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Learning to Learn to Think: Investigating Compensatory System 2nd Years' Learning Capacities at the University of Constantine

Thesis submitted to the Department of Languages in candidacy for the degree of
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أَخِي لَنْ تَنَالَ العِلْمَ إِلَّا بِسِتَّةٍ سَأُنْبِيكَ عَنْ مَجْمُوعِهَا بِبَيَانِ
ذَكَاءٌ وَحِرْصٌ وَ اجْتِهَادٌ وَبُلْغَةٌ وَصُحْبَةُ أُسْتَاذٍ وَطُولُ زَمَانِ*

Thou shan't get knowledge lest six thou shalt implement
So here there art, for thee I fix in easy rime.

Smartness, eagerness, go-go will, 'n' accomplishment
All go with a teacher's company, patience 'n' time.

*ديوان الشافعي (1998)
دار الهدى، عين مليلة

‘I *daresay* that the compensatory system is the *gravedigger* of pedagogy in our universities’

Nacif Labed

Dedication

This thesis is dedicated to my wife, and to my kids: *Wiem* & *Weil*, my most loving supporters.

This dissertation is utterly dedicated to my late mother, *may she rest in peace*, amen! Thank you for your genes, mum!

The dedication also extends to *Si* Lazhar, father, friend and mentor by whom I was first motivated to learn and think. May he be blest now and forever!

This work is also dedicated to my brothers, to my sisters, and to all the extended family; and to my in-laws.

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Abstract

This dissertation, a total of eight chapters aims at describing and analyzing how learners behave while they make the efforts in learning and thinking. For this, it was hypothesized that is that our learners can learn effectively and develop their thinking abilities and utilize learning strategies if a learning atmosphere is created for them in which they behave without giving absolute priority to the compensatory system. Data was collected through a series of questionnaires administered to teachers of different disciplines) and to 2nd-years students at the Department of English, plus the researcher's classroom observations. These research instruments intend to investigate the students' learning and thinking, and thus decide for specific course objectives to be attained. All this was to be sustained by an appropriate methodology. The general objective is that students should learn how to adopt a learning pattern to learn the language they are learning, i.e. *learning to learn* in concert with activating/re- activating their thinking potential and abilities, namely *learning to think.* This research also aims at showing that what is happening in the department of English (and probably elsewhere) is that learners have developed an attitude vis-à-vis learning which is to rely entirely on a Samaritan compensatory system which has made them indefatigable least-efforts learners. A total of two experiments were designed with the intention to study the effect of building awareness in learners for working without relying on the compensatory system, but rather on their learning and thinking efforts and potentials. The results tend to show that first, the compensatory system turned out to be the gravedigger of pedagogy in the department of English (and probably in all Algerian universities!), a fact which all the teachers agree upon. This ends up in that learning and thinking are 'sentenced' to be limited to getting a pass mark.

الملخص

تهدف هذه الرسالة في ثمانية فصول إلى وصف وتحليل سلوك المتعلمين حين يبذلون جهودا في التعلم والتفكير. تم تقديم الفرضية أن المتعلمين يمكنهم التَّعلمُ بشكل فعال وتطويرِ قدراتهم في التفكير واستخدام استراتيجيات التعلم إذا تم خلق جو تعليمي يتصرفون فيه دون إعطاء الأولوية المطلقة للنظام التعويضي. تم جمع البيانات من خلال سلسلة من الاستبيانات التي تم إجراؤها علىالأساتذة من (مختلف التخصصات) وطلاب السنة الثانية في قسم اللغة الإنجليزية، بالإضافة إلى ملاحظات الباحث في الفصول الدراسية. تهدف أدوات البحث هذه إلى التحقيق في كيفية تعلُّم الطلبة وتفكيرهم ، وبالتالي تحديد أهداف الدورة التدريبية المحددة التي يتعين تحقيقها. كل هذا كان يجب أن يستمر من خلال منهجية مناسبة. الهدف العام هو أن يتعلم الطلاب كيفية تبني نمط التعلم لتعلم اللغة التي يتعلمونها ، أي تعلَمُ التَّعلمِ بالتنسيق مع تنشيط / إعادة تنشيط إمكاناتهم وقدراتهم في التفكير، أي تعلم التفكير. يهدف هذا البحث أيضًا إلى إظهار أن ما يحدث في قسم اللغة الإنجليزية (وربما في اقسامٍ اخرى) هو أن المتعلمين قد إتخذوا موقفًا تجاه التعلم وهو الاعتماد كليًّا على نظام التعويضي/فاعل الخير جعلهم اصحاب الجهد القليل. تم تصميم تجربتين بهدف دراسة تأثير بناء الوعي لدى المتعلمين حتى لا يعتمدون على النظام التعويضي، بل على جهودهم و امكانياتهم في التعلم والتفكير. تم تحليل النتائج إلى إظهار أنه أولاً ، تبين أن نظام التعويض هو قاتل البيداغوجيا في قسم اللغة الإنجليزية (وربما في جميع اقسام الجامعات الجزائرية!) ، وهي حقيقة يتفق عليها جميع الآساتذة. ينتهي هذا الأمر في أن التعلم والتفكير "يُحكم عليهما" بالاقتصار على الحصول على علامة النجاح.

Résumé

Cette thèse, d'un total de huit chapitres, vise à décrire et à analyser le comportement des apprenants lorsqu'ils font des efforts d'apprentissage et de réflexion. Pour cela, une hypothèse a été émise et que les apprenants peuvent apprendre efficacement et développer leurs capacités de réflexion et utiliser des stratégies d'apprentissage si une atmosphère d'apprentissage est créée pour eux dans laquelle ils se comportent sans donner la priorité absolue au système de compensation. Les données ont été recueillies au moyen d'une série de questionnaires administrés aux enseignants (de différentes disciplines) et aux étudiants de 2e année du Département d'anglais, ainsi que des observations en classe. Ces instruments de recherche visent à s'enquérir sur l'apprentissage et la réflexion des étudiants, et ainsi décider des objectifs spécifiques du cours à atteindre. Tout cela est soutenu par une méthodologie appropriée. L'objectif général est que les étudiants apprennent à adopter un schéma d'apprentissage pour apprendre la langue anglaise, c'est-à-dire apprendre à apprendre de concert avec l'activation/réactivation de leur potentiel et de leurs capacités de réflexion, c'est à dire apprendre à penser. Cette recherche vise également à montrer que ce qui se passe dans le département d'anglais (et probablement dans d'autres départements) est que les étudiants ont développé une attitude vis-à-vis l'apprentissage qui consiste à s'en remettre entièrement à un système de compensations plutôt Samaritain qui les a rendus infatigables apprenants du moindre effort. Dans le but d'étudier l'effet de la sensibilisation des apprenants à travailler sans compter sur le système compensatoire, mais plutôt sur leurs efforts et leurs potentiels d'apprentissage et de réflexion, deux expériences ont été conçues. Les résultats tentent à montrer que d'abord, le système de compensation s'est avéré être le fossoyeur de la pédagogie dans le département d'anglais (et probablement dans toutes les universités algériennes !), ce sur quoi tous les enseignants s'accordent. Cela aboutit à ce que l'apprentissage et la réflexion sont «condamnés» à se limiter à l'obtention d'une note de passage.

Abbreviations and Coding Conventions

LMD	Licence Master Doctorate
C.A	Chronological Age
C.R	Conditioned Response
C.S.	Conditioned Stimulus
E.A.P	English for Academic Purposes
E.F.L	English as Foreign Language
E.O.P	English for Occupational Purposes
g	general factor
G.E	General English
I.Q	Intelligence Quotient
I.V	Independent Variable
S.R	Stimulus-response
T.T.T.	Teacher Teaching Time
U.R	Unconditional Response
U.S	Unconditional Stimulus
F.L.	Foreign Language
G.P	General Purpose
N.S	Native Speaker
S^2	Variance
SD	Standard Deviation
S.S.T.	Student Speaking Time
T.L	Target Language

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General Introduction

Chapter 01

General Introduction

Rationale

This research attempts to explore the fundamentals of two related milestones of the cognition act: learning and thinking. These two are firmly grounded in the cognitive enterprise and represent its corner stones. Learning means to employ a set of strategies to make possible comprehension, acquisition, retention, retrieval, and application of information (Hedge.2000). On the other hand, thinking means to consciously process information in the mind to find a thoughtful solution to a problem. In other words, a puzzling problem is broken down to its components and then it is re-built up again and synthesizes it into a novel final form (cf. Sternberg.1995). In the process of thinking, people learn to decompose and compose a puzzle or a quiz to find out how to solve it, and in learning and use their thought and mind to find a way, a pattern to follow to utilize their mental and cognitive capacities to 'survive', to extend and to transform the milieu in which they are evolving.

1.1. Statement of the Problem

Students come to university to learn a language to later utilize it for their own 'survival', for their job, or for their manifold communication purposes. Thinking and learning are firmly grounded in tertiary tuition. Indeed, at the university level, students are expected to behave in a more elaborated manner than they used to while they were in their respective high schools. At university they must set free their imagination, creativity, and

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***** For ease of exposition, the pronoun 'he' will be used in its genetic sense throughout this research.

problem solving capacities which the tertiary tuition is all about. In other words, at the university -more than before, it is likely improbable that English as Foreign Language (EFL) learners would learn the language they are learning, extend the environment in which they evolve, and broaden the scope of their knowledge –together with between-the-lines knowledge- and their wit without first using appropriately their learning capacities, *in concert with* their other mental and thinking abilities. In primary school, middle school, and high school, the gate keeper of ideas, information, and knowledge is the teacher, the imperious deliverer of the truth and science. In the university, things are different. For obtaining knowledge and science, the gate keeper is the learner himself; the teacher is a facilitator and a motivator. The learner has *to learn to learn*, as well as *to learn to think* to judiciously employ the maximum of his grey matter potential to achieve the purpose of acquiring a knowledge which *he set himself to acquire.*

1.2. Aims of the Study

The guiding commitment of this research is that while dealing with human minds, not dead matter, an intrinsic kaleidoscopic compensatory system tends to distort the pedagogic objectives which teachers set themselves to reach, together with the expectation to see learners active members in the little *g* fan club.

Sternberg (1995) explains that in a wise investment, it is to buy low and sell high. In the classroom, as a matter of fact, once the teacher has convinced the 'other people of the worth of his idea, this [teacher] moves on to the next idea' (p.363). The compensatory system as it stands and regulates the language policy does not allow such an investment to take place. Learning the foreign (target) language is reduced to rote learning and to giving/obtaining a pass mark be it a bad one since compensation guarantees to balance out any deficiencies.

The basic findings about a deeper recognition of learning to learn and learning to think through a habituation of learners not to consider the compensatory as a good means for succeeding without *truly* learning, and without making the *real* effort of thinking appear to agree with our contention to make of that habituation an approach to the T.L while learners learn and utilize their thinking potential. This adopted view and other closely related views which are being reflected here, will be discussed in some detail in this study, in order to bring more support for the hypotheses.

1.3. Research Questions and Hypothesis

As a matter of fact and for the purposes of our present research, the researcher tries to answer the following questions.

1. Do students learn only by relying on the compensatory system?
2. Do students develop any strategies while learning?
3. Is the learning atmosphere appropriate for students to grasp the language they are learning?
4. Do students have any knowledge of the existing learning strategies?

In considering these questions, it can hypothesized that our learners can learn effectively and develop their thinking abilities if they find a suitable learning atmosphere in which they behave by developing an awareness about the usefulness of constructing a solid knowledge by utilizing learning strategies without giving priority to the compensatory system..

1.4. Research Population: Random Sampling and Null Bias

The research population is a sample of one hundred second year students (N=100) taken from the parent population of 280 English B.A students of the Department of Languages,

University of Constantine. For randomization, the researcher chose 04 groups ogf25 students each. The reason for working with second-year students is that they are students who have gone through a whole year of tertiary tuition and they are liable to know enough about learning at the university.

1.5. Research Tools and Methodology

The research population were administered two sets of questionnaires (cf. Appendix # 1 & 2), one entitled the motivation questionnaire, or the *MotQuest* which intends to know the motivational profile of the sample, what pushed them to learn English, to see if someone has helped them choose their stream; their relationship with their peers, their teachers. Questions were also put to enquire about they behavior outside and inside the classroom, and other related questions.

The other questionnaire entitled *The General Information Questionnaire* or the *GenInfQuest* tries to ask questions the former questionnaire does not ask. If both questionnaires seem to ask the same question –which is not repetition- it is because we want to reinforce our quest for really understanding who our population students are, how they think, and which positions do they [really] take vis-à-vis the points raised in the questions. Generally, when the questions are the same in both questionnaires. The questions were formulated in a different way (cf. Tables 03 & 20; Tables 11 & 25 or Tables 34 & 18).

A third questionnaire is administered to 16 teachers at the department (cf. Appendix # 03). This questionnaire probes many aspects of teaching, namely the teachers' way of teaching, their opinions about the program, and many other pedagogic aspects of interest in this research. The results of the questionnaires brought light to many points in the research about the learning and the thinking capacities and anilities of our learners.

1.6. Structure of the Thesis

The research consists of seven chapters. Chapters *Two*, *Three, Four, Five, Six* and *Seven* are about the theoretical background of the basic assumptions: *Learning to learn* and *learning to think.* In the subsequent Chapter *Eight*, the results of the experiment on the effect of building awareness about not relying too much on the compensatory system are described and interpreted in some details.

Chapter Two is about a discussion of learning and the learning act and its other different dimensions. The discussion is also about the relationship of leaning and the brain, and the Wernicke or Broca's areas of the brain that harbor particular linguistic functions. The study of these areas has been substantiated by the works of Kimura (1993) who has observed that his patients with brain damages, in the spina fida (Cromer.1994) have been found to have language deficits, as well as cognitive impairments. Piaget (1983) and Karmiloff-Smith (1979) have also observed that cognitive impairment entails linguistic retardation. Such brain-and-mind relationships have in the 1920's given rise to Emergentism, an empiricism which explains the relationship between the brain and the non-physical mind.

In fact, such a relationship between the brain and the non-physical mind has long ago triggered the cogitations of the ancient Greek philosophers who wanted to understand how learning occurs. To Aristotle, learning occurs with associations, and under the impulse of stimulus, and we also learn by associations, or the trigger chain, in which an element calls for another, and like this (McMahon.1999; Sternberg.1995).

In present times, Pavlov (1928) has set the principles of classical learning or classical conditioning; also known as stimulus-response. The conditioned response –the salivation of the dog- is due to a conditioned stimulus –the sound of a bell. The dog learns to respond to

salivation whenever food or any other stimuli, the concept of generalization, and gradually ceases to respond when the stimulus is no more presented the notion of extinction. Such a classical conditioning has served, in the long run, to step the way to truly understand the whole process of leaning. Concepts like *operant learning* have come up to investigate how learners, as well as people at large, act upon the environment in which they live. The studies of Thorndike in operant conditioning have brought about the law of trial-and-error exploration of the environment. Giving bonus mark to students for a good answer will, in all likelihood, push them to always try to do well to make the same reward occur again and again. (Skinner.1953; Gardner. 1983, and elsewhere).

Learning is also observing people's behaviors, as a student does inside the classroom imitating his teacher. Such social learning -observational and experiential- results from assimilation, representations of people's behaviors, and modeling; it is a communal activity, a sharing of culture (Bandura.1977; Bruner.1986). All this help shape the behavior of learning of learners, that is *learning to learn* how to construct their own knowledge.

Chapter Three, closely related studies to this research are discussed in some detail within the quest of learning and learning to learn. Indeed, authorial research has been carried on language learning strategies to try to determine how much these are prominent for any learning behavior. The final aim of the research is to inculcate in the learner –at large- the awareness of the utilization of learning strategies for the acquisition and the construction of knowledge. The ultimate aim is to try to see if such an attempt to raise awareness finds its way with the *compensatory system- bound* learners.

One of the important accomplishments in learning strategies studies (cf. O'Malley (1990); Oxford (2000) is to investigate how much these strategies have been/are employed by teachers in their different teaching tasks, and by learners while learning. The

propounding principle in pedagogy tends to be that in *teaching the teacher does not teach, but students learn*. Of course, this principle does certainly not mean that the teaching activity is reduced to presenting core matter to the students asking or expecting them to change it and develop it into comprehensible knowledge.

This is not so because, as a matter of fact learners have little or no opportunities at all to receive language outside the classroom (cf. Kougaro.1993). Worse, the overwhelming majority of our learners has never been, and will probably rarely if ever go to the English-speaking community (for visa and financial reasons) to supposedly practice the language they are learning [listening and speaking/communication skills]. At any rate, for the aforementioned impediments and probably for others, we did not discuss in the present research the idea of 'going out there' (to receive the desired linguistic bath) as a learning strategy. Thus, the learners' possibilities for picking up the language they are learning remain confined within the confined province of the classroom with –at the end of their tuition- to function in a non-English situation (Lowe.1981). To parry this, one is to provide them with a total all clear about what these learning strategies are, how to utilize them and how to profit from them in constructing their personal idiosyncratic way to gulp knowledge. For this, one does not expect the different learners to employ evenly the learning strategies. One cannot expect [to witness] an explosion of concepts either, but still –as practitioners– to bound themselves to inculcate idiosyncrasy, together with self-awareness, and to never be afraid to kick open and anthill (cf. Honey. 1998). The idea that *learning to learn*, central in this research, represents the essence of the teachability of the learning strategies.

Chapter Four is a discussion of memory and how to enhance effective memory in students. Memory is an active process that helps construct a stock of information (Neisser.

1982). It is also a dynamic process with mechanisms which helps retain and to retrieve information whenever needed (Crowder.1976; Sternberg. 1995). Studies by Atkinson and Shiffrin (1968) see that memory is threefold: sensory memory, short-term and long-term memory.

The active dynamism makes that what is stored in the long-term memory is judiciously and regularly updated and renewed, actively worked out and exchanged with the short-term memory, also known as working memory (Baddeley. 1980), as the Atkinson and Shiffrin model (1968) shows. The human brain processes the information, processes and transforms these stimuli [into cerebral waves] into coded information, stores them, and retrieves them whenever necessary. Such sensory memory helps us remember icons, colors, sounds (echoic store), and figures. People utilize as aids for memory mnemonics as 15GCE 15 Pizzas which stands for *15 girls can't eat 15 pizzas* and many more similar ones (Sperling.1960, Anderson.1995). Perception and attention help detect a new stimulus and giving it a particular meaning according to data that has been already internalized, and internalizing it in terms of [Gestalt] patterns and wholes (Russel.1961; Saadi.1990).

The short-term memory, later coined by Baddeley (1986) as Working Memory, is the corner stone between sensory memory and long-term memory. In the two last decades, starting from the work of Baddeley (1986, 1998), working memory is described as comprising a central executive, a phonological loop, and a visuospatial sketchpad (cf. Woolfork. 2004). The central executive supervises, rehearses, retrieves, makes plans, and integrates in-coming data (Brown 1958; Peterson et al 1959). It is the headquarter of all the memory operation for which it requires the help of the phonological loop and the visuospatial sketchpad. The first is a system that stores a limited number of sounds for a limited period of time (Gatherhole.1997), whereas the second stores images and icons.

People visualize what is being told by giving it a spatial representation in the form of *a scene or occurrence* (cf. Woolfork.2004).

The long-term memory, or the long-term reservoir, has the particular characteristics of capacity and duration. The capacity of the long-term memory is much greater where information is securely held, through rehearsals basically, for a longer time for long-term requirements and future needs and applications. Long-term memory hosts also the explicit memory, or the consciousness-driven memory; and the implicit memory, which deals with habits as we feel involuntarily afraid to sit for an examination even if one has revised well for it (Wolpe.1969; Mook.1982). Long-term memory also hosts the procedural memory, the habits skills and the way of doing things.

Remembering is most of the times coined with forgetting. It represents the other side of the coin. With the passage of time, and with the diminution (or disappearance) of rehearsal, memory traces decay (decay theory) which causes us to forget (Anderson.1995). Furthermore, people also forget a piece of relatively old information when new information *interferes* with (interference theory) *and* displaces it in the short-term store. Put in a nutshell, one can say that memory plays a redoubtable role in learning and it is hard to conceive how could one simply learn or think or do anything without the help of our memory.

Chapter Five is a discussion of what thinking is all about. Thinking is to consciously process information to find a thoughtful solution to a problem. It is an operation of deconstruction, analysis synthesis and of reconstruction. Thinking develops in society and acts upon it. Vygotsky (1978) sees that the process of cognitive development is greatly dependent on social interaction. He identifies a Zone of Proximal Development as being the distance between solving a problem by our own capacities (individual thinking and idiosyncrasy), and under the tutelage of an adult.

To Piaget (1954 and elsewhere), our cognitive processes change radically as we strive to understand the world in which we live through maturation, activity, and social experiences. The thinking process can be categorized as problem solving; decision making; reasoning, and creativity. Before solving a problem, we have first to understand its contours, after which we solve it by taking different routes and approaches. Taking a [final] decision could be one aspect of solving a problem. In striving to do so, the researcher, again, took recourse to many optimal decisions, using a matrix of correspondences in which we draw all the elements that compose the problem to try to solve it (Greeno.1991; Matlin (2003). By so doing, people try to seek the maximum of pleasure and avoid pain (Sternberg. 1995) as they weigh the positive and the negative utilities and seek the highest possible utility. Satisficing is to choose an option; the one which people see satisfies their need to solve a problem.

A problem is also solved by reasoning. When reasoning, people choose among many alternatives, but do not always make a well-thought decision. In the realm of thinking, there are sets of rules that tell what to do, how to do, and when to do. People sometimes try to deduce from general premises through syllogisms to [finally] arrive to a logical conclusion. Conversely, they may reason inductively, through analogies and classifications, moving from specific facts to reach a general conclusion.

Creativity is another stance of thinking. Some believe that for solving a difficult problem, it is advisable to give it to a lazy man because he will find the easiest way to solve it. He creates a new idea, a theory, or a new style. Thinking is an issue of paramount importance. Some light will be shed on all its components, all of which are important. Using the appropriate heuristic is most of the time done thoughtfully. If one can implement in our learners [all] these aspects of thinking, one can then be confident that could stop the badly

influential compensatory system, making of learners true thinkers.

Chapter Six is an attempt to discuss intelligence which is closely related to thinking. Intelligence seems commonplace to many who think that we are born with a potential of intelligence. Others see that we acquire it from experience and from the observation of the others. If this is intelligence, could we know how much one is intelligent *par rapport* another one. The nineteenth century Galton, and the twentieth century Binet (1916) have each one of them tried to measure intelligence by putting a scale of measurements.

Theorizing about intelligence, Galton's observations led him to think that gifted people have the capacity and the energy to do things which ordinary people can't. Wechsler's (1950) findings, less [racially] discriminating found that the same people can do good or bad on the same large number of tests. Accordingly, denotes the state of being intelligent, but does not explain it.

Alfred Binet (1916) on his part, with his colleague Theodore Simon devised tests that measure intelligence. For this Binet's (and his colleague) findings were also discriminatory, but not in Galton's sense. The discrimination Binet brought about concerns more realistic about mental age according to which an individual judges well, comprehends well, and reasons well. People develop a good sense, or a practical sense with which they customize with their environment.

Spearman (1927) a psychometric psychologist has put forward in his treatise the idea of a multilevel hierarchy dimension to intelligence. He elaborated a two-factor theory of intelligence with at the top a general factor *g* common to all tasks requiring a kick of intelligence which represents the power of reasoning. At the bottom, a fact that differentiates between the mental energy (Sternberg et al. 1982) of people while performing intellectual tasks as problem-solving, and the like.

Since intelligence is not static it, so, develops, and one can act upon to improve it as human cognitive systems are modular and encapsulated (Howe.1997). Since every class is different and every one topic should be considered according to its specific core ideas, issues, and most of susceptibilities to misconceptions (Gardner.1999).

In education, intelligence imposes itself for it molds the way the student reacts to what he does as it is pervasive both in learning and thinking, and it is hard to try to see the latter without the interference of intelligence. In giving marks in examination, teachers probably test their learners' intelligence according to Boring's (1921) definition that 'intelligence is what intelligence tests measure'.

Chapter Seven is entirely consecrated to the situation analysis. The data obtained from the different questionnaires which we administered to colleagues and to learners are described and analyzed. Such an analysis allowed the researcher to have a clear and distinct view about teaching –in general– and how it is conducted in our department. Suggestions concerning teaching and learning in our department are given.

Chapter Eight is about the analysis of the experiments on the effects of awareness building, i.e. in making students think they are not in the compensatory system but to behave otherwise so as not to totally rely on it. The results of the experiment bear about one important research hypothesis (H_1) that making students work without thinking to totally rely on the compensatory system (the independent variable) allows the learner to think more and better activate his cognitive abilities (thinking, memorizing, utilizing learning strategies, reasoning).

Chapter Two

Learning and Motivation

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Learning and Motivation

Introduction

In this chapter, we will show the contours of the operation of learning, how the student learns and internalizes knowledge, and which strategies does he adopt to achieve the operation of learning.

We will try also to demonstrate whether the operation of learning requires from the learner to be intelligent, or whether it simply requires a social exposition to the language he is learning and to the knowledge he* wants to get, that is whether the operation of learning is only conscious or also unconscious.

A discussion is conducted on motivation as a driving force responsible of initiation, direction and vigor of goal-directed behavior. This will be discussed in the light of how to motivate our students to learn to enable them to fulfill in the best way possible their task of learning the self-schemes together with the motivational factors that help them enhance their own learning.

Finally, the process of learning within the theoretical and practical opportunities that our language policy (with the compensatory system) offers, and we will try to shed light on the efficiencies and the inefficiencies that mark the very language policy.

2.1. Learning Defined

Philosophers see that acquiring skills, knowledge and information constitute learning. This learning comes from observation and experience, and this is true to a very great extent. Perception means observation and experience, (as two important modes of

perception being background actions to the process of earning) that is to be aware of something by means of which is the awareness of something by means of seeing, hearing, and which represent the audio-visual tools.

As an operational definition, learning means using strategies defined as specific methods or techniques used by learners (as individuals at large) to first make possible comprehension, acquisition, retention, retrieval, and later, whenever needs arise, the application of information (Hedge. 2001). Using strategies also requires a certain degree of consciousness or cognition, which permits the learner to reinforce his learning, as opposed to rote learning (cf. Lan 2003; Yamamori et al. 2003:381).

At any instance of learning, there is an important interplay between the individual's - the student's brain, his nervous system, and the external environment in which he evolves, which surrounds him, and in which he may find himself alien at times, and to which he responds and acclimatizes, in other times.

To Sternberg (1995), learning is any 'permanent change in the behavior, thoughts or feelings of an organism(…)that results from experience' (p.236). Such an experience could be linguistic and non-linguistic resulting from the external environment (cf. Steinberg et al. 2001). Learning affects the learner's behavior as when put in a [total] different environment as the university environment, for instance, the learner learns new chunks of language in the form of responses or even questions which are prompted by the (sudden) change or demand in the environment in which he evolves.

2.2. Learning and the Brain

The study of the relationship between language production and the brain is not a new one. Broca and Wernicke's discoveries about aphasia give well-documented instances about brain lesions that affect linguistic functions. Studies on these lesions have concluded

to know a lot about the relations between precise areas of the brain and particular linguistic functions. Indeed, many linguistic functions and manifestations are located in the Wernicke's area of the brain -the posterior of the cortex- or Broca's area -closer to the front of the brain- (cf. Sternberg.1995).

Language and other cognitive skills are believed to be a product of separate-skill-specific brain nuclei as Chomsky (1983) and Fodor (1983) see it. To Fodor (1983), who advances the *notion of modularity*, the brain is structured in the form of modular processing units (the computer has the same structuring) each one having a specific function. The processing modules in question are set to harbor the innate 'universal grammars' (specific linguistic structures) which allow the child proceed his linguistic input (Chomsky.1983). Other evidence shows that, for example, the cerebellum (a common brain area) is active when the learner engages in linguistic or cognitive tasks (Leiner et al; 1993a & b).

Kimura (1993), on the other hand, sees that the linguistic spatio-temporal representations, for instance, are innate. Such evidence is supported by a host of different ideas presented about neurological evidence (Hewes.1992; Gazzaniga, 1992). Kimura (1993) has observed that patients with localized brain damage have been found to have deficits language (as well as motor malfunction), suggesting that precisely the damaged area is required for linguistic (and motor) functions.

These brain damages when they occur lead to (severe) cognitive impairments. Such impairments were observed in cases of hydrocephaly and spina bifida (Cromer, 1994). By ricochet, this explains Piaget's assumptions of a sensorimotor cognitive development (1983) as conditional for language development, that, for example, cognitive deficits could entail linguistic retardation (Karmiloff-Smith, 1979). The mind and the body and their intrinsic relationship have triggered the curiosity of researchers as early as the 1920's, in

those times an empiricism called Emergentism was already popular (Morgan.1923). Emergentism is a form of the relationship between the mind and the body as to say that the brain can give rise to non-physical mind (Steinberg et al. 2001).

2.3. Early Explanations of Learning

In Greek times already, philosophers such as Aristotle had discussed the idea of learning and how it occurs. According to him, learning is threefold: 1. similarity; 2. contrast; and, 3. contiguity. So, we learn things when they are similar, or when they are opposites. With contiguity, Aristotle explains when events or sensations occur together [repeatedly] many times; they will become associated -*learning by associations*.

Learning by associations occurs when one of these things or sensations, let us call it *stimulus* occurs, it brings about the other things or associations that have been learnt together, that is they will be remembered, too, that is response. (cf. Wasserman et al. 1997). Such a remembering operates in a chain reaction style as one stimulus brings about the occurrence of another one. Chain reaction remembering can be explained as follows.

Relying on senses, one can remember by making associations as to associate a particular event to an odor, a scene, or a sound. One of these in a trigger chain fashion 'activates a [stimulus] which in turn motivates a subsequent set of [stimuli]' (McMahon. 1999:147)), and like this. If the trigger-chain theory does not explain everything about memorization, it has the merit to give us an idea that our mind works in an orderly assembly line while we are learning. So, we perceive the sensations and events through our senses and our mind, through the executive processor in our mind which understands and stores information.

The concept of association or associative learning is debatable and asks for further validation. To Sternberg (1995) associative learning, after many experiments, has been

found ‘again and again to be among the poorest measures of intelligence’ (p. 337). We will discuss intelligence further down in the coming chapters.

2.3.1. Classical Conditioning

Contiguity, so, with its stimulus and response leads us to deals with another process of learning best known as classical conditioning. Pavlov, the Russian psychologist, had in the 1920’s greatly inspired the works and research on learning of many psychologists and behaviorists such as Luria, Vygostsky, and Leontiev and their followers. They have, later on developed different views in psychology, in learning strategies, stimulus and the response to it, and the other subjects.

Pavlov (1928) has demonstrated with dogs that response *salivation* is generated by a stimulus which is *food*. The same response (salivation) could be obtained by the introduction of another stimulus, the *bell* at the same time as food, and food could be dropped, and the bell becomes the new stimulus for salivation. If the first natural stimulus - food- is closely associated (repeatedly associated) with the neutral stimulus, the
the bell, then the response (salivation) tends to appear immediately upon hearing the ringing of the bell. The animal (the dog) has associated in its mind the coming of the food just upon hearing the bell. This typical behavior is being *reinforced* whenever the experimenter keeps associating, for a certain time, the natural stimulus withy the neutral one. The decrease of the response (salivation) occurs when there is no more reinforcement of the behavior of the animal through the close association of the two stimuli.

So, using three elements: The food, the salivation and the bell/buzzer, Pavlov demonstrated that a dog could salivate after hearing the sound of a bell or buzzer. The contiguous pairing of sound and food is the basis of S-R, that is the association of automatic responses with new stimuli. First, food is an *unconditioned stimulus* (US),

unconditioned because it is needed to obtain salivation. Salivation, on the other hand is an unconditioned response (UR), again because it occurs automatically. When food is replaced by a sound, the latter becomes a conditioned stimulus (CS). The response of salivation after hearing the bell/buzzer has become the conditioned response (CR). Still within the classical conditioning, Pavlov has also identified other processes: *Generalization*, and *extinction*. The first is when the subject responds in an even way to similar stimuli, and the second is the gradual disappearance of a learned response.

Classical conditioning focuses more on the learning of involuntary emotional and physical responses as salivation, sweating, and fear. It happens sometimes that one salivates whenever they remember *anchovies* simply because before they first tasted them in their childhood, they thought they were mere sardines but they discovered that they were very salty.

2.3.2. Operant Conditioning

Undoubtedly, Pavlov's classical conditioning had stepped the way to understanding the process of learning. Different from conditioning and involuntary responses as salivation, another type of conditioning helps also understand deeper and more clearly how learning takes place. Most of behaviors are conscious and rather voluntarily enacted. Furthermore, classroom observation leads to contend that learning is not [all] automatic of unintentional. The alternative is so associative learning, also known as operant conditioning.

As an operational definition, *operant conditioning*, also termed instrumental conditioning, means that learners (and people at large) act upon the environment in which they live. They *operate* 'on their environment to produce different kinds of consequences' (Woolfolk. 2004:203). It is the learning produced by actions or behaviors of persons (or

animals) called operants interacting in and with a particular environment or situation. Thorndike is to operant conditioning what Pavlov is to classical conditioning. Through his famous experiment with the cat in the puzzle box, Thorndike proposed a mechanism called Law of Effect that goes around the concept of trial-and-error search of the environment (Sternberg.1995:250). The guiding principle of such a mechanism is reward and punishment, and our lives in general are principally guided by these two. It is commonly held by this law that the actions for what we have been rewarded and which resulted in pleasurable consequences; these tend to be largely consolidated for we will incite them to reoccur again and again; whereas those actions for which people have been punished and which resulted to aversive consequences tend not to be engraved in their memories, maybe because they will act for not allowing them to occur again. In the same ardor to follow the general law and processes in [basically] the human the capacities to do the things, B.F. Skinner, on the other hand also had a share searching for the basic laws of:

> sensation, perception, memory, attention, and learning, which, once discovered, were assumed to *work equivalently across language(...)across visual and auditory stimuli*, across elementary and complex patterns and problems.
>
> (Gardner.1983:281-2. Our italics)

In his search to conceptualize the principle of operant behavior, Skinner saw that only a minor portion of actions and behaviors has to do with the classical conditioning. To him many human behaviors are operant, especially the *new* operant behaviors. For this he advanced the idea that the environment influences upon our behavior are twofold: actions that precede behavior which he called the *antecedents* and those which come after it called the *consequences*. (cf. Skinner. 1953 and elsewhere).

2.3.2.1. Reinforcement

Since early childhood, parents reward their children for the good deeds, and punish them for the bad ones. In rewarding their children, parents hope to reinforce a particular behavior and do not want to see it fade away. For a maladaptive behavior, they punish for it so that to see it weaken and later disappear from the memory of the child.

A reinforcer is any good result or consequence whose job it is to strengthen the behavior we intend to strengthen and increase its duration and, -it is well hoped- its frequency. Good behaviors in the classroom as 100% attendance, or a bonus mark or a 100% attendance and diligence certificate (cf. Appendix 6) for having been spotted in the library four days a week are meant to persist for the entire academic cycle of the learner (4 years or 3 years for L.M.D. people).

In school as well as in universities, the same mechanisms are applied seeking the same objectives. In old primary school, for encouraging pupils to study and make efforts, teachers used to give them a coupon called *Bon Point good point).* At the end of the academic year, every four coupons collected, the pupil gets a present from the teacher! As a matter of fact, Woolfork (2004) proposes a set of different rewards:

- Concrete rewards as: prizes, stickers, certificates
- Activity rewards as: free time, free reading
- Exemption rewards as: no homework, no weekly test
- Social rewards as: praise, recognition (p.203)

All these rewards have been tried in classrooms with learners and they all gave visible results. Indeed, rewards such as ‘certificates’ (concrete rewards), or the welcomed decision to give ‘no homework’ (‘welcomed’ because most students wish to have no homework at all!) are good rewards helping, first to differentiate between easy going students and hardworking ones. Second and most importantly, entice those who do not want to work to

develop further and greater effort to follow their hard working comrades. It will be sketched it out further down. Furthermore, reinforcement can be seen in the teachers' behaviors as such. For Ur

> There are(…)certain teacher behaviours which can quickly catch or lose learner interest, and it is important to be attentive to their effect(…)Teacher-associated fluctuations in interest(…)can be observed to some extent in all classes.
> (Ur. 2001.282)

In this context, reinforcement depends greatly upon the individual and his particular perception, for a learner 'may choose(…)a course to become more spontaneous in learning(…)a wide range of stimuli' (Roger.1983:159). Reinforcement, thus, comes principally from the teacher, especially when he understands beforehand what his real learners' needs are.

2.3.2.1.1. Negative Reinforcement

However, since we are dealing with human minds and not with dead matter, it is not always true that what does not seem desirable to us may be reinforcement for others. For example, being given a break when a student has a sudden bleeding nose may become reinforcing to this student, a stratagem to escape a particular course -not necessarily with the same teacher, though. Such reinforcement could be considered as *a negative reinforcement*.

By negative is meant here that instead of strengthening, a particular action as when a student provokes a bleeding nose example (someone who has a sensitive nose and bleeds for the simplest touch –I had a case like this in my classes) and the stimulus which is attending lectures disappears. The following figure illustrates this case.

Provoking nose bleeding -	not attending any 'boring' session -	is increased and repeated (behavior)
	(result / consequence)	(effect desired)

Figure 01. The Negative Reinforcement Chain Reaction

2.3.2.1.2. Positive Reinforcement

In contrast, when the behavior produces a new stimulus, then it is called *positive reinforcement*. A bonus mark for a good and an original answer (an answer the teacher did never expect to get from his students) could create new stimulus for it opens up the race for more rewards, as figure 03 shows.

Attendance and diligence	100% attendance certificate-	maintained and copied
(behavior)	(result/consequence)	(effect desired)

Figure 02. The Positive Reinforcement Chain Reaction

To put it in a nutshell, the aim of reinforcement is to increase the occurrence of future response and to maintain a certain desired behavior either on the part of the teacher or by the learner himself.

2.3.2.1.3. Scheduling Reinforcement

Having seen the good aspect of reinforcement upon tuition in general, it grows important; we take, to try to maintain this reinforcement in every class and in every session, keeping what might be called a *schedule for reinforcement.* Such a schedule will have a primary job of ensuring the learning *and* the complete mastery of the [new] behavior wanted and desired precisely because it is what the student needs and wants. As operational definitions, 'n*eed*' means what the student needs and does not know he needs; whereas '*want*' means what a student simply desires.

The teacher is master to judge whether a behavior should be maintained or be decreased. If, for example, he sees that a bonus mark creates in the student(s) some sort of 'gluttony for marks' but not a genuine effective desire to learn, he may then decide to slow down the pace of reinforcement making it intermittent, rather than occurring every time. Indeed, the gluttony for marks may create at times, as our classroom observation revealed, a disappointment when some students answer before others, and thus the latter do not get the so desired mark. This might create as a consequence chaos in the classroom rather than a positive reinforcement as desired primarily by the teacher. What follows is a schedule for our reinforcement.

Type of reinforcement	**Genre**	**How it is carried out**	**The behavior desire**
1. ongoing	in every session	every time an original answer is given	maintain it
2. intermittent	now and then	a quiz	maintain it
3. varying – intervals	when the need for is required	buzz group work / interrogation	maintain it

Table 01. Scheduling Reinforcement

In Table 01, by comparing and contrasting the effects of the different reinforcements at different timings, any other further re-composition or amelioration of the components could be achieved to go in the same direction as the requirements of the learners and the behavior they adopt, or the behavior the teacher wants them to adopt.

Moreover, the reinforcements could also be re-thought, re-distributed, or completely abandoned according to the demands of an established program, or an adapted one, or a matrix that is 'the activities, tasks, and learning experiences used by the teacher within the

[language] teaching and learning process' (Richard.1990:35). It remains, however, advisable that if we want to establish or maintain a behavior, will be more successful if we partially reinforce it (Sternberg.1995). For such a reason advanced by Sternberg, we should always think of a possible re-scheduling of reinforcement, especially for its timing, as to make it at good intervals, 'good' with regard to what the teacher sees fit to his class). Doing so would not, first, make the learner feel the 'assaults' of reinforcement; second, he will not feel it when it stops, or when it disappears. To give a different example is what happens to customers when they discover that, for example, a slot machine that used to work stops to work, they immediately abandon it, whereas, if it sometimes works and sometimes one has to tap on it to make it work, then they will continue using it, and whenever needed they tap on it (T.V serials most often show such attitudes with the coffee or coke machines).

At the other side of the continuum, if reinforcement is withheld long enough, then one should expect the extinction of the behavior, and as far as classroom experience goes, intermittent reinforcement sounds the best.

2.3.2.2. Punishment

Different from negative reinforcement, punishment means decreasing or completely suppressing behavior by applying an unpleasant stimulus or by dropping and removing a pleasant one. The examples of punishment are varied and some could be very serious as being hit, laughed at, humiliated, and suspended of an action; being restricted of the freedom of an action, a negative evaluation, or a reprimand.

A behavior that has been punished is likely not to be repeated in similar conditions, or is likely to change, but to what extent such a change is practical or 'dangerous'? It is not all true that when in punishing a learner or a boy, one necessarily gets the results they desired, things may worsen. Indeed, punishment leads in many instances to the decrease of

certain behaviors, or worse to a complete suppression of such behaviors.

Punishment is viewed differently by different learners. While a student may find that be kicked out of the classroom is a punishment for an unwanted behavior, another student wouldn't see this like that, as the diagram shows.

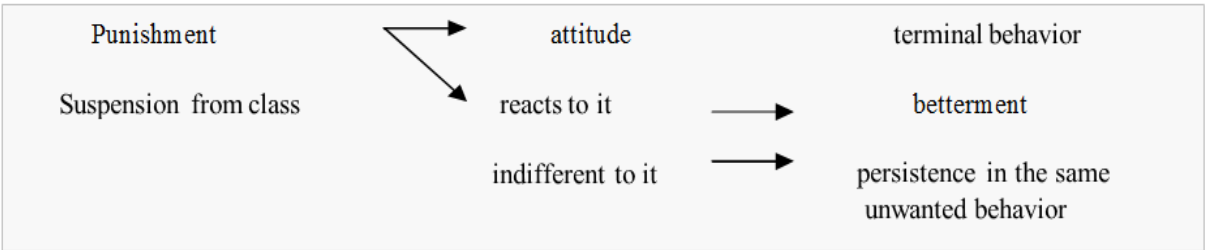

Figure 03. The Punishment Diagram

Punishment, too, may take different guises. In the classroom, the teacher has a panoply of punishments ranging from suppression from course to extra work, suppression of bonus mark (stimulus removal), and so on. The wanted effect is to decrease an unwanted behavior, or the behavior that leads to the punishment.

Considered from another angle, since one does not punish just for punishing (punishment for punishment sake?), punishment –in the form of the teacher's authority- could then be regarded as reinforcement rather than a punishment per *se* especially where the exercise of authority is required when some learners resist learning, that is they don't want to learn. Such force 'or punishment is the most appropriate way of overcoming such resistance in the classroom' (Williams and Burden.1997:57). However, as teachers we should be sensitive to the effects of certain of our behaviors for they can quickly *de*motivate the learner and make him lose interest. For the unwanted behavior, it is the teacher alone who could judge which behavior is suitable and which is not, and this varies greatly from one teacher to another, according to the idea every one teacher makes of *reinforcement* on one hand, and *punishment* on the other hand. Such a difference in

consideration could lead to undesired results if punishment would lead to frustrating the student instead of motivating him, that is, or asking him to challenge himself (as we want him to drop or suppress an unwanted behavior as not doing homework, being absent, or not participating, and so on), as follows presently.

2.3.2.2.1. Positive Consequences

In many instances, when we punish a learner, we always think that it is for his good. Kicking out a student, reprimanding him, or giving him a bad mark does not necessarily mean that we don't like him or that he is a dud. On the contrary, by so doing, we first show him his weaknesses, and second we give him a 'shock' to awaken him and allow him to do better in future. In other words, in applying an unpleasant stimulus (a kind of eye-opener) to get a good response, and later on, one may think of applying a pleasant stimulus to boost the individual towards doing well. Some individuals react well to our punishment. For a bad mark, some learners 'kill' themselves in revision, in participation because they are aware of the punishment, aware also that their teacher did not do so simply to punish them (punishment for punishment sake), but that when he did so, he acted rather as an *eye opener*. When a learner understands such an affinity –which could be made clear to him by the teacher himself- he will change his bad or weak behavior for a better one.

Globally, if such punishments are well administered, they could turn out as motivators towards positive change and progress in learning. All depends on the teacher who remains – as will be presented in the subsequent chapter- the pivot of learning, and the scaffolding upon which relies the entire enterprise of learning.

2.3.2.2.2. Negative Consequences

It is important to note that sometimes 'one man's meat is another man's poison' as, for example, kicking out a student from class because of something wrong he did may be for the student a punishment, while another would *not mind at all*, but would rather find the punishment a release. Punishment may lead therefore to unexpected, and more particularly *unintended* bad consequences, but bad still.

First, a student, instead of avoiding the bad behavior he was punished for, may simply decide *to circumvent* it but not abandon it, or completely change his operant behavior. He may continue to do what he was used to, and whenever in the presence of his teacher, he simply controls himself and hides away all the possible misconducts and shows to his teacher a saint-like behavior. But this is not what is wanted!

Second, the student who has been, say, kicked out of class, reprimanded or humiliated, may *become aggressive* with his mates or with his teachers because he thinks he has been hurt in his self-esteem -receiving a sudden change in his behavior. So, instead of 'regulating' his behavior, the teacher may cause him to distort more his already distorted behavior, and yet, this is certainly not what teachers are after. In his mind the student does not see such a punishment as a motivating force, but rejects it.

Third, the same student *may imitate* the punishment with his friends, at home, or later when he becomes a teacher! So, instead of trying to weaken or decrease a 'bad' behavior in a student we may push him to perpetrate it throughout either immediately or –worse- in the long run. In either case, none of these terminal behaviors are wanted but could be the result of a not well thought, or a well-considered punishment.

2.3.2.2.3. Remedial Attitudes towards Punishment

Thus, things do not always happen in the same way or as we always want them to happen. What follows are some remedial attitudes to correct or even to avoid 'creating' an errant behavior.

- Present alternative to punishment as to suggest a pleasant stimulus if such or such behavior is avoided in future.

- Make sure that the subject being punished understands that his punishment has nothing to do with him as a young individual and that it is not meant to hurt him.
- Make him understand that as long as the operant behavior is demonstrated, than punishment should be expected.

- Make the students understand that we favor penalties, that dropping the pleasant stimulus is better than really punishing (physical, emotional, or otherwise).

Basically, the remedial attitudes (cf. Walters and Crusec.1977) we suggested above can also be changed, bettered, and abandoned if other better alternatives arise. What truly matters is that we should consider punishment not as a means of frightening learners or spurring upon them to be obedient, but rather to teach them the language and at the same time good manners. This is what we should aim at. After all, our students are with us in our classes only for a short period of time, and it is us who shape their future.

2.4. Forms and Functions of Learning

In the light of all this, we can say that the learning enterprise takes different forms and has different functions each one is as important as any other one in the leaning continuum line. We have, for that matter, selected the following few forms and functions of learning.

2.4.1. Preprogrammed Behavior

As an operational definition, preprogrammed behavior means whatever is built to us, whatever one builds in their learners. Preprogrammed behavior or pre-learning (Ur.2001) can take the form of spontaneity –or reflexes; instincts; and later on habituation. The

learner responds to the impulse of a stimulus then he engages into a preprogrammed behavior to respond to such a stimulus. Likewise, the student learns how to comprehend what he is about to do, what he does, or what he intends to do or say. In other words, he is 'characterized by the fact that [his] behavior can be interpreted as "adaptive" in the sense of optimizing [his] chances of survival' (Piattelli-Palmarini.1981:233) in the new environment in which he evolves and which shapes and will continue to shape his 'ever new' behavior for 'ever new' purposes, tasks and achievements.

As an instance, in his new classroom and his new tertiary tuition -that is a totally different environment- the student learns chunks of language in the form, say, of responses or questions which are generally prompted by a sudden change or demand in the environment in which the learner evolves.

In other words, this preprogrammed behavior could take the form of spontaneity or the ability to react without being prepared. We do not mean here by 'without being prepared' the innate language abilities or grammar innateness as put forward by Chomsky (Chomsky.1987; Cook.2003). It is simply the new conditioned behaviors to which the learner is going to be subjected, as it will be highlighted presently.

2.4.2. Scheme and Novelty

I cannot engage any further and write about this aspect of learning in a disinterested fashion without dealing with *scheme* and *novelty* because the very idea of 'scheme' and 'novelty' fuel our present research. With the production of scheme, in the Piagetian sense, that is a pattern of a concept or an idea, the subject, can be then free to make the necessary construction exchanges. Piaget sees that 'the hallmark of cognitive development is a "construction of the new", i.e. the newly acquired experience. In the case of the young child, the newly acquired sensori-motor *scheme* or the pre-cognitive structure, and later on

the true cognitive structure. (Piaget. 1972; Palmarini. 1981) that is psychological construction. Piaget's idea of schema goes with the 'principle of habituation and dishabituation' as put forward by Sternberg (1995). Dishabituation, as he explains, is a change or a little change in a familiar stimulus which in turn prompts another stimulus which the learner has previously become habituated to.

In trying to specify more on the notion of the Piagetian scheme, Case (1978) sees that there are basically three kinds of schemes, viewed, as a matter of fact as Neo-Piagetian, known as: *figurative*, *operative*, and *executive*. The figurative schemes represent all the [internal] representations which the subject knows. If one asks a subject to describe the beaches as, say, El-Aouana Beaches in Jijel, then we can say that the subject has a sensory manifestation of a figurative "beaches scheme". The operative schemes, on the other hand, are the figurative schemes when put into practice, as to ask the learner, for instance, to compare two different beaches. He can show the similarities and the differences of the two beaches which he knows. He has the capacity to represent the notion of sameness to the figurative scheme which he has in mind (cf. Widdowson.1978). Finally, the executive schemes come to make the previous two schemes interfere and act together to determine which figurative and operational schemes the subject has to activate in a particular given situation. Language, so, can be acquired in different ways and through different modes.

Through repetitions, drills, and substantiating exercises, we make our learners learn. Learning does not stop as there is a continuous exposure to stimuli, every time new and changing stimuli. In the course of learning, learners tend to forget old acquired stimuli and turn [and replace them] to new ones. What happens is that we make our learners learn to shift from already familiar stimuli to tune out to other (new) stimuli. Slowly, then, learning tends to become every time a little conscious as learners learn to endeavor to shift direction

of learning any time new needs and stimuli arise.

Such a learning continues to heat debates among cognitive psychologists, and applied linguists, for research in the human mind about how learning takes place can never be exhausted, a matter that seems to be at times somehow uncovered (but only *seems* to be)have been totally uncovered, understood and analyzed. This is so because with every new generation of learners, new learning phenomena surface, and open up new debates. The present work follows this line of thought in trying to analyze and try to understand how learning takes place among a new category of learners: learners in a particular socio-cultural context and at a given period of time.

2.4.3. Reflex and Spontaneity

Some psychologists agree that people are born with a preprogrammed knowledge, namely the *reflex* or as will follow, *spontaneity*. Such psychologists see that a reflex is an animal act, which does not require any cognitive effort from the individual. One view, as far as our students are concerned, is to see that it would be more judicious to wed the two terms together. Reflex and spontaneity both mean 'act without being prepared' (with the difference, though, that to be spontaneous means to respond naturally to things and person in an environment, but at the same time having some understanding of what pushes us to be spontaneous which is not equated with 'reflex' which is a mechanical or automatic reaction), or without a previous good preparation.

Reflex means here that the learner becomes so prepared that he tends (or gives the impression) that his responses are reflex-like. If the first is purely organic, the second has its roots in the schema either in the Piagetian sense as seen by Case (1978) representing the neo-Piagetian sense, as discussed further down.

To give an example, kids at the Koranic School tend to raise their hands (fingers, voice) as a reflex or spontaneously to respond to the pulse of a desire as: moving around the room, moving round for a better look, asking for a leave, or anything else, they do not think about doing it, they simply do it. They act in an 'unconscious' response to a momentary need or want.

The other example of 'reflex' and spontaneity*, also known as *oriented reflex*, is when students raise their hands and erect their heads to show that they know the answer to

Spontaneity takes the form of a mechanical behavior that could be mistaken with

the question posed. This change in behavior is directed and prompted by a change in the classroom environment, which are the teacher's questions and his suggestion of a stimulus in the form, say, of a bonus mark in the exam. The operation of reflex is not fully 'reflex', but a stimulated one, an oriented one, as follows:

- To give students *a ringing bell of some sort* to make sure that they are [or they continue] to follow and be attentive,

- To guarantee that students are being [carefully] trained to become participating individuals, not just passive learners, and,

- To help *maintain* among all learners, however difficult, the desire to follow with *heartthrob* classroom activities, and participate thoroughly in the 'ethos of the classroom' (Widdownson.1990).

Such an attitude from the teacher and an expected response from the learner leave us to envisage that in their long *learning enterprise* spontaneity is what our learners need to

internalize the language they are learning and make it their own (Krashen.1987). For us practitioners, this is what really matters and we should work to attain it.

Innate language abilities, or grammar innateness advanced by Chomsky (cf. Cook, 2003). If spontaneity is thus understood, it is because of the advanced acclimatization of

the individual with the environment he is living in; an acclimatization that has been embedded in him through exposure to language by means of a series of intensive repetitions and drills, intensive different language functions and notions (Wilkins. 1976) as well as other aspects of language.

The other aspect of spontaneity is that innate capacity to discover similarities and our capacity in organizing accordingly our ideas, concepts, and all the other mental representations, our inborn expectations of finding regularities, and our need to find them (cf. Brown and Yule 1984).

Such an innateness of looking for regularities prompts the learner's behavior to act 'without thinking, *that is*, without being prepared'. In other words, it is this spontaneity or 'reflex' which will push our learners towards expertness. The learner trains his brain to organize and classify information so as to bring them out without ado and *whenever necessary*. In behaving likewise, the learner becomes an intelligent individual, *intelligent* in the lay people's sense of the word knowing how to take part actively in an intelligent (not meat-and potatoes) conversation.

2.4.4. Instincts and Intuition

The other kind of preprogrammed behaviors are more than simple reflex, as one such kind is the *instinct*. If we take the same example of students mentioned above, we can see that the oriented reflex to the teacher's question and his stimulus makes, as it is known, the students' brainwave patterns change: Blood flows in their veins, their pupils dilate, their mouths open into a smile, or in a request like 'me, sir, me sir!,' while other students who don't know the answer (those who didn't not revise, or simply the duds) look pale as their veins narrow and blood lessens in their veins; they look afraid [or even sorry] in trying

to avoid the teacher's attention and the worries of his unwanted question. We cannot say that those reflexes are the result of a particular teaching or learning, or that learners have some sort of control upon them (for a particular stratagem); these are mere *instincts.*

The external environment is essential to the learner for it represents the social framework for appropriate social interactional frameworks to grasp it in vivo (cf.Labed.1997). In other words, the learner also needs to be versed in the society at large to be able to identify himself with it, and to create his own idiosyncratic learning paradigms. If any problem arouses, he can consult his teacher for any necessary guidance or councils.

2.5. Social Learning

All the points discussed so far involve the concept of learning that is carried out through classical or operant conditioning. As an operational definition, social leaning means to learn from the others after observing their behaviors, and the effects or the results of such behaviors on our constructed behaviors: Both resulting from assimilation then representations and modeling what comes to be known as the social learning theory (Bandura. 1977). People also learn through their interaction with the others through observation, imitation, modeling, through dialog; it is 'a communal activity, a sharing of culture' (Bruner. 1986).

To Piaget (1974) there are stages across which people continually construct people's behaviors. In his early childhood, the individual conceptualizes actions and representations. Later on between 7 and 10 years of age, he advances to discover functions between the different actions and representations. The individual goes on progressively actualizing his successive and sequential constructions as he gets more and more mature where he continually and progressively interacts with the environment.

In the same vein, the old saying 'like father like son' consolidates Bruner's view of learning as a sharing of communal activities and culture. A child is so often impressed by his father or mother or siblings. The effect the behavior of any of these will be clearly seen in the behavior of the child. In other words, the child learns from the social milieu in which it evolves: i.e. the child has been subjected to a social learning.

The guiding principle of social learning is that there is '*no learning without some laws of learning'* (Palmarini. 1981:301. Original italics). Palmarini adds that for such a fact, no empiricist has ever denied such a fact. Such an empiricist generalization allows tounderstand the vicarious aspect of learning as opposed to the classical learning from direct participation as discussed in the sections above. The vicariousness, that is the experience we get from observing, watching, listening or reading about the activities of other people with whom we live and interact highlights the effectiveness of social learning. Bandura's classical experiment (Bandura. 1965) on children learning to punch a doll [imitating the behavior of others] by observing the behavior of a woman aggressively behaving with a Bobo doll reveals empirically the observational aspect of [social] learning.

Bandura (1965) adds that for such learning no reward or punishment is necessary or needed. At any rate, a layman' attitude to such findings will bring him to understand that a boy who imitates his father for a particular behavior, say, the way he walks, talks, or eats, will not get *de facto* reward, an encouragement, nor a punishment for that. A father who notices such a behavior in his child will probably simply have a self-contentment about being 'aped' by his child, but it's very rare that he would go as far as to kiss him twice for that!

For language learning, the process is not different. The individual becomes with exposure to language and the language environment attuned to such an environment to discover the different ways in which they can be able to recognize, use, and extend what he has already learned towards getting every time a closer approximation of the target language (cf. Candlin et al.1978), or language socialization, i.e

> the process whereby children and other novices are socialized through language, part of such socialization being a socialization to use language meaningfully, appropriately, and effectively.
> (Ochs. 1996: 408)

Researchers in language socialization examine how the foreign language pragmatic ability, the appropriate learning and utilization of language are acquired. For foreign language teaching, for example, the language socialization is seen in the teacher's interaction with his students.

2.5.1. Observational Learning

To Bandura (1965) observational learning is fourfold, respectively: 1. *attention*; 2. *retention*; 3. *motivation*; and 4. *potential reproduction*. (cf. Woolfork. 2004). Having square or goggled eyes, children watch nowadays violent T.V programs in the form of science-fiction cartoons would lead to aggressive and sometimes tragic behaviors. We have all heard of the tragic accident of the little boy who defenestrated himself by imitating one of his [flying] heroes. Such a defenestration resulted from intensive watching of his favorite cartoons, that is his *attention to the behavior of his hero*, and he later *retaining the observed* scene waiting for the right moment to imitate his hero, every time he watches much more *motivated to reproduce the observed behavior* of his cartoon hero, and finally, having watched enough to *potentially reproduce the behavior of the flying hero.*

It goes without saying that social or observational or even 'experiential' learning is not watching and imitating a woman behaving aggressively with a doll, or watching and imitating [sometimes blindly] a hero or a heroine. What is important in observational learning is that it is not of a direct participation of the individual(s). It is most of the time implicit, we do not consciously see that we are learning but we learn it anyway, we rather undergo such learning than undertake it. In other words, in 'vicarious learning', or learning by observing others, we do not imitate per se, we do not look at someone doing something and then [before a mirror] try to imitate or ape him do a particular gesture or any other body movement, or do any other communicative act. We observe people doing, and in the long (or short) run, because we are always with them as social beings, we find ourselves doing as the others.

For example, such vicarious learning takes the form of what we use after we have observed the others do as 'rules of taking conversation turns, the choice of topics for our breaking-the-ice situations, rules of politeness, rules of being active and effective members in a conversation (cf. Kasper.1997), and the like. All these are part of language socialization in which observation –as such- plays a major role.

2.5.2. 'Experiential' Learning: Old Experience, New Experience

On the other hand, 'experiential' learning is not very much different from observational learning. Both rely very much on *attention*, *retention*, and especially *production*. In 'experiential' learning, learning is based principally on learning from the experiences of the others –teacher, father, bother, friend, and so on in which there is 'stimulus variability, multiple talkers, an identification paradigm, and feedback' (Hardison.2003:498).

'Experiential' learning also takes the form of the experiences one gets from their extensive and intensive readings, or listening. From reading alone, for example, the individual learns how to map new words onto the sounds of the corresponding spoken words: it is learning the grapheme-phoneme regularity. In class, the student gets the necessary information from his teacher about the grapheme-morpheme relationship but the teacher cannot teach his students all the possible manifestations of such regularity. It is only through his personal experience with words and sounds that the student constructs his vocabulary and sound repertoire and stocks to use them appropriately and correctly in his communications either in the classroom or elsewhere.

With listening, things are not different. It is through a constant exposure to language that the learner gets the 'experience' of the sounds of English. Hall (1993) posits that through intensive exposure, participation and practice:

> the novice member is eventually able to analyze language [chunks] in their more syntactically and lexically detailed parts which can be used to create(…) interactionally appropriate utterances.
> (Hall. 1993: 149-50)

In teaching, as we will see in the subsequent chapters, observational learning is quite necessary and tends to prompt learning among our students for teaching requires basically *attention, retention,* and *production* and of course a good pedagogic environment and expertise (teacher, program, teaching aids, and so on).

2.7. The Desire to Learn and Motivation

Learning efficiently is a major concern of both the teacher and the learner. The latter, besides his preprogrammed behavior, is expected to involve himself in his learning task, and to develop his own cognition (cf. O'Malley and Chamot.1990).

Viewed from such an angle, the efficacy of such an effective learning cannot be decided a *priori,* but it is rather seen while the student is taking language, that is according to the platform of Needs and Needs Analysis. If the student chooses himself to study one particular subject (namely English), and not another, this would put him on a good spot for he would demonstrate a good sense of *will to learn*, and he, therefore, would be expected to become motivated to learn. As a consequence, the student is expected to learn easily, he would perceive, retain, and retrieve language with easiness and enjoyment. (Perception, retention, and retrieval will be substantiated further in the following chapters).

The will to learn means the attitude learners have 'toward investing effort to learn' (Yamamori et al. 2003:387). This could be seen in the degree of the motivation our learners have. Motivation is manifold, and is certainly complicated if one tries to understand where it begins, how it develops, and how, why, and it stops, as we will see further down. Above was discussed the pertinent role of the teacher in the whole process of learning, what follows is a discussion of the inevitable effect and impact that the teacher has in his class with his learners.

It is the teacher who indeed determines the level of motivation or arousal in his learners when he presents to them an activity such as brainstorming to work on, or a task which invites competition or cooperation. With this, the teacher will check how much 'effective learning' (Child.1980:53) takes place in his class and among his learners. If learners take on seriously the activity they are set to do, the task or the activity the learner performs generates interest and enjoyment, then the will to learn is rather more profound and more interesting to study: it is intrinsic. If, on the contrary, some students work a little, or as in buzz groups (work groups) one or two rely on the others, to those the will to learn is extrinsic (cf. Allwright and Bailey. 1991). The teacher, who is watching over, would, if

he wants to, that is if he understands it worthwhile, draw the necessary conclusions, and would decide for the adequate feedback, or punishment, or none. To try to understand and measure the degree or the level of motivation, Yamamori (Yamamori et al, 2003) suggest the following four items:

1. "I participate in the English class ardently"
2. "I want to be good at English"
3. "I intend to learn as much as I can"
4. "I am interested in the English class"

(p. 387. Organization added)

In whatever order they are taken, the four items tend to focus more on the intrinsic side of motivation as opposed to the extrinsic side. As a matter of fact, items as: '*ardently'*, *'I want(...)to be* good', '*I intend(...)as much as I can*', and, '*I am interested*' all impose the signature of a learner who has *the desire to learn.* Besides, the strong '*I*' in the different items reveals how much *personal* and *idiosyncratic* [in essence] the will to learn is, a point we want tentatively to highlight throughout the present research. In the late 90's, Williams and Burden (1997) suggest a linear three- stage model of motivation that goes as follows:

Reasons for doing something	Deciding to do something	<	Sustaining the effort, or persisting

Figure 04. A Three-stage Model of Motivation (Williams et al. 1997:121)

Williams and Burden and Yamamori et al have both has displayed their viewpoints about motivation and the motivating factors, and both models fueled the idea that motivation and the desire to learn are the milestones for helping the learner to think of himself as a *capable learner* and thus to learn to *manage himself* as a learner (Oxford. 1990), not as an empty recipient devoid of any sheer waiting to be filled with knowledge.

Williams and Burden's three-stage model and Yamamori's items seem to go hand in hand towards achieving a common effort: making the learner develop an operant behavior as he learns to take part in his learning activities, i.e. learning to learn, knowing what he does, not just learning for the sole aim of moving from one year to another; or for only getting a pass mark, be it a poor ten! The following table reflects that both Williams and his comrade, and Yamamori did arrive to the same results.

Yamamori et al items	Williams and Burden three-stage model
1. '*I* participate in the English class'	*Deciding* to do something
2. '*I want* to be good at English'	*Deciding* to do something
3. 'I intend to learn *as much as I could*'	Sustaining the effort or *persisting*
4. '*I am interested* in the English class'	*Sustaining the effort* or persisting

Table 02. A Cross-analysis of Yamamori's Items and Williams and Burden Three-stage Model

The bold italics are meant to clarify more the matching between what comes of the left side of the table with what is in the right one. According to the table, *the reasons for doing something* and deciding *to do something*, for example, can be considered as the two catalysts of motivation; whereas *sustaining the effort, or persisting* help keep motivation going. Sustaining the effort could also be seen as a rehearsal of some sort, which is to ensure that the data (learnt) have been stored and could be retrieved whenever needed. (Piattelli-Palmarini.1981; Ur. 2001). In structuring language we need to think and in thinking we need a language to think with. The discussion of the language of thought is of the province of philosophy, which is not the aim of the present research.

At this level of learning, learners will have developed in their brains an organization to help them behave with language; to expand it, to environmentally correct it, change it, according either their immediate or long-terms needs; or to external demands and needs, and to any other environmental exigencies.

The interrelationships that have been pictured in the above table link the two concepts of the *will and the desire to learn*, together with the ever changing *motivation*. As a matter of fact, the literature reviewed on motivation lets us contend that it never received a full-fledged treatment. We will try, however, to discuss it presently in some detail.

2.6.1. General Approaches to Motivation

To ensure an effective learning and to ensure that students want to learn, nothing is more recommended than motivation. A study of motivation is crucial for a teacher. Knowing the 'appetites' of learners, being sensitive to their interests is expected to render the task of the teacher easy and enjoyable both for him and for his learners.

Motivation is that inner impulse and drive that pushes or causes a person, namely the learner to perform an act, or to act in a given suitable way so as to achieve a particular goal of interest. This 'strong desire to win through the difficulties' (Floyd.1984:1948) or the desire to learn (McCrimmon.1963) to activate and keep behavior going, and most importantly to know where to go is necessary in any learning activity. In language learning, to Gardner (1985), motivation is the effort of learning the language plus the desire to learn that language for instrumental ends as 'passing exams, financial rewards, furthering a career or gaining promotion' (Williams et al.1997:116), that is the desire to achieve a goal of learning a language together with attitudes that favor such learning.

On the other hand, there is the integrative motivation which correlates with higher achievements in the language as to wish to identify with the native speakers of that

language, or with the culture of speakers of that language. Gardner's model the AMTB (the Attitude/Motivation Test Battery tends to test the desire to learn a language, the motivational intensity, and the attitudes towards learning the language (cf. Gardner.1985. pp.177-84). It can be summarized as follows

- Interest in foreign languages
- Attitudes towards learning a foreign language
- Motivational intensity, and
- Desire to learn the foreign language.

To these tests items, learners can respond differently revealing the type of motivation they develop. To the first test item, the answer could to 'survive in a foreign country', to the second, is the sentiment that 'the language being learnt is great'; to the third, 'to make the necessary efforts to learn the foreign language'; and to the fourth is 'the desire to be fluent in that language'.

As a strategy *per* se, motivation is the inner drive that provides someone with a [good] motive for achieving a certain purpose. Varying in intensity and direction, it changes from one individual to another. While a student may be motivated to study Belles Letters, another one will not, and would rather turn to study grammar or pure linguistics. Motivation determines how much the 'quantity' of information the student gulps *par rapport* to how much he has the will to learn and how much he is motivated to learn from the classwork, or homework, which he takes in the course of his learning.

2.6.1.1. The Behavioral Approach

The rewards and incentives presented in the classroom affect positively the behavior of the learner which classroom observation has confirmed. Indeed, a 'classroom rewarding' in the form of a bonus mark (a reward), or simply a congratulation or a praising (an

incentive), or at times punishment –as we explained above- bring change in the learner's learning behavior. Of course, to avoid S-R behavior type (as explained above), it is advisable to avoid constant rewarding, especially to the same student, for it is feared to create in him not a behavior of learning but a behavior of expecting the reward and losing interest in learning *per se.*

At any rate, attempting a positive change in the learning behavior is what all the teachers are after, provided it is done in the most efficient way. A teacher with expertise and knows when to play over the reward and when to play it down.

2.6.1.2. The Cognitive Approach

As an extension of what we said above, if we make the learner develop a learning behavior safe of any rigid behavioral reactions then we are helping the learning develop his thinking. Developing such a thinking means that the learner does not develop an automation but rather develop a behavior which is regulated by a plan, a goal to attain for which he uses his schemas which he is expected to have developed throughout his learning experience since his early age on (cf. Weiner. 1986).

The central interest in such an approach is that the learner does not just wait for knowledge and for the reward to come to him, but he is rather an active individual who searches for information, who asks question and wants to know. As a consequence and in all likelihood, the learner is expected to develop an intrinsic motivation that is seeking to internalize the language he is learning and making it his own, not just seeking a passing mark. Such an intrinsic motivation will let the learner try to make sense of what he is learning, the reason why he is learning, and the other individuals with whom he is learning asking himself questions as

- Why did I get a bad / good mark?
- Why did my mate get a good mark and not me?
- Why did I succeed?

What is interesting is that the learner will start to explain or attribute his successes and or his failures to his own effort, will, mood, knowledge, interest, clarity of explanations (whether or not he asked for a further clarification whenever needed), an even luck. He also makes attribution (Attribution Theory) that the others, his classmates, are also smart, lucky; knowledgeable, that they work hard, and in respect of this he learn by engaging himself in an intellectual (cognitive and metacognitive) competition. So for success and failure and the causes behind them, the ***Attribution Theory*** advances three dimensions as put forward by Weiner (1986):

1. Where the act of learning takes place which acts upon the learner (locus),
2. Whether the cause(s) are the same or if they can (be) change(d) (stability),
3. Whether the learner can control the cause (controllability) (cf. Woolfork. 2004).

Success will lead to pride (external and internal locus) and will increase motivation, which will increase, as it is expected, further successes), as failure may decrease self-esteem. The stability dimension is related to future expectations. If a student believes that his failure is due to stabile factors as difficulty of the subject or luck, then he is expected to [always] fail in the same subject in the future. On the contrary, if the student attributes his results to unstable factors such as shyness, mood, or luck, then he is expected to rid of these and perform better next time.

The controllability dimension, however, is what we think all learning is about. If the learner has understood what locus and stability are about, that mood, shame, gratitude,

responsibility govern his learning behaviors, then he will continue to learn and succeed if he know how to control them. If he loses self-esteem and believes that he failed because he is unable, then *the lack of ability* will become uncontrollable. On the contrary, if the learner thinks that his failure is due to a lack of effort, he will think that he is responsible of this failure that he can control it and engage in better performances in future to ensure success.

2.6.1.3. The Humanistic Approach

Intrinsic motivation is what the humanistic approach is all about. The individual tends to want to develop his self-esteem, to understand that he is a capable one, that he is autonomous, capable of self-realizations. (Maslow. 1970). Maslow suggests a hierarchy of needs ranging from survival and safety (lower-level needs) to achievement and self-realization (higher-level needs). Maslow explains that when these needs are met, then motivation for further fulfillment increases.

Maslow's theory fuels more the concern that teachers should look at the student as a whole individual whose emotional, intellectual, together with his physical needs are interwoven. If any of these is deficient in one way or another, then motivation will be impaired. If, for example, the student realizes that he is too shy to integrate a group of students, then his sense of safety is impaired and he may not do well in group work and he may lose interest in learning. For that, the concern in this research should not be seen as to fill the student with knowledge (spoon feeding), but rather to create situation of understanding to allow the students to shape their own (idiosyncratic) behavior of learning.

2.6.1.4. The Sociocultural Approach

Participating in community practice motivates students to learn. If students realize that group work values learning, that is they understand that through exchange, discussion

they learn better than, say, if they learn alone, then they are expected to learn with more appetite. They understand that they learn effectively by watching the others talk and conduct themselves in different learning situations and with different teachers.

As an example, by working in groups, or buzz-groups (as we will see later), the students of such groups will discover little by little their weak and strong points. The novice becomes expert and like this. On a broader scale, students who had the chance to go abroad for their studies that good sociocultural instances of motivation as they learnt how to speak and conduct themselves in restaurants, in shopping malls, in cafés, in railway stations, airports, bus stations and the like, and in every other place, learning every time the jargon and the manner of every new speech situation.

The behavioral, cognitive, humanistic, and sociocultural approaches to motivation are theories that differ in their explanation of what motivation is. Each one contributes in giving an understanding that motivation is humanistic which concerns learners as human beings having intellect making plans, having expectations; living in a society, in groups, or in group work, not passive individuals waiting to be filled with a cocktail of knowledge.

2.6.2. Which Threshold

Classroom observation and monitoring have revealed different categories of learners who, all of them seem to have taken different decisions. At this level of *prise de decision,* the learner is not yet ready or sure about what he is going to do with the new world of ideas which he finds himself indulged in. In effect, the degrees of motivation for learning new things in a new fashion and style are not viewed evenly by the two categories of students: some react *positively*, they have or they develop a positive motivation, whereas the second category reacts rather negatively (or doesn't react at all), and thus has a negative motivation (reacts badly).

First and foremost, positive motivation should not be seen as a token of integrational motivation (for affiliation as such); nor should negative motivation be considered as some sort of instrumental motivation (seeking academic success only). The discussion of the two latter has been substantiated in a previous work (cf. Labed.1997). What we will see presently is a stance of motivation which, in the long run leads either to integration/affiliation –depending greatly- as we will see further down, on how the learners of the two different categories will behave with what they are doing. What is of our interest in the present research is the terminal behavior within the institution which harbors them. What they will do later after they graduate could be the subject of another research.

2.6.2.1. Constructive Motivation

As an operational definition; positive motivation is the energy which pushes the learner to give his cognitive behavior (see Chap. 03) the possibility of action for performing tasks which he is required to do *and* tasks that he is not required *but which he understands* as necessary, ancillary, or otherwise.

To take a decision can be the result of a strong desire (positive desire) or motivation because the learner who comes with a 'positive motivation is often quick to pick up further ideas from peers or from the teacher' (Hedge. 2000:100). On the face of it, this sounds possible and even plausible because the role of such a motivation is to entice such a learner to do something, *especially* when he sees that he is capable of doing, and thus he will start to seek for more. However, doing things could be viewed from two different angles, according to different learners: either for seeking success or/and avoiding failure (Atkinson. 1964), they fall into two categories: 'failure avoiders', and 'success seekers' (cf.

Weiner. 1986). In our view, this represents rather a different trend in motivation because it is not easy to determine which learners as such belong to which category, their degree of motivation, and their desire to learn. Our inventory and questionnaires (cf. Appendixes 03 & 04) tend to give a general view about how things are going with our students and with their different and changing motivational attitudes.

Being either 'success seekers' or 'failure avoiders', the overall impression is that our students have developed what might be considered as a potential for self-realization which we hope they would efficiently utilize for 'playing an active role in the construction of [their] knowledge' (Gardner. 1972:221).

Furthermore, for the student, his positive motivation will let him make expectations that he will be subjected both to success and failure, that more precisely success 'is not guaranteed but that making a real effort might make the difference between success and failure' (Allwright and Bailey.1991:172). Such a behavior and such an understanding will represent a veritable treasure trove to help the learner enrich his thinking for further cognitive achievements, that is 'to be more reflective about thinking(…)and more effective in(…)problem solving' (Gardner. 1993:109).

With time, this is believed to lead to the emergence of 'intuitive understanding'*, to use again Gardner's words. These learners will also start to understand that at the university (their new nurture with a new nature) receiving a completely different treatment either from his comrades, his teachers or his entourage. He is basically on *his own* with the inescapable truth that he ought to develop and individualization of some sort (cf. Houghton et al. 1988) or self-reliance for *no one except him* would further enlarge his

*"intuitive understanding" as opposed to "disciplinary understanding", i.e.; learners are expertly aided by their teachers.

new [cognitive] environment. In the university, he can no more rely on high school*wise* behavior which has been shaped by a 'dreadful' principal, by [rather] severe an unsmiling teachers, and by a straight jacket timetable which allowed no true motion or freedom.

2.6.2.2. Deconstructive Motivation

Negative motivation, on the other hand, would prevent the learner from discovering his true dormant capacities which he possesses, and which in many instances does not know he possesses. Such a deconstructing or negative motivation would, as it is feared, reduce the learner's sentiment about himself to a state of a mere 'enthusiasm' of being at the university, an enthusiasm which would easily wither away as the student would experience his first disappointment with his new environment, in all likelihood with his first bad exam marks. The learner might develop a *learningcide* (learning suicide) that is the conviction that that nothing is worth to matter for; that whatever /how-ever he would do, he will always fail. With his probable repeated failures and misfortunes, this learner would maintain a negative self-image 'so afraid of creativity because that might cause change and undermine [his] sense of security.' (Roger.1983:12). He would then hide behind a defensive shield of negative attitudes as

to be frequently absent, to pretend illness, family problems, *only to* protect him from not responding positively –or at all- to his teacher's [repetitive] feedback trials. To put it otherwise, one can fear that such students do the best they can do.

Such a deconstructive motivation would let such a learner to feel 'lost in the maze', knowing not how to get out of his troubles! As a consequence, he might decide to drop, or change department and stream (which after all would let him escape discomfiture).

Yet, if the same learner might decide not to drop anything, but would decide to carry on, things would take a novel turn. At this level of decision, and knowing not really what to

do with this hostile environment and nurture, his terminal behavior would be deconstructed as his dormant competence would never find the appropriate nurture to be activated because he would not be able to establish new and appropriate cognitive and learning relationships with his new environment.

In the light of what have been exposed, what follows is an apercu of the learner's self-schemas as self-concept, self-efficacy and self-determination which help the student believe in his ability to learn.

2.6.2.3. Self-schemas and Self-fulfillment

So far, the main running theme in the learning enterprise is how the learner rates himself in accordance to his competence in doing his particular tasks. Add to this, the image he makes of himself and the self-evaluation (or self-value) he generates of himself. All these are going for sure to affect his way of approaching his learning [problems] and the way he solves them.

These conceptions the learner makes of himself and which influence his learning behavior in one way or another are known as self-concept. As an operational definition, *self-concept* can be seen as an amalgamation of how the learner perceives and conceives himself within the world of his education and learning which will [finally] give him a sense of personal identity (cf. Child.1973). In effect, if the learner does well, then such a self-scheme will help him affiliate more easily and it will enhance him [gain prestige] together with the others' approval, namely the teachers, of his academic prowess. Furthermore, such a self-scheme will put this learner, it is hoped, within a cumulative process wherein 'education is viewed as involving the whole person, the emotions and feelings [not] merely transmitting pieces of knowledge' (Williams et all.1997:33). In other words, self-concept

develops as a result of the learner's own external and internal comparisons. For frames of reference, he uses his comrades, his teachers and himself. This is exactly the image we wish our learners develop in the course of their tuition for we do believe that coming to the university is simply succeeding because of a Samaritan compensatory system but rather for truly acquiring the notions of why and how so that each learner will develop his own self-concept and make up his own conception of *learning to learn.*

The other self-scheme which is not of a lesser importance is self-efficacy. *Self-efficacy* is the belief about one's personal ability and effectiveness in performing a specific task in a particular domain. To Bandura (1997), self-efficacy is the belief of the individual in his capacities of organization and execution of an action or a particular task for attaining a goal.

As a matter of fact, on the basis of such belief of the learner in his capacities, self-efficacy may develop as it may drop (or start to drop) is the learner knows bad experiences and for which he does not combat enough to better his situation. On the other hand, the individual may become more efficacious when [he learns to] masters his learning (vicarious) experiences, when his self-concept is not affected, and especially when he receives boosts from his surrounding as mates, friends, and parents. More importantly, self-efficacy develops also when the student discovers a trustworthy and credible teacher whom he may consider as his mentor. Such a boost in self-efficacy is expected to encourage for further achievements.

As a consequence of such a boost, the learner is also expected to affect his *self-esteem or* the judgments of the self-worth. So, in wanting to become an adequate and knowledgeable person, self-esteem develops when the learner has a high level of self- efficacy. What is interesting, then, is that greater efficacy influences motivation and

both help the learner show ‘greater efforts and greater persistence in the face of setbacks’ (Woolfolk.2004:369).

While acquiring experience and by recording successes as well as failures (from which the learner learns), correlated with a cheerleading teacher, the learner tendstowards developing his self-determination. Deci and Ryan, quoted by Woolfolk (2004) define self-determination as ‘the desire to have our own wishes, rather than external rewards or pressures, determine our actions’ (p. 370). Indeed, at this level, the learner is expected to have a high level of [true] self-confidence together with self- concept to start to challenge himself to remain in command of his own learning, refusing at times external help, and struggling in other times external pressures as timetabling and working constraints of any sort that could be imposed upon him either by the institution or by histeachers.

In the classroom, such self-determination is seen in the learner strong desire to always perform better showing greater interest, creativity. Self-determination, as our classroom observation revealed, develops within the learner the feeling that what he doing is enjoyable and worth doing. The learner also starts to comprehend and internalize educational goals, especially when he understands that the language he is leaning is ‘in a state of constant flux(…)changing all the times in thousands of tiny ways’ (Honey.1998:42). This is expected, at least, to push the learner to challenge himself and accept the [daily] learning challenges.

Self-determination will continue to influence the learners’ intrinsic motivation, especially when they discover that such a determination pays off. In other words, he discovers that the information he gets from his determination in learning increases his competence and his efficacy.

However, with the compensatory system, these self-schemes seem to pertain to a scientific paradise. Observation and monitoring, (cf. the experiments), reveals that these self-schemes are indeed manifested in some of the students' behavior but remain unfortunately below the expectancies.

2.6.3. The Teacher: An Expert Motivator

As a case in point, motivation has been encouraged in institutions of higher education in North America, Britain, and Australia. For that purpose, tutorials have evolved in a way to accept a lively class where:

> teachers ask to be called by their first name, *invite interruptions*, and in general encourage free participation through much of the class(…)*unconstrained by focused exchange*, where students talk to each other and their teacher to them as equals.
> (Jones.1999:250. Added italics)

For that matter, the learner can also feel he can *interrupt his teacher* whenever he needs to put a question, to ask for a repeat, or for a further clarification. He does not wait till the end of the course for he runs the risk to forget what he wanted to ask about as would his train of thought.

The other motivating factor: abolishing *exaggerated* deference, for example, as our classroom observation has shown, allows better learning, more motivation, and a better understanding. The learner would discover that all shibboleths of deference have [now] been replaced by adult*wise* and more appropriate deference.

As teachers, one must continue to motivate our students and enticing and pushing them towards learning by themselves. It wouldn't be imprudent to purport that *in pedagogy the teacher does not teach, but students learn.* It goes without saying that the teacher is still present in the classroom, but in a novel fashion, away from the old- fashioned *fatigued*

considerations that the teacher is the unique source of knowledge, the *Mister-Know-It-All* of some sort, the imperturbable man of knowledge and science whom we ought to fear more so than respect! Such novel attitude of teachers comforts us because it is expected to "*empower* students by assisting them in acquiring the knowledge, skills, and strategies needed to become *autonomous* learners who can take the responsibility for their own learning." (Yang. 2003: 293. Italics mine)

For such empowering to take place, fear, as a matter of fact, is what should precisely be deterred. It's a curse to have a teacher who is feared; while is it a mercy to have a teacher who is loved (cf. Tables 24, 25, 27). I recall from my reminiscences the story of Plato who went one day to see his master Socrates about a problem he encountered with his disciples. Plato, addressing his master said that his disciples no more understood him. Socrates masterfully gave a plain and simple reply: 'How could you expect your disciples to understand you if they wouldn't love you.' Socrates' answer seems to summarize generations of hard-earned experience and expertise in pedagogy.

If it is true that the teacher is an expert motivator, his expertness should then be seen *on the terrain* in how he teaches and how he behaves with his students for the outcomes of learning almost entirely depend on the 'way students react to the learning environment(…)on the perceptions of the teaching(…)which they are experiencing-perceptions of the meaning and relevance evoked by the content presented by the lecturer or the tutor' (Entwistle. 2002:115).

Students are not thus as naïve as many think. They can have a value judgment on their teacher, on the materials he presents, as well as his teaching method. Such a teacher is worth of imitation and may become with time the students mentor as he would provide them with the necessary guidance and counseling.

It is undoubtedly the role of the teacher to make his students understand how to wed effort and efficacy in learning. More pertinently, he is expected to make his students aware that effort without efficacy would be ephemeral contentment, especially when students are expected to adjust their behaviors to a changing environment.

2.7. Shaping a Behavior of Learning: Learning to Learn

The aim was to try to show the traditional components of the operation of learning, namely conditioning, preprogrammed behavior, as well its cognitive aspects. Learning in humans is very much different from learning in animals. In the circus, for instance, while being trained, animals form and internalize a general framework of the task they have to accomplish when their master asks them to perform it. With human beings, learning is a highly complex activity.

Knowledge and information are inculcated by using stimuli. Later the individual develops and establishes his own learning set, a *learning-to-learn* techniques which help him foster his personal knowledge of the world around him the way that he sees fit to accomplish whatever action. Nothing is better for students than when they learn to handle their own affairs by themselves. It is believed that

> learners who construct their own knowledge of subject areas rather than being ‘‘taught’’ such knowledge *have a greater ownership* of how to use the knowledge that has been created, being able to transfer learning strategies from one subject area to another.
> (Allen. 2003:326. Added Emphasis)

This is done by pushing them to learn ‘to shed baggage’ is to help them activate their cognitive development that is ‘the active construction of knowledge’ (cf. Piaget 1964). Such a construction of knowledge will sharpen the students’ capacity to understand –as operant learners-the intellectual processes that they acquired through time and practice to serve them later when they transfer the strategies being learned to other situations.

Conclusion

In this chapter, the attempt was to show the most salient aspects of learning, trying as many times as it was possible to link the discussion with the classroom realities and to show the how sanguine is learning for cognitive activities whatsoever. It was also attempted to show the many guises learning takes, from the classical and operant conditioning, through preprogrammed learning, to social learning, or learning that takes form 'out there'.

Some light was shed on the forces responsible for fueling the intensity direction, strength and quality of learning. These constitute motivation and the desire to learn which might foster or hinder its application in a pedagogic forum of a four-wall classroom, as well as in society at large, manifested in the learner's extracurricular cognitive activities which help him identify himself with the environment in which he evolves.

Last but not least, the attempt was to show finally how all these elements about learning when grouped together help shape a behavior of learning, or, in other words form the learning set, namely *learning to learn*, of concern in the present research. Learning is an issue of an utmost importance which will continue to heat ongoing debate. In his chapter, it is far from exhausting, in this chapter, what could be said on the vast topic of learning.

Chapter Three

Strategies for Learning to Learn

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Introduction

Thorough authorial studies on language learning strategies for foreign language interests especially have been carried out worldwide. Their aim is to raise awareness of the use of learning strategies in relation to the desire to learn, and to achieve something. These researches focused on learners in different countries, but the need for such strategies has not been voiced out by our learners probably because being students of the compensatory system, they could not see the strong relationship existing between strategy use and proficiency.

In this chapter, we will try to describe the existing learning strategies that have been developed by prominent researchers, and one will also try to describe the motivational outcomes of the use of such strategies in the learning effort of the student, and in general the effort in learning to learn

3.1. Learning Strategies Defined

A strategy means a plan put by conscious control and intention to tackle a difficult task to ultimately achieve success, to win and meet a goal. (Procter.1999). Learning strategies are personal behavioral attitudes and thoughts of processing information to facilitate comprehension, learning and to retain information employed by students learning a foreign language and using it (O'Malley et al.1990; Cohen.2003).

As an operational definition, learning strategies are operations:

> employed by the learner to aid the acquisition, storage, retrieval and use of information, specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective and more transferable to new situations.
> (Oxford. 2001: 1966)

Put otherwise, strategies are the management of these operations which need tactics to achieve their success. To achieve success, a strategy requires: good plan, competition (within the classroom, but not adversarial), adoption and adaptation –or what is commonly known as conscious manipulation, and the will for the attainment of a goal or an aim.

Learners do not employ one strategy or another as they may, for example, use one book and not another. Being basically cognitive and pertaining to the intrinsic and complex cognitive network of the mind, learners sometimes utilize more than one strategy while behaving with particular tasks, and so it is fuzzy to try to draw a boundary as *such between* strategies. It is recommended for a good practice of these learning strategies the existence of certain conditions, namely a good pedagogic and suggestopedic environment (cf. Buchman et al. 1976; Lozanov. 1976; Gold. 1985), a well-thought [and continually re-thought] program; teaching aids (preferably of the blue-ribbon type) as a convenient practitiatory (cf. Labed. 2001)in which the learner uses while receiving language.

3.2. Considerations of the Learning Strategies

Nowadays, the propounding principle governing pedagogy is: *in teaching the teacher does not teach but students learn*. It grows then paramount to make the students be aware of the importance of such learning strategies. For that, the major concern of teachers is to always try to put the learner first in their quest to best make him participate in his own learning where ‘conscious control, intention, and goal- directedness remain essential criteria’ (Oxford. 2003:247).

Learning strategies are tactics, specific actions, and in a practical context they include also the will to learn (cf. Chapter two) and to attain a particular goal they set as to learn to be fluent, accurate or even spontaneous to survive in an English environment as to take notes, write a straightforward business or application letter, to ask for direction, to read and understand direction in a manual, and the like letter. Learning strategies also help the learner develop self-efficacy as he will discover by himself the most efficient (probably the easiest) way to attain effectiveness.

The necessity of training the student to know and put learning strategies in action inside the classroom is worthwhile, however teachers' expectancies are thwarted by the realities of the outside English-free environment where 'learners have little opportunity to hear or read the language outside(…)the classroom' (Kourago.1993:167). Furthermore, the great majority of students has never been, and probably will never go to the English-speaking community where they would practice the language they are learning. Those who go anyway even for short stays, they don't really practice the language, especially if they go with their comrades speaking probably more the mother tongue more than the foreign language. Yet, for those who go very often, or those who [decided to] live there, they don't really need any learning strategies because they pick up the language in vivo for there is 'no escape from it' (cf. McArthur. 1983).

As a result, one can say that EFL students' abilities are restricted to the '*unique*' possibility 'to function in a foreign (non-English) situation' (Lowe.1981:34), a context which Lowe identifies as an ERP (English for restricted Purposes) context that well be a form of EFL (English a Foreign language) or ESP (English for Specific Purposes) (more likely for pure EOP -English for Occupational Purposes- perspectives, as Strevens' repertoire below shows). The learner is then deprived of grasping in vivo how language actually functions and the effective teacher is thus frustrated to see that the sensory

context' (i.e. the T.L (target community) at large) of his learners is reduced to the confined classroom situation. He is also frustrated because he knows well that that the assimilation or perception of language cannot work (or cannot work effectively) when the students *remain alien* to the sociolinguistics factors.

Knowing the sociolinguistic factors means learning to communicate, with the expectation to use meaningful contextualized language –or in other words, to use language appropriately in different social contexts. A meaningful contextualized language could be seen through the code of communicative conduct, or Hymes (1972) four sectors (*Possible grammatical use; Feasibility; Appropriateness; and Accepted use)*. For the realization of such a communicative competence, Wilkins (1976) sees that a foreign learner can be taught (strategy training) as:

> a *strategy for communication*(…)consisting largely of forms of address (greetings, gratitude) essential lexical terms(…)and intonation and paralinguistic features(…)to these would have be added some *cultural do's and don't's'*.'
>
> (Wilkins. 1976:72. Italics mine)

Cultural do's and don't's could be seen in speech habits, or speech behaviors and must be introduced, according to Hymes (1972) to particular receivers by using 'a particular code with messages of particular forms(…)about particular settings' (p.288). The emphatic 'particularity' in Hymes' standpoint is a declaration of *social relevance* and it is only the learning strategies, especially the metacognitive (beyond the cognitive, or higher executive skills) which help learners 'regulate their own cognition and to focus, plan, and evaluate their progress as they move towards communicative competence' (Oxford. 1990:8). So, according to all these sociocultural considerations and correlations, we can say knowing and employing learning strategies have an inextricable role to play within the province of communicative competence.

Last but not least, these strategies teach the learner autonomy as to learn how to adopt a personal idiosyncratic way to make up his knowledge. Idiosyncratic learning is a concept we want to bring to the fore in the present research because it can be contended that in its different manifestations, language is encapsulated into various domain-specific parsers, one of which, for the sake of an example, is the vocabulary parser where 'modular vocabularies and combinatory principles [interact] in idiosyncratic ways' (Dekydtspotter. 2001:92). The credit we would give to idiosyncrasy is that it has the merit of setting the learner free from the hold of *negative* formalism; negative because it not only keeps the learner within the narrow province of rules, but hinders his personal endeavors for flexibility, and creativity. Again, the metacognitive, as well as the cognitive strategies (as we will see further down) also help the learners shape such an idiosyncrasy. Some features of the learning strategies are to teach the learner the possibility to be more *self-directed* that is to discover that they are *specific actions* to take (cf. Oxford.1990, O'Malley Chamot. 1990).

The italics above explain the *individualistic* aspect of the [utilization of] learning strategies for one cannot expect the same learners in the same group to evenly employ the [same] learning strategies. Nonetheless, and to avoid indulging in a possible ill-considerations or an exaggeration of the possibilities of achieving idiosyncrasy, it would be more appropriate to contend that such an idiosyncrasy could be 'an error or a deliberate attempt to represent an ongoing sound change' (Crystal. 1996:17). But still, the overall contention is that idiosyncrasy is more 'an ongoing sound change' than error because first, we are dealing with adult tertiary tuition learners; and second because one of the objectives of the teachability of the learning strategies is to help 'each student to gain self-awareness'. As a matter of fact, teaching learning *to learn* is strategy-training in essence.

If such issues tend to darken the horizon of the pedagogic firmament, they yet have the merit to shed light on the true realities about the whole subject of learning strategies, their

importance, and how they could possibly be implemented while we deliver an EFL course. At any rate, learning strategies are, in our view, the scaffolding for any [modern] and fruitful teaching-learning relationships.

3.3. Ubiquitous Primary Learning Strategies

The educational psychologists have always tried to study to find out and they apply their findings to assist the learner in learning in the most effective way possible. Of course there are differences of approach which could be restricted to classify, describe, experiment, or to [possibly] find out cause-effect relationships. In all these attempts, we meet up with the same issue of research: the findings or the theory, and how every teacher envisages the application of the results to his classroom realities (as his students' changing needs) to achieve efficacy. Sometimes, these attempts are thwarted by the compensatory system which does not mesh with our pedagogic expectancies as it allows students to move easily from one year to another. As a consequence, the gap between findings and application is yet to be appropriately bridged. Some of the findings in language learning-training spheres as there are the primary ubiquitous strategies that can be classified under three basic features: *1*. having a goal for learning a particular language; *2*. self-access; and *3*. achieving something.

3.3.1. Goal-seeking

One cannot imagine an individual leaning a language without having -in advance- set himself a goal for *why, or for which purpose* he is learning language. In ESP taxonomy, this is known as EOP, EAP, EST, or simply LSP. Strevens' taxonomy (1977a) represents a repertoire of [disciplines] goals to be reached by the learner.

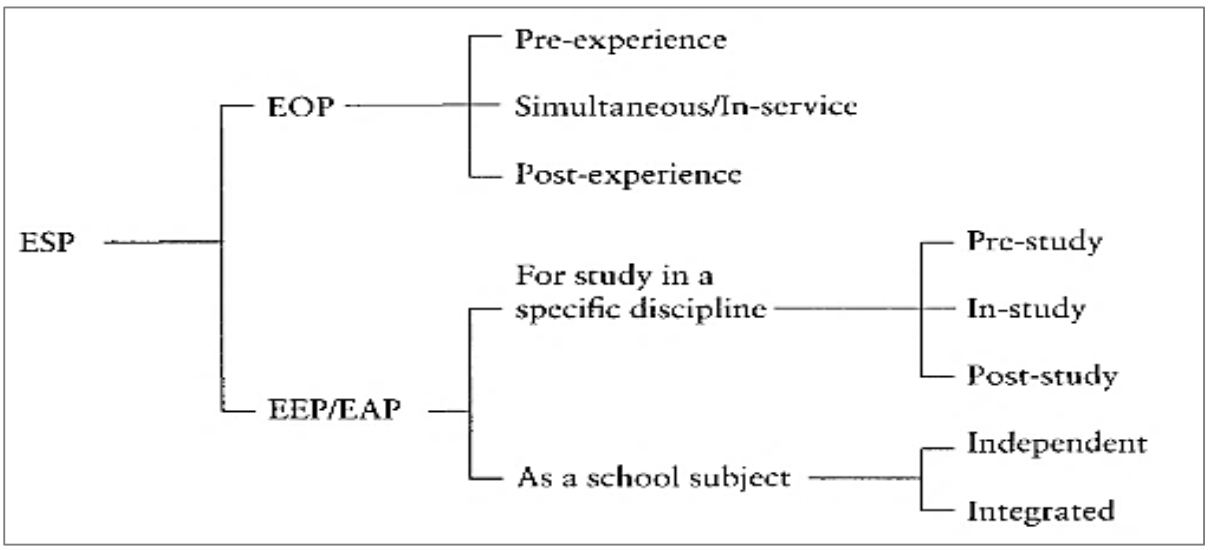

Figure 05. A Taxonomy of ESP Courses (Strevens. 1977a:92)

The diagram above shows the educational and the occupational courses that could benefit the learner. On the face of it, we teach our learners educational disciplines, but in the course of our teaching, we also make the students aware of the occupational aspects of learning a language. In the present research, the study is about efficiency of the learning strategies and their efficacy vis-à-vis the students' personal behavior with learning. Strevens (1977a) taxonomy consolidates our interest in an approach to language teaching 'in which all decisions as to content and methodology are based on the *learner's reasons* for learning' (Hutchinson et al. 1987:19. Our italics). For this, the teacher's perspective could be to enable the learners to set their own goal as to learn to know what they want to do with their own learning, or to learn self-monitoring and assessing their own progress. This does not mean to let the students take their decisions without the teacher's intervention for they may run the risk to err. In concert, the teacher and his learners can discuss and think over and set the goals.

3.3.2. Self-access

In the intrinsic pedagogic network, teaching learning strategies could be viewed as the announcing curve of the avenue of language training. This training will allow learners, as it

is expected, to *learn to explore by themselves* the different 'subtle shades of meaning and style, producing insights into how various language forms are employed to communicate them.' (James. 1988:79).

To suggest an operational definition, self-access is independent or autonomous learning. Being 'independent and autonomous' does not mean that the learner does not attend classes but it rather implies that *1*. the learner should possess or develop abilities that enable him to make decisions, *2.* there should be a support system according to which he displays his responsibility potential, and *3*. the learner should know how to manage his self-assessment as to be able to make his self- assessment. (cf. Holec.1979).

ELT/EFL methodology (cf. Rivers and Temperly.1978; Montgomery.1982; Brooks and Grundy. 1988; and elsewhere) has shown that adult learners (of interest in the present research) with a good guidance and [self-esteem - considering] monitoring are quite capable of effectively investing themselves in undertaking language learning 'with the kind of self-reliance they use in other areas of their lives' (Hedge.2000:85). Further down, Hedge suggests a figure in which she put the facilities which a self-access centre might contain.

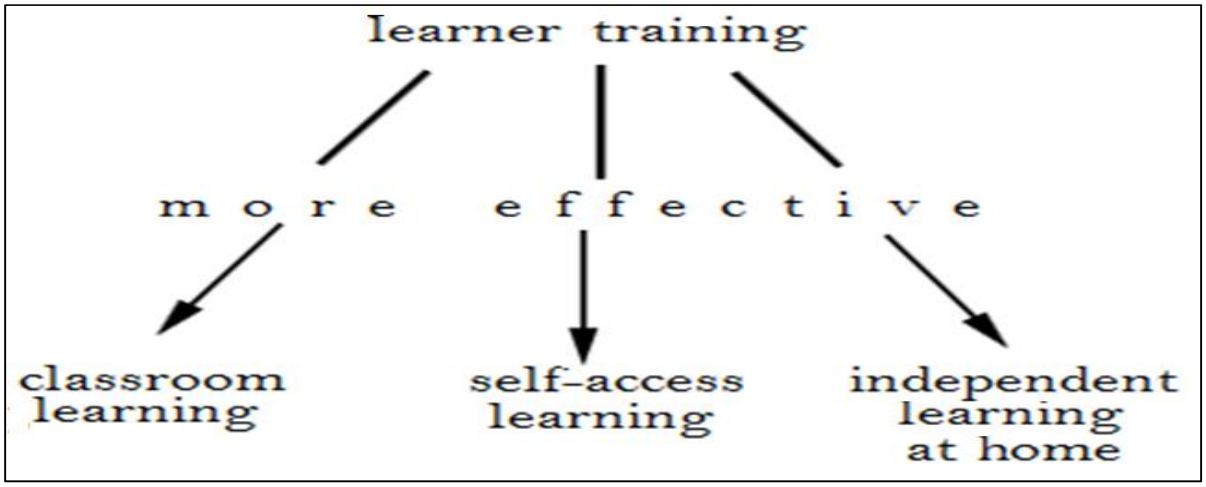

Figure 06. The Aims of Learner Training (Hedge. 2000:85)

The figure shows that self-access begins in class, and continues in the library or through the Internet, and finally the homework. This *3-in-1* ubiquitous strategy is very often not utilized by students who have become less library-goers -more *bench-warmers* (cf. Labed. 2001a) because of a *compensatory system* which digs the trench between pedagogy and the learner, giving a new brand of learners whose only effort about learning is to be bodily present knowing that the 'teacher will do job and somehow, learning will take place' (Henner-Stanchina et al. 1978:78), whose job is in fact to activate the dormant abilities of students which they possess anyway, as seen above.

3.3.3. Achieving Something

Achieving something could be the result of having a goal, and doing extracurricular efforts. Our classroom observations, supervisions and monitoring have shown to us that with sustained classwork, out-of-class works, especially homework when the student is home having his own working time, (or *temps preferential* a new concept which came up with the B.M.D (Bachelor Master Doctorate more known as L.M.D. Licence Master Doctorate) [offspring] system) learners have learnt in a latent way self-access because they have been made aware that if they continue to rely on what they see with their teacher in class, they will not achieve anything.

The first palpable results is the growing number of extra homework (more than what they take as homework) presented by students. For my Written Expression classes, the researcher always invites students to write as many essays as they wish (for which they choose their own topics by themselves- a more sustaining self-access efforts) to write. Checking students' writings was always exciting. Reading and correcting them is tiring and time consuming indeed but it is encouraging and worthwhile. It is not altogether

inappropriate to consider those students' efforts as well as encouragements to them as a 'retaliatory response' to the detrimental compensatory system.

So, ensuring that learners seek a goal vis-à-vis their learning means that they are not recipients waiting to be filled with knowledge, that they are not dead matter but they have human minds capable of creativity. As a matter of fact, they go to seek knowledge and don't *only* wait for it through their self-access endeavors. Finally, being aware of seeking a goal and of doing personal extra-curricular efforts will, as it has been exemplified, lead to achieving something: finishing the year with a load of different personal works, all of which help foster the learner efforts toward shaping his learning behavior present and future.

3.4. Other Types of Learning Strategies

The concern for language learning is interested in trying to identify the strategies that language learners employ while learning a language. Such strategies have been classified into two major groupings and subgroups (cf. O'Malley.1990), as itis shown below). Such effects on learning have made it important to train learners for employing strategies for improving their performance.

The language learning repertoire includes *cognitive strategies*, for memorizing and using the different language structures, *metacognitive strategies* or the strategy about how to use these strategies, and *social strategies* whose aim is to enhance learning as to learn in cooperation with other learners, and to possibly interact with native speakers for enhancing learning the target language. To these we can add the affective or compensatory (or motivational) strategies which principally allow the learners lower anxieties (Oxford .1990, 2003; Cohen.2003; Yamamori et al.2003).

3.4.1. Memory Strategies

Long before the invention of writing, men used to rely so much on their memory to learn long speech, epics, and thousands of verses from different poets. The oral tradition and the oral heritage survived because men used then their memory strategies. Plato was known for his 'walking school or academy' where he used to lecture walking in shady groves with his disciples following him and attentively listening and retaining what their master was saying: they used memory strategies [they did not have too much choice, anyway!]. When the written page superseded the oral tradition, people started to forget their memory strategies replacing them by mnemonics which are words or acronym s and the like to aid retention (cf. Chapter on Memory). Our brain has titanic capacities of storing (trillion of bits of information and more!), which 'forces' the learner to regularly renew and update his schemata who relies on his memory strategies. The diagram below sketches out all the memory strategies.

With the memory strategies the organization within the schemata, and all the incoming data is at once grouped according to sameness creating a semantic web or network for future as well as immediate applications, as the learner does for his vocabulary building elaborating his vocabulary stock to two different and distinct vocabulary sets: The recognition vocabulary, or the words with which he is familiar and which he recognizes –relying principally on his retention strategies- any time he meets them but which he does not necessarily use, and the active vocabulary that is the vocabulary which he knows and which he utilizes in his everyday writings and creative essays and otherwise (cf. McCrimmon.1963).

For the images and sounds, the learner utilizes his iconic (or visuosketchpad) as well as his echoic memory to retain, classify and map semantically all the images (and sounds)

according to audio-visual receptive skills. Anderson (1995) sees that visual information exists –is stored- in the memory system at different levels after we see something (p. 87). Sensations and feeling, as well, are also stored and the manifestation of these by remembrance brings to the learner the same feeling and reaction as the fear of an exam on the eve of the exam day; the 'awful' recall of the notes of history and bewildering dates as soon as the word 'civilization' is heard, and so on. Primary or important or top priority, whatever label we put on them, memory strategies play an unequal and never-to-the-full exploited role in the entire process of learning. Anderson (1995), for imagery involving visual properties sees that verbal-images linkages as the 'keyword method(…)is used by developing an English- language homophone for the second language vocabulary word' (In O'Malley. 1990:49).

3.4.2. Cognitive Strategies

Cognitive strategies are tactics that operate directly on the incoming information and help manipulating and restructuring information. For enhancing learning, the learner's mind does not store information in the form it comes in but proceeds according to his own goal and according to what he wants to do with it later while retrieving it. This is done in three different ways: *rehearsal*, *organization*, and *elaboration*. These cognitive strategies are applicable to general and particular learning activities and tasks as listening or reading, as can be employed in concert to achieve a particular learning goal. An example listed by O'Malley and Chamot (1990:45) can be summarized as

1. *Rehearsal*, or repeating the names of items or objects that have been heard.

2. *Summarizing* then *organizing*, or grouping and classifying words, terminology, or concepts according to their semantic or syntactic attributes after having *understood* or *inferred* the meaning of the new incoming items,

3. *Retention* by using images and sounds (visuospatial sketchpad (cf. chapter on Memory) to understand *further* and *remember new* verbal information,

4. *Deduction* and *transfer*, or match in the incoming data with the formal schemata (i.e. the knowledge we have; and

5. *Elaboration* – linking ideas contained in new information or integrating new ideas with known information (elaboration may be general category for other strategies, such as imagery, summarization, transfer, and deduction)

Cognitive strategies aim at allowing the learner to practice the target language, to manipulate and transform it so that the learner responds to his immediate needs as to survive' or adapt in a particular context of language use (meaningful contextualized language), or long-term needs as to plan for future requirements of language use as to travel to prepare (be mentally ready) to move to the community where to utilize the target language.

Such strategies are practical, and are utilized by learners in different ways for manifold language manipulations. They vary from *repeating* for better remembering, *elaborating* and using them in different linguistic purposes or demands; *analyzing* to find out sameness and differences, *recognizing* already learnt items, or grammatical, sound, or stylistic patterns (schemas); *summarizing* for easification and for a better storage.

In the pedagogic sphere, the most ubiquitous word is practice, and it is practice alone that determines the efficiency of learning strategies. For repeating, for example, students sometimes react negatively when their teacher repeats the explanation of a point which he sees still unclear to his students. By doing so, he is teaching them a very important strategy -repeating- which enables the memorization of what is being learnt. Even with what is carried out in classes in terms of practicing the different language features as creative writing, the surface and grammatical features for the Written Expression classes, the practice of sounds, stress, intonation patterns and pronunciation in the Oral Expression,

still more practice is needed to reach an acceptable proficiency, especially with the lack of time on the timetables, for in teaching, as Roger (1983) put it there is always a lot to do but we never have enough time.

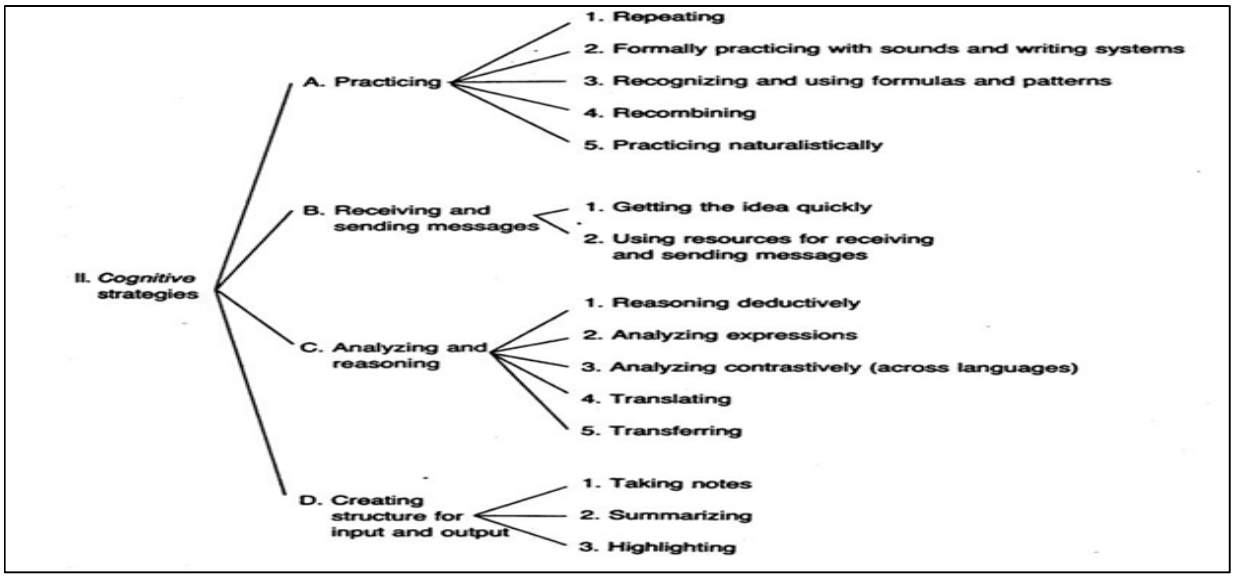

Figure 07. Diagram of the Cognitive Strategies (Oxford. 1990:44)

Oxford (1990) sees that there is one particular strategy that goes into action at a time. She classified four major strategies which she identified as *Practicing, Receiving and Sending Messages, Analyzing and Reasoning, Creating Structure for Input and Output.*

The figure shows that cognitive strategies are under four major headings, each one gives extensions resulting in a total of 15 cognitive strategies, which all interact according to the activity or the task on which the learner works, and according to one of the four skills being utilized. Under A, for example, and under *1, 2, 3, 4,* and *5,* especially under 2, we have eight other strategies only for pronunciation, the *pronunciation strategies* (Osburne (2003) which are

1. Global articulatory gesture
2. Local articulatory gesture or single sound
3. Individual syllables
4. Clusters below syllable level
5. Prosodic structure
6. Individual words
7. Paralanguage
8. Memory or imitation. (p.137)

With a further and sound study, we can find for almost every item under the major headings many more strategies which will make the issue of learning strategies more complicated and may be not encouraging to study for its intrinsic difficulty because, after all, our primary objective in foreign language teaching is to make things sound easy to learners.

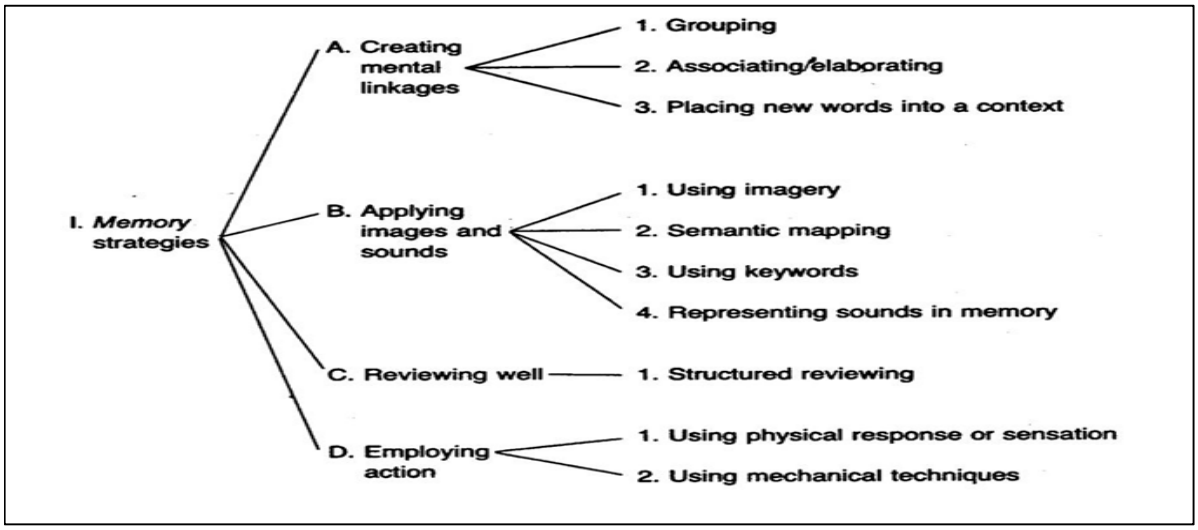

Figure 08. Diagram of the Memory Strategies. (Oxford. 1990:39)

According to all these different practices, and for each purpose, Oxford sees that there is one particular strategy that goes into action at a time. She classified four major strategy which she identified as *Practicing, Receiving and Sending Messages, Analyzing and Reasoning, Creating Structure for Input and Output.*

The above diagram shows that cognitive strategies are classified under four major headings A, B, C, and D, each one gives extensions resulting in a total of 15 cognitive strategies, which all interact according to the activity or the task on which the learner works, and according to one of the four skills being utilized. Under A, for example, and under *1, 2, 3, 4,* and *5,* especially under 2, we can have eight other strategies only for pronunciation, the *pronunciation strategies* (Osburne (2003) which are:

1. Global articulatory gesture
2. Local articulatory gesture or single sound
3. Individual syllables
4. Clusters below syllable level
5. Prosodic structure
6. Individual words
7. Paralanguage
8. Memory or imitation (p.137)

With a sound study, one can find for almost every item under the major headings many more strategies which will make the issue of learning strategies more complicated and may be not encouraging to study because, after all, the primary objective in foreign language teaching is to make things sound easy to *learners.*

At any rate, in Oxford' diagramming, the idea of *practice* is found ubiquitous under all the other subheadings. Under B, *2. Using resources for receiving and sending messages* that is using print or imprint materials and resources to understand how messages circulate for producing: 'using' and 'producing' are also part of practice. Under C*, arrow 4 'translating'*, and *5*, 'transferring', the aspect of practice is overwhelming More, under D, arrow *1 'taking notes'* and *2,* summarizing' also mean practice. The same could be for '*taking* notes' (found under D 1) which could be applied to A *1* or B *1, C 3*, or D*2.*

Besides, it is important to note that the cognitive skills as in the diagram tend to apply more to second language learning situation more than to foreign language learning one. If

Oxford contends that most learning strategies can be applied equally to both situations, thinking probably of 'a scientific paradise' of the University of Alabama where she lectures, in our foreign language learning situation things are much different. In our university, the language policy makes it that year after year, a swelling number of students enter the university with the belief that it is an 'easy' place of work in which success is guaranteed by a Samaritan compensatory system. Those students discover a *land cocagne* where least-effort learners succeed just like those 'boasting' hard-working students! What is comforting; however, is that some 'hard working students' still occupy a good place in classrooms.

3.4.3. Metacognitive Strategies

Metacognitive strategies are considered as higher order executive skills O'Malley and Chamot. 1990), they are also tactics but which operate i*ndirectly* (classified by Oxford (1990, indirect because the learner does not actively use but rather undergoes them) as indirect strategies on the incoming information and help further and more elaborate restructuring of information. Metacognitive means beyond the cognitive. They are actions which the learner takes beyond his cognitive devices, which help the learner be more capable while learning. Metacognitive strategies (cf. O'Malley and Chamot.1990; Oxford.1990; Cohen. 2003)) include three main processes arranged in three sets, which can be summarized as follows

1. Focus on particular aspects of a learning task as to set a goal that in writing, for example, focus is to be put on unity and coherence and the choice of words, -one at a time. Inother words, it is centering learning.

2. Organizing by putting plan to [personally] set priorities and goal according to language tasks as to put a timetable for revising the different module contents, especially as out-of-class activity. This aids the learner for more balanced and effective learning.

3. Evaluating and checking whether comprehensible input has been effective. Students can check their weak and strong points or underrate and overrate their proficiency–and learn consequently positive thinking as to learn to learn (***learning to learn***) from their mistakes.

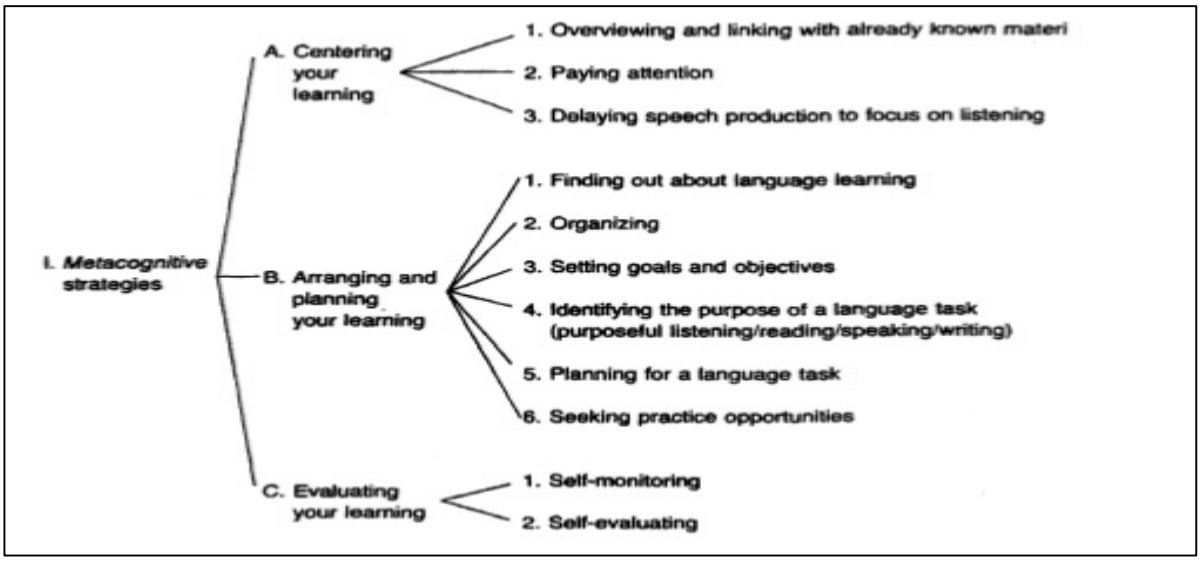

Figure 09. Diagram of the Metacognitive Strategies (Oxford.1990:137)

As dealing with human minds and not dead matter, one can, accordingly, say that the learner uses the metacognitive strategies rather sporadically and without necessarily thinking that what he is doing is truly important but he does it still. In planning or in organizing his learning activities, he may do a self-evaluation of such an organization and learn to re-organize or re-think his planning, and thus he re-center his attention without necessarily following a *1-2- 3 -set organization*. Within the major headings 1, 2, and 3 mentioned above, there are other strategies which the diagram below clearly shows. The11 extensions running out from the major headings represent the other important indirect strategies –or *sub*-strategies that help in the improvement and in the shaping of the *learning-to-learn* [as well as the *learning to think* behavior]. It is worth noting that classification conflicts are inevitable. For example A *2* '*Paying attention'* –i.e. deciding in advance to pay attention (direct attention so not necessarily a metacognitive strategy but rather a cognitive one) to one specific language aspect to the detriment of others, connects well

with B*4* '*identifying the purpose of a language* task' which necessitates full and direct attention; the same B *4* connects well also with A *2* mentioned above a, and C *1 'self-monitoring*'; for the latter, full and direct attention is also necessary.

3.4.4. Social Strategies

For such social considerations, there social strategies as Asking questions, cooperating with the others, and empathizing with others that are important for they 'for the development of greater strategic competence and fluency' (Hedge.2000: 60).

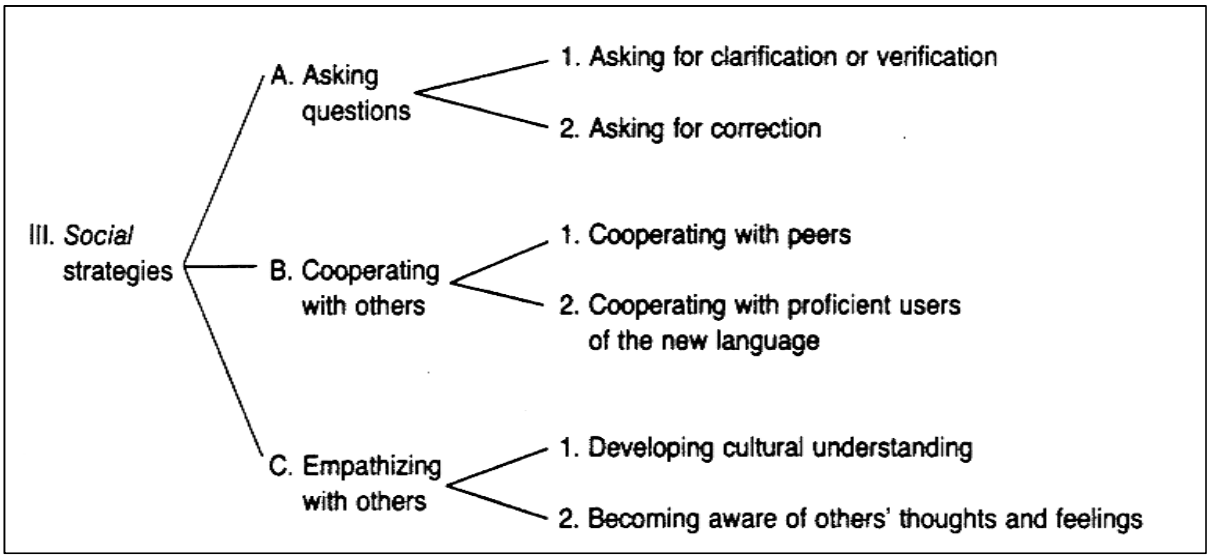

Figure 10. Diagram of the Social Strategies (Oxford. 1990:145)

Maybe the most popular form of communication is asking questions, be it for mere *phatic* communion –empty talk- purposes as to try to break the ice with a stranger in a train carriage, at a bus stop, in a waiting room or elsewhere. For more beneficial purposes, people ask questions as to get a particular piece of information. In the classroom setting, asking question is for a repeat, for clarification, or for providing more comprehensible input, as to consolidate a concept (a mental representation) or an idea (a mental event) already known or formed. (cf. Gardner. 1993).

Social strategies also mean to cooperate with the others and with peers, to build up implicatures whenever the connotative aspects of language surface (cf. Grice.1975; Sperber and Wilson. 1986). The language is denotatively plain because it is meant to serve the communication purposes, interdependence, mutual support then it is necessary as Locke, cited by Rost (1990), puts it, to make words 'serviceable to the end of Communication, it is necessary that they excite, in the Hearer, exactly the same Idea they stand for in the mind of the Speaker' (p.29. Original parentheses). Communicating likewise allows the learner avoid ambiguity or competition. For the latter, some ambitious [foreign language] learners confuse vocabulary richness with the learning and the utilization of big words, phrases and structures rarely met and seldom used, either by them or by anyone else (cf. McCrimmon.1963) maybe for the sake of competing with less proficient or even proficient learners [or for boasting], believing that this is the way to do.

Last but not least, understanding and developing awareness about the others culture beliefs and ways of looking at life is part of having a communication competence. Such competence serves to empathize, that is the capacity to understand and enter into the other people's perspectives and feelings for different people differ in many fields of life, one of which is societal behavior which is, according to Troike (1982), one of the functions of language to unify speakers as members of a single speech community and exclude others from intergroup communication. Precisely, it is the social strategies that help learn how to empathize with the others and become aware of their thoughts and feelings for not being excluded.

Conclusion

For reviewing the learning strategies, a much an elaborated diagram (Oxford. 1990. pp.19-21) displays all the learning strategies which Oxford classified according to direct and indirect strategies. According to her, the direct strategies are the cognitive ones, which the learner purposefully uses as '*Creating mental linkages*' (memory strategies); '*Analyzing and reasoning*' (cognitive strategies); '*Overcoming limitations in writing and speaking*' (comprehension strategies).

The indirect strategies are the ancillary strategies employed by the learner more unconsciously and uses them according to the external environmental influences, and according to the rising needs and nature of the subject which are schemata based such as '*Arranging and planning*' (metacognitive strategies) which are the result of the *C*ognitive strategy of 'analyzing and reasoning'; or '*Lowering your anxiety*' which could result either from the *M*emory strategies '*Reviewing well*' or '*Employing action*',
or still the *C*ognitive strategies as '*A*nalyzing and reasoning' or '*C*reating structure for input and output'. Either direct or indirect, all these strategies overlap indeed or are intrinsically inter-exchangeable to serve the student's reason of learning.

Last but not least, for the social strategies it sounds much of a challenge to try to truly find the demarcation line between each different strategy. They could be [simply] diagrammed only by taking into consideration the type of work the learner tends to do, in which environment he does such a work, does it, and for which purpose he does it. The analysis of Oxford's classification of the learning strategies allows to link such diagramming with the Fishman's classical '*Who speaks what language to whom where and why?'* (Fishman. 1972).

Chapter Four

Memory and Enhancing Effective Memory in Students

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Memory and Enhancing Effective Memory in Students

Introduction

Memory has long been the marvel of many a psychologists and researchers. They have worked to try to understand and decipher the many mysteries of what is commonly known as memory and memorization to demonstrate and understand and answer the *wh-* and *h-* questions about the subject. Indeed, when we try to understand how we memorize and event, a number or a picture, we ask many other relevant questions about why do we memorize at all; in which place of the brain do we store the information; in which form are the information stored; and many more pertinent questions.

In the 19th century, the pioneering researches into such memory and memorization phenomena were undertaken by Ebbinghaus. His works on memory on human memory have paved the way to more elaborated and more technically-based research and experiments. Ebbinghaus used learnt a list of nonsense syllables, consonant-vowel trigrams such as BUP, DAX, LOC, and the like. He then tested his ability to memorize lists of thirteen syllables and repeated (rehearsal) the lists, *first* twice, *second* in order, and *third without error.* He then tested his retention of these lists at various delays; counted the amount of time it took him to relearn the lists. Using 24-hour retention test, he achieved without overlearning a result of 33.8 per cent; and with overlearning he scored 64.1% (cf. Anderson. 1995a). With Ebbinghaus' primary but first solid investigation on memory, research on human memory has developed more intrinsically.

4.1. Memory Defined

As an operational definition, memory is an active and a constructive process (Neisser. 1982); a process with dynamic mechanisms for retaining and retrieving information about past experience (Sternberg. 1995).

Memory is a vast reservoir of unknown width, depth, and length, if it ever is a three-dimensional space. What we know with some conviction is that what is stored and being stored every new day is used to understand and enlarge the world we are living in. (Gardner.1995; Sternberg 1995; Anderson 1995b; 1999, Woolfork, 2004). In other words, our memory constructs, that is we recall useful than meaningless information, meaningless that is for the moment of recalling (recoding). The same information could become meaningful in another stance. Put differently, the constructivist idea about memory is that people always try to match the surfacing memories (stored information) with the existing schemes (stimuli). In fact, these memories surface assaults, our memory reconstructs what has been already constructed. Our memory is both *constructive* and *reconstructive* (cf. Anderson 1995).

Memory is also the acquisition of vocabulary and the other different language patterns as syntax, phonology, or stylistic skills. Children by the age of five, for example, have been observed to possess a vocabulary stock which could be in excess of "two thousand words, and are producing and comprehending sentences which reveal knowledge of complex syntactic rules and semantic relationships." (Gathercole.1990:57)

In language acquisition/learning, it is hard to imagine how language could develop without the contribution of memory skills. The learner learns language because he has developed intelligence during his early months of life and his capacity of associating symbols (cf. Karmiloff-Smith.1992), also known as semiotic representation, and later for

memorization, semiotic function or the ability to use symbol, signs, pictures and body language as signs, gestures for his mental imagery.

What is interesting in it being dynamic is the power of keeping in memory only the salient things we need in everyday life. This does not mean that our memory is selective, but it means that we retrieve only those important elements one needs and which help the others remain stored for the appropriate time we need to recall them.

4.2. Information Processing

The human brain processes information, i.e. when we take the information, as a student does in the classroom, the brain does not store all the information but performs actions on it. Words, sentences, pictures, illocutions, and the like are not stored as such but their form and content are changed into cerebral electric waves by the brain, then stored to be retrieved whenever needed. Furthermore, out of the stock of different words the brain prepares and generates responses to a question being posed, to a brainstorming activity, to answering a particular exam question, and the like.

Since there are dynamic mechanisms associated with retention and retrieval, what is stored in the long-term memory is not 'forgotten' but is actively worked out and activated by a constant exchange with the working memory. With continuous intake, and output, the brain needs messages and information and so goes to take it first from memory, and at the same time renewing the memory stock of both the working memory and the long-term memory (cf. Atkinson and Shiffrin.1968, Schacter.1996). The brain works in an orderly fashion, following a pattern, drawn in the following table

1 Input or intake takes place
1. Encoding information in sensory memory. Perception, attention, *urgenc*y, *saliency* determine what should be kept for immediate or short-term use, and then,
2. All is sent to a primary reservoir called the *working memory*. The other particles of information which perception and attention have determined to be of a long- term need are
3. Stored in the long-term memory storage.

Table 03. The Brain Working Pattern

One cannot imagine ourselves living without the help of memory, for what we already know represents the basis or the scaffolding upon which people construct all what they will learn in future. We should wonder about those people who suffer from trouble or brain damage, somewhere in the hippocampus.

The brain cannot be observed in a laboratory and cannot be inspected to determine what goes on when someone is thinking about solving a problem. Serious technical difficulties must be cleared, for the brain is composed of some 100 billion nerve cells; millions of them are *probably* involved in solving brainstorming activities, some other one hundred million for playing chess, and the like. The brain is organized into a number of different zones or areas, and each one serves a particular area. Carrying a physiological approach turns then impossible.

A more appropriate approach is *the information-processing approach* which has come to be dominant in psychology. It aims to analyze cognition or the mental activity of the brain in the different steps it processes information in separate steps For many, the brain resembles the computer in the intaking operation of storing and retrieving information, especially in the way information is stored and arranged (as in alphabetical order). Many researchers started to think to study memory and how the

human mind processes information from 'a computational metaphor' perspective (cf. Matlin et al. 2003:18-19) as information is stored in electro-magnetic waves, so is our brain in which the sensory cortex is the storehouse of past impressions, as Bartlett put it speaking of Head (cf. Bartlett.1932, p.200). The study was to investigate the very nature of memory: how information is being processed. The computer has been largely designed on the basis of human memory and thus, in return, offers grand opportunities to test, try, and observe again how information is being processed from letters and figures into a series of digits 000000, 1111111 and other items which are proper to every program.

4.2.1. Sensory Memory

People live in an environment in which they undergo the continuous assaults of stimuli like sounds, signs, images, cries of all sorts which our five senses remember and identify, discriminate, classify, store and reject (to be forgotten) with an indefatigable accuracy! They recognize a sound as *a* sound not as something else, and so with images, scenes, smells, ailments, and the rest.

This is so because our brain absorbs and transforms these incoming stimuli and transforms them into coded information which is later decoded and understood: this is *sensory memory*. Sperling (1960) identified the existence of a discrete *iconic memory* or visual sensory stored in the form of icons in our memory. An example of iconic memory is the use of a highlighter to precisely not forget something people believe important. In fact, the images people have drawn with a sparkling color will become to

the sensory memory a series of icons people are to remember, or that the highlighting operates as a reminder. The other example is the use of three bright colors in the street lights, or the use of the red pen for correcting papers so that the rater makes sure the learner sees and follows the remarks that he put to him.

4.2.1.1. Mnemonic Devices

Cambridge Advanced Learners' Dictionary (2004) defines a mnemonic as: 'something such as a small poem or a special word used to help a person remember something' (p.798). Mnemonics could also take the form of an acronym that is word stand for the great lakes in America *Superior, Erie, Michigan, Ontario* and *Huron,* or *FGCE 15P meaning: Fifteen Girls Can't Eat 15 Pizzas* (as seen on an American T.V serial *Monk*) used to retain the numeral plate of a car) and similar word formation like these. Such word formation has been identified as the chain mnemonics for every one item of the acronym leading to remember the next one.

Another more practical mnemonic is the keyword method; a method extensively researched in the realm of teaching for it makes learning easier and more practical (cf. Levin et al.2000) as for teaching the principles of writing for students, the six P's stand for:

1. *P*leasant appearance	4. *P*roportion
2. *P*roper choice of the subject	5. *P*erspicacity
3. *P*lanning	6. *P*ersuasiveness

Table 04. Mnemonics for the 6 *P*'s

Another example of acronym is VIBGYOR (or *Roy'G'biv*) or which stands for the seven colors of the spectrum (or the rainbow).

1. *V*iolet	5. *Y*ellow
2. *I*ndigo	6. *O*range
3. *B*lue	7. *R*ed
4. *G*reen	

Table 05. Mnemonics for the Colors of the Spectrum

The keyword method helps gulp long stances of information encoded in a simple set of letters. Such acronyms if given intensively to learners might render learning difficult to them for they may run the risk not to remember what each acronym embeds as information, or worse they may confuse between two or three acronyms (Pressley.1991). However, if students feel that such a method is effective, they must –if they wish- be encouraged to form their own personal acronyms and likewise they might not run the risk, or lower the risk to get confused. Images (iconic store) can also be used as mnemonics. A rebus is probably the best example of picture/image mnemonic.

It is important to note that with overlearning and repeated use, retention may become unconscious, and the effects of the mnemonics may 'actually diminish as effective storage and retrieval behaviors become progressively automatized(…)as the behaviors it once mediated become more self-starting' (Flavell et al. 1977:28-29). Using mnemonics should not, however, be taught an aid to remember *per se* for learners may start to rely very much on using them and may get encode in their long-term memory a series of rebuses which they could not decipher. Constructing mnemonics should be left to the learners own appreciation. What is important is that they should be made aware not to exaggerate the use of such a plausible way. The other aspect of the information-processing approach is to examine the flow of information that is being preceded in the human brain or the human organism as well as between the organism and the surrounding environment. Cues, shapes, colors, speech, noise, and many other things can interfere in processing information, and this exactly what the information-processing approach aspires to study.

Many models about how information have been designed as the one presented by Atkinson and Shiffrin (1968) believed that memory in our brains is threefold

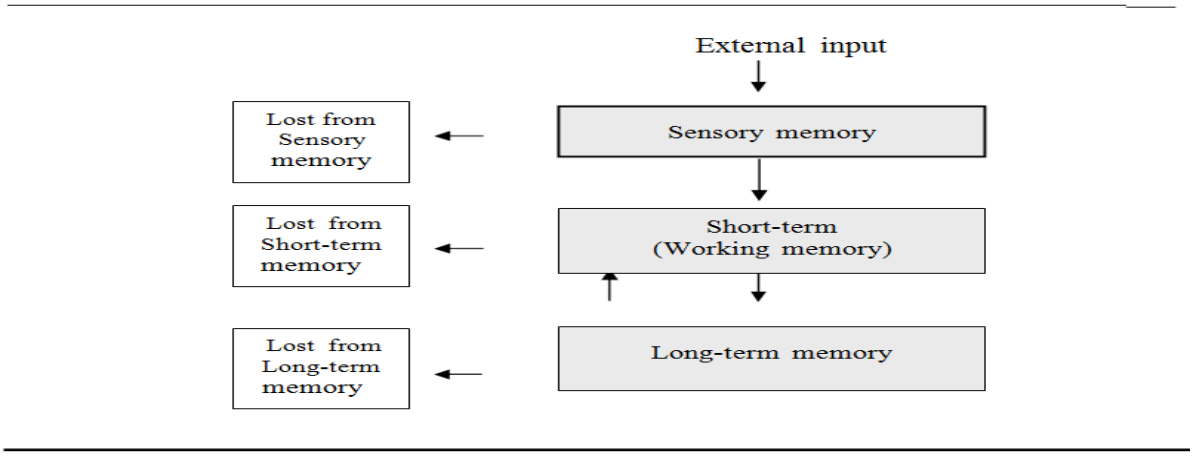

Figure 11. Atkinson and Shiffrin's Model of Memory. (Matlin et al. 2003:11)

1. *Sens*ory *memory, 2.* short-term memory (or Working memory*), and 3. *Long-term memory,* as their model below suggests.

To Atkinson et al (1968) three-step memory model has influenced and persuaded psychologists that we use the cognitive perspective to understand and explain how memory functions. Information comes then from the outside the surrounding world of what is and is transformed into sensory signs and pulses and these are stored in the sensory memory entity; others in the short-term memory for everyday use, and the rest in the long-term storage to be retrieved whenever necessary, as we will sketch it out below.

4.2.1.2. Capacity and Duration

Sensory memory is for holding information of the matter of second or minutes as to remember a telephone number, an address, or the names of two or three people; to remember these long enough to dial the number, to rewrite the address on our note book memorandum (to help our memory), or the names of people to call on the telephone, or to write on the desk pad.

Sperling (1960) works on sensory memory indicated the existence of a *brief* visual sensory storing of what has been seen; brief, but that can effectively hold all the information in the visual display. Indeed, his experiment which consisted of presenting light): high tone for the upper row, medium for the middle, and low for bottom which were presented to subjects. The results obtained were classified by Sperling as *a.* partial report procedure, and *b.* whole-report procedure. Indeed, for the first, the subjects could remember all or most of the items from a row of four.

X	M	R	J
C	N	K	P
V	F	L	B

Figure 12. The Letter Display for the Visual-report Experiment (Anderson.1995:85)

The subjects have stored the items in what he called a short-term visual memory. When they were given the cue -the tone- they could recall from their short-term memory and report the digits of that row. (cf. Anderson.1995, pp.85-57). Sperling also varied the length of the display and the offset, and the results obtained is that as the delay decreases, to 1second, the subjects' performance also regresses below what was obtained in the whole-report level, back to four or five items. With blazing light, however, and exposure to different items, the previously memorized items disappear and are immediately replaced by the new presented ones.

Duration of exposure is then primordial so that the operation of memorization takes place in an effective way that is if we want to avoid forgetting. The latter is altogether a whole issue with its ups and downs in the issue of memory and memorization. In the present research, we are very much interested in memory and memorization than in forgetting and why and how we forget. This issue could be the interest of another future research.

4.2.1.3. Perception and Attention

Sperling's experiment highlights the very essence and meaning of what sensory memory is all about: it is basically visual and alters with colors, light, and length of exposure. The longer the exposure, the longer the memory is, and vice-versa. If the brain uses memory (memory strategies), it uses the power of the eyes, and all the light that comes in taking with it the icons that are processed into sensory language and stored in the short-term memory or best known as the sensory memory.

In the same vein, memory that has to do with sounds has also been identified and labeled as echoic store. It has to do for hearing what iconic memory does for vision. Further researches have been done (cf. Greene and Crowder 1984) to understand the nature of such an echoic store, how we perceive and pay attention to the environment that surrounds us, people pick and what they don't –information discrimination of the store, its form, and duration.

Perception is by definition the operation of detecting a new stimulus and giving it a particular meaning according to data that has been already internalized. It is matching the novel stimulus with the schemata that has been formerly built. Schemata can also be viewed as building 'patterns' or 'configuration' or a *Gestalt* (Russell.1961; Rost.1990; Saadi.1990). According to the Gestalt theorists, people tend to organize their sensory information in terms of patterns and 'wholes' rather than in fragmentized (bits and pieces) fashion.

Other researches, observations and monitoring have fueled the quest for understanding how memorization 'truly' functions. Feature analysis theory or *top-down* & *bottom-up* approach. For the latter, people hold information (sensory memory), and organize it (perception) into components. In top-down, the mind refers generally to 'higher level organization' (cf. Robinson.1991:26), an organization which is arrived to according to a

preexisting schemata. Schemata, or schemas, are all cognitive, mental plans that are abstract and which serve as guide for action, as structures for interpreting information, or organized frameworks for solving problems (cf. Barllett.1932). For the bottom-up process, information is decoded 'step by step, from the smallest elements, for example, sounds of letters [echoic store], gradually building up to larger units' (Hedge. 2000:407). In other words, in recognizing patterns (rapidly), we use what we have already stored as information about the situation (sounds, words, icons, etc.) stored in the long-term memory, as we will be presented further down.

In the interests of precision, we have to show here the role of attention in sensory memory. So why we pay attention to certain elements and not others could be explained by the variation of colors, sounds, shapes and the like. By paying attention to some of these elements and not others could be explained and understood by the 'pulse' that determines, *first* what people know (schemata), and *second,* and most importantly by what people want to know, that is information discrimination, or meaning negotiation.

So, both iconic and echoic information is perceived according to the level of attention which is brought to them. Bright colors as the highlighter (see above) or particular sounds, teacher's or parents' expressions like 'listen!', 'pay attention!'; 'can I have your attention' and other similar ones help discriminate information. In fact, in our memory, we do not retain all what we hear. According to Widdowson's view, the affective wellbeing of the self could be understood as the particular and personal perception which make of information we listen to, see, smell, or touch.

4.2.2. Short-term/Working Memory

In the Atkinson and Schifrin's model, the arrow going from the sensory memory to the working memory well indicates the direction with the amount of information takes.

Indeed, 'stronger' than the sensory memory, the working, or short-term memory holds information for 30 seconds after which the information is lost, unless of course it is reinforced by repetition.

As an operational definition, working memory is a component of memory whose capacity is to hold memory for about 20 seconds. It is a 'corner stone' between sensory memory and long-term memory. Baddeley (1986) sees that it is that information that recent textbook in educational psychology (Woolfork (2004), working memory is described in terms of threefold: *1*. the central executive*; 2.*phonological loop; and *3.* Visuospatial sketchpad, (a description already introduced by researchers in the area, in the late 1980's and early 1990's eg. Baddeley, 1986; 1999), as presented presently.

4.2.2.1. The Central Executive

If working memory is called *working memory* it is because it is believed to contain the storing of what one is thinking about at the moment. In doing arithmetic operations, for example, the working memory possesses a complete information processing system which at once goes into action to accomplish what the brain is about to do. In other words, a mental effort is applied to the new incoming information and to the old one. In our example, the calculation to do *now* will be processed thanks to the old storage of the multiplication table and other digits that have been stored with the help of brain strategies identified as groupings. In storing the information for any particular time, and because of:

> the small capacity of people's working memory, which is usually considered to be about seven items at any one time, it is necessary to find ways of breaking down complex material into related 'chunks' before consigning these to the *long-term memory* store.
>
> (Williams & Burden.1997:16)

Executive, that is matching the in-coming data and processing it according to the already existing data which is relative to the nature of the new coming information together with what the brain wants to execute as an operation. The central executive has the sole job of supervising attention, rehearsing, retrieving, making plans, and integrating information. The central executive requires the 'help' of two other elements: the phonological loop, and the visuospatial sketchpad.

Information is kept in the short-term memory through rehearsal; this is what most psychologists have fairly contended upon. Repeating the recitation or the processing of an item or a stimulus keeps it 'engraved' on the *walls* of our short-term memory. Research by Brown (1958) and Peterson et al (1959) have demonstrated that without rehearsal, information is forgotten after a certain time. (cf. Long-Term Memory below).

4.2.2.2. The Phonological Loop

The phonological loop is the system in the memory which stores a limited number of sounds for as limited period of time. This system which is part of the short-term or working memory has the principal function of rehearsing verbal as well as sound information at a speed of about 1.5 to 2 seconds! For example, an utterance as: 'she sells sea shells by the sea shore' is, according to the phonological loop *feats,* rehearsed in 1.5 to 2 seconds (cf. Baddeley. 2001, Matlin et al 2003).

The phonological loop, there are limitations of the storage space. Name of places as, for instance, Tunisia, Burma, Ceylon, Lake Titicaca are pronounced quickly, whereas we can pronounce only a limited number of longer names as, say, Massachusetts (USA),

Tinghanimin* or other names with longer syllables. As another example, in wanting to rehearse such nouns or utterances as 'she sells sea shells by the sea shore' (a tongue twister) or the mouthy 'he wrote the lesson with the piece of chalk that Ali bought him yesterday'.

On the other hand, digits such as 21 or 58 or 8 are much easier to remember than long ones as 6689523 or 1023356. Telephone separate paired digit especially of friends and intimates, are, however, much easier to remember than long ones because of their practical uses. Digits, long or short, are more likely to be remembered by a talented mathematician than by a lay learner. Language, of course, does not function like this, but this is just an illustration of what the phonological loop might be subject to rehearse.

By ricochet, we remember more easily single words or digit than longer ones. At any rate, the phonological loop is what the learner uses in learning the different sounds of English in high phonetics courses, or in his aural/oral sessions.

4.2.2.3. The Visuospatial Sketchpad

Information is received by the central executive and is therefore stored. For example, the idea we make of a colorful rotating atlas is stored in our visuospatial sketchpad which gives us the image of the spherical *3-D* image of an object representing the earth, with names of places, seas, and rivers. Furthermore, if an adult if asked to draw a cube, his representation will be different from that of, say, an artist, especially what concerns the perspectives of the oblique lines (cf. Saadi. 1999; Cox. 1986).

In the interests of precision, what truly happens about this sketchpad is that when we are told a story (or a tale), we visualize what is being told by giving it a spatial representation in the form of *a scene or occurrence*. It so often happens with us that after

* Tinghanimin: historic and sight capturing gorges in the Aures, south east of Batna, on the route to Biskra via Arris, which were the scene for the first revolutionary act against the French colonization during which a French teacher and a cadi were slain, days before the historic November 1, 1954 upraise.

we read a book, we are sometimes surprised to discover the same scene we have made of the story which we find, for example, in the film adapted from that story. Indeed, for that matter, I still recall in good details what truly happened with me. When I read the novel *Rebel without Cause* by Nicholas Ray, I was marvelously surprised to discover that to some extent, the very scenes and images I made of the story were *almost identical* in the film (starring the late James Dean) adapted from the novel and which bears the same title. This is no sheer coincidence, but could be rather explained by the fact that it's Nicholas Ray who himself wrote the scenario of the film.

The interest in this reminiscence is that all the operation of encoding an image and a scene took place in the cerebral cortex, in the visuo-spatial sketch pad, or still the association area where the assorted pieces of the scene of the novel are integrated.

For example, in different disciplines as in architecture, arts, music, engineering differently use the visuospatial sketchpad to integrate the sounds (echoic store) or the images (iconic store) of their respective needs and stimuli. A worker in the pipes factory in El-Kala, has engraved in his memory (probably more in the long-term memory, as will come further down) the spherical and rounded part of the pipe, and the *container* where tobacco is burnt. In a personal description of the pipe, the descriptive features of what a pipe is are recalled from the working memory (or maybe from the long-term memory).

If this be the case with the visuospatial sketchpad, then in teaching there must be a functional and a conceptual framework (cf. Gardner. 1995) planned at the beginning within which teaching is to take place so that 'what is likely to be most urgently needed(…)is what is actually taught first' (Wilkins. 1976:70). The loop and the visuospatial sketchpad execute in the whole enterprise of memorizing, i.e. of receiving, preceding and storing different types of information.

It becomes clear from the figure below that in working memory, the Central Executive, as its name suggests, is where every memory process starts. According to the incoming stimulus, the central executive transfers the necessary electric waves*wise* decisions as reasoning, comprehension towards the phonological loop, the echoic store, processes –are for a short term protected (buffer) probably from being drained away without cause, that is when no difficulty arises.

SBesides, for another stimulus assaults as images, search tasks are accordingly undertaken. The three could be overwhelmed if information is difficult, crammed or difficult to understand (as to try to explain nuclear fission or aerodynamics to a lay old person).

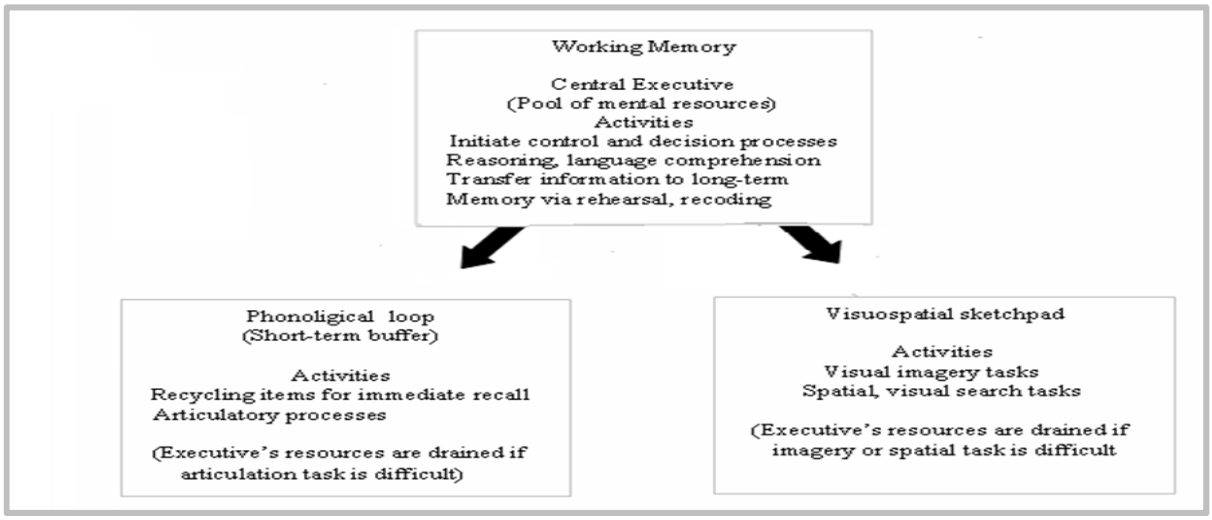

Table 06. Diagram of Problem-solving Process (Woolfolk. 2004:288)

However, when the brain sends messages of information retention, things could be handled differently. The maintenance rehearsal goes into action to keep information in the working memory when information is [being] repeated, and the same information is elaborated with the help of knowledge drawn from the long-term memory. Association is thus made when *maintenance rehearsal* changes into more elaborated repetition the *elaborative rehearsal*.

Through this process information is being moved from short-term memory to long-term memory If elaboration takes place, this means that incoming information has been processed into schemes or schemata or *chunks*. Such chunking procedures are identified by Widdowson (1983) as being *procedural negotiations*. He posits that

> Procedures(…)are to match up and adjust schemata activities processing[that is]the interactive negotiating activities which interpret the directions provided and enable us to alter our expectations in the *light of new evidence* [stimulus] as the [information]

On the other hand, if such chunking is not realized, that when there is no matching and adjustment, this leads to forgetting. The new incoming data and information 'change place' with the old or obsolete information which wear out and are erased. Forgetting, as a matter of fact, should not be seen as always being negative or destructive. If the brain or the psyche has received no 'destructive' hurts, then forgetting tends to operate as a charwoman cleaning memory from aging information and replacing it with a fresher through rehearsal, basically Woolfolk (2004) sees that forgetting helps the memory from

not being overloaded which might, as she sees, prevent learning to cease. By forgetting we don't mean amnesia caused by a trauma of some sort. Amnesia could be the subject of a further research. Forgetting is to be understood as the continuous 'natural' cleaning, and the regular updating of the memory reservoir for ensuring better achievement in the learning efforts in the entire learning enterprise, and which learning would become *mind cramming* instead of well thought and *intelligent* learning.

4.3. Long-term Memory

These basic parts of the working memory and their different tasks and processes work for sending information and data further to the long-term memory when such information are well learnt. Coming still on the same line of the memory continuum, but further along, is the

long-term memory. In the interests of an operational definition, long-term memory could be identified as the long-term information reservoir.

In teaching, long-term memory is what both teaching and learning are about. This is true precisely for the particular characteristics of its *capacity*, *duration,* and *contents*, which are largely different from the preceding sensory and working memories. In what follows are the devices that help retain large and much larger amounts of information.

4.3.1. Storing and Duration

If for sensory or working memory storing is brief, really brief (a matter of seconds), with long-term memory, as its name suggests, it is much longer. The other difference is that for working memory, we need not a lot of rehearsal, for example, to maintain a bit of information, information enters and circulates very quickly, whereas for long-term memory much more efforts have to be deployed to encode, store and maintain the information.

For these matters, the capacity of the long-term memory is, then, much greater than the one of the working memory. Information is held for a longer time for long- term requirements and future needs and applications. Some people can recall stretches of information from their infancy in minute details, others could recite long poems and epics with a thrilling exactitude; mathematicians hold whole tables of intrinsic figures and formulae; actors learn long scenarios and scripts; some other people learn the capacity of the long-term memory is really unlimited and could never be exactly measured or quantified.

Either in the form of sounds (echoic store) or pictures, graphs, images, scenes (iconic store), schemata, grammatical networks, such information has been securely stored. To be *securely stored* means that efforts have been deployed to *precisely* maintain such information, through rehearsals basically. Storing, as pictures and events from the far

childhood could also be explained by factors of a psychological nature like shocks as having had a road or home accident; a thrilling experience as the success in an exam, or events having an influential psychological drive. As far as capacity goes, Woolfolk (2004) proposed a comparative table of working and Long-term memory described below.

Type of memory	input	capacity	duration	contents	retrieval
Working	Very fast	Limited	Very brief: 5-20 sec.	Words, images, ideas, sentences	Immediate
Long-term	Relatively slow	Practically unlimited	Practically unlimited	Propositional networks, schemata, productions, episodes, perhaps images	Depends on presentation and organization

Table 07. Working and LongTerm Memory (Woolfolk. 2004:247)

4.3.2. Content

When one works on a given subject, say, writing a dissertation on the differences existing between an epic and an ode, they need to recall that we have stored on the subject. We pull information from the long-term memory –*storage*- in which each single and minute detail has been stored previously throughout our learning experience in the university (and throughout our personal readings). This information is brought to the working memory and it is processed -*process*- to accomplish our task of drafting the dissertation. So since no one can really see the real demarcation line between working and long term memories, these lines are only concepts and suppositions made by psychologists and experimenters; other psychologists see that there are no two distinct ones from which people retrieve information, and another one in which we process it, but that the two are only extension one another and that the only difference is that the long-term memory is basically for [long term] storage,

and the working memory is for processing information. For that matter, some psychologists have seen that there is in fact no real difference between the two memories, but that the only difference is that long-term memory is for the *storage* of information, and working memory is for the *process* of that information (Wilson. 2001).

In the same line of thought, Sternberg (1995) sees that people organize information and data in their memory according to personal experience and according to the general knowledge of the world. These subdivisions are labeled as *semantic memory* Ashcraft (2002) sees that there are two distinct categories of long-term memory, namely *explicit* and *implicit*, *each* one having subdivisions. Within the *explicit memory*, lay the *semantic* and the *episodic* memories; and within the *implicit memory* lay the *procedural memory*, the *productions*, and *priming*.

4.3.3. Explicit Memory: Semantic and Episodic

As an operational definition, explicit memory is the storage of information which we can consciously recall and use whenever needed. For example, during an examination, we recall the precise information about the question. The mind sends signals to the storehouse and retrieves the necessary information to help formulate the right answer. If the question is, say, about Robert Frost's imagery, then the information is recalled about Frost's imagery and metaphors (from the long-term memory) and not another one.

4.3.3.1. Semantic Memory

As its name suggests, semantic memory has to do with meaning: it is the memory for meaning and words since these latter words are the vehicle of meaning. In Written Expression, Oral Expression, or Literature classes, we often teach our students the importance of well choosing words to express a particular meaning. For that, teachers make

them aware of the difference between words in general –which vehicle meanings as well as *meaning-carrying words.* And to avoid those students to be perplexed, we explain to them that all words do carry meaning, but that the difference than one meaning. As an illustration for this, the meanings borne is the word '*seize*' which means 'to take hold of something or somebody suddenly and or violently' (Hornby.1998: 1065). So in 'seize' we have both the two meanings of **1**. *suddenly, and* **2**. *violently* which the word '*hold'* does not hold. Such words abound in the English language, but what is of our interest here is that such words make up our semantic storehouse.

Semantic memory is also the storing of events, facts, theories, and concepts; all of these bear a semantic value. These memories are not tied up to particular experiences: people do not remember them because of an experiential attitude, but people learn them in the course of our tuition and they become part of our memory. Those meanings as Anderson (1995a) explains it are linked to a set of propositions and propositional networks, and one proposition leads to another one, in a trigger-chain fashion, (cf. MacMahon. 1999) which we discussed in the previous chapter. In saying:

'The little girl in red visited her grandmother', it has the same meaning as when we say 'The Little Red Riding Hood visited her grandmother. Thus, the two propositions:

1. The little beautiful girl in red visited her grandmother, *and*

2. The little Red Riding Hood visited her mother.

It is a particular meaning (about a small girl clad in red visiting her grandmother) which is loaded in memory as a set of relationships people semantically recall whenever the same story is told to us. Such connections are also carried out by the schemas, or the basic structures for organizing information as concepts, as far as semantic memory goes.

The other meaning is about grammar. In grammar, that is grammar + meaning, the same operation takes place. In saying 'I was going to Algiers tomorrow', a novice learner might cast doubt about the grammatical veracity of such a proposition for he may find it wrong to use a future adverb 'tomorrow' with a past verb 'was going'. The two propositions are

1. I had the intention to go to Algiers tomorrow
2. I changed my mind.

In formulating one proposition instead of one, we have recalled from the long-term or the grammar storehouse two semantic propositions which we have, according to a particular network –translation/paraphrasing, arranged in one proposition having of course the same meaning as the two.

4.3.3.2. Episodic Memory

From episodes, episodic memory has a close relation with the different episodes of our life. We remember the time, the place and the manner which marked our life in term memory for particular events tied to particular time and places, particularly the personal life of the individual. For instance, any time we see a little girl in a red dress, one can directly recall from the long-term memory the episode of reading the story of The Little red riding Hood, and nickname the little girl and to say' *here the little red Riding Hood*' or '*Beware of the wolf, little Riding Hood*', and similar other funny remarks.

In the course of learning, episodic memory intervenes to allow the learner remember one particular information which he has linked with a particular experience as to remember the chapter of Gold Rush in American history by remembering Charles Chaplin's '*Gold Rush'* (1925. The table below shows the different memory systems which involve different neural systems.

4.3.3.3. Implicit Memory

Implicit memory is out-of-awareness memory (Woolfolk, 2004), the opposite of the consciousness-driven memory. This type of memory has also to do with retaining events and habits. Having the same concept of classical conditioning, in implicit memory, nothing is done to recall any event, feeling or event, as when a student has an irrational fear (cf. Wolpe.1969; Mook. 1982) because he knows that [tomorrow] he has to sit for an examination, be it easy (an exam is an exam!). The following table shows the different memory systems which involve different neural systems.

Procedural memory has to do with habits, skills, and the way and manner of doing things: the procedure. How can one explain that someone gets his driving license but does not drive until after 15 years? When he then gets into a car, he easily starts off the engine and goes. He has learnt how to drive a car and has kept this engraved in his long-term memory for a long time. Procedural memories are condition-action rules or productions (Woolfolk. 2004:252).

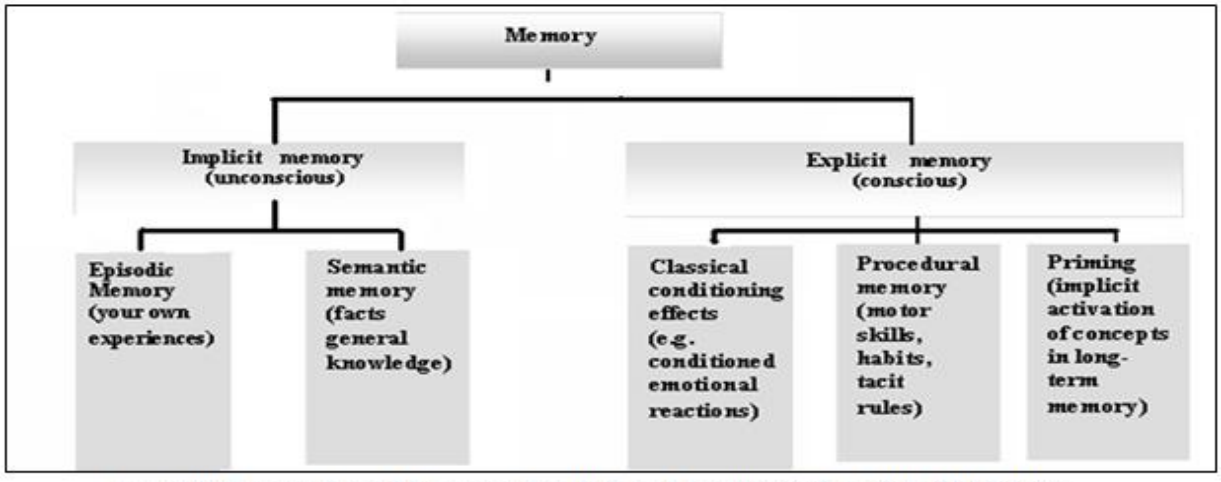

Table 08. Long-term Memory: Explicit and Implicit (Woolfolk.2004:249)

In driving, the novice driver when igniting the motor knows that to start off the car, as to push on the clutch (the gear pedal), engage the first gear, push a little on the petrol pedal and release slowly the clutch and the car starts to move. This has been imprinted

in his long-term memory and to do the action quickly and satisfactorily, all the novice driver needs is two or three days of practice to *automatize* the conditioned learning about how to drive a car for everything has been properly stored in the long-term storehouse.

4.3.3.4. Priming

Priming is preparing or initiating someone for a particular situation belongs to the implicit memory. For example, a primer could be the booklet which contains basic facts about a particular subject used by someone who begins to learn about that subject.

In an examination, remembering the most salient things about the subject of the question could explain the primacy effect in remembering. This is supposed to be primarily the effect of the long-term memory and then recall from the end of the list as the effect of the short-term or working memory. Even though priming seems not to be very much different from procedural memory, but what is particular is the serial position of information.

According to Sternberg (1995), most people have the tendency to recall items at the ends of a list, which he calls 'superior recall', or 'greatest recall', and at the beginning of a list (second-greatest recall) with greater easiness than items from the middle of the list (p. 281). What is remembered last is due to the *recency effect*, or what comes next after the superior recall, and the second-superior recall.

4.4. Storage and Forgetting

With rehearsal, people retain information in the short-term store (and later when necessary -still with rehearsal- transfer information into long-term memory) as shown above with Ebbinghaus. Further research on retention functions, as described by Anderson (1995) presented subjects with a sequence of words after delays ranging between 1 minute and 14 days. It was noticed that recall of performances deteriorates with delay, and remembering and forgetting have to do 'with the strength of encoding the memory traces'

(Anderson.1995:202). With the passage of time, and with the diminution (or disappearance) of rehearsal, memory traces decay which causes to forget. Such an explanation paved the wayto the *decay theory*.

Furthermore, people also forget a piece of relatively old information when new information *interferes* with and displaces it in the short-term store. The explanation of such interference was known as the *interference theory*.

4.4.1. The Interference Theory

The originators of this theory, as Lloyd and Margaret Peterson (cf. Sternberg. 1995), explain that we forget because new information interferes with old information present in the short-term store (working memory).

Much of the research on interference has involved the learning of how a list of associates would [strongly] impact on the memory for another list. The experiment discussed by Anderson (1995:204) during which the two groups were given a series of three lists (same A-B, different A-D, and again same A-B) of paired associates to learn. The retention test was administered after a considerable delay of 24 hours to one week. The important observations made are that the learning of the A-D list interferes with the A-B list and causes the latter to be forgotten. This research shows that generally it is hard to learn new items and retain old ones. Anderson argues that that there might be dismal implications for people's ability to retain information and that 'learning additional associates to a stimulus can cause old ones to be forgotten' (Anderson.1195:205).

Interference theory is also explained that what occurs when we forget is that we do not rehearse. Sternberg (1995) reports the experiment conducted by Peterson and Peterson in 1959. The Petersons asked their subjects to recall strings of three consonants, or trigrams at intervals of 3, 6, 9, 12, 15, or 18 seconds after they are being presented the last letter.

The Petersons noticed a rapid decline of recall because after they orally presented each trigram, the Petersons asked their subjects to count backward their figures by threes. The purpose of having the subjects count backward was precisely to prevent them from rehearsing during the retention interval that is 'the time between the presentation of the last letter and the start of the recall phase of the experimental trial(…)the trigram is almost completely forgotten after just 18 seconds if subjects are not allowed to rehearse it' (Sternberg.1995:279). Rehearsal, as a matter of fact, is what allows information to be engraved in the short- term memory (working memory), and later into the long-term memory is rehearsal when is strongly accentuated. Therefore, any interference would not cause information to be forgotten. In the same vein, Anderson (1995) states that 'interference does not occur when the memories are somewhat redundant' (p. 209).

On the other hand, proactive interference is when interfering materials *precede* the information to be remembered. For example, in presenting to subjects a series of three trigrams to be remembered, and just before the beginning of the experiment, other trigrams are presented (Keppel and Underwood, in Sternberg.1995).

4.4.2. The Decay Theory

This theory asserts that forgetting happens when a piece of information gradually disappears because nothing was done to retain it as revising it (as to revise a lesson), or continually using it.

However, the decay theory remains very difficult to test because it is not evident to prevent subjects from intentionally or inadvertently rehearsing which lead to maintain information in the memory storage. Wickelgren (1973) conducted a research on the retention function and on forgetting. He presented a sequence of words to subjects and after delaying ranging from 1 minute to 14 days, he has observed that the remembering function

deteriorates with delay. More recently, Wixted and Ebbesen (1991) have demonstrated that 'practice functions show diminishing improvement with practice, whereas retention functions shows diminishing loss with delay' (In Anderson.1995:200).

The reason that some memories decay rapidly over a period of seconds and others over days is caused by the strength of encoding the memory traces that is practice is what allows postponing the decay of such memories. Researches by Bahick. (1984) have demonstrated the role of visible decay in memories when rehearsal is not accentuated. For learners, the power of learning is closely dependent on the power of their rehearsal (and other strategies, as we saw in the previous chapters) if they wish to maintain information stored, respectively in their short-term/working memory and in their long-term memory.

If this is not effectively done, then the power [law] of learning will turn to [a power of] forgetting where retention functions will weaken with delay. The very idea that memory loses traces and *decays in strength with time* can be taken as a common explanation of forgetting.

Conclusion

Memory plays a redoubtable part in learning. For the interest of precision, we have tried to show that memory is basically *perception*, *retention*, and *retrieval*, but has research, in helping to shape his [entire] learning behavior. In trying to explain the phenomenon of why people remember those gross quantities of information in the form of, icons, sounds, events, why people recall certain items quicker than others, and other related phenomena, psychologists in concert have drawn a triarchic division of memories, *namely* the sensory store, the short-term /working store, and the long-term store, giving to each a particular role to play a particular effect on one another.

Last but not least, the loss of memory or severe loss of memory as amnesia, retrograde or anterograde amnesia have not been discussed because they are of the province of neuropsychology, and it requires a sound research, not of interest in the present research.

Chapter Five

Thinking and Learning to Think

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Thinking and Learning to Think

Introduction

From an early age, people do not stop making cerebral operations in different situations and for different purposes all of which are all important as they get along with age. With age also, people's mind continues to gather information, learn, invent and put into action different strategies.

For these different cognitive behaviors, people manipulate different pieces of information to depart from a premise to arrive to a conclusion. If someone tells "Once at home, if I find the address of our friend, I'll ring you up." When two hours later, the friend does not ring me up, I draw the conclusion that he did not find the address he was looking for. Peoples' mind deduces such a fact by manipulating different pieces of information which they have learnt through their contact with other people, in school, or within the family, or circle of friends. With minds, people also make decisions, either true or false, good or bad, choosing among several alternatives and the consequences of such decisions may not be [immediately and] clearly seen. How do peoples' minds proceed while thinking is not clearly explained, and they arrive to draw conclusions and later they verify that our reasoning was right, we still don't know what thinking is, on how we think and the other related mental activities.

5.1. Thinking Defined

From the days and the times of the so-called *homo-sapiens sapiens,* 'the man thinker' the issue of thinking has always triggered the curiosity of researchers Worldwide from Socrates to Horace, to Averroes, to Descartes, to the present time.

Research psychologists as William James, Broca, Vygostsky, Piaget, Gardner, Steinberg, Sternberg, Luria, their colleagues and their contemporaries, and the others, have all tried to *dig deep*, to *look twice* in their researches to try to uncover the mystery of how the human mind proceeds in the thinking enterprise. Digging deep and looking twice are two important 'instruments' utilized in the cognitive enterprise by such researchers: they made judgments; deduced truths and made decisions about what they have seen, monitored, and investigated. What they have done is *thinking*.

As an operational definition, thinking means to consciously process information in the mind to find a thoughtful solution to a problem. In other words, when we think, we analyze the many components of a particular situation, problem, and puzzle by breaking it down into its components to try to understand it than to build it up again into a novel final form in which the components have been put into wholes or synthesized them (cf. Sternberg. 1995). To Galotti (1989) thinking is going beyond the information given. In other words, it is intercepting data not according to 'generalizability regarding what is found in the data [but according to] the way an1996:46). Woods advances the idea of 'own theoretical constructs', that is a kind of schemata with which the mind can work. In other words, the individual's mind discovers how to 'turn around its own *schemata*' (Bartlett. 1932:208), or what Doughty (2001) identifies as 'cognitive mapping' which –he believes- a cognitive focus tend to facilitate.

5.2. Development of Thinking

Every society, all along the timeline, looks at the human being as having particular features. For the ancient Greeks, a person is known by the physical force he possesses and his agility in the battlefield (the Spartans –*military men*), or by the sound reasoning and the logical judgment, his way of contemplating Nature and people's behaviors (the

Athenians- *the intellectuals*). Later, the Romans praised the manly man, the virile combat soldier; the Muslims put their preference of a balanced man who understands that he and the others are equal in rights and in duties before one God. The Indians, the Chinese, the Japanese, the Black Africans, the Red Indians, name it, all have shaped society and human thought according to what they saw fit to the human race.

However, a common and pervasive factor that dominates all these different 'appreciations' of the human being is that society shapes his behavior and his cognition. Human beings are considered culturally literate for they have had a formal education, 'casual reading, movie or television viewing, and their residence in a news-saturated culture' (Gardner. 1999:157).

5.2.1. Higher System of Behavior: A Vygotskian Perspective

The approach of Vygotsky (1978) about how the individual is integrated into a social community. To Vygotsky the life long process of cognitive development is greatly (if not totally) dependent on social interaction, a 'scaffolding' or an instructional process. In other words, the learner is/becomes able to do something which he might not been capable of doing without an adult guidance of the help of 'a more capable other'. Such 'scaffolding' is constructed in an area which Vygotsky (1978) calls the Zone of Proximal Development or

> the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (p. 86)

Further down, he adds that human learning 'presupposes a specific social nature and *a process* by which children grow into *the intellectual* life of those around them' (p. 88. Our italics). What we are interested in this chapter is the *process* that leads to the formation of an intellectual life or cognition/*thinking*.

5.2.1.1. Zone of Proximal Development

In the above extract the 'distance' Vygotsky talks about means learning and forming a cognitive potential to allow to 'flying by one's own wings', and it is twofold:

1. vicarious*wise* stimulant: the learner *consciously* listens to, views, and watches his tutors,[his mentors] around him and learns from their experiences

2. 'experiential' stimulant: the learner experiences himself [and by himself] what he has been watching for 'some time', in other words he moves from pure theory to actual *conscious* practice. (cf. 2.6.2. 'experiential' learning).

The *consciousness aspect* of such development fuels our idea that thinking is conscious and cannot be regarded or understood as the imitation of the 'others' or *do-as-the-others-do-to-survive,* but it should rather be viewed according to the connections between people and the cultural context in which they act interact by sharing each other's' experiences (cf. Crawford. 1996). To Vygotsky, people use tools such as speech and writing (which they develop from a culture) to live and survive in the societies in which they live. Always to Vygotsky, internalizing these tools –not abandoning them- is what leads to later construct higher thinking skills. Orators like Cicero or Kennedy and others could mesmerize people because they have developed higher thinking skills in oratory and in writing as well. Vygotsky and Piaget have observed children practicing egocentric speech*, and while Piaget believed that that speech disappears once the child reaches the stage of concrete operations, Vygotsky viewed that the egocentric speech* thoughts (cf. Driscoll.1994) because thinking is to *consciously* process information in the mind to find a thoughtful solution to a problem, as we put it above. Next, the learners gradually gets more competent, the vicarious stimulant or the 'scaffolding is removed and they gradually take increased responsibility for their learning' (Allen. 2003:323) and in developing higher system of behavior.

Vygotsky (1978) recognized the importance of authentic writing tasks for he saw that writing 'should be incorporated into a task that is necessary and relevant for life. Only then, can we be certain that it will develop not as a matter of hand and finger habits but as really new and complex form of speech' (p.118) of authentic writing tasks for he saw that writing 'should be incorporated into a task that is necessary and relevant for life.

5.2.1.2. Individual Thinking: Idiosyncrasy

So, the usefulness of *learning to think can* be equated with the usefulness of developing one's cognitive potential. For that, and concerning the psychic outlet, *I* had to seek out the truth and unravel the snarled web of my motivations. *I* had to find out who am and what *I* want to be, and what *I* could do to become the best of which *I* was capable. Only then, one can be certain that it will develop not as a matter of hand and finger habits but as really new and complex form of speech' ((In Winterowd.1975:05. Italics added) of authentic writing tasks for he saw that writing 'should be incorporated into a task that is necessary and relevant for life.

Although Cleaver was voicing out his anger in a context of self-identity search, but his strong '*I's*' consolidate our purport that the usefulness of developing a *personal cognitive potential* and a personal thinking pattern will help our students get through tertiary education satisfactorily, i.e. with the satisfaction of having learnt a language with all its [possible] different guises to truly use it whenever possible, and every time the occasion permits, but not having crammed their heads with sets of rules and stereotypic patterns (cf. Frank et al.1987; Ladousse.1983). Indeed, developing such a type of thinking –the individual as opposed to the group– may also develop an individualization of some sort while learning (cf. Houghton et al. 1988; Saadi. 1996, and others) and it is precisely that type of individualization which teachers want to probe and instill in learners.

To Vygotsky (1978) there are certain phenomena which define the properties of all higher system of behavior what he calls 'rudimentary forms' of which are: 'casting lots, trying knots, and counting fingers' (cf. Wertsch.1985:135). *Casting lots* represents the problem solving situation, which is the situation where a certain particular problem arises; *trying knots* is trying to solve the problem by trying situation; and finally *finger counting* is the adaptation of available information for an intellectual problem-solving situation as brainstorming activities, brainstorming means 'storming the brain to generate ideas(…)and that the technique of brainstorming depends on how well we understand the *art* of doing it' (Goyal. 1999:179). If there is an 'art' of doing things, this means that things should not be done because students see no escape from it (fearing punishment, for example), but the activity should be done *consciously proceeding* information to know how well to solve the problem, that is developing higher systems of behavior.

5.2.2. Influences on Cognitive Development: A Piagetian Perspective

What follows is the drawing of the contours of the Piagetian perspective on how our cognitive capacities develop and what the elements that influence such a development are. In the interests of precisions, some details are important to show how sanguine and insightful Piaget's research on the issue.

Piaget's (1954, 1963) observation and the wider Piagetian research, especially in monitoring thousands of children of different ethnic groups and cultures have arrived to describe what and how humans do in trying to understand the world in which they evolve by receiving-gathering, proceeding and organizing information. To well understand how such making sense of the world truly takes place,

Piaget decided to study humans beginning with children (1954; 1963), the adolescents (1972) and on to study, describe and understand the foundation of the cognitive structures

and what influences them (1985). Information as facts, ideas (mental events), and concepts (mental representations) that are added to an already existing information (schemes) in the storehouse. For him, the matter is much more elaborated for our cognitive processes change radically as we [daily] strive to figure out the world in which we evolve. Although such a fact may seem commonplace to the lay people, but Piaget after sound observations and monitoring, could draw four basic factors which he sees influence in concert such a radical change. They are: 1. *maturation,* 2. *activity*, 3. *social experiences.*

5.2.2.1. Maturation

As an operational definition, maturation concerns the changes that occur spontaneously and naturally and which are genetically programmed. These changes occur over time and are relatively unaffected by environment, individuals in their early stages of life should receive the appropriate nutrition and psychological care to grow healthy and sane (as a matter of fact can one consider children of the province of Darfour in the south of Sudan, in Ethiopia, Sahel countries, and other poor places in Africa as not mature enough to be incorporated into the interests of the cognitive development research?). At any rate, these are the dominant factors about maturation.

Cortical maturation, as a matter of fact, could be seen according to the exposure of one of the language the individual is subjected to which might, in all likelihood, affect the way language is structured, processed, organized, and presented in the brain (cf. Nedjai.1988; Patkowski.2003;). What applies to language could well apply to any other type of learning.

5.2.2. Activity

As its name suggests, activity means to truly participate in the elaboration of thought while sharpening the curiosity and exploration of the surrounding world by sharpening [with every new experience] the observation of the world, and the experience about it to

finally form a clear representation of what people do without which they can 'fail to understand something or someone(…)by not achieving any *coherent representation* at all' (Nelson.1992:4; Italics added).

What is interesting in activity is that in actively taking part in the understanding of the environment people transformation it, that is shaping it according to people's personal cognitive senses, they are altering and sharpening their thinking processes, making them every time different more elaborated to suit any behavior. Classroom observation and monitoring have shown that over two decades (since 1982-on *to the present time*) they are *impinged upon* by a *Janus-faced compensatory system* as while it displays Samaritan intentions (as helping students move easily from one year to another), it is threatening their *maturation* and *activity.*

Indeed, instead of truly participating in learning the language and actively searching, heartily participating in classroom activities, doing out-of-program activities as going to the library, leafing through internet e-pages (the number of those who do so is not negligible but remains, to our considerations, far below the expected norms, as the questionnaires have revealed (anticipating on the analysis of the data collected through the questionnaire (cf. Appendix 04). To avoid the undesirable heavy-fuel modules such as Written Expression, Oral Expression, or Grammar (not mere replication of grammar rules but the teaching of *functional grammar*), or yet the threats' of a *severe* teacher, severe because he wants to work as if the compensatory system does not exist giving a bad mark -*note éliminatoire* (below five), students take recourse to rote learning for getting in the other content-based modules the desirable mark of 12 or 14 or more to compensate with. However, they remain totally alien of what they are expected to do with the language if they are to teach one day. As a matter of fact, inspectors with whom with had discussion on the matter always showed

their worries about the low proficiency of the teachers they visit in their classes, and the overall impression is that these teachers will *only* get on with time and experience.

The disappointing fact here is that instead of getting *mature* and learning to be *active* while getting their tertiary tuition, they wait –that is for those who are lucky to get a job once they finish their studies- until they teach for a certain number of years to become mature and reliable. A consequence of this, our teaching purpose was not without its attendants difficulties (achieving good maturation, activity, etc.) keeping it totally unseen and felt by our learners, and worse it loses its heuristic values (what the researcher is after: *Learning to* think, not giving one mode of thinking) which makes it be 'somewhat less overt and demonstrable feature than, say, form and therefore *serves less well* as a *primary criterion*' (Askehave et al. 2001:198). More, the purpose for teaching will be without its attendants (maturation activity, etc.). As an illustration of this is that these last five years, we always hear of gaffes being detected in the question sheet of examinations as important as BEF, BAC, and even '6ème'. Other mistakes are constantly being made in course books, as the glaring example is *Think It Over* (Menasseri et al.1989) which instead of being a course book of English has become some sort of *how-to-make-as-many-mistakes-as- you-can-in English*. This is not an exaggeration! As a matter of fact, after two years of should be thrown away which was instantly done and the very course book became sarcastically nicknamed "*Throw It Over"*.

It is worth noting and which justifies our constant and hot concern about the compensatory system is that some of the teachers who were on the board of designing such a course book have been to Britain for their further studies but this did not serve them much because being the product of a compensatory system, the scars on the 'cognitive apparatus' were so serious that they affected their overseas training!

For the reasons invoked above and elsewhere (cf. Labed 2001a) we have decided to make of the compensatory system our *case in point* hoping to see such a system one day disappearing from our pedagogic tertiary system forever!

5.2.2.3. Social Experiences

Living alone away from society and people would, in all likelihood, keep cognitive development in its first stage. As we develop with age, we live and interact with people and this allows us to transmit to people knowledge and information as well as them transmitting to us these information and knowledge. Social transmission, according to Piaget (1970a), or learning from the others, is appropriate to each different group of people and according to the stage of their cognitive development. The latter go and mix with people, they talk and exchange language and experiences whereas the introvert they live within their narrow circle and thus they miss a good opportunity of sharpening their cognitive abilities, or at least they do not develop them as much as their counterparts do. The other example would concern the taciturn people, who also do not interact with the others for they hate to speak and hate to listen to the others speaking. The taciturn as well as the introvert develop some sort of 'egocentric learning' (Piaget.1954; Vygotsky.1978) for what they learn they learn it by themselves for they do not accept the others' point of view, and worse they keep it for themselves. If it sounds somehow an idiosyncratic learning and thus developing and enlarging the cognitive capacities, it is not any idiosyncratic because it does not go through the test of social transmission, so dear to Piaget.

The concerns [and the worries] about social experience and social transmission and all that could result from it could be seen and understood in what Robinson Crusoe felt when he was alone on the island. Daniel Defoe vivid, exhilarating, profound, and powerful imagination gives us the record. He writes

> In this government of my temper I remained near a year, lived a very sedate, retired life, *as you may well suppose*; and my thoughts being very much composed as to my condition, and fully confronted in resigning myself to the dispositions of Providence, I thought I lived really very happily in all things, *except that of society.* (Defoe. 1965:153. Italics added)

Defoe has put this to indicate that Robinson Crusoe is doing something unusual that in isolation has had imperious conditions that obliged him to do so.

The next italics concern the topic in question. Defoe signaled it to the reader in plain language: possessing an island for one's own does not provide an individual with the same enjoyment as living in a society interacting with people. Robinson's (or Dafoe's) exception fuels the idea that social transmission is a provision for cognitive development. Robinson Crusoe felt that indeed his mind's reflections have changed through twenty years to come to the stage of teaching a parrot to talk to him so that he feels there is 'someone' to talk to when he says: 'I diverted my self with talking to my parrot, and teaching him to speak, and I(…)learned him to know his own name(…)POLL, which was the first word I ever heard spoken in the island *by any mouth* but my own (op cit. p.131. Additional italics). Again, listening to some else speaking is something which we do not understand only when we are deprived of it. We can now understand through these different examples how salient it is to live in a society and interact with it to be safe on self-grounds for achieving cognitive development which would allow us continue to act on the environment and to also continue to have cognitive development.

The Rodin's famous sculpture *The Thinker* stands still in the museum but offers perhaps the best illustration to what people throughout the ages have pondered what the fundamental questions seemed to them. With his hand in head, *The Thinker* seems to tell that thinking is primordial and that people always think, be it for the simplest things as to posit about a dead person that: '*a quarter before his death he was still alive*'.

Thinking is the representation and the processing of information, either instant or already existing. When we think it is generally to bring about something new as to think of the solution of a problem, and this in two ways. One way is to try to find out the solution to a critical problem to which we need to cogitate more thoughtfully than we would do for an easy problem, and this is *critical thinking*. Using such thinking certainly entails that people analyze the components of the problem they are facing and arrive to a synthesis after which they decide for the solution they think is best.

However, the other way is when people take an easy recourse when a common problem faces them as to take powder milk when they do not find fresh milk. This means that they do not really cogitate to find what they could possibly take home if for some reasons there is a shortage of fresh milk. Such thinking could be labeled as non-critical thinking.

According to this aspect of finding something new, psychologists in their quest to understand the underlying strata of thinking come out with a threefold categorization: *problem solving*; *reasoning*; and *decision making*.

Problem-solving means to attain a certain goal but when the solution is not clearly stated in the memory or when it is not [immediately] obvious, because if the solution is obvious then there is no problem. Still problem solving is going beyond the simple application of previously learned schema of rules (cf. Woolfolk 2004).

Problem-solving requires thus to *1.*understand the problem; and *2.*to solve it (cf. Matlin (2003). To Sternberg (1995), we formulate a strategy after we understand the problem and we seek for a solution by representing and organizing the information that have been stored in our (working) memory, and finally evaluate and choose the most

satisfying one. What follows is the presentation of the steps towards reaching the goal, to reconcile between the two pathways suggestions.

5.3. Categorization of Thinking

For categorizing thinking, one might think of first understanding the problem to be then able to solve it according to some problem-solving approaches

5.3.1. Understanding the Problem

The crux of the problem is to understand the problem. The following example might give an idea of what is meant by understanding the problem, or how people understand the problem. It is the story of a dwarf who lives in the 20th floor of a building, and who takes the lift up the 13th floor and continues on foot up to the 20th floor. This dwarf understood his problem which is his inability to reach the button 20 on the lift panel, and thus has found the solution to his problem by pushing on button 13 and continuing on foot up to the thirteenth floor (of course he is likely to use such a strategy whenever he finds himself alone in the lift cabin).

The other example is about Mr. Bean's way of understanding a problem and solving it. As an aid to sleep, people generally *count sheep*, Mr. Bean does otherwise: He counts the ears of the sheep and divides the number by two. In fact, doing so makes Mr. Bean get tired and he falls asleep. What is interesting here is the creativity (the fourth step) as Mr. Bean suggest that people could understand their problem in a multitude of different ways.

Put in simple words, understanding the problem is half way through it simply because if we do not know what we are going to do, then we may take recourse to many different approaches without necessarily reaching our goal. The following example illustrates, we think, what is meant by *understanding the problem* and more what is the importance of understanding the problem. It is a quiz that I learnt from my grandmother

always tried to probe our intelligence in solving problems.

> *Arriving at the right side of the river bank with a goat, a wolf and some hay, the shepherd wanted to cross to the left side. To his contentment there was a boat. His problem was that the boat couldn't carry them all, but only three at a time. There is a problem. If he carries the goat and the hay to the other side, and returns to take the wolf, then the goat will eat the hay, which he does not want to. Second, if he carries the goat and the wolf and returns for the hay, the wolf will eat the goat. If he takes the wolf and leaves the goat and the hay, then the goat will eat the hay, and like this. How should the problem be solved?*

When the problem is set as it is, the individual who attempts to solve it has to first understand the elements composing the problem and how they interact. In other he tries to find out whether there is coherence between the elements of the problem as to try to understand what elements in the problem cohere as

The wolf eats the lamb

The lamb eats the hay;

and

The wolf doesn't eat hay

If the individual discovers such coherence, he then moves to [try] to find out the between-items *correspondence*. He ties to see which items corresponds with another. For such a correspondence, there is a matrix. A matrix is a chart that helps get all the possible combinations to keep track of the items, especially when the problem is complex. For the problem set above, a matrix could be likewise

1. Take the wolf and the hay together and return with the hay then take the lamb and the hay.
2. Take the wolf and the lamb together and return with the wolf, then take the wolf and the hay.
3. Take the lamb and the hay and return with the hay, then take the wolf and the hay.

Matrices are very helpful in problem-solving because they help draw *black on white* all the elements that compose the problem to try to solve it. For problem-solving process, Woolfolk (2004) proposes the following diagram

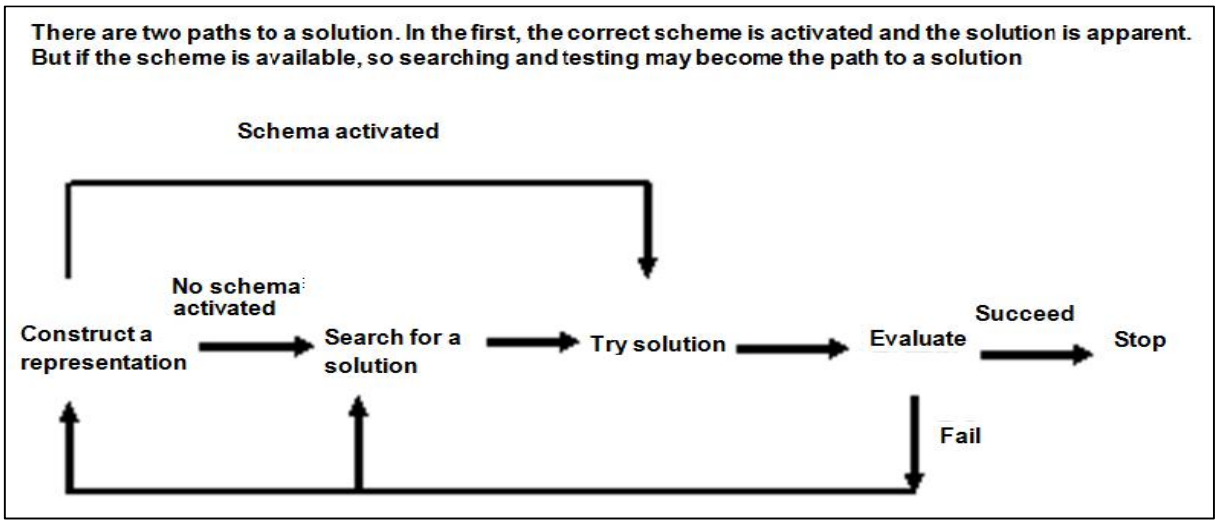

Figure 13. Diagram of Problem-solving Process (Woolfolk.2004:288)

The figure in the next page shows the possibilities that a schema-driven problem solving offers as it allows the individual to discover that the problem he has to solve is 'nothing but' a stealth version of an old problem for which he (or somebody else) has already found a solution to. Yet, when this is recognized, the problem nonetheless goes through the process of evaluation where the individual will try to find out the similarities and differences and weigh them out and reach a conclusion.

This is what lawyers, for example, do while trying to find good arguments for defending their clients. They always seek for *precedents,* a precious information which hey evaluate in the light of the case. They generally seek such information in the records of the archives of the different departments of justice where similar cases of trials and law suits have been solved out in the past. For a psychologist such information is schema or schemata or the brain archives.

However, when the schema is not activated, either because of problem in memory recall or because there is no previous schema formation for an 'identical' problem, then seeking for a solution would take another guise as the search for a totally novel solution would become required. Such a solution would form a schema for future schema-driven problem solving. The mind is never at rest to find immediate and long-term solution because it is duty-bound to find solution otherwise the world would be living in eternal misery!

In language classes, problem-solving exercises could be different and differently posed as the following examples show. This language game is called Context and Meaning (cf. Frank et al.1987). In such an exercise, only a statement is given, and students try to find out many elements about the statement as who says it, to whom it is said, where the two people are. In this exercise, the students are given:

a. A *statement* and the *context* it was said in, and the students say what it *means*

b. A *statement* and what it means, and the students have to find its *contexts*

c. A *statement* and the student has to think of the *meanings* and *contexts*
said, where the two people are. In this exercise, the students are given:

The exercise runs like this

STATEMENT	MEANING	CONTEXT
a. 'it's raining'		mother to young son dressed only in T-shirt and short who is going outside
		Farmer to harvesters
b. 'I feel tired'	It's time you went home	
	Carry me	
	I've done enough work today	
c. 'He is not answering me		

Figure 14. A Challenge to Think (Frank et al.1987:22-23)

Such an exercise helps the student to free up his mental space in his working memory to try to find out other possible answers. To understand the problem, in *a* and *b,* for example, the learner can play on what comes in the context box to understand what is missing in the meaning box and vice versa. Understanding the problem as in *a* and *b* helps for a further understanding for *b*. Whether general or domain (and culture) specific, understanding any problem depends greatly on finding out coherence, building up correspondences and finally using a matrix or a schema or schemata.

5.3.2. Problem Solving Approaches

To attack the problem, the student may take recourses to different strategies depending on the nature of the problem. In playing scrabble, for instance, each player fishes seven letters and tries to arrange them into a word that makes sense, that is which exists in the dictionary. Every player is in front of anagrams which he tries to identify the first two or three letter of his target word as to get GNKTALI. As a first instance, the player will try the first two/three/four letters combination as to get KIN or KING, then next he may play on the pronounceable two/three-letter combination as IN, or KI or [ideally] TAL. Such a strategy is known as heuristic, or a general rule that is always correct. The TV game Letters and Numbers is the best example in which we see the trying of many different combinations as possible to get the best and the quickest answer possible.

Apart from calculus or algorithms, heuristics are employed more to solve problem of everyday life for which calculus is not actually effective. For problem- solving approaches, Matlin (2004) suggests three heuristics which are: *the-Hill- Climbing Heuristic, the Means-and-Ends Heuristic, and the Analogy.*

5.3.2.1. The Hill-climbing Heuristic

The Hill-Climbing Heuristic is not much different from the wisdom that says 'of the two devils, try the less experienced one'. In other words, generally when people reach a choice point when solving a problem, they simply select the alternative that seems to lead most directly towards our goal. This heuristic was named so as when we imagine we are climbing a hill and ahead there is a fork in the path and we have to choose only one way for one cannot see far into the distance where the two ways take. Yet, because our goal is to climb the hill, that is *going upward*, then we are likely to choose the path that has the steepest incline which takes us quicker up.

However, if the Hill-Climbing heuristic tends to facilitate problem solving, it nonetheless renders it difficult because such a heuristic may lead astray. Its drawback is that for trying to solve a problem, the individual may easily take recourse to the Hill-Climbing heuristic because he has not thought hard (or didn't bother to do so) to find the appropriate solution. In other instances, however, the same Hill-Climbing heuristic could be the best recourse for decision making in rather very important issues as to make a life choice. In this respect, Robert Frost famous poem *The Road Not Taken* (cf. Appendix 10) reveals how poignant it is to solve a problem when facing a two-point choice for we are -in fact- forced to take one decision and not another. For such a dilemma, a strategy such as the Hill-Climbing heuristic is used. Frost' poems first stanza opens like this

> Two roads diverged in a yellow wood,
> And *sorry* I could not travel both
> And be one traveler, *long I stood*
> And looked down as far as I could
> To where it bent in the undergrowth.
>
> (Frost In Cury.1981:217. Italics added)

In the above example from literature, Frost lets us understand that he understood his problem when he found himself before a fork in the path. He did not simply take any of the two roads haphazardly but he rather knew well what he was doing. First, in saying 'sorry' he makes us understand that he has understood that he could not travel the two roads at the same time but that he had to make just one choice. Second, when he says 'long I stood' he has also understood that he has to make a random choice, but rather a reflected [and weighed one] when he said 'and looked down as far as I could'. Here, as a matter of fact, the only strategy or approach he employed was to choose either path, that is The Hill-Climbing Heuristic (He used *looked down* but the strategy he used is nevertheless Hill-*Climbing* and the meaning does not change).

5.3.2.3. The Means-and-ends Heuristic

This heuristic bears the name of *means-and-ends* because the problem solver has to know and identify the 'ends', that is what he wants to do, and then to figure out the 'means to be used to reach those ends, especially we do so in a quick manner. In other words, when we face a problem, we try to divide it into parts:

1. Into smaller problems or sub-problems, *and*
2. Try to weaken the problem by reducing its initial state to the goal state

As an illustration of this is what generally happens to people when they find themselves in a delicate position as get the zip of our trouser gets loose, or when we are in an embarrassing situation and we have to get out of it very quickly.

For the first, one can quickly divide the problem into sub-problems, that is: First, one tries to find out how or with what they could fix the zip, and second, how could one find that object. One may run into the director office (hoping it is not a woman) and ask for the stapler with which people deftly tack the two parts of the loose zip together using as many

tacks as possible. Proceeding in a forward direction, the *means* here is the stapler and the *end* is to tack the loose zip, especially if we cannot go home for that because we will give a lecture in the few minutes to come.

For the second, it is what happened one day while I was strolling downtown. A young man was trying to stop a young girl and have a discussion with her. The young lady seemed not to be willing but the young man was so insisting that the young lady in a fury slapped him so strongly that everybody who was nearby turned around and started to gaze at their direction. Everybody, in all likelihood, believed that it is the young girl who slapped the young man, but the latter to get himself out of his problem very quickly divided his problem into two parts: *1.*firing back with another slap, and *2.* saying something to make people believe that it was him who slapped the girl but not the victim. He indeed gave the young girl a rather stronger slap and he shouted in her face 'Huh, do you need another one?' Likewise, he solved his problem making the passers-by think it is the man who slapped the young woman and not the opposite*****. In this example, the *means* is the slap and the *end* is to make people believe that he was not the victim. This gentleman has rather proceeded in a backward direction because he first thought of what people might think, and then he gave the slap.

5.3.2.4. The Analogy Approach

Using the analogy approach means solving a problem in the same way we have solved a previous and similar problem. When preparing an exposé for the American civilization course, students tend generally to use the same strategy as when they prepared an exposé for their literature class (choice of subject, data gathering, putting an outline, way

* Such a deed might raise the question of an archaic male-oriented society where people see a lady being slapped and do not react Yet, whether a lady should not slap a man and conversely, the choice of this example is *but* to illustrate the point we wanted to highlight, and thus it should not be considered otherwise

of presentation, etc.). The more people solve problem, the more they are inclined to use this approach in solving one problem than another one because analogies have pervaded thinking. People arm themselves with problem-solving strategies that we have picked up from our [human] experience that is human thought.

People who use the Analogy Approach tend to seek easy ways to solve their problem solving but this approach serves them to only look at the global puzzle and
going into details for their [new] problem resembles in its structure to a problem they have encountered before. Detective, police officers tend to utilize such a strategy in trying to decipher the mystery about a crime, or a robbery, for there are always analogies between crimes and robberies. The outlaw is 99% well traced and captured and so are the burglars (The Postal Train Affair in United Kingdom, The Watergate Burglary, Agatha Christie's novels, etc.) are good examples of how the analogy approach is employed). Lawyers and barristers, as a matter of fact, consult the police and justice departments' archives to seek for analogies, and in effect they study such analogies to get their clients out of troubles. Almost all the problem cases have *isomorphs, that is* the same underlying structures (structural features) and solutions of different problems, but with different details (surface features).

Although the Analogy Approach seems to be ubiquitous in problem solving, and that at the face of it, the majority of people seem to use it, to Reed (1977), however, people often fail to see the analogy between and old and a new problem. If such a fact has been empirically proven, this explains once again that in dealing with problem solving means that we are dealing with human minds, not dead matter. This means that people use these strategies which we have enumerated but every one [probably] in his own way, a problem-solving idiosyncrasy of some sort.

5.3.3. Decision Making

Making decisions could be where to register registering in college (in which department); how to choose friends and roommates (and deciding for the degree of deference); how to spend money; what to do after the B.A degree (try find a job or continue studies or both) and other decisions that we take in the course of our everyday life.

When people have different choices and they select one choice, then we are taking a decision. To buy one tape recorder and not another one is because one has chosen among many different marks a particular machine evaluating the costs and the money available. In other words, people evaluate the opportunities available for, say, a tape recorder that would suit them and which they can afford. So, reasoning goes around the affordable tape recorder, not necessarily the best tape one. This is establishing a rule of 'available money, not the item itself). However, some other times, for decision making, rules are established and the decision making could sound arbitrary for not known whether it is correct or wrong. When asked about their decision to go to college, students have given three different answers

1. For education.
2. For social poise.
3. For fun.

Their decision has not been taken according to a definite set of good reasons (rules). If the first reason tends to be global and general, the second, however, is weak in its form for there is no guarantee to get a job after getting the diploma. This doubt explains that such a decision taking was not the result of a good reasoning that could allow assessing the [relative] merits or demerits of such a decision. The third reason (for fun) seems to be the

fruit of the students' creative mind rather than a plausible reason for which one could build a theory.

5.3.4. Strive for Making Optimal Decisions

Many times we hear people saying, and we say ourselves, that the decision we have taken is the best one, the ideal one. Decision theorists assume that we do not really make ideal decisions simply because decision makers in general *do not* operate in ideal circumstances. If they operated in ideal environments, then there would be no need to make decisions and making decisions would be only for the form, but we are away from such an environment. People, in fact, differ in their ways of portraying the environment around them, and everyone has his own way of seeing what best fits him, and maybe because of this that when one someone takes a decision which he sees goes well with the goal he wants to attain he then claims that he has taken the optimal decision. He may be thwarted by the results of his decisions. As an instance, when someone buys, say, a Korean car, he goes around to claim that he has bought the best car ever on the market, and that the decision he made is an optimal one: the Korean cars are powerful, robust, elegant, and cheap. A close analysis of such a decision taking may lead us to the following conclusions. After talking to different persons and friends, every one of them tried to convince him to buy one different type of car until he meet people whom he asks for the characteristics of a Korean car, and then for a strive to make the optimal decision, he gulps and buys it thinking he has made the right ideal decision. Later, he may discover that a German car is as good as or better than the car he has bought, and for which he has paid approximately the same price. This is also called the anchoring and adjustment heuristic (cf. Matlin.2004; Poulton.1994).

The other example is about choosing in studies a major subject, say French instead of English. The learner may be well aware that he has made the optimal choice and make the ideal decision when they discovers that they should have probably chosen one subject because the international needs favor more subject over the other.

Striving for making optimal decisions could be seen as a hint of self-pride in which the individual feels he is old and mature, a man of experience who knows what he does and who always does the right things and who always makes optimal decisions.

5.3.5. Utility Maximization Theory

Generally, in making decisions, we always 'seek pleasure and avoid pain' (Sternberg.1995:348); to get ourselves out of troubles and to make our life sound better. As a consequence, making decisions for a positive utility wishing to maximize pleasure, and in the same time minimizing pain. To be sorry for something could be considered as pain and for that reason, the utility maximizing theory emphasizes that all decision makers seek such a goal.

Therefore, in making a decision, one can weigh the positive and the negative utilities, and it is assumed that we seek the highest possible positive utility maximize pleasure. For example, one decides to buy a portable computer to replace his 'old' one. He hesitates to buy because he may regret to have bought another computer when the old one works well, and he is not really certain that he can make a better use of the new one. On the other hand, he may also think that a portable computer offers him grand opportunities for freedom of use and he can take it with him wherever he goes. These factors show the positive utilities of the new portable computer. Whether this person buys a new computer or not depends greatly on which of the positive of the negative utilities would overweigh.

The other decision making for the same example could be to buy the new computer thinking and rather convincing oneself (convincing comes from thinking, anyway) that the bargain is interesting and that after all everybody is doing so, or that two computers are better than one: One for home use, and the other for office and 'out there' use. Making such decisions is definitely not objective, and they do not represent accurate representation of reality on which we are likely to base our decision making. Therefore, instead of having a utility maximizing decision making, people have a subjective-utility framework a fact that highlights our purport in the present research that we are dealing with human minds, not dead matter, and that the system of values differs from one person to another, and so is the whole issue of decision making. It becomes so difficult to study all the variables that interfere in the decision making and to try to build a theory.

5.3.6. 'Satisficing': *The Good Enough* Option

To attempt an operational definition, satisficing (cf. Sternberg. 1995) means to choose an option, not the best about a host of options, but rather the one which *we consider* satisfies more our goal attainment and which maximizes our pleasure (gains) and minimizes our pain (losses). In other words, after considering all the options people have (recalled from our memory), we select the one which is *good enough*.

Most of the time, students use satisficing in choosing topic for their exposés, classroom observation showed that students when they are given a list of topics for choice very frequently choose rather randomly, picking up the first topic they read thinking that it is *good enough* to work on Other students, however, use 'satisficing' but in a more elaborate way for they choose one by one the option presented to them and they make their final choice/decision. Generally they choose topics not very frequently tackled by students. The

feeling is that they have made a sound exploration of all the topics they were given to choose among. Since they choose a topic that they think satisfies them, then we saw that they have used satisficing in some way.

Satisficing is an interesting trend that deserves, perhaps, some further exploration probably for another research, but what is interesting to say is that satisficing shows how bounded is the rationality. While people strive for making the ideal and optimal decision in the most rational way possible, their thinking which is different from one another makes different resolutions and most of these resolutions find a judicious platform in using satisficing. Satisficing is like the *Availability Heuristic (*Matlin et al. 2003) and *Representativeness (*Kahneman, 1971) that is to choose the available option in that in satisficing an exploration is made of all possible considerations before making a decision. People choose an answer, a solution when they 'have "suits, uniforms, and tweeds" in the same room [and what] we need is agreement on priorities' (Scott. 2005:73). In fact, while choosing one option among a plethora, people act according to priority, i.e. to choose the option which fits better a particular purpose than any other one.

5.3.6.1. Reasoning

Reasoning is when people try to solve a problem by choosing the most appropriate solution by evaluating opportunities and selecting one option above many. They try to understand a problem and to make judgments based on facts and evidence to arrive to making a decision or drawing a conclusion.

Yet, reasoning could be more complex than what a mere definition might indicate. When people reason, they choose among many alternatives, but the decision we make is not always a well-thought one could not be objective but rather in most cases it could be personal, and hastily taken. In adopting satisficing (see section above), our decision making

is not rational at all but respond to a desire to finish off which the problem. Moreover, the consequences of such a decision are not always clear, but remain subjected to verification *over time*. This is true when a student, for example, make a decision to register in one department and not another. His judgment could be well reflected in the sense that he has proceeded from the information he possessed and drew his conclusion. The consequences of his choice could become very clear probably when he finishes his studies and then he could see whether he made the judicious decision and choice. To make things less complicated, he could get a flavor of his decision making , say, after he terminates his freshman year (this allows him to change direction if he sees that his decision making was not rational enough), but still it takes him one year for verification. If the consequences will not be immediately apparent, it is simply because in the realm of cognition and thinking and reasoning, there are 'no clear-cut rules that tell us how to proceed from the information to the conclusions' (Matlin.2003:401). Frost's *The Road Not Taken* again shed light of this nuance about reasoning over something and having the pious claim that we have made the right choice but we could never know that if we choose the other alternative, it would be better. Our reasoning served only one [sole?] purpose of maximizing our gain, or maximizing the minimum gain (maximum gain rule), or minimizing the maximum loss (the minimax loss rule) (cf. Sternberg. 1995 and elsewhere).

Reasoning if often twofold: deductive and inductive. Deductive reasoning is when one proceeds from general rules to reach a logical (?) and specific conclusion; whereas inductive reasoning is to proceed from specific facts or rules to reach a general conclusion.

5.3.6.2. Deductive Reasoning

To reason deductively is to proceed from a set of general premises to attain a specific -and an expected- logical conclusion. A premise is an action or an idea on which the act of thinking is based.

Probably the most ubiquitous deductive reasoning manifestation is the rational reasoning (or conditional reasoning) in which there is rational construction of relationships between conditions. A typical deductive reasoning of this sort is the one we studied in our philosophy classes is the following.

> Every man is mortal Socrates is a man
> Hence, Socrates is mortal (Katz. 1975: xviii)

Understanding that deductive reasoning is constructed upon two premises and one [logical] conclusion, in the then philosophy class with an indefatigable appetite playing deductive tasks constructing such superficial and erroneous deductive modes of reasoning things

> I eat on the table
> The table in on the floor,
> Therefore, I eat on the floor.
>
> *or*
>
> I eat chicken, chicken eat garbage
> Therefore, I eat garbage.

If such constructions have triggered smiles in our teacher, they also triggered evenly people's lust for solving reasoning tasks which people abundantly did. More seriously, what is noticeable in such constructions is that the validity of such an argument is totally independent of the words chosen. If we choose any other triple words, we will also have a valid argument, at least on the level of grammar and sentence. However, what makes a

problem of real logic is that the surface grammatical forms sometimes render stealthy their underlying [illogical] dimensions. For example, in saying

(1) There is pain in my thumb
(2) My hand is in the glove
(3) Hence, there is pain in the glove

Of course, the human mind distinguishes easily that logic is not simply replacing occurrences in (1), (2), and (3) by another member of the triple. This might be considered as the ground-zero of logic, and reductive reasoning is much more serious than *chickens and worms* business. An elaborate deductive reasoning task is the one which deals with quantities where syllogisms (a syllogism is two statements assumed to be true with a conclusion, they involve quantities). Here is a typical syllogism:

Some cinema goers are big businessmen
Some businessmen are cheerful
Therefore, some cinema goers are cheerful

Yet, a quick consideration of such a syllogism could lead us to say that the conclusion is all logic, but a deeper consideration might also lead us to make other implicatures (Grice.1975). In fact, the businessmen who are cinema-goers and the cheerful businessmen could be two different groups of people, not necessarily pertaining to the same population in the syllogism. So, as far as reasoning goes, what is interesting is such a judgment and reasoning is that it explains well how reasoning becomes *meta-reasoning*, that is *reasoning about reasoning*, and in the latter one can also *deduce* something from logical facts that are presented to us. Sometimes, the premises contain information *sufficient enough* to reach a valid (?)In conclusion, as in saying:

He never carries an umbrella
Today it rains and he is with no umbrella He doesn't like to carry umbrellas

Syllogisms are complex and can cause deductive-reasoning problems. Many types of such syllogisms have been the subject of study of psychologists. The three basic syllogisms which might be connected with reasoning are respectively *linear syllogism, categorical syllogism, and conditional syllogism*. (Sternberg, 1982)

5.3.6.2.1. Linear Syllogisms

As its name suggests, linear means that there is a relationship between the first two premises, that is they go in the same line, describing a given relationship existing between the two items as to say

You are more practical than James
James is more practical than Pete
Which is the most practical?

A linear grammatical viewing of these two premises gives us the following:

- *You* in (1) and *James* in (2) € subject
- *are more practical than James in* (1), *and*
  is more practical than Pete in (2) €
  information about the subject

In this deductive-reasoning task, the solver has to infer that *James* is smarter than *Pete* to understand that *You* are the more practical of the three. The answer itself gives such a syllogism its linear dimension for it puts *You* in the beginning (top) of the line, *James* in the middle, and *Pete* in the end [bottom] of the line. Since it is a line across which there is a gradation, this gives such a syllogism a spatial dimension. Finally, we can say that the conclusion is logically valid only if the relation linking the term allows transitivity. In the example above, in

(1) James is indirect object
(2) Pete is indirect object
(3) James is indirect object
(4) Pete is indirect object

In other words, one leads to the other, if we say (*3) you revise better lessons than James*, then there is true transitivity because understanding the relationship becomes quite different in the sense that James revises his lessons, but you are much smarter in revising than him: there is no expression of weakness. The comparison is made within positive considerations, whereas in saying

(1) You are more practical than James
(2) James is more practical than Pete

and the conclusion is that *You are the most practical* points out to a state of weakness which does not exist in (3).

5.3.6.2.2. Categorical Syllogisms

Such a syllogism, as it is called, states categories. In (1), we have one category of *businessmen*; in (2), we have another category of *cheerfulness*. In categorical syllogisms also, one notices that the members (or some of them) of the category of the first term (1) are also members of the category of the second term (2).

(1) Some cinema goers are big businessmen
(2) Some businessmen are cheerful
(3) Therefore, some cinema goers are cheerful

To verify whether the conclusion is logically drawn from the two premises, the solver or the reasoner must come out with a third categorization of the two terms. In the example about businessmen, a (re)consideration of the conclusion would push us to ask the following question: 'Does the validity of the logic ensure that the conclusion is true?' The answer is:

'no'. Again, it is, we think, our *metareasoning* that have pushed us to reconsider the validity of the logic in the conclusion. Our reasoning about reasoning has led us to understand that logically (3) above is not the logical conclusion for (1) and (2).

The conclusive categorization (3) is that: *some cinema goers are cheerful*. Again the discussion of categorical syllogism is much lengthier, and for such a matter, Sternberg suggests, naming his colleagues, the review of an abundant literature of psychologists who have undertaken empirical research on the matter. This consolidates more our purport that making our students learn to think –via such cognitive mental exercise, for example- would, it is hoped, entice them to reflect on every point they encounter during their tuition and to slowly but surely shift away from the hold of the parrotry repetition which a rather iniquitous compensatory system has imposed upon them.

5.3.6.2.3. Conditional Syllogisms

Not entirely conditional, such a syllogism has taken the label of 'conditional' because of the if-clause. It is not entirely conditional because the second term prepares for the fulfillment of the condition. An example would be:

(1) If Jake prepares well, he will succeed;
(2) Jake prepares well.
(3) Therefore, he will succeed.

The term (*2) Jake prepares well* has the tendency to prepare for the condition *(1) If Jake prepares well to* be (in all likelihood) to be fulfilled (*3) Therefore, he will (shall) succeed*. This is at least on the face of it, but we can advance the following reasoning-questioning (i.e. not a mere questioning): If Jake prepares well, can one confirm that he will succeed?

In this syllogism, as the preceding one, the premises can be negated: If Jake prepares well, he *cannot/ may not* succeed, unless we advance an arbitrary conclusion, and yet, arbitrary means that the conclusion is not the fruit of serious and "objective" reasoning. By "objective" we mean that all the possibilities of the fulfillment of the action have to be taken into consideration: Jake is trustworthy, hard-working student, serious, dedicated to his work, etc., together with considering also the other possibilities that might hinder the accomplishment of such a condition such as: sudden illness, too strong an examination fear to bear; faintness; strong headache that thwarts concentration, and the like. Reasoning like this, and only like this would allow, once again, to put our students on a safe ground and on a good spot for they will start to realize that if a condition is put like this, and that there are the elements for accomplishing it, this by no means would allow them to think that this is how things work.

5.3.6.3. Inductive Reasoning

Reasoning inductively is following a process of reasoning from part to whole (Sternberg. 1985), or from specific facts and observations (especially) to reach a general conclusion that may explain what has been reasoned over or observed. The conclusion that one reaches through inductive reasoning is not

All observed doctors wear spectacles; hence *all* doctors have glasses.

[necessarily] all truth, but most often is a probable conclusion. The phenomenon of exceptions plays a great role in making the inductive reasoner reach conclusion which is never of the type of.

In the incomplete syllogism above the difference between the fist 'All' and the second one is very central. What truly poses a problem to the inductive reasoner is that he will discover that his inductive reasoning is not true. If the theory about inductive reasoning is to

move from specific facts (category of people, animals, etc.) to reach a general conclusion, and *exception* is that reasoning is not always mathematical where the authorial figures imposes their dictatorship upon the results. Many people have been surprised to discover that not all birds fly, that the ostrich, which is a confirmed bird does not fly. This creature has tails that do not allow her to be a sky tripper, but the observation of the ostrich has disapproved people's inductive conclusions based on varied observation of birds. This serves to *constantly update schemata* to be able to execute further inductive reasoning tasks. Executive schemes, according to Case (1974b) are 'internal representations of procedures which can be applied in the face of particular problem situations, in an attempt to reach particular objectives' (p.546). In inductive reasoning, the information in the premises of a given problem does not constitute a reliable data for constructing a conclusion and the subject should take recourse to his different schemes/schemata to solve the problem or the riddle. To Sternberg (1982), the problems of inductive reasoning are three: *1. analogies*, *2. series completion*, and *3. classifications.*

5.3.6.3.1. Analogies

Building up analogies requires a well-updated schema to be able to reason correctly mathematically, socially, philosophically, and culturally. Sometimes, the inductive reasoner may not find the appropriate answer simply because he is weak in a particular field that the problem poses, as in saying

Height, width and length are to Newton as time is to…?

This is about physics, a cultured person (not well acquainted with physics) could answer:

Height, width and length are to Newton *as* time is to *Einstein**

*It is Einstein who first thought of and introduced *Time* as a fourth dimension. (cf. Bernstein.1973; Ridley.1976)

The other examples of analogies are as

Coffee is to Brazil *as* oil is to Gulf countries. (*geography, economy*)
Cigarette is to Humphrey Bogart *as* pipe is to Sherlock Holmes. (*cinema, fiction*)
Bordj El-Arab is to Dubai *as* Maqam Chahid is to Algiers (*geography, tourism*), etc.

If analogies –which could be of different formats as cloze exercises, MCQ, true-false constitute a problem it is because, we think, they do not always allow the inductive reasoner to find a good solution because he displays signs of weakness in general culture or other.

5.3.6.3.2. Series Completion

Of equal interest in sharpening reasoning, the series completion presents to the inductive reasoner and to the reasoner at large a series of exercises of the form of *true- false*, *filling-the-gap* formats. The exercises can be presented in basically two different ways; the reasoner task could be to fill in the term following the last given one (extrapolation task). As example could be:

(1) 2, 4, 6, … (completion using even numbers only)

(2) September, August; …, October…etc. (the reasoner's task is to mention the month and the one that comes before it)

Without a practice in series completion (inside the classroom or outside), the reasoner may face the same problems in finding out a conclusion as with the other type of reasoning.

5.3.6.3.3. Classifications (Odd-items out/in)

To classify is to order according to category of type, as to classify animals according to different families (mammals, carnivores, etc.). Classification could also be player on the level of grammar as 'write out the irregular verbs from the following list, or in the following text; which of the following color does not exist in the color spectrum; classify

vegetables (including tomatoes which are fruit but commonly held as vegetable), and the like. Subjects can also be asked to find more than one item that does not match with the others in the sense that it does not belong to the same family of sub- family as to classify tiger, chimpanzee, wolf; camel, monkey leopard; dog, cow, mouse deer, etc. For example, one classification would be to put the chimpanzee with the deer; the tiger with the leopard and the wolf, the camel is the odd item and it is counted out. Classifications differ according to persons; their ages, their degree of instruction, and their general culture (cf. Sternberg 1985). According to the Piagetians, starting from the age of 5 ½, school children are given some concrete operational tasks on classification (Meadows.1983:48). Such a built in schemata is expected to grow and

be continually and regularly updated and renewed (at least this is what is expected) to help the subject solve the problem of classification whenever he meets them, and to behave as capable reasoner.

5.3.7. Creativity

G.B. Shaw's 'people look at things as they are and say *why*, but I dream of things that never were and say *why not*?' is try to produce something which could be preferably original (cf. 5.3.1.2. above) and worthwhile. The product could be anything for human interest: A theory, a manufactured problem, an idea, a new style and approach, etc.

The twin brother of creativity is innovation for it is believed that everything we do is based on something that has been done before us. To be creative, by definition is to flaunt the convention, to go against the stereotypes, 'entailing the rebellion against logic and propriety [gaining] mastery over reality' (Davis et al. 1989:356) and to break the mainstream line of thought. They may seem worthwhile at least to some segment of the society. However those who cling to old beliefs would never accept change and creativity.

When we read a novel and feel that we have read something particular, novel, enthralling, captivating, then we have certainly read a creative work. Commenting on Dan Brown's *Deception Point,* the Washington Post wrote the following 'A case study in suspense; *Unputdowable.*' (Brown.2001: cover page. Our italics). The italicized word shows that the author has produced a creative, worthwhile work.

In the realm of reasoning, creativity means 'finding a solution that is both novel and useful' (Matlin.2003:387). Some psychologists see that creativity is related to everyday problem solving that leads to experience formation, while others argue that ordinary people are not likely to produce anything new.

5.3.8. Approaches to Creativity

Since creativity is the production of something novel and varied, then it would be assumed that approaches to studying creativity are also very varied. The two distinctive approaches are: *1.* divergent production, and *2.* investment theory of creativity.

5.3.8.1. Divergent Production

As an operational definition, divergent production means the number of diverse responses to each question/test item. It is the ability to generate a host of varied appropriate responses. In this respect, psychologists as Langley and Jones; cited in Sternberg (1995) have come to the conclusion that highly creative persons distinguish themselves from less highly creative persons for two reasons; first, because they have had a lot of experience which framed their expertise (rich schemata background), and more importantly, 'their commitment to the creative endeavor' (p.361). One is to consider the second reason as more important because it is commitment to work, to endeavor, to anything which allows the subject to *precisely* gather experience and shape up his expertise domain-field*wise,* or domain- general*wise*, as we will see further down. At any rate, experience and expertise are

in one way or another fruit of education and metacognition in which:

> a wide variety of cognitive enterprises occurs through the actions and interactions among four classes of phenomena: (a) metacognitive knowledge, (b) metacognitive experiences,
> (c) goals (or actions), and (d) actions (or strategies).
>
> (Flavell.1979:906)

Metacognitive knowledge or knowledge about knowledge, i.e. the knowledge which is stored –schemata- of what people in the surrounding environment do as well as their experiences. By ricochet, this leads to metacognitive experiences or knowledge and experience about experience which means the knowledge about people's experiences (stored in our memory) and how to react to it, or how to utilize it. This again leads to knowing about our goals and the appropriate actions and strategies to undertake to reach such goals.

5.3.8.2. Investment Theory of Creativity

If the vignette imposed on such creativity is *investment theory* it is because certain elements have to be incorporated so that investment truly takes place. In effect, Sternberg and Lubart (in Sternberg.1995) have seen that multiple environmental factors and attributes such as 'intelligence, motivation, an encouraging environment, an appropriate thinking style, and an appropriate personality' (Matlin.203:389) should [necessarily?] converge to allow creativity to occur. But should this mean that if

A person qualifies in the five but he lacks *an encouraging environment* this person will be expected not to produce anything creative? This is relatively true for Third World literary and translation productions are far less than any other Western country principally because we do not have the *required* [suggestopedic?] environment as countries on the other sides of the Atlantic provide their people with.

When students would finally understand the magic of creativity, such an approach to creativity (investment theory of creativity) was activated again. I asked students for homework to write an essay on the *benefits of overpopulation*. Instead of starting to complain, they knew that they could write something on such a matter. I believe I could trigger in them *1. Intelligence* as they could build up inexistent relationships between the different elements of Overpopulation just as they did with Pollution*; 2. motivation* (intrinsic more than extrinsic) (cf. Chap.02 above) because now they awakened from the *conformity sleep* right to the *cultivating creativity consciousness*: they have understood that topics do not all and always a one- way move. With relish, they started to always create good reasons for sustaining their arguments, and they discovered that now they know about the different facets of the topic; *3. an encouraging environment* which is the Written Expression class in which I always try to create an enthusiasm-bound atmosphere of work. I also tried to foster in them that the four mentioned attributes will help them develop their own *appropriate thinking style*; with which, they have been made

to understand- they will construct their own and *appropriate* personality for they learnt to never accept things without discussion, nor cling to old beliefs. With such attributes, discussed by Sternberg and Lubart, every student has learnt to

> focus attention on an idea undervalued by contemporaries ("buys low"), then develops that idea into a meaningful, significant creative contribution. Once the creator has *convinced* other people of the worth of his or her idea, this creator moves on to the next idea ("sells high").
>
> (Sternberg.1995:363. Italics mine)

In a wise investment, it is to buy low and sell high. The compensatory system –as it stands and as it regulates our language policy- does not allow such an investment to take place. With the investment theory of creativity, the subject not only learns to be creative, but

also learns to argue over his creativity, as Sternberg pointed at. Learning to be argumentative fosters in the individual the ability to choose problem- bound topics as well as develops in him a *criticizing readiness aptitude (CRA)* which aims at making the learner always want to improve his work. In other words, it pushes him to activate (or re-activate) his thought process to be insightful –not just scratch the surface– and indulge in divergent thinking, as discussed above. What truly matters in the creative endeavor, to use again Sternberg's words.

When people accept the new born ideas, then the subject could go for other creativities, changing likewise the world in which he lives (Gardner.1995) and constructing his new personality of a new brand of learners.

5.3.8.3. Incubation and Creativity

Before asking students to produce a creative work for an examination, such creative works, as we discussed above should be given either as classwork or more preferably as homework. In the classroom, as a first instance, students are given enough time to reflect over the topic presented to them. More interesting are the homework because students will –supposedly, yet when well motivated- have more time to think, ask questions, consult references, read, etc., What they need is an incubation time.

As an operational definition, incubation means putting the problem aside for a while. In other words, when we are unsuccessful in solving a problem probably because one of the attributes discussed above is missing (motivation, proper environment, etc.), one needs to take a break, a sip of water, a walk, name it, it is advisable to stop 'working' than continuing to work without interruption which might cause to disappointment, or loss of self-confidence. By taking a break, the individual is expected to rest his mind so as to let it reorganize itself again, and to allow memory's information processor rearrange for a better

and more appropriate recall. Such a 'blockade' is so common, especially when the individual firmly stick to solving a problem or to making a decision.

Gilhooly (1996): Matlin (2003) citing Houtz and Frankel (1992) and others say that incubation improves creative problem solving. Cognitive psychologists suggest that if a top-down strategy (looking at the higher-level of the problem), that is beginning with a consideration of the overall organization developing only an "aboutness'' of the text (Robinson.1991), then taking a break or changing location will allow the individual to look at the problem differently and use, if necessary the bottom-up approach which consists in decoding the problems step by step from the smallest elements on to gradually building up a larger understanding, (as the example on *Pollution* or Overpopulation illustrates: looking at the components of the problems rather than simply looking at the problem as a whole and saying that there is answer to it).

Further and deeper research could be conducted to truly verify whether incubation does really solve problems. A practical consideration, though, demonstrates that not all problems have been or will be solved by taking recourse to incubation, but it remains within the province of practice that when ideas block, it is better to stop, to change potion, or to postpone the task to a further moment.

Conclusion

When people thinks and involve their mental work, they dig deep and look twice for making judgments, solving problems, deduced truths, making decisions about something and in novel and original things: The use the mental process to solve problems, to make decisions, to reason, and to be creative. For this, one sheds some light on the distinction between reasoning and problem-solving, or reasoning and decision making for people see that for any of their mental activities they reason, as to reason for bringing up something

new and original (creativity). Using the appropriate heuristics or those intuitive strategies as hill-climbing, means-and ends, or the analogy, or even 'satisficing', to use again Sternberg's word is not done haphazardly but rather with sustained thought. Reasoning seems to be at the center of all the thinking process.

Last but not least, if one can well implement all these aspects of thinking in our students, then one can voice out the claim that people could stop the badly influential compensatory system towards pushing our students to become a new brand of learners and thinkers!

Chapter Six

Intelligence and Thinking

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Intelligence and Thinking

Introduction

An apple tree with six branches with in every branch two pears, how many pears do we have in the tree? Such a question might truly trigger the whole matter of intelligence. A first individual may answer: 'twelve pears' and a second one may remain silent and smiling. On a first shot, we can say that the second subject is intelligent, and that the first is not so because he did not pay attention to all the elements of the question, build up relationships, and [only] then use calculus. On the contrary, the second one understood that an apple tree cannot give pears, and therefore he did not need to show his aptitude in calculus as the first subject did. Did the second subject answer well because of some innate intelligence capacities, yet did the second one answer's reflect that his pedigree shows some signs of weakness? Measuring intelligence is not as easy as that, as we will see presently.

However, responding to such 'intelligence questions' does not reveal the capacities of one individual as compared with another. Other elements as distraction, must be verified to be cleared so as to account for the result of a well elaborated intelligence test. Furthermore, the first respondent could do better in other instances, as the second one could do less –or well. In other words, there are differences in individuals' intelligences, as there are multiple intelligences. Measuring and determining IQ's through robust tests up to recent past and nowadays the measurement of multiple cognitive abilities and their evaluation could only allow seeing where everyone stands vis-à-vis intelligence.

6.1. Intelligence Defined

In a few words, to say that person is intelligent person could mean that they are the ones who learn quickly; knowledgeable person with high capacities in handling difficult matters as, for instance, problem solving situations. As a concept, intelligence achieves its meaning according to what people claim it to mean a certain thing or behavior. In the ancient *intellectual* city* of Athens, people like Socrates, Plato, and their likes were viewed by people as intelligent people when compared to the idiots (who certainly existed) of the same city. Early and modern and contemporaries' theories about intelligence all involve at different variations the following themes: the *capacity* [and speed] *to learn*; the *knowledge a person possesses*; and *the ability someone has to adapt quickly to the environment or new situations* he encounters.

Many psychologists as Gardner (1999); Sternberg (1985); Howe (1997) and the others who met and discussed intelligence have shown considerable controversy on the issue. Many of them mentioned problem-solving and reasoning, or higher-thinking process (cf. the preceding chapter) as important manifestations of intelligence; others have added metacognition (Nelson.1992), that is knowledge and beliefs about one's own cognitive processes, or in other words, it refers to 'the knowledge people have about their own cognitive processes and to their influential use of certain cognitive processes to facilitate learning and memory' (Ormrod. 2006:46) mental processes. Disagreements were also about whether people possessed one intelligence –one ability, or many separate abilities (Sternberg. 1982).

*Named the *intellectual city* in which intellectuals and thinkers their colleagues and disciples lived, as opposed to Sparta, the military city *per se* where people were not likely to meet men such as Socrates, Plato, Euripides, and their peers.

The literature reviewed shows that there a profusion of definitions of intelligence. Sternberg (1982), citing Thorndike and his colleagues (1921) proposes some definitions as 'the capacity to acquire capacity' (Woodrow) or 'the ability to carry out abstract thinking' (Terman). To some other intelligence is seen only when it is tested (Boring (1921). In my opinion, this definition seems to be the most operational for it highlights the empirical character of research on intelligence (as opposed to lay people's view of intelligence). At any rate, on the face of it, Boring's definition seems to have triggered many a definition but it poses itself as the pivot for any tests or interpretations of tests of intelligence (cf. Sternberg et al. 200:5). Later on Deary (2000), citing Hunt posits that the 'study of intelligence has historically revolved around three questions: what does intelligence do, what causes it, and how should it be measured?' (p.3).

6.2. Considerations of the Nature of Intelligence

Discussions and interests in understanding the issue of intelligence trace back to the late nineteenth and the beginning of the twentieth centuries where two great intellectuals Francis Galton and Alfred Binet, who had completely two different approaches concerning the measurement of intelligence. To Galton, it was a Psychophysical approach, whereas to Binet, it was judgmental: The converging point that intelligence can be measured.

6.2.1. Galton's Principles: Energy and Sensitivity

Following the tracks of Darwin's writings about 'human faculty and its development', Francis Galton (cf. Sternberg. 1995) perhaps pioneered in proposing a theory of intelligence and for measuring human faculty. His (rather anthropological) observations led him to believe that intellectually gifted people share two characteristics: first, *energy*, that

is the capacity for work, and *sensitivity* to outside stimuli as odor, sounds, and the like which, according to him, constitute the bulk upon which intelligence works. In other words, those who bear pain (the stoics, for example) because they don't show they are suffering, are to Galton idiots! Tests on olfaction, and other on pitch, especially (using a whistle) led Galton (following the implications of his cousin, Darwin, and his investigations on human and animal capabilities) to consider that cats are at a superior level to humans [simply] because they are able to hear notes of higher pitch than humans! Later on, on the other side of the Atlantic, in Columbia University, Cattell, and later Wechsler (a disciple of the latter) tried to operationalize Galton's theories but the results they obtained were not very rewarding. Wechsler (1950) found out that different from Galton's findings, there is not a 'general ability' between people, or at least what the same people do (well or poorly) on the large number of tests, albeit they revealed some general constructs of intelligence for as 'an account of why and how people differ in their capabilities is more fiction and fact.(…)intelligence is the abstract noun that denotes the state of being intelligent, but it is not an explanation for it' (Howe.1997: viii-ix). Galton was somehow simplistic in dealing with an issue as complex as the measurement of intelligence (cf. Sternberg et al.1998), and other views were ultimately to supersede his.

6.2.2. Binet: 'Judgment', the *Essential* of Intelligence

More serious interests in the measurements of intelligence came to the fore as they have become highly influenced by market demands, more so, than for mere memory abilities or odor and pitch considerations. Binet's findings in 1904 were to prove again. When asked by the minister of public instruction to identify 'more gifted' students who would be placed in a special class (who would need extra teaching and extra help) from 'the less so' suspected of retardation. Binet (1916) considered that children who would do perform badly in class

because of different reasons (not well off) would be written off from school because discriminated and accused of being slow learners.

Both Binet and Simon viewed *judgment* as central to intelligence. With his collaborator Theodore Simon, they devised tests that measure school achievements *per se* but the other intellectual skills that students need to do well in school were not neglected. In other words, *judgment* entails many other cognitive operations.

6.2.2.1. Mental Age

Binet (1916) and his colleague arrived after many [discriminatory] tests to determine the factor of *the mental age* for a child. For example, a child who passed on the items tested on 6-year olds was considered to have the mental age of 6 whether the child's age was inferior, equal or superior to this age, (4, 6, or 8). Binet and his friend came out with the conception that intelligence is

> judgment(…)good sense, practical sense, initiative, the faculty of adapting one's self to [new] circumstances. To judge well, to comprehend well, to reason well, these are the essentials of intelligence.
>
> (Binet et al. 1916:42-43)

To Binet (1916), 'good sense' means *direction* or that the individual knows what he wants to do and how to do it; 'practical sense' or *adaptation* that is customizing (according to the schemata of existing strategies, and the perennial demand for a strategy) and adapting it while performing a task; 'to judge well' means 'criticism' or the ability to critique one's own thoughts and actions. All these cognitive behaviors

develop into cognition about cognition or metacognitive behaviors (Flavell et al.1979). Binet and his colleague [already] distinguished the underlying 'strata' of intelligence namely: *direction*, *adaptation*, and *control*. *Direction* (or accuracy) means the ability the

individual displays as he knows what he is to do, or asked to do, an ability that comes from the direction of thought, but does from not the result of haphazard mind spluttering. *Adaptation* entails the choice of the appropriate *strategy* to be used in solving a problem (cf. *problem-solving.* Chap. Five*)*. If we asked to add two numbers, we have to decide which of the strategy to apply, is it adding even uneven numbers and why. *Control* is again to know what to do, not simply do things as chores. In the Goat-wolf-and-hay heuristic (cf. Chap. Five) the individual has to check and verify whether the two elements that should go together are the right ones, and if not, he should consider the other alternative and the mistakes that must be cleared.

Mental age also allows distinguish between *ideational intelligence* from *instinctive intelligence.* The first one reflects how much the individual knows about his schematic background, for such an intelligence is based on analysis and verbal reasoning, and this can be given only to individual of a certain mental age (of course, geniuses are not considered as they are the nature's best exceptions). Instinctive intelligence, on the other hand is behaving without logical thinking -which has nothing to do with animals' instinct (as Galton would consider it). This has triggered and adumbrated further researches on thinking.

6.2.2.2. Mental Age and Intellectual Quotient

Nowadays, the best way to segregate children in schools is according to their age. Yet, we sometimes hear that some children are assessed on their mental age by the application of the theory of intelligence based on judgment when their intelligence (ability to learn and use knowledge in behaving in a new environment) was compared to an average (homogenous?) superior class.

The concept of intelligence quotient or *IQ was* introduced for the first time by the German psychologist Stern (1871-1938). From Binet's conception and Stern's reformulation and reconstruction, the concept was later introduced in Stanford University by Terman (1877-1956), to constitute the Stanford-Binet test of intelligence. There, it was suggested to use an intelligence quotient that would be useful when comparing mental ages within a group of children of different chronological ages (for mental age is an observable phenomenon -an index-since it is a composite of more than one measure (cf. Kerlinger.1973:151) as sex, status within the family, social status, etc.) The intelligence quotient was suggested to comprise: a ratio of mental age (MA) divided by the chronological age (CA), multiplied by 100. Mathematically, the ratio runs like this:

Intelligence Quotient=Mental Age/Chronological Age x100

or

$$IQ = \frac{MA}{CA} \times 100$$

Strictly mathematically speaking, if a child MA equals his CA, his IQ will be exactly 100, the latter represents the normal or average performance. An IQ below 100 indicates intelligence 'below average', a much lower IQ (eg. 70 and below) indicates retardation, and the one above 100 indicates intelligence 'above average' (eg. 120 and more), indicates acceleration. Cautious considerations of mental age for they do not have the same meaning as children get older, and thus calculating an IQ ratio proved problematic and deceptive. Psychologists see that in older age scores (on some kind) of mental tests actually decrease.

Anastasi (1982) posits that

> the mental age does not remain constant with age but tends to shrink with advancing years.(…)Since intellectual development progresses more rapidly at the earlier ages and gradually decreases as the individual approaches his or her mature limit, the mental age unit shrinks correspondingly with age.
> (Anastasi.1982:72)

The analogy Anastasi presents is the 'height age' in which she explains that the difference in inches between 3 to 4 years would be greater than that between a height age of 10 and 11. So, for the mental age, this makes the calculation of intelligence on mental age less effective across the life span. This could be explained, in our view, by the schemata formation *together with* the decrease of creativity (cf. Chap.5) where the individual tends to stick to the strategies he possesses for solving problems, or for reasoning.

For such a matter, the early Stanford-Binet test has been revised and the *deviation IQ* has been introduced. More reflections have focused on how intelligence is *distributed* within a given population at a given age or range of ages across the span of life. For intelligence tests, the median (average) score is 100 where the distribution, in a bell-shaped curve, two-thirds –average score- are computed to fall between 85 and 115, and about 95% of the scores fall between 70 and 130. The deviation IQ 'is a score based on statistical comparison of an individual's performance with the average performance of others in that age group' (Woolfork.2004:113; Anastasi.1982:82-83).

6.2.3. Spearman: The Two-factor Theory and the Little *g*

The Binetian school of thought largely paved the way for other theories and tests of intelligence, among which the most influential is the Spearman theory. Spearman (1927) viewed that human intelligence obeys a multilevel hierarchy. In his treatise about human psychometric intelligence differences, Spearman proposed a two-factor theory of

intelligence. First, a general factor *g* at the pinnacle common to all tasks that requires the 'interference' of intelligence, and second at the bottom a specific fact *s* which applies to each different type of task. The individual differences in *g* could be understood regarding the differences of mental energy that individuals could exhibit during the performance of intellectual tasks, problem-solving, analogies, and creativity, as examples. However, Spearman himself admitted 'he was not sure of what the psychological basis of *g* is, but suggested that it might be mental energy' (Sternberg et al. 1998:16). For 'mental energy' it is a term which Spearman never defined very clearly.

The Spearman's *g* factor brings about the fact that almost any set of mental tests, how-ever different, have the tendency to show positive inter-correlations, that, for example, high scores represent the more *desirable, competent* behaviors. The 'desirable' and 'competent' behaviors could be explained or understood in that Spearman posits that intelligence –as a phenomenon- exists among people but at different levels. From the abundant results he obtained from [group] intelligence tests he conducted, Spearman could easily take a detour from [pure] statistical psychology right into cognitive psychology explaining the reasoning process as seen in, say, solving syllogisms, making inferences, and the like (cf. Chap. 05) arriving 'to the notion that the "general factor" represents the power of reasoning, or the "neogenesis" of abstract entities' (Sternberg.1982:38).

In the present research, we strongly abide by the idea that we are dealing with [students as] being human beings, that is very changing, and not with dead matter and this might explain why Spearman could not give an accurate definition of 'mental energy', probably because he saw it very changing from one individual to the other, and changing within the same individual one thousand times. He could not, in all likelihood- ventures a

multi-purpose definition of the term. But at any rate, in an intelligence test performance, the *g* factor is a primary source of individual differences. Again, taking into consideration the 'mental ability', how many types of abilities there are that requires from us an explanation? If a student learns well and answers well on an essay-type examination, which psychometric test should we subject him to measure his intelligence? Do they predict variance in the outcomes? Why should people intelligences be measured at all? If Spearman and his followers suggest the *g* and the *s* factors for measuring intelligence, they seem to be looking up from human intelligence. A rather different-direction approach, that looking down on intelligence, would probably let us, we think, regard intelligence with a more 'realistic on-the terrain' considerations of intelligence.

Psychometric intelligence differences tend to by certain taxonomy, but what makes it that people are so different and varied in their behavior and in their responses to the same problems. No one could mount Bucefallo, Phillip the Second's (of Macedonia) strong horse except the Great Alexander, then an adolescent, because he intelligently made the horse face the sun, the animal blinded by the hot sun rays remained calm.; a feat that perplexed his father's friends. Alexander was said to be an intelligent young man. If Alexander could mount the horse (as he did) but not any of his father's great warriors, it's probably because no one wanted to defy the King father, or maybe because no one was allowed to mount the King's horse at all! Alexander solved the problem and he could mount the horse, and he displayed a kick of intelligence. Nonetheless, it remains all probable that any other young man of his generation could solve other and different problems exhibiting intelligence feats which could correlate with Spearman's little *g* factor considerations.

6.2.4. Gardner's Viewpoint: Multiple Intelligences

Trying to understand what intelligence continues to heat debate among psychologists and psychometricians. Again, in considering Boring's (1921) definition of intelligence that *it is what intelligence tests test (measure)*, we can become more akin to the idea that human beings possess largely independent mental powers that is *intelligence*. Every time and in every different walk of life, intelligence is manifested through certain behavior and achievements. Beethoven and his contemporaries are as intelligent (musical intelligence) in playing with musical tones tunes and melodies as Bohr or Einstein (mathematical intelligence) are with figures, theorems and equations. The little child in the way it plays with a jigsaw or in assembling the different parts of a puzzle displays also his personal intelligence.

In this respect, can we truly assume that the results of a test or a battery of tests in the form of an interchange or with paper and pencil that an individual takes while spending an hour or two with an examiner can determine his degree of intelligence? To Gardner (1983) there is a variety of excellences which are to be found in different individuals in different times and of course in different cultures (no one culture/people is more intelligent than the other); and that 'many individuals display intellectual strengths that are not reflected in high intelligence test scores(…)that there are different kinds of intelligence within the same person, and that each of these is to some extent separate and autonomous' (Howe.1997:127-128). For this, Gardner assigns eight criteria against which it can be decided whether or not capabilities can be regarded as forming intelligences. The criteria are summarized as follows

1. potential isolation to brain damage
2. Evidence from exceptional individuals, such as mentally retarded savants and child prodigies.
3. An identifiable code operation or set ofoperations
4. A distinctive developmental history
5. An evolutionary history and evolutionary plausibility
6. Support from experimental psychological tasks
7. Support from psychometric findings
8. Susceptibility to encoding in a symbol system (In Howe.19887:128)

For the first, Paul Broca's findings that 'a patient of his who was suffering from loss of speech was shown post mortem to have a lesion in the left frontal lobe of the brain(…)involved in speech(…)referred to as Broca's area' (In Sternberg et al.1998:32) have certainly fueled Gardner's apprehension that certain abilities could be destroyed as a result of brain damage. For the second, certain people can have precocious abilities in a particular field (as Mozart who played the piano at a very early age, or Einstein) and thus they cannot truly be said intelligent but geniuses. Considering the third and the fourth, and the fifth, Gardner points out at individuals and specifies as someone might have sensitivity in one field and can thus gain abilities (musical, painting, and the like) which another one cannot have. The fourth one is also important because the psychologist has to make sure that the individual expertise has gone through different stages and [continues to] develop, but not a case as shown in criterion 03.

The fifth criterion takes into account an anthropological consideration of the genes as to investigate about whose forefathers were more *homo fabers than homo sapiens* (according to anthropological research all human beings come from homo-sapiens sapiens). The Greeks, as an instance, are *more* likely to have roots of the 'thinkers', than of the 'makers' if compared with the Romans who were *more* 'makers' than 'thinkers' (a matter of relative proportions).

Finally, the sixth, seventh and eight criteria deal with the psychometric and observational aspects of intelligence. It is important to note that Gardner in his listing put the psychometric aspects last to show that the individual's intelligence manifestations should be seen first 'naturally' –in vivo, then according to a battery of tests –in vitro. The criteria presented by Gardner are a little vague for he sees that it is often hard to say for sure if an ability as put in the list of intelligences actually meets them. As a matter of fact, Gardner himself mention the example of hyperlexic children who are mentally retarded who exhibit at an early age an ability to read , however understanding little what they read.

To Gardner, there is no such thing as 'intelligence' but rather there are 'intelligences'. In other words, the little *g* which Spearman and his comrades wanted to impose as 'the only aspect of human intelligence differences that matters' (Deary. 2000:09), would not find its way, for independent intelligences or mental abilities would be necessarily uncorrelated and thus would not obey the *g* statistical weight. This is not to mean that psychometric findings have no value at all. In effect, IQ tests provide sources of information, especially in assessing one's intelligence (high correlations), but in assessing other intelligences such outcomes correlate less, or less highly.

Different people of different ages and sexes and cultures react to the ups and downs of life in a multitude of different ways using different sensory systems. According to Gardner (1983), intelligence is the capacity of realization through different sensory systems. Intelligence is analysis, synthesis, computational mechanisms, problem solving, and the like.

Gardner posits

> Intelligences should be thought of as entities(…)that each operates according to its own procedures and has its own biological bases(…)It is thus a mistake to try to compare intelligences on all particulars; *each must be thought of as its own system with its own rules*. Even though the eye, the heart and the kidneys are bodily organs, it is a mistake to try to compare these organs in every particular: the same restraint should be observed in the case of intelligences. (Gardner, 1983, p.68. Italics added)

The analogy about the body organs is in itself a manifestation of a [linguistic] intelligence which Gardner himself displayed while discussing his multiple intelligence theory. Gardner drew a list of intelligences, namely: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, and personal intelligence which he purports are 'continuous with one another(…)and potentially useful scientific constructs' (op cit. pp.69-70). According to Gardner, the intelligences listed in his (non-exhaustive list) can be identified (cf. Howe.1997) on the terrain according to individuals' practices and behavior manifestations. For pressing clarification purposes, some light will presently be shed on the types of intelligences, of concern in the present research.

6.2.4.1. Linguistic Intelligence

For the linguistic intelligence, Gardner (1983) sees that the linguistic skills machinery necessitates brain mechanisms that facilitate language acquisition pointing out in his posit to the research findings that show the relationships between

Brain damage and reading disorders. To Gardner, poetry is a good example of linguistic intelligence. He considers that a poet must have a keen sensitivity to the sounds of words (phonology) which are the proper of [good] poetry.

A careful study of Frost's *Stopping by Woods on a Snowy Evening* will reveal that writing poetry should not be seen as putting words one after another and forcing them to make sense. Writing poetry or prose is the manifestations of an individual's capacity, his

intelligence in manipulating words and making them say what he wants them to say.

The way Frost wrote his poem proves how intelligent he is in manipulating rhythm and rime to make them give an entity leaving the reader impressed by the quality of his diction and the 'potential scientific construct of his poem.

Stopping by Woods on a Snowy Evening

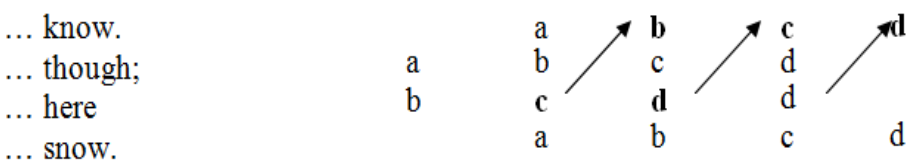
Whose woods these are I think I **know**. a
His house is in the village, **though;** a
He will not see me stopping **here** b
To watch his woods fill up with **snow.** a

My little horse must think it **queer** b
To stop without a farmhouse **near** b
Between the woods and frozen **lake** c
The darkest evening of the **year.** b

He gives his harness bells a **shake** c
To ask if there's some **mistake.** c
The only other sound's the **sweep** d
Of easy wind and downy **flake.** c

The woods are lovely dark and **deep.** d
But I have promises to **keep,** d
And miles to go before I **sleep,** d
And miles to go before I **sleep.** d

Robert Frost (1874-1963)
(In McMichael.1974:1525)



(Knickerbocker et al. 1955:316)

The words in bold ink show that the words chosen have the same riming musical pattern. Not only that, but Frost consciously and purposefully has chosen this rime.

The poet has masterfully played on rime and has woven the poem together as a piece of tapestry by using the *aaba*, *bbcd*, *ccdc*, and finally terminating his poem by *dddd*. He made of his different stanzas 'sound-and sense units(…)and in the last stanza(…) [presenting] the key-symbols which finally reveal the full meaning of the poem' (op cit pp. 316-17). Such 'intelligent' dealing with poetry makes sometimes some students think that poetry is an alien language or 'xenoglossia' (Crystal.1997) because it has not been constructed with a suffocating easiness but that some brain has been used to arrange, re-arrange words to give them the final and wanted form.

As far as linguistic intelligence goes, Frost and his colleagues have understood how [to build up relationships –intelligence-] to exploit the flexibility that their mother tongues possess as well as their 'linguistic heritage for communicative and expressive purposes' (Gardner. 1983:97) for auditory-oral ends.

6.3.4.2. Logical-mathematical Intelligence

Ordering and reordering objects, assessing their quantity are the first steps in the acquisition of logic and calculus among children in their early years in primary school. They begin by quizzes as to ask them how much time does a snail take which moves at one minute each fifty centimeters to get out of a well as high as fifteen meters. Later on,
much more developed calculus or mathematics will ask the same grown up children more complex mathematical equations to solve. Probably one of the eminent figures in the study of developmental thought is Piaget.

Piaget believes that because people live in a particular environment, they take actions upon this environment. From his early ages with his contact with the outside world, the

child begins moment-to-moment experience with objects, the slowly start to refer to them even when they are not with him [object permanence], compare and group them in terms of color and shape, shape, then he starts counting them. Creating thus arrays on the basis of form and colors, the growing child will master, in every new step in his age something different in the realm of calculus. He can move further to adding and subtracting amounts to playing marbles, purchasing goods, to bargaining with friends, to playing video and computer games. In each of these activities, the child learns to follow certain logic, i.e. he learns not to do things haphazardly. His mental activities develop for, as we have seen above, for calculating the speed of the snail coming up the wall of a well, the individual needs not see the snail and the well, but simply does the operation mentally.

Piaget's account of the move from sensori-motor actions to more brainy operations is the trajectory an individual takes in the development of his thought remains largely germane. The major bone of concentration is always to try to show how students who have not been reared up in a Western civilization do with the type of learning –and language policy- they have is the result of a many environmental contributions.

6.4. Improving Intelligence

As discussed above, intelligence is not static, it does develop, and it is malleable, that is one can act upon it to improve it. Students have acquired knowledge through their interaction with the tertiary education environment, and also through experiences. Classroom observation and monitoring have also shown that in their cognitive enterprises, they have developed a knowledge about what they know –*metacognitive knowledge- or* knowledge about knowledge, that is they know what they have learnt and they know what to do with it. To this can be added a *metacognitive experience* or knowledge about their experiences and this is seen in the way they use strategies for learning in the sense that

they have set goals and actions for learning. With such metacognition our learners are thus conscious individuals about what they do and about the experiences they acquired and they can utilize them in the most effective way possible.

However, in the teaching-learning enterprise, many impediments can rise such as lack of motivation, no short-term or long-term follow-ups, passivity of the teacher, lack organization, and the like. If students display intelligent behavior in their dealing with their [new] tertiary education, that is they perform well, more efforts should be done to allow them to know better 'what factors or variables act and interact in what ways to affect the course and outcome of [their] cognitive enterprises' (Nelson.1992:4).

In the light of multiple intelligences, it has become evident that human cognitive systems are to a considerable extent modular and encapsulated (Howe.1997). Improving intelligence or intelligences can be achieved through these different aspects of modularity. In that respect, one should not think of one particular aspect of education which is likely to achieve all the purpose of education. On the contrary, we have to acknowledge that every class is different and so each topic must be considered in terms of 'its own specific core ideas, network of concepts, issues, problems, and susceptibilities to misconception' (Gardner. 1999:174).

6.4.1. Metacognitive Knowledge

Metacognitive knowledge is the stored world knowledge with the consciousness the individual has about the tasks, goals and experiences and what to do with such knowledge. In other words, it is not a static knowledge that one possesses and which he does not know what to do with. Amount of schooling does interfere in the making of metacognitive knowledge. Sternberg (1982) reports studies by Anastasi and Husen which show substantial correlations between years in school and intelligence. Knowing about knowing is a manifestation of intelligence.

Before one thinks of the *g* factor, intelligence tests, or correlations of intelligence tests, we have first to ensure that such a metacognitive knowledge remains a treasure belonging to a cognitive 'creature' and that it should by no means become mere knowledge. For that, the more learners' attitudes, interests, temperament, and the like are known; the better the teacher is placed to help them improve their knowledge. Indeed, it is feared that if learners indulge in a routine-like learning, they will cease to behave as 'true' cognitive beings and will become passive 'bench warmers' seeking only a pass mark and utilizing a same one easy strategy for learning.

Worse, it is also feared that through repetitions and routine teaching and cramming the student's head with knowledge –or overlearning- the thought process may become automatized and unconscious, and 'the need for it to become conscious may well diminish as the behaviors it once mediated become more self-starting' (Flavell et al. In Hacker et al. 1998:07). One should remain aware that after all students are foreign learners and that the language they are learning may seem easy or difficult, yet boring to them according to how they are receiving it. Teachers should always remain attentive, precautious to keep our learners abreast with every new improvement in education. Likewise, we can seriously think of improving our learners' intelligence and foster their metacognitive knowledge for further cognitive tasks and actions, and for the achievements of their present and future goals.

Metacognitive knowledge should be thought of in three different aspects. First, that the student has gained the metacognitive knowledge of how his knowledge of, say, writing a good descriptive essay in the Written Expression class could be used to write another good descriptive essay in the literature or civilization classes. Second, the use of metacognitive knowledge can be inferred again when the learner realizes that his memories of the essay-writing techniques are not mere (or crammed) theory but rather serve to

accomplish the task of writing a good essay *on whatever topic given*. Third, and most importantly, when the student realizes [or should be made to realize] that he does not master well enough the materials: he 'has knowledge about the knowledge that he does not know', or put in simpler words, he has metacognitive knowledge of what he does not know. It is on this third point that the teacher should think of improving the cognitive capacities of his learners, or his intelligence.

6.4.2. Involvement with the Learner and Positive Responsivity

If we ensure that the third point we discussed above is secured, then one can think about improving intelligence performances within our students. Yet, another major point that should be given awe attention to is to ensure that our learners respond positively, together with makingsure we involve ourselves with them.

Law students always complain about the lack of involvement of their teachers with them during the course. This could probably be explained by the number (battalions- like) of students attending lectures which forcefully prevents the teacher from any effective involvement. Whatever the excuses we present to justify such an absence of involvement, the consequences are that students lose control of what they know and their metacognition becomes mere rote learning for they are asked to learn by heart piles of handouts. When asked about their future involvement with law and civil code and things like that, they all responded that with exposition and co-working with lawyers they will inevitably learn law, but that what they are doing at the university is a *forced passage* towards the diploma without which they can do nothing.

Our language students are luckier because the number of students per group is much reasonable. More so with L.M.D. students where the number of learners per group does not exceed 25 students (at least in our department). In the light of this, expecting a positive

response together with the teacher's involvement with his students is more likely to take place and the matter is in the hands of the teacher.

For matters of teacher's involvement, our classroom monitoring and observation has revealed that indeed students are *more keen to learn* when they see that their teacher is around them, especially with learner 'develops one's capacity to a single mentor, one's ability of getting along with others' (Gardner.1983:352).

When students show motivation and enthusiasm in learning because their teacher has involved himself with them, they develop another brand of metacognition: 'the knowledge of the knowledge that they should never be satisfied with what they know', or the metacognitive knowledge that they should continue to learn (to improve their schemata). When this is guaranteed, positive responsivity will take place in the learning process: students become more curious, more wanting, gluttonous (as discussed in Chap .02) They go beyond the teacher's involvement with them, they start to involve themselves with the teacher. Their participation rate rises as they get hooked by classroom ethos, and likewise they sharpen, both consciously and unconsciously- their wits and their intelligence. *Consciously* means they have deliberately started to be develop their skills of participating, taking notes, asking questions, and so on, becoming active members of their own learning -a consciousness-raising- as they discover that they have to do the things if they want things to be done. *Unconsciously* means that students embark in *unmediated learning* taking knowledge in vivo and in *observational learning* observing how their teacher's features of performance, how he moves, what he does, says, etc., developing a will to learn that takes the form of a habituation (cf. Chap.02) but which is a continuous sharpening of their intelligence and their 'know-how'.

6.4.3. Bringing in Novelty, Innovation, and Variety

Probably of the weakening element in learning is routine. It is a weakening element because first it does not bring new things to the learning, and with time, the capacities of the learner tend to become dormant because precisely the student does not see himself fit to think or learn to think and learn to learn so that he can develop his own pattern of learning. The compensatory system as it goes is doing, in my opinion, a lot of harm to the tertiary institution as such for it does not allow any personal involvement on the part of the student who has been made to expect a pass mark thanks to the Samaritan compensatory system (cf. Chap.02 and 05). One cannot say for sure what the proportion of the unused and dormant potential is within students, but one can say that since 1982 (when the compensatory system was launched in the tertiary tuition) till now, and according to our classroom observations, the rate is 90%. If such estimation is exaggerated or provocative, it bears nonetheless the inescapable truth and the unclad evidence that the students we have are indefatigable candidates of rote learning, cheating and begging for extra marks and substantial help from their teachers. If I try to adduce such a fact is simply that we witness year after year that our libraries are deserted, that the closing hour of our central library has changed from 18:00 hours to 16:00, simply because the librarian has not seen fit maintaining it *open and desert further on in the afternoon!* Speaking whether it opens in summer or not, that is a totally different story. This is not pessimism as much as it is the statement of facts that the adoption of a system, namely the compensatory system, has triggered in a chain reaction fashion many weaknesses in our tertiary tuition, one of which is the settling down of routine which, in turn, triggered rote learning, no desire to learn but just to pass, keeping the inner abilities dormant and unused, and as an ultimate strike:

giving a new guise to intelligence which succeeding and getting (a piece of Bristol paper) a diploma. By opposing things, if routine does what it is doing, then novelty, variety and innovation variety will bring about change, improvement and development. In this respect, Gardner cites the philosophy of the Club of Rome and the plan for joint actions to be taken to exploit opportunities and avoid disaster. It is as follows:

> Innovative learning(…)main attributes are integration, synthesis, and the broadening of horizons. It operates in open…situations or open systems. Its meaning derives from dissonance among contexts. It leads to critical questioning of conventional assumptions behind traditional thoughts and actions, focusing on necessary changes. Its values are not constant, but rather shifting. Innovative learning advances our thinking by reconstructing wholes, not by fragmenting reality**.** (Gardner.1983:369)

This passage is hortatory (encouraging) in positing that there are no limits to learning, and recommends teachers -and also learners- (and why not decision-makers) to exploit their inner capacities for a more practical i*nnovative learning* whose job it is to anticipate learning and take a forward-looking orientation. The Club of Rome has, in our view, purposefully avoided to interfere in people's businesses for it made for particular suggestion, which represents in itself another encouragement for innovation according to *the proper needs of individuals in different institutions.*

Conclusion

The guiding commitment of this research is that the concern is with human minds not dead matter, and in the view of the compensatory system adopted by the language policy, the trial was to tie up the many foundations and understanding in the field of intelligence to how we could possibly and effectively implement the theory about intelligence notions and manifestations to the reality of our classroom ethos.

Intelligence as a topic or as an issue will continue to draw the attention of many more researchers. Intelligence necessitates for itself a thorough research, and with our contribution, we aspire to become in the hereafter active members in the club of the little *g* friends.

Chapter Seven
Research Situation Analysis

Chapter Seven

Research Situation Analysis

Introduction

This chapter aims at presenting and analyzing the research situation where the present study has been carried out. It includes the presentation and the analysis of data obtained from three different sets of questionnaires plus our own classroom observations and monitoring. This is followed by a presentation of the situation design, namely the population to whom the questionnaires were administered; and the E.A.P teaching/learning situation, the area of interest of our present study.

We will then describe and analyze the questionnaires. This analysis will permit us to build our viewpoints about how teaching is carried out in the department of foreign languages. We will then present our suggestions and recommendations concerning teaching and the use of learning strategies studied in the present research. The questionnaires are in the appendices 1, 2, 3, 4, & 5.

7.1. Situation Design: Population and Sampling

In this present study, a sample of 100 second-year students has been randomly selected from the parent population the Department of English, University of Constantine.

For their learning background at the intermediate and secondary schools, the students in the sample have had their respective streams in his stream, the same course density, and almost the same course books. Furthermore, we believe that in reaching the 2nd year, the difference between students have to a great extent all balanced out in the sense that during their first year, students got acquainted with university tuition in general. The other reason for choosing to work with 2nd–year students is that these students have not changed stream

right after the first year. In all likelihood, they have decided to continue to study in the Department of English. We think this is so because it is unlikely that a student who could not make it in English would continue to study English and probably would continue to encounter problems.

7.2. The Compensatory System and the Teaching/Learning Setting

Before 1983, the grading and passing system was a total average of 10/20 to move to the next year. Such a system does not help students succeed unless they work hard which made many of them be repeaters year after. In all probability, because of such problems and others, the *compensatory system* was introduced to supposedly guarantee to students to pass easily through the different academic years. Moreover, a 4 -year (instead of a 3-year) curriculum was introduced to balance out any difference between the other streams which always had a 4-year curriculum −which correlates in no way with the introduction of the compensatory system.

It is important to note that in fact the introduction of the compensatory system did not bring any visible betterment in students' achievements. The argument is that a striving few only continue to work hard, not relying too much [profiting of it nevertheless] on such a system to pass from one year to another. The others, however, have understood that thanks to such a *Samaritan system*, they had to work a little to pass, and what happens is that -for many of them- working a little does not help them to pass! The consequence is that such students continue to add their names to the long swelling list of repeaters. The introduction of such a system has added nothing novel to tertiary tuition. Students have become far from making the least to accomplish the mission of *learning* and to develop their *thinking*. Instