encouragement and getting and giving help to others through mutual stimulation for the basis of this third set of strategies.

Apart from the three strategy areas, metacognitive, cognitive and social/affective, there are also two basic approaches to studies in reading comprehension. One is Learning to read, which covers the basic skill of decodification. The other is Reading to learn which concerns itself with how learners comprehend what they read. **We are interested in Reading to learn, and the metacognitive and cognitive strategies involved in this task**.

There has been a constant stream of studies concerning reading to learn using metacognitive and cognitive strategies as a base for research. At their core these studies aim to reveal how learners, especially good learners, read texts. They aim at establishing a paradigm for reading comprehension. We believe that by using Nlp tools it is also possible to shed new light on this objective.

Wendin & Rubin in a well-known study (Wendin & Rubin 1987) based their research on the reasoning that efficient learners of a language used certain strategies. They believed that these strategies could be uncovered through study and be made available to other learners. This was also the outlook adopted by Bandler and Grinder at the outset of Nlp investigation: the study of excellence in action. In fact this is what Nlp tools were honed to do: model the strategies of exceptional practitioners.
Nlp allows us to sift through others' internal strategies and we expect to be able to build up a clear picture of how readers are construing a text. These strategies are naturally sense-based because we perceive reality through our senses. In this aspect it was remarkable that the

students interviewed in our study had never heard of Nlp and were in general unaware of the reading strategies they used, yet they found the Nlp interpretation of their strategies so natural that they were immediately able to participate in an exchange about the strategies they were using. What was even more important is they were able to contradict the interpretation suggested to them by the interviewer if they found it incongruous with their internal strategy. This was helpful and clarifying on more than one occasion.

The internal strategies Nlp referred to are those based on the processing of the input that makes up our perceptual data of reality. Every second we absorb through our senses millions of bits of raw data from the world around us, principally through our eyes, ears and sense of touch. We build up our perception of the world by selecting from this information and transforming it into internal images, sounds and sensations. The importance of Nlp is that it has developed tools which let us contemplate the structure of this subjective reality. At the end of an Nlp study, then, you would expect to see clear strategy sequences based on a combination of visual, auditory and kinesthetic micro-strategies. This forms the description of how particular learners build up their comprehension of a reading text. (Those studied in this project can be viewed in Appendix E.) Through this format we are able to compare the individual strategy sequences of efficient learners and discern a general reading strategy, a paradigm for efficient reading that will guide us when helping less efficient readers.

These are the kinds of results you would anticipate from the Nlp approach, but the conclusions from other approaches have given us different data.

Let's take, for example, Wendin & Rubin's research into reading comprehension. Their studies lead them to define three major factors in efficient reading:

1. The ability to use Background Knowledge which involves applying cultural aspects such as the learners' experience and education to reading texts. Efficient readers give support to their linguistic abilities by recalling all that they know about the subject and using it to help themselves understand the text. The extent of the learners' previous experience and knowledge and their ability to apply it to the new learning constitutes an important atout in understanding and assimilating the new data.

For example reading a text on nuclear physics without having any previous knowledge of the science of physics would make the text appear unreadable even though the reader was normally an efficient reader. It is only through an extreme example like this that we may come to realize that in fact most texts presuppose a certain previous acquaintance with the subject. Telling less strategic readers about this simple fact may help them to improve their reading comprehension abilities. Now that we have this information it may appear as obvious and even commonsense. Wendin and Rubin were among the pioneers able to point out the obvious through their research.

2. Recognition of the Rhetorical Structure of Text Recognition. This implies deducing the general meaning of a text from its layout, technically called formal schemata. This refers to the meaning or even the layout. The efficient reader uses this strategy to

situate the type of content likely to occur in the text. For example, the formats of a personal letter, a newspaper article or a philosophical dissertation will all have a distinct appearance and will use very different rhetorical registers. The letter will probably be worded in intimate, colloquial language, whereas the dissertation will use a formal register and very precise, even abstruse, language. The newspaper article, on the other hand, will usually be written according to a fairly predictable format, much more rigid than the personal letter but not as carefully worded as the philosophical treatise. The efficient reader recognizes these different clues and uses them to help themselves understand the meaning of the text.

3. Finally Wendin and Rubin refer to Reading Strategies which include the use of Hierarchical Summaries and Pre-reading Questions.

Hierarchical Summaries allude to the types of summaries you usually find at the beginning of a book such as the Contents page. By simply reading through the Contents page of a novel, for example, you can get a good overview of the story. This is also true for more technical books. Similarly the efficient reader uses the title of a short article and even of a book to enable themselves to predict something of the content they are about to read. This is a straightforward strategy and, with practice, can easily be assimilated by less efficient readers.

Pre-reading Questions is a strategy used in many language-teaching books. It consists in presenting the reader with a series of introductory questions to be answered before reading a text. Answering these questions stimulates the reader's previous knowledge about the content, and context, of the text to be read and thus makes it easier to understand. This strategy can be applied to any text and readers can improve their comprehension about what they know of the content to be read by asking themselves pre-reading questions, based on the text's title and illustrations.

The efficient reading strategies proposed by Wendin and Rubin are certainly insightful as well as easy to understand. They are also readily transferable to less efficient readers. However they remain at a rather formal level. They do not explain how efficient readers actually represent schemata, pre-questions or background knowledge in their heads.

This question of internal representation is important for a number of reasons. For example, if we encounter an inefficient reader who cannot grasp the idea of background knowledge or schemata: how do we explain these concepts to them? How do we explain how to implement the new strategies if we don't really know their mechanism? Another solid reason for studying the internal representation of these strategies in the efficient reader is to be able to improve on them. If we only have an outside knowledge of them we cannot really understand how they work. Wendin and Rubin's research pioneered a brilliant model for the study of strategy improvement by proposing the close observation of efficient learners. Despite that, however, their findings do not allow us to answer the deeper questions about how efficient learners read.

Fyfe and Mitchell have also researched reading strategies (Fyfe & Mitchell 1985). Instead of studying efficient readers at work they devoted their investigation to how readers construct responses to assessment items. In a sense they were concentrating on assessing readers who

were answering comprehension questions. They concluded that the readers studied used three main strategies for dealing with these items:

1. Internal representation.
2. Text-based response and personal experience.
3. The use of assessment items as a major source of information.

1. In their interviews with the subjects it became apparent that the latter were representing the text information in some internal form. The authors questioned the candidates about these representations and came to the conclusion that many of the readers studied tried to understand the written material by making internal pictures of it. The actual process of this strategy was not investigated by Fyfe and Mitchell. They mention its existence but give no details about the kinds of images their subjects constructed.

2. The second strategy mentioned by the authors is that of text-based response and personal experience. These are in fact two distinct strategies. The first one is linguistic and depends on knowledge of grammar, vocabulary and text structure. It is not unlike Wendin and Rubin's strategy of rhetorical structure. The strategy of personal experience rejoins Wendin's idea of background knowledge and implies the application of the reader's cultural awareness and general education to understanding a written text.

3. The last strategy they name is one common to seasoned exam takers. It consists in using the comprehension questions themselves as sources of information. For example readers might use the vocabulary, grammatical structure and meaning of a comprehension question in order to answer the question itself.

Fyfe and Mitchell's study rather restricts the field of reading comprehension to the strategies learners might use for answering exam questions. This makes it difficult to apply the results directly to non-exam situations, which are the more usual circumstances in reading comprehension. They themselves acknowledge this in part in their final conclusion where, ironically, they recommend that teachers do not concentrate on exam exercises but rather on reading comprehension activities:

> "*... teaching must be directed towards success in reading tasks, not assessment tasks.*"(Fyfe & Mitchell op. cit.)

The strategies these authors found were not dissimilar to Wendin and Rubin's. The strategies they mention are also of a formal type, except one which is of a more psychological cast: internal representation. This is an interesting find but in their book there is no follow-up describing the characteristics of this item.

The two studies that we have considered emphasized the processes and tended to disregard their underlying mental representations. This is probably so due to the set-up of the studies: information was gathered through the think-aloud method, that is by asking

learners what they did. In this way the results they obtained are descriptions of the learner's internal strategic processes as perceived from the outside. This external approach is also supported by an external method of verification: statistics.

The think-aloud method followed by both teams of researchers was developed by Newell and Simon and in other studies which used it has tended to throw up similar external strategies as a result of inquiry (cf. Block, E. 1992). Fyfe himself, in an e-mail exchange which we had about this project warned me to be careful of taking student self-observations at face value. We took this wise advice into account but in fact we have found little problem in discussing student self-observations since in our project they are raw data, not interpretations. The learners we studied could not interpret their own internal strategies because in many cases they had been unaware of them until the interview. They had no theoretical framework either, for understanding their own observations even when they gradually became conscious of their own strategies through the interview. On the other hand, they were able to clearly discern between the strategy they were using and the interviewer's incorrect guesses, when these occurred. This was a very helpful safeguard against the imposition of the interviewer's preconceptions, or the temptation to mind-read. It also gave us a basis for concluding that our use of the think-aloud technique was an asset and not a hindrance in collecting true data.

Another point to notice is that what the authors mentioned refer to as strategies are what we prefer to call techniques. We choose to maintain a clear distinction between the term **strategies**, which we use to describe intuitive internal programs, and the word **techniques** which for us indicates practical skills.

Another study, this time in Catalonia, important because of its use in internal assessments of Catalan primary schools, gives a very succinct summary of reading comprehension:

> *"Comprendre un text - tal com hem exposta - comporta construir el seu significat, elaborant un model mental que s'enriqueix a partir de les noves informacions contrastades amb els coneixements activats en la memòria a llarg termini (coneixements prévis)."*(Català et al.1996)
>
> [Translation: Understanding a text - as we have explained - involves building its meaning, assembling a mental model which is fed with new information corroborated by long-term memory knowledge (previous knowledge).]

The authors go on to list 11 processes underlying the act of reading comprehension, including decodification and the correct reproduction of their internal representations. The Nlp model does not contemplate these two latter processes but does coincide with the other nine procedures mentioned. However, the exhaustive listing of analytic terms leads these authors to conclude that, "it is not possible to observe a process in action, only its result..." ("... *no és possible observar un procés en acció però sí el resultat, ...*"). (Català et al.op.cit.) This is the point where the Nlp model is most useful because it does allow us to do just that: observe the reading process in action.

In the studies of reading comprehension which are echoed in much of the bibliography below, the method of inquiry leads to an accurate, if external, description of learners' strategies but still leaves unanswered two important questions:

-Are the strategies described applicable to all learners in the same way?
-How can we help less efficient readers change their strategies if we don't know the internal mechanisms through which efficient readers effect their learning?

Parallel to this external approach to the study of reading comprehension researchers are gradually beginning to look at the more internal, strategic, processes learners use when reading. One researcher who uses this kind of approach is Brian Tomlinson whose investigations revealed that visualisation was a central strategy used in reading comprehension.(Tomlinson 1986). In the 1993 Barcelona EFL Congress he described how his research had discovered that the readers in Japan who made internal images of what they were reading had better comprehension and higher recall of the material read. He also observed that further studies had revealed that it was easy to boost recall in readers simply by reminding them to visualise while reading. One of the most striking aspects of this research is that it disclosed that there was a conspicuous lack of literature on the effect of visualisation in reading.

Nlp, on the other hand, regards visualisation as one of the central strategies for learning:

> *" ... learning to 'see content in their minds'. This is the key to high school graduation and the ticket to 'doing college'."* (Grinder, M. 1991).

However the word 'visualisation' takes on an extended meaning in Nlp and includes auditory and kinesthetic attributes as well as visual ones. Imagination, literally, making images, is just one of the aspects which comprises our learning strategies. Others include self-talk, internal audition and feelings well as the recollection of smells and tastes (the most famous of these is probably Marcel Proust's "madeleine"'). This is how we `make sense' of reality. Dr. Oliver Sack's neuro-psychiatric studies of parkinsonians express this same `making sense' in similar terms. On the subject of visual perception he gives a comprehensive view of how we perceive by stating that *"Experience is not possible until it is organised iconically;"* (Sacks 1985). He also describes the same findings as those that Nlp practice terms `auditory digital', the self-talk aspect of perception, : *"A man needs such a narrative, a continuous narrative, to maintain his identity, his self."*(Sacks 1985). Sacks again describes the existence, even the necessity of internal auditory representations in this way: "*the physiology of one's cerebral rhythms and `tone' must at least be reasonably constant in order to provide a base for action and freedom;"* (Sacks 1990). The conclusion of his observations are to ask for the inclusion of an `art' therapy based on "inner melodies and scenes" in conjunction with the present `systematic' therapy to understand our perception of reality. (Sacks 1985). In the search for a reading comprehension paradigm we use similar tools to those described by Sacks to probe the perception of readers.

Our primary objective is to describe the different strategies used by efficient readers, then compare them to find where they coincide and finally establish a paradigm of efficient reading.

The second objective is to improve the reading comprehension efficiency of less competent readers using the resources learned from the effective readers.

2. Method

In this chapter we will describe the Nlp modelling tools and the different phases of the project.

2.1. The Nlp modelling tools used in the project.

This is a description of the principal theoretical models we used in our research. Together they constitute a account of how Nlp has helped us to reflect on how we are thinking, what Flavell called our "*metacognition*". The summary of the Nlp models below also reveals another attractive aspect of Nlp's metacognitive models - their practicality.

In this project we used three models: the ROLE model, the TOTE model and the BAGEL model.

2.1.1. The R.O.L.E. Model

The R.O.L.E. model helps us to identify the cognitive processes, the essential elements of internal thinking, which people use when going through a thought process. To do this we must identify the steps of the mental strategy and the role each step plays in the overall process. This role is determined by the following four factors which make up the acronym R.O.L.E.: ***R****epresentational systems;* ***O****rientation;* ***L****inks;* ***E****ffect.*

Representational systems
These systems have to do with which of the five senses are most dominant for a particular mental step in the strategy: Visual (sight), Auditory (sound), Kinesthetic (feeling), Olfactory (smell), Gustatory (taste).
Each representational system can perceive certain basic qualities of the experiences it senses, together with its sub-characteristics. These qualities are called "submodalities" in Nlp because they are sub-components of each of the representational systems. The full list of submodalities can be found in Appendix F.

Orientation

This has to do with whether a particular sensory representation is focused externally towards the outside world or internally towards remembered or constructed experiences. For example, when you hear something, is it in the outside world, in your memory or in your imagination?
People often have a preferred representational system and orientation for certain tasks. If a student's system clashes with the teacher's system then non-communication is the result. If, for instance, a student in kinesthetic state *feels* internally that they cannot *grasp* the sense of a reading text and the teacher in a visual state offers help by telling them to *focus* on the external task, *look* closer and *clear* up the problem, the resulting clash in communication will probably make the student completely turn off. However, if the teacher is resourceful enough to solve the problem in kinesthetic terms and internal orientation then they will establish rapport which is the key to effective communication. She can then lead the student into a visual, external orientation state, more appropriate to effective reading.

Links

This elucidates how a particular step or sensory representation is linked to the other representations. For example, is a particular feeling linked to constructed pictures, memories of sounds or other feelings?

The two basic ways that representations can be linked together are:

- sequentially, through *anchors*, where one representational system triggers another in a single response or a chain of stimulus-response events. By saying something to a person you might inadvertently make them `see red' and fly into a fit of anger. You have unknowingly pressed a button, so to speak, and fired off an automatic response: anger. The anger response may stop there or it may stimulate raising the voice tone which in turn might lead to physical aggression and so on down through a whole chain of pre-anchored responses.

- simultaneously, through *synthesia,* where the systems overlap one another in a synthesis and you see *the shape of a sound* or *feel the impact of a colour*.

Effect

The result or purpose of each step in the thought process is referred to as its effect. For instance the function of the step could be to generate or input a sensory representation, to test or evaluate a particular sensory representation or to operate to change some part of an experience of behaviour into a sensory representation.
What makes the difference between a good speller and a poor speller, for example, is the way that they orient and link their various senses and sensory representations together. They have different strategies for spelling.

2.1.2. The TOTE Model

In order to use our cognitive processes we need to direct them towards a learning goal. The basis for studying others' learning is also provided by Nlp and we have incorporated it into the interview format (see Appendix A). This model is called TOTE, an acronym for *TEST - OPERATION - TEST - EXIT*. The model indicates that, as we think, we set **goals** in our mind (consciously or unconsciously) and develop a **test** for when that goal has been achieved. If the goal is not achieved we **operate** to change something more. We do something to get closer to our goal. When our **test** criteria have been satisfied we then **exit** on to the next step.

We applied this model to the interviews we conducted with our reading candidates (Appendix A) which gave us the following outline:

Our **goal** was to find out how they read.

The **test** we applied was the direct question: Do you know how you read? We listened carefully to the wording of the candidate's reply while at the same time observing closely the feedback from their body language which we interpreted through the BAGEL model

explained below. The sequence of strategies observed during this test constituted a reference for the next procedure: operation**.**

The **operation** phase is the interview proper where we elicited the sequence of strategies the readers were using while they were reading. Interpretation of this also involved the use of the BAGEL model.

The second **test** was another direct question: Do you know how you learn? Once again we attentively listened to and watched the pupils' linguistic and sensorial feedback using the BAGEL model described below, then we **exited** to analyse the results.

In the interviews with less efficient readers the **exit** stage became that of advising students on how to adjust their strategies to improve their reading comprehension.

2.1.3. The BAGEL Model

Nlp modelling considers body language is to be a clue to internal representation and so it is necessary to observe particularly carefully the outward response that a person is committing to a task. These clues cannot tell us the content of others' thoughts but they betray the strategies through which they are constructing their thoughts. In order to be able to make use of this essential information the interviewer needs ways of identifying which senses or combinations of senses are being mobilized. Nlp makes a number of different distinctions and offers strategies to help accomplish that. The various cues have been put together into what it's termed the BAGEL model. The acronym summarizes the following concepts:

Body posture
Accessing cues
Gestures
Eye movements
Language patterns

Body posture

People often take up habitual body postures when they are thinking or learning. These postures can indicate a great deal about the representational system the learner is using. Visual learners tend to lean back with head and shoulders up or rounded accompanied with

shallow breathing. Auditory learners are inclined to lean followed, cock their head, put their shoulders back and fold their arms. Kinesthetic learners often keep their heads and shoulders down and breathe deeply.

Accessing cues

When people are thinking they trigger certain types of representations in a number of different ways including breathing rate, non-verbal noises, facial expressions and so on. These are idiosyncratic to the individual and can be associated with particular sensory processes. In visual mode people often have high shallow breathing and a higher voice pitch and faster tempo. The auditory mode produces diaphragmatic breathing patterns and the tone and tempo of their voice fluctuates. In kinesthetic style thinkers tend to demonstrate deep abdominal breathing, a deep voice and a slow tempo.

Gestures

People will also often touch, point to or use gestures indicating the sense organ they are using to think. Some examples include learners in visual mode who touch or point to their eyes and make gestures above eye level. Thinking in auditory style may induce a person to point to or gesture near the ear or tend to touch the mouth or jaw. In a kinesthetic model gesturing would be made below the neck and touching the chest and stomach areas might occur.

Eye movements

Another kind of clue comes in the form of eye movements (Miller 1960). If, for example, you want to help someone become more ready to visualize something (to picture it in their mind's eye) you might ask them to move their head and eyes up. If you want to prepare somebody to access their feelings, you would have them position their head and eyes down. Seven eye movement clues have been categorized by Nlp into the following pattern. This applies to right-handed people when you face them:

Eyes looking up to the right: remembered visual mode. (V_r)
Eyes looking up to the left: constructed visual mode. (V_C)
Eyes looking straight ahead also usually denote visual mode. (V)

Eyes looking to the right: remembered auditory mode (A_r)
Eyes looking to the left: constructed auditory mode. (A_C)

Eyes looking down to the right: auditory digital mode. (A_d)
Eyes looking down to the left: kinesthetic mode. (K)

Language patterns

Another method of Neuro-linguistic analysis is to search for particular linguistic patterns, such as "predicates", which indicate a specific neurological representational system or submodality. Nlp takes seriously what people say about their senses. For example, if someone says, "I have a *feeling* that something is going on." We believe that they really are

having a feeling, in other words, that they are accessing and representing their information internally at that moment through feelings. Again, if a person says to you, "I *can't see* what you are *saying*." We can infer that the person is trying to make some kind of image based on your words. If this were a student's statement we would interpret the student to be saying, "I can't make a picture of your words, and until I can make a picture I won't understand."

As in all sensory observation in Nlp modelling it is set practice to calibrate every subject individually before deciding on an interpretation. The above scheme is used only as an indication, never as a substitute for comparative observation of all the BAGEL components.

2.2 The phases of the project.

The project developed in five stages:

-Selection of candidates (efficient and less efficient readers)

-Elicitation of strategies from the efficient readers
-Comparison of the efficient readers' strategies
-Elicitation of strategies from the less efficient readers and alignment of their strategies with the efficient paradigm.
-Follow-up of changes in the less efficient readers.

2.2.1 Selection of candidates and materials.

The project was carried out in seven high schools in the Garraf and Penedès counties which lie to the south of Barcelona, Spain. A total of a dozen teachers cooperated to furnish the candidates who were pre-selected from around 500 students. These were students in their last year at the school and had attended the school for four years so that their competence was well-known to the members of the Department.

The selection of candidates was done in two stages.

First we asked the teachers to use their professional skill and experience to choose at least three students they considered efficient readers and one student they considered less efficient. This pre-selection was conducted through consultation between the members of each department. The departments offered a total of thirty-one students between the two categories.

It was now necessary to sort the pre-selected candidates into two homogeneous groups of students with a similar reading level: one would be the body of efficient readers, the other the less efficient readers. We obtained this selection by giving all the candidates the same cloze test (see Appendix B). The test, entitled *The Key to Olympic Success*, consisted of a past paper in reading comprehension for the university entrance exam. Twenty of the words were blanked out and the candidates were instructed to fill in the gaps with appropriate substitutes. The aim of the exercise was to grade the readers according to their lexical and morphosyntactic level and the text was gapped with these criteria in mind. The morphosyntactic analysis of the original blanks is the following:

nouns-2	prepositions-4
verbs-4	connectors- 5
adjectives-3	negative particles-1
pronouns-1	

The criteria for correcting the cloze test were based on the appropriateness of the word used by the reader. Any word which made sense in the context was deemed acceptable and allotted 1 mark. However, when the reader included an unacceptable word in the given context, one of two possible marks was assigned based on the parsing strategy they had used:

0.5 was given if the parsing was correct but the student had committed a basic grammar error or used vocabulary based on their native language.
0 was given when the error revealed incorrect parsing.

The cloze test was administered to all thirty-one candidates who had up to one hour to complete the test. As a result of this evaluation we were able to retain fifteen students as a homogeneous reading comprehension group. These were to be our efficient reader models. We also chose a group of five homogeneous candidates who were less efficient readers.

For the whole project we needed a total of three texts: one for the cloze test, another for the strategies interview with all candidates and the third for the follow-up interview with the less efficient readers. The type of text which seemed appropriate for all these tasks was that used in the local university entrance exams. We chose this format for several reasons.

First of all, it is a real language text, that is, an unsimplified extract from a magazine or newspaper read by native speakers of English. These texts all have a similar level of difficulty yet they are not technical.

The style of text used in the local university entrance exams influences the types of reading texts which teachers use in our interviewees' schools. For this reason these texts greatly affect local learners' reading comprehension strategies.

The texts have been chosen, revised and discussed by the local universities and represent a reference point in the reading abilities of all university entrants. It would thus seem reasonable enough to choose them as tests of efficient reading comprehension strategies.

2.2.2. Elicitation of strategies from the efficient readers

We elicited the reading strategies of the group of efficient readers by conducting interviews with each one of them. These were carried out using the outline shown in Appendix A.

First of all we established rapport with the student whom we had not met previously. We found out their name and initiated small talk about the school. We also explained the outline of the project and how the interviewee fitted into it. Any questions the student had about the project or the interview were then answered. Some students were very curious as to the

nature and outcome of the project and others cooperated but did not display immediate interest in it.

We calibrated their general responses by finding out if they were left-handed or right-handed. This is important for the interpretation of eye movements. We then moved to the first ***Test*** by asking the question, "Do you know how you read?" The behavioural responses to this question, especially eye movements, help to establish the students' habitual learning strategy. The response will normally consist of three separate movements revealing three different accessing cues. For instance, the interviewee might glance up then to the left then down left. This pattern indicates that they are accessing **V**isual then **A**uditory then **K**inesthetic information. In this sequence the person is demonstrating that they represent new information first of all in images then in sounds then in feelings. In this case their overall strategy would be abbreviated in Nlp as **V- A- K** and their mini-strategies, still to be explored, would be submodalities of each of these representational systems.

The next stage is to lead into the ***Operation*** which in this case means reading the text and checking comprehension. We presented the text in Appendix C and briefly explained the sense of the title in order to introduce the content of the topic and stimulate the student's previous knowledge of the subject. Then we asked them to read through the text so as to be able to tell us what it was about. While they were reading it we used the BAGEL model, described above, to observe and calibrate their response. In this way we could collect information on how they set about the task and how they coped with it. This information was especially useful for deciding the initial strategy students employed to approach a reading text. This is an important moment in any learning process because it determines the initial impetus and concentration the learner brings to the task, their state of mind. In efficient learners it is especially important to capture this initial mindset because it gives us essential clues as to how the learner sets about the task. In Nlp this phenomenon is called *state*, a dynamic concept open to change as the task proceeds. This study found, to our surprise, that **the initial *state* invoked by many pupils coincided with the first mini-strategy used by them in their habitual learning strategy**. This means that the *state* the learner is in at the outset of the task will probably determine the strategy they use to complete it and, more importantly, whether they succeed at it or not.

After the first reading we checked that the interviewee had understood the gist of the text by asking them to summarize it briefly. The oral summary they produced also gave us information as to how they understood the text. The reading was clearly structured in four sections : the introduction followed by three paragraphs expanding on it. We were thus able to note whether the student reproduced this clear format or whether they offered a confused version. Most of them gave an oral summary consciously based on the text structure; the others used the structure unconsciously. This is the nearest we got to observing decodification of the text. This did not surprise us since we were dealing with 18 year-old students who had long ago learned to decode text and did it unconsciously. The decodification process is also of less interests to us because we are not concerned here with Learning to read but rather with Reading to learn.

The next step within the *Operation* stage was to study in detail how the students were representing what they read. To achieve this we had the learner re-read the first paragraph and summarize it. After checking that it was globally understood we started a detailed reading process, line by line. The interviewee read the first sentence and explained its

meaning. Once they had established what it meant we asked them to say how they represented this meaning to themselves. The usual reply was meaningless to the student themselves but the language they used normally gave us a good indication of how they were generating the representation. For instance, one answer was, "*I know which direction the meaning is taking...*" The phrasing of the first answer sounds very general but in fact denotes a kinesthetic representation. Another students replied, "*I imagine it from the context.*". The language of this second response alludes to imagery and a visual mini-strategy. Once we had established a hypothesis of this sort then we could check it out. To further examine our initial inference we would asked the student, "How do you represent, *direction* or *taking* or *imagine*?" This would normally provoke a more concrete response such as the description of a feeling or of an image. These representations usually came from the learners' memory because they were links to something already experienced in the past. **It became progressively obvious in this way that the learners understood what they had read not by creating a new experience but by relating it to a previous experience stored in their memories.**

Another way in which we delved into the learners' representations was to ask about the key words in the sentences. Once these were established by the interviewee we then put the question to the students as to how they represented the meaning of these essential words. For example in the first sentence, second paragraph, many readers underlined the word "*multilingualism"* as a key word. One student represented this word by creating two contrasting internal images: one of their parents and the other of younger people. According to the student the interpretation of this representation was that the younger generation tended to speak several languages, whereas her parents' generation did not. Once again it is noteworthy that the reader used her own experience, in this case her immediate environment, to represent meaning to herself.

The readers were at first completely unaware of these internal representations and some were surprised at their own images and sensations. However, once they became conscious of a particular representation they were sure of it and were not open to suggestions to the contrary. It was surprising that once they were aware of their own representation any suggestion which contradicted it was summarily rejected. We were always at pains not to impose our external hypothesis on the readers. However, when the interviewer occasionally ventured interpretations that did not coincide with the learners' internal representations the learner immediately rejected them. This was reassuring since we already had reservations about the possible dangers of the think-aloud method as we mentioned in our discussion of previous research done using this method. However, in the case of this project, the discussion with the learner became a safeguard rather than a hindrance to corroborating data.
During this sentence by sentence reading we occasionally asked the learner to point out vocabulary which had given them problems. We then analysed the strategies employed to deal with these occurrences. **Most interviewees immediately returned to their initial state strategy when they had problems**. For example, an auditory learner tended to ***hear*** the problem word first in English and then, if possible, in translation. Other learners applied their full strategy to dealing with such problems. One girl, whose overall strategy was V- K- A, employed the following mini-strategies to solving the problem: first she *saw* herself *saying* the words in English, then she *wrote* the English words and *saw* the translation on top of them, *felt* more self-confident and comfortable because she could see her mother tongue, and finally *heard* the word in translation. In other words, she used the same strategy for reading as for solving vocabulary problems, and possible many other problems too. **It was at this**

point that we began to suspect that efficient reading strategies might be intimately related to efficient learning strategies.

The fact that some learners used their state strategy and others their whole learning strategy to elucidate their semantic problems was a valuable source of information for us. It supplied us with data about how the learners were resolving their problems and, more importantly, it acted as a further check for us on the type and sequence of mini-strategies they were applying.

To terminate the *Operation* stage of the interview we proceeded as above, sentence by sentence, until we were satisfied that we had elicited the student's full strategy.

We ended the interview, following the R.O.L.E. model, with the second ***Test***. This consisted in ascertaining that the strategy was complete and needed no further additions to work efficiently. We did this by asking the student a reflexive question on their reading and carefully observing their linguistic and behavioural response. The question we put was, "How do you know that you understand this text?" The effect this has on the listener is two-fold:

- it forces them to review the strategy they used,
- it elicits a verbal answer.

By attentively monitoring the behavioural response corresponding to this rapid strategy review we could read off the strategy used by the learner and compare this information with that of the first *Test* to check whether the observations coincided or not.

The linguistic form of the learner's reply to the question, when taken with all the other evidence collected, also gives us information about how they approached their reading. For instance Sira, whom we had observed to be using a predominantly Auditory representation to read, answered the final question by saying, "*Reading English is as if I explained it to myself*.". This little verbal summary acted as another confirmation of our previous research since the *self-explanatory* action of Sira's reading coincided with the Auditory digital (self-talk) representation we had observed her to be using during the reading interview.
The verbal response to our final question was normally given in a cryptic form such as that exemplified above. The samples were varied in form as can be seen from the following:

Rosa *:""Reading is like someone telling you and you and you take photos of it."*
Albert*: "Reading is a set of images and feelings."*
Ana*: "Reading is photographing text."*
Sira*: "Reading English is as if I explained it to myself."*
Arnal*: "Understanding is assimilating."*
Enric*: "Reading is a sequence of slides."*

However, there was a common form to all the examples the learners gave: they were metaphorical. This means that the information they contained was basically unconscious, an automatic and unthinking description of how they responded when reading. This is probably why the sentences may appear enigmatic. Nevertheless, they do make a lot of sense when viewed under the light of Nlp models. In fact we felt that these metaphorical responses were

an even more valuable confirmation of our observations precisely because they were not consciously manipulated.

The second *Test* gave us information about some students' complete strategy and alerted us about another phenomenon: students' self-evaluation. This is a internal reference strategy which many used to ascertain whether they had actually understood the text, in the same way we used the second *Test* to complete our interview. This is fairly logical since both interviewer and interviewee are applying a learning strategy: one to learning about the interviewee's reading and the other to learning about a text.

Reading is normally a solitary occupation and readers often need an internal reference which will give themselves proof that comprehension is complete. We found that many efficient learners had devised their own internal devices for telling themselves that their reading strategy had concluded. This took different forms. Sometimes a student would integrate it into the whole strategy and then it took the shape of another mini-strategy for comprehension and doubled as a completion. Others re-used their whole reading strategy at the end as a completion strategy. Then, again, other learners returned to their initial state strategy and re-employed that as the touchstone of comprehension. A reference to the completion strategy used was also normally contained in any metaphorical description of their reading the student gave.

2.2.3. Comparison of the efficient readers' strategies

In order to compare the individual strategies of the efficient readers interviewed we summarized the observations taken in the following manner:

Test:
-The interviewee's full strategy in acronymic form, for example V - A_d - K meaning Visual - Auditory digital - Kinesthetic.

Operation:

-The full strategy operation.
-The student's accompanying linguistic response
-Any behavioural response noted by the interviewer.
-The strategy used when confronting problems in the text.

Test:
-The completion strategy.
-Student metaphors.

The details of these summaries are set out in Appendix E.

We then compared all the above observations obtained from the efficient readers' interviews. We were looking for a pattern which might be construed as a common reading paradigm. In fact we found a certain common sequence which we then used as a blueprint for the next stage. It can be briefly summarized by saying that **the efficient readers we studied applied their habitual learning strategy to reading comprehension.** This conclusion surprised us because, since so much effort and study in schools is put into reading, we expected reading strategies in efficient learners to be something exceptional and out of the ordinary.

The normality of literacy is not an unknown premise in research on reading. Throughout his authoritative and ground-breaking study on reading, Frank Smith insists that neither physically nor psychologically can reading be considered an extraordinary process for humans: *"But the first point to be stressed is that there is nothing about reading that is unique."*(Smith 1978). Nevertheless, we didn't expect to find that it was such an everyday process.

This result is also an encouraging conclusion for the next stage of our project because aligning readers' strategies with their habitual learning strategies seems a less daunting task than revamping their strategies from zero.

2.2.4. Elicitation of strategies from the less efficient readers and alignment of their strategies with the efficient paradigm.

From our findings we were able to formulate a hypothesis : that less efficient readers would deviate from the efficient paradigm. Thus we conducted a second round of individual interviews in which we spoke to the students designated by their teachers as less efficient readers. We followed the same procedure as with the efficient readers, using the T.O.T.E and B.A.G.E.L. models and the same reading text (Appendix C). At the end of each session we checked whether the interviewee's strategy was aligned with the efficient reader paradigm. **We found that none of the less efficient readers we studied used the paradigmatic strategy**. They all used a reading strategy which was different to their normal learning strategy. This was a confirmation of our hypothesis. At this point we used the **Exit** part of the T.O.T.E. model with each student to restart the learning loop by explaining to the interviewees how they must alter their reading strategy.

There were five students involved in this second stage of the study. The details of the interviews with them are in Appendix E. We should like here to comment on the course of these exchanges.

There is notably less information available from these students compared to the efficient readers' interviews. It would seem that when a learner uses efficient strategies they have fewer problems talking about their strategies, whereas less efficient learners are also less aware of their strategies. This is the reason why these interviews are comparatively less insightful than those conducted with the efficient readers. In other studies we have conducted this was also confirmed and we believe it is probably generalizable. In fact studies in cognitive-contextual theories bear out this conclusion:

> "*More intelligent persons, then, find a niche in which they can operate most efficiently.*" (Encyclopaedia Britannica on Human Intelligence.)

This points, in an indirect way, to the importance of metacognition in learning. 'Knowing how you know' appears to be an intimate part of the learning process. It also points to the real need for teacher intervention in cases of poor strategy use because this is very probably due to the students' complete lack of information on the correct strategies. It is possible that less efficient learners, if left to their own devices, won't have enough metacognition to help themselves.

We found, however, that there were differences in the degree of inappropriateness of the strategies the less efficient learners used. Three of the students, Ismael, Yolanda and Ilumninada used an initial mini-strategy which did not put them into an efficient reading state. This seemed to us to be an important breakdown since they got off to a bad start each time they approached a text. Yolanda and Ilumninada used exactly the same learning strategy: K - A_d. - V. However our research does not lead us to believe that any specific sequence is inefficient since we had observed many differing strategy sequences in the competent readers. The basic flaw in their reading strategy was that both of them employed an inhabitual initial strategy. This was also the case with the third learner, Ismael.

Inefficiency in the remaining two learners, Alfredo and Monica, took a different form. Both coincided in the use of a single mini-strategy as a complete strategy instead of using a sequence of mini strategies. This led to a sort of tunnel vision of the text in the sense that they perceived it in a single dimension instead of using a range of mini-strategies to understand it. It is also worthy of note that both of these readers used an auditory channel to process text. In fact, both used an Auditory digital (self-talk) mini-strategy as their principle operational mode when reading. Monica added a visual mini-strategy, but very timidly, while Alfredo stuck rigidly to the single processing system mentioned.

The hypothesis we set out with in this part of the study was that inefficient readers would use a reading comprehension strategy which was different from their habitual learning strategy. The readers we interviewed confirmed our hypothesis so clearly that we suggest that it be applied generally to diagnose reading inefficiency**.**

The axiom resulting from this suggestion is that aligning these readers' individual strategies with their habitual learning strategy paradigm would enable them to achieve more efficiency. Our next step was to investigate this assumption.

To make this change we advised them on the practical measures they should take to change their reading strategy. The procedures we advised them to adopt were designed to enable them to adapt their inefficient reading strategy to their efficient learning strategy.

Yolanda and Illuminada were recommended to perceive the text not only through self-talk and visualization but by empathizing more with the material they read. In experiential terms what we were asking them to do was to assimilate written passages by creating internal feelings for them. This was designed to help them bring the meaning of the text nearer, specifically during the critical period when they approached the text and began reading it. This is when efficient students adopted an initial state of mind which usually coincided with their prime mini-stately.

Ismael was asked to align his reading strategy with his habitual learning strategy by intensifying his use of images to understand written texts. He had an certain facility for visualizing text meaning but made too little conscious use of that ability.

Monica tended to neglect her support mini-strategy of visualization in favour of auditory strategies and so we required her to make more use of visualisation of the text. She complained that vocabulary was a major problem in understanding English texts. We dealt with this by explaining that visualization was also an excellent method of learning and retaining vocabulary. When Monica confided to us that she had spelling problems we also explained that one spin-off of increasing visualization would also be easier recognition and recollection of words and their spelling. Spelling problems are characteristic of many auditory learners and are corrected by teaching them to see words in their minds as well as hearing them. Robert Dilts has devised a straightforward 4 point programme for helping poor spellers to visualise words. A study conducted in the Université de Moncton using the programme found that spelling improved close to 100% using it. (Dilts & Epstein 1995).

Alfredo's reading difficulties stemmed from the fact that he used only one mini-strategy to read. We gave him more resources by recommending him to incorporate more images and feelings as support strategies when reading.

We asked the different students to put these adjustments into practice during the following months and said that we would come back later to evaluate the advance achieved. With each reader studied it was becoming clearer that the basic difference in their reading and learning strategies was one of quality. Their learning strategy was rich in resources and used an abundance of mini-strategies. Their reading strategy was poor in options and in fact in two cases mentioned reduced to a single mini-strategy. In this sense it was basically a question of these learners enlarging their reduced reading strategy to make it fit their own efficient learning strategy. After the individual study of these learners our hypothesis was sharpened. It could now be formulated more precisely as : **the inefficiency of the students' reading strategy was rooted in a restricted use of their habitually efficient learning strategy**.

2.2.5. Follow-up of changes in the less efficient readers

Two months or so after the first interview with the less efficient readers we revisited each one of them and conducted a follow-up meeting to find out how far they had succeeded in changing their inefficient reading strategy. To carry this out we used a different reading text (Appendix D).

We found that all five students had had little practice in changing their inefficient reading strategy. It became obvious that they had not really internalized the new approach. It is easy to blame lack of interest or indeed laziness for this lack of progress. However, we learned that it was probably more due to a certain inadequacy of resources about how to implement the change. We found this out when we began to check for new strategies by reading the second text with each interviewee. It was this intensive practice which opened most of their eyes as to how to use the strategies they had been neglecting.

With Yolanda and Iluminada, who needed a reinforced kinesthetic strategy to help them read better, we had to advise techniques such as:

- relating the text with real past or imaginary feelings,
- implicating their feelings by taking a critical stance with respect to the text
- consciously searching their internal sensations on reading the title
- investigating the feelings they related to images they made of the text.

After a little practice, Ismael quickly learned to make more images from the text. He said that he was discovering an ability he did not know he possessed: that of the "making unconscious images". We interpret this as a recognition that he did in fact make images when he read but was completely unaware of them and did not use them to support comprehension. We asked him in future to believe more in his ability to visualize and pay more attention to his internal imagery when reading.

Monica had been requested to visualize more in order to improve her reading comprehension. She was obviously more aware of her use of different strategies for reading and had, to some extent, synthesised her auditory representation with a new visual one. We learned this from her explanation of how she now read: she said that reading for her was like doing a crossword puzzle in which she could hear and see the words. She also demonstrated a certain new metacognition when she distinguished between scientific texts and literary texts. She said that she felt able to visualize when reading on the latter type of topic, however, when reading scientific content, she felt more at ease summarising it in word outlines.

Alfredo was an tireless talker as are many other auditory people. Nevertheless, when we practised seeing and adding feeling to a text he demonstrated the ease with which he was able to translate it into images and sensations. At one point his lack of understanding of a passage was resolved simply by focusing on the internal image he had made of it but had not paid attention to.

3. Results

The observations made during the field work done with the students produced two practical results:

-An efficient reading comprehension paradigm
-Application of the paradigm to less efficient readers.

3.1 An efficient reading comprehension paradigm

Our primary objective at the outset of this project was to establish a typified approach to reading comprehension, what we call a reading paradigm. We intended to achieve this by describing the different strategies used by efficient readers then comparing them to find where they coincided. We have already described some studies which pursued a similar aim and we expressed a belief that by using Nlp tools it would be possible to shed new light on this objective.

In the comparison of efficient readers' strategies we did indeed find a certain common sequence among efficient readers which might be construed as paradigmatic. It can be briefly summarized by saying that **the efficient readers studied applied their habitual learning strategy to reading comprehension.**

This was, very strictly speaking, the conclusion in 8 out of 13 (61%) case studies. These interviewees used exactly the same strategy in the first *Test* as they did in the more lengthy *Operational* phase and they all confirmed the same strategy in the second *Test*. These observations left little doubt in our mind that these students approached each reading comprehension as a new learning situation and used the same strategies for reading as they did for any fresh learning. As we have already indicated this was, for us, a surprisingly straightforward description of reading which we had previously assumed to be an exceptional act requiring extraordinary strategies. For us it put the act of reading comprehension in a new, more understandable, light because we can now envisage it as an act of learning. We can now define the efficient reader as a person who brings to reading tasks the same approach as they bring to any new learning situation. This means that they bring to bear on the reading activity all their previous learning experiences including efficient learning states, self-confidence, world views, concentration and so on. **For them, reading is not a specialised, restricted, activity but a natural extension of their everyday learning behaviour**. This does not imply that they are more efficient learners than the others but simply that they apply what they have learned more efficiently to their reading activities.

In the other cases, 5 out of 13 (39%), there were two subpatterns of reading among the efficient learners. Two of these students reversed their habitual learning sequence when reading and the other two used an almost exclusive visual strategy.

Let's take the first subpattern, the reversal of strategies. Both Rosa and Raquel used a similar strategy for both habitual learning and reading but they inverted the order of the strategy. This reversing of strategies is categorized in Nlp as a motivational strategy. Rosa confided to us that she had always been a slow reader and that she had been diagnosed in primary school as being dyslexic. Her reversal of strategies may be a motivational compensation for her earlier stigmatisation as a dyslexic reader. She relied heavily on auditory representation, especially on an Auditory digital (self-talk) mini-strategy to understand texts. This is what she used as her initial mini-strategy for reading but it was the final mini-strategy she used when learning :

Her learning strategy appeared as: K.- V - A_d.
whereas her reading strategy was: A_d -V - K

Her metaphorical description of reading was illuminating too because it was an unusually neat description of her actual reading strategy: *"Reading is like someone telling you something and you making photos of it."*

If we analyse this statement it reflects faithfully what she did when reading:

Reading is like someone telling you something: mirrors her A_d or interior dialogue.
***and you make*:** explains her kinesthetic, doing, processes (K.).
photos of it.: shows how she visualizes words. (V.)

The other person who used strategy reversal was Raquel. This was obvious enough in her TOTE interview but the explanation for her using a motivational strategy escapes us. Her cryptic metaphor, *"Reading English is like doing a puzzle."*, is of little help either in answering this question.

Two other interviewees of the 39%, Joan and Enric, used a completely visual strategy for reading. This coincided with their first mini-strategy which was indeed Visual, but they used their other mini-strategies in an apparently haphazard way.

One of them used a predominantly visual mini-strategy occasionally backed by auditory digital when a critical opinion was needed and kinesthetic when the need for a sense of identification was felt. This student seemed to establish meaning while reading by imagining the scenes of the text, criticising it through self-talk and identifying himself with it through sensations.

The other student had little recourse to anything but a visual mini-strategy. He read through the text in a hallucinatory mode. He described reading as: *"... a succession of slides."*- an accurate description of his unique strategy. He gave an unstructured answer when asked to summarize after the first reading and appeared to have only a vague notion of the text. When he couldn't understand part of a text he imagined (visualized) an answer. This response was coherent, given his visual strategy, but it was hardly appropriate. We believe that this student may have been a relatively efficient reader but that his strategy could have been improved.

Finally, we include in the 39% one interviewee from whom we could elicit no usable data. This learner may well be an efficient reader but it was not possible to elicit exactly how she went about reading.

Each individual used a particular sequence within their strategy and it would not be possible to describe the paradigm as a specific sequence. Each sequence obviously had been built up through personal experience and worked for that particular person. However, the individual learning and reading strategies corresponded in so many cases that we believe it is more than coincidence.

The discovery of the link between efficient readers' learning and reading strategies also revealed, at a deeper level, not only the actual strategies but also *how* they worked in practice. This was achieved using the Nlp tool called submodalities which enable us to probe beneath the surface of each mini-strategy.

When examining, for example, the first sentence in the second paragraph: *"The first is the remarkable rise in multilingualism*.", we would first discover the main representation system used to understand this sentence then explore it further. Exploration had two main objectives: to confirm our own interpretation of the mini-strategy being used and to discern how the student was processing their strategy.

One student, Rosa, told us that she *saw* what this sentence meant through its principle *idea* contained in the word "*multilingualism*". This is interpretable as a linguistic reference to the fact that she was visualizing its meaning. When we explored her representation we found this hypothesis corroborated. She explained in detail how she was making an internal picture of a

world map where people placed in the different countries spoke different languages. The map was drawn from an educational T V series she had seen as a child.

Albert represented the sentence through the word *"rise"* which, for him, was a sensation (K). He had learned this word from a magic card game he had played.

Sira processed the word "*multilingualism*" through recalling its sound which reminded her of the word "*monolinguals*". She then also remembered a joke about monolinguals and felt the urge to laugh - a kinesthetic reaction.

Another reader's representation of this word threw up an image of the person's parents accompanied by younger people. The interpretation of this representation, according to the student, was that the younger generation tended to speak several languages, whereas her parents' generation did not.

What is common here is that the readers all used their own experience, in this case their immediate environment, to represent meaning to themselves. Most of the representational systems worked in a similar manner. They were based on representations of past experiences. In this sense our findings rejoin those of the authors' work we mentioned at the outset of our project: **readers perceive the meaning of text by relating it to their previous experience**. However, now we can know this experience and check whether it is relevant to the meaning of the text being read. In this way we can understand and correct deviations of interpretation. In short we can appreciate *how* exactly efficient readers comprehend text and we can help less efficient readers improve comprehension.

3.2 Application of the paradigm to less efficient readers

Once established that efficient readers used their habitual learning pattern as a reading strategy the axiomatic hypothesis resulting was that less efficient readers would deviate from the efficient paradigm. We found this to be true. However, we went further and applied this information as a support strategy on the assumption that inefficient readers could probably be helped by aligning their deficient reading strategy with their own efficient learning strategy.

Applied to the readers studied this hypothesis we found that the inefficiency of their reading strategy was rooted in a restricted use of their habitually efficient learning strategy. This also gave us a more precise target as a second objective : **to attune the reading strategies of less efficient readers to their own learning strategy.**

We followed the progress of these inefficient readers during the rest of the school year, advising each one about how to realign their reading strategy. They all showed improvement in realigning their reading and learning strategies, especially in visualising text.

This reorientation, of course, depended in great part on the students' motivation, their comprehension of their own strategies (metacognition) and the backup they received.

At the outset of the project the less efficient readers were chosen by their teachers with the double criteria of borderline abilities in reading and some evidence of a desire to improve.

They cooperated in the tasks we gave them, which they accomplished in good faith and we have little doubt that they were willing to develop.

Yolanda had lately received a mark of 75% in a reading comprehension corrected by her teacher but she said that was not an outstanding improvement on her previous record. Her teacher confirmed this by saying that she tended to hand in uneven work, sometimes well done and sometimes poorly. As regards her strategy improvement she needed to intensify her initial state which was kinesthetic. She felt that the obstacle to doing this was her lack of enthusiasm which she sensed she couldn't drum up. This was indeed a confession of lack of motivation. However, Yolanda bucked up when presented with the University entrance exam and passed with a 9!

Illuminada said that she understood more when she read now, but she couldn't say why. She seemed to have tackled her main problem of enhancing her kinesthetic strategy but she still lacked the metacognition to analyse how to go forward. Illuminada decided not to sit the University entrance exam and received a 5 as a final reading comprehension mark in classwork.

Ismael had acquired the ability to visualize text more efficiently. This was a specific improvement we had advised him to make. His reading comprehension mark in class did steadily increase moving up from 5.5 at the beginning of the year to 6 in the final exam. However, he still didn't believe in his own capacities and said that the mental images he made were unconscious. It became obvious that he didn't have the metacognitive strategies required to allow him to control his intuitive image-making. This can be acquired but only through intensive practice.

Monica, on the other hand, demonstrated a certain metacognition when she distinguished between her different methods for processing scientific and literary texts. She also showed an ability to visualize which she had developed from the previous session. Monica sat the University entrance exam in September and received a 6 in English reading comprehension. This was a better result than that she had received in classwork throughout the year.

Alfredo revealed an important new ability to use visual and kinesthetic mini-strategies in his reading. However, this only appeared after we had practised together. He seemed incapable of the metacognitive work of eliciting these strategies himself. His teacher says that he remained very much a borderline case in reading comprehension during classwork. However, Alfredo sat the University entrance exam for English reading comprehension and passed with a 5.

There seemed to be two basic reasons why these students found changing their strategies so difficult. First, they not only had less efficient strategies than the more capable students, they also had less metacognitive resources. This had already become clear to us when comparing their strategic approach to that of the efficient readers. We obtained more information more easily from the capable readers than we did from these less accomplished ones. This was probably because the more efficient readers had more strategic insight into how they approached reading and so were better able to analyse their own perceptions. This also helped them to improve on their own strategies when necessary. **The less able readers, on the other hand, were less competent at analysing their own strategies and developing on them because their metacognition was less developed and so they were unable to make**

judgments on improvement. In this way, although some did realign their strategy they did it at an unconscious level. This made improvement on their own difficult because they were unaware of progress.

The second reason we believe that these students made slow progress adapting their reading strategies was due to the backup they received. Because of practical circumstances like class timetables, teachers' schedules and such, it was not possible to work with these students in a regular way. The teachers themselves could not take on this responsibility either, since they had not been trained in the methodology. **In any case it has become clear that less capable students need intensive accompanied practice in the new strategy sequences in order to effect change.**

4. Conclusions and Applications.

The most important conclusion of the study can be summed up in a single sentence: most of the efficient readers studied approached reading as an act of learning and so used their habitual learning strategy to read. The corollary to this conclusion is that less efficient learners can improve their reading comprehension abilities by aligning their reading and learning strategies.

Within the comprehensive school system such practical knowledge is of invaluable help to the teacher who is attending to individual differences. Since we know how to elicit reading and learning strategies this precise conclusion is of direct value for the immediate improvement of the quality of reading comprehension in classrooms. The diagnosis is simple and the remedy is straightforward. This makes it all the more readily applicable by teachers and easy to assimilate by learners. Our research has demonstrated the basic pattern efficient readers use and it has pointed to the way in which less efficient readers can be guided to improve their reading strategies. This is a plain process and teachers can be trained to use it in order to understand and intervene correctly to realign less capable learners' reading habits. A previously difficult task is now feasible.

This task is all the more achievable since the modelling method we applied reveals exactly how individual students make sense of their reading. They do this by relating what they read to their previous experience through traceable representation systems which are well-documented in Nlp. This information is concrete and is also verifiable by the teacher intent on helping the student. Thus the instruments to reorient the student are directly available to

the teacher and the whole process can be followed up with great accuracy. This is of invaluable help when dealing with students on a one to one basis.

There is one caveat however, in this statement of feasibility. We found that the less efficient readers were also less competent at analysing their own strategies and developing on them because their metacognition was less developed and so they were unable to make judgments on how to improve. In plain terms they were unable to solve the problem by themselves since they were unaware of their own reading strategies. This became very obvious when the students were asked to practise the new strategies by themselves. They did it in a haphazard way with no real control over what they were changing. To effect change the teacher needs to take this information into account. We would suggest that this can be done by giving less capable students intensive accompanied practice in the new strategy sequences. It is also clear that teaching learning to learn strategies in classrooms will also boost students' abilities to help themselves.
Another application of the study is its extension to all reading situations. The research was carried out using second language readers. However, the real substance of this research is not determined by the language but rather by students' individual strategies. The important coincidence is that of reading strategies with learning strategies. This conclusion touches on each individual's ways of structuring their own thinking patterns. We therefore believe it suggests that these students would use the same strategies to read any language, including their mother tongue. Thus the conclusions of our investigation are applicable in all reading classrooms and we would recommend their implementation there.

Beyond the immediate practicality of improving reading standards we think that the Modelling method of studying efficient learners should be extended widely. Who better can we learn from than those who perform with excellence? The method could be applied to all learning circumstances in education in order to help students learn better, whether in primary or secondary schools, in arts or science subjects. Teacher development could also be enhanced using Modelling methods to learn how efficient teachers teach. It is a precise tool and would provide a bonus to progress in education.

A final word : underlying the Modelling process there lies a deeper level of learning which we have described briefly as a solution to less efficient learners' needs. It also forms the prototype of learning which students will need for the future. It is clearly described in the "The Four Pillars of Education" a UNESCO report on Education in the 21st. Century:

> "... *one of the bases for education in the future is that of learning to know defined as ' learning to learn, exercising attention, memory and thought'."*

Modelling is the precise tool we need to accomplish learning to learn.

Appendix A **Name:**

School:

TEST
Do you know how you read?

Body posture/breathing
Accessing cues
Gestures
Eyes
Language

OPERATION
Do the operation and say how. (observe BAGEL & discuss)
How do you understand this text? (Observe BAGEL & discuss)
When you find difficulties what is your response? (observe BAGEL & discuss)

TEST How do you know that you understand this text?

Appendix B **Name:**
School:

The Key to Olympic Success

Here's how Rebecca Park remembers her first Olympic competition. "A few ..... before the race I felt strong and physically prepared ..... also extremely nervous. I kept on telling ....., `This is very easy. I've done it a hundred times', but when I had to ..... running my legs began to shake and I felt sick and out ..... breath." Every athlete knows the feeling. The ball looks ....., the game seems endless, the arrival looks far away.

At the Olympics, the physical condition of ..... athletes is as close to perfect ..... human beings can get. The difference between winning ..... losing may all be in the mind. "Olympians have ..... their movements many times, but repetition guarantees only ability, " ..... Muhaly Csiksen, a psychologist at the University of Chicago. "The key is both the type and the amount of attention an athlete pays to the task so ..... he reaches the right mental state."

A mind "in flow" - as psychologists call this mental state - can make an athlete invincible, but getting there is ..... easy. Almost every sport now consults ..... to help athletes integrate mental focus with physical ability. Visualisation,

self-hypnosis, and tapes of simulated competitions are ..... to create a link between mind and body. For..... tennis player Steffi Graf repeats key words aloud to keep herself focussed. Swimmer Tom Dolan visualises every arm movement before and ..... the race. Runner Carl Lewis "talks" to every single muscle of his legs while running.

Though the psychologists might not be sure ..... is happening when an athlete's mind is "in flow", they know a few things about it. Ironically, the harder athletes try to win, the ..... likely they are to be "in flow". "When you are thinking about the result instead of what you are doing, you have lost all your chances ..... win, " says Shane Murphy, a sports psychologist.

Appendix C

The Future of the English language

English seems to be everywhere. But what is its future? I invite readers to reflect on three political and cultural developments that will shape the use of English at the end of our century.

The first is the remarkable rise in multilingualism. More people than ever before now use two or more languages. As Peter Strevens, a famous linguist, often pointed out, those who command only one language are at a distinct disadvantage, especially those monolinguals (including English-speaking monolinguals) who need agreements and commerce from language communities richer or more powerful than their own.

A second factor will have an even greater impact far from approaching the status of a universal language, English is diminishing proportionately as explosive birth-rates are changing the balance of the world's population towards other language communities. No doubt English is the most frequently chosen "additional" language, and will, most probably, continue to enjoy that popularity. But even the major centres of the

Anglophone world (Britain, Canada, the United States, and Australia) are becoming more and more diverse in languages and language varieties. These demographic facts have implications for the future of English and for the kinds of languages we will use in the future.

A third question that merits our present consideration derives from research in second-language instruction. For those acquiring a new language, attitude is the most influential of the variables that predict the success of learning. It is more important than age or teaching methods. Consequently, attitudes towards English are strong predictors of uses of English that will, in the future, shape its form and purposes.

Appendix D

Greenpeace

They are called eco-commandos, nature's soldiers, and even green mercenaries. Some people think they are the modern David who fight with powerful Goliaths. Greenpeace's philosophy of direct action and civil disobedience to promote awareness of environmental issues has become famous all over the world. The media love them because nobody can be indifferent to images of baby seals being killed by hunters, or images of brave people who stand up against soldiers and police officers to stop pollution in rivers or nuclear testing.

Greenpeace started off as a small organization in 1971 but today it is a multinational with 4.5 million members, more than 1000 employees and operations in about 30 countries. Their campaigns take the form of boycotts, shocking films, secret videotapes, litigation and loud demonstrations. Nowadays they are protesting against French nuclear testing in the Pacific Ocean, against the construction of an uranium enrichment plant in Clairborne (USA) and against some oil companies in Europe. Thanks to Greenpeace and other similar environmental organizations, companies and governments cannot do whatever they want any longer because they are afraid of the consequences. For instance, French President Chirac

has lost much electoral support in his country and in Germany a well-known oil company has lost 30% of this year's profit because of the consumer boycotts promoted by Greenpeace. However, now that the world has become conscious of environmental issues, many in Greenpeace feel that it is time to change. They are suggesting more docile approaches, such as working together with businessmen to produce more and better recycled plastic and educating companies on environment-friendly production methods. All in all, it is not about replacing their 1970's philosophy, but adapting it to a modern society that in the last 25 years has become more aware of how necessary it is to take care of what nature offers us.

Appendix E

Individual student results

1. Efficient learners

Sira:

Test: A - K - V

Operation: V_e - Ad - Ae - Ki - Vi - Ad

(reading metaphor: It is as if I explained it to myself .)

Test: A - K - V

Joan:

Test: V - A_d - K

Operation: V_e - Vi - Vi - Vi -Vi

(reading metaphor: I grasp the idea and tell myself I understand. I feel it's credible.

Test: V - Ad - K

Enric:

Test: V - K - A

Operation: V_i - Vi - Vi - Vi - Vi - Vi

(reading metaphor: It's a sequence of slides, of coloured images. A text is a story.)

Test: V

Rosa*:*

Test: K - A_d -V

Operation: V_e - Ad - Ki - V - V

(reading metaphor: I explain it in my own language.)

Test: K - Ad - V

Raquel:

Test: V - K - A_d

Operation: V_e - Ad - K - V

(reading metaphor: It's like doing a puzzle.)

Test: Ad -V - K

Ana:

Test: V- K -A

Operation: V_e - Ki - Ad -Vi

(reading metaphor: It's like photographing the text.)

Test: V - K - A

Olga:

Test: A_d - K - V

Operation: V_e - Vi - Ad - Ad

(reading metaphor: It's like making pictures of words.)

Test: Ad - K - V

Ivan:

Test: K - V - A_d

Operation: V_e -Vi - Vi - Ad - Ki

(reading metaphor: It's like someone telling you where the text is going.)

Test: K - V - Ad

Elisabet:

Test: V - A_d - K

Operation: V_e - Vi - Ad - Ki

(reading metaphor: It is as if I was taking photos or movies.)

Test: V - Ad - K

Albert:

Test: V - K - A

Operation: V_e - Ki - A - Ki - Vi - Ki

(reading metaphor: It is a set of images and sensations.)

Test: V - K - A

Arnal:

Test: V - A_d - K

Operation: V_e - Ad - Vi -Vi - Vi - Ki - Vi

(reading metaphor: Comprehension is assimilation.)

Test: V - Ad - K

Desirée*:*

Test: V - K - A

Operation: V_e - Vi - Ki - Ad
(reading metaphor: It is as if I explained it to myself .)
Test: V - K - A

Olga:
No information elicited from this candidate

2. Less efficient learners

Alfredo*:*
Test: A_d - V - K
Operation: A_d - Ad - Ad - Ad
(reading metaphor: I trust myself .)
Test: Ad - V - K
Exit: More resources in V and K

Yolanda:
Test: K - V - A_d
Operation: V_e - Vi - Ke - Ad
(reading metaphor: It's like someone telling you and you and you take photos of it.)
Test: A - K - V
Exit: Use more K in texts.

Iluminada*:*
Test: K - A_d - V
Operation: V_e - Ad - Ad - Vi - Vi
(reading metaphor: It is as if I explained it to myself .)
Test: K - Ad - V
Exit: Get into K state before reading.

Ismael*:*
Test: V - A_d - K
Operation: V_e - Ad - K - Ad
(reading metaphor: -----)
Test: V - Ad - K
Exit: Make more images when reading.

Monica*:*
Test: A_d - V - A
Operation: A_d - Ad - Ad - V - Ad
(reading metaphor: ------)

Test: Ad - V - A
Exit: Make more images from text.

Appendix F

Submodalities

Visual Submodalities
BRIGHTNESS: dim - %5,*+7
SIZE: large - small
COLOUR : **black** & white - colour
MOVEMENT: *fast* - slow - still
DISTANCE : near ------- far
FOCUS: **clear** - *fuzzy*
LOCATION

Auditory submodalities

VOLUME: ORXG- quiet
TONE : **bass** - treble
PITCH: high - low
TEMPO: *fast* - slow
DISTANCE: close ----- far
RHYTHM
LOCATION

Kinesthetic submodalities

INTENSITY: **strong** - weak
AREA.: large - small
TEXTURE : rough - smooth
DURATION : constant - inter.mit.tent
TEMPERATURE: *hot* - cold

WEIGHT : **heavy -** light
LOCATION

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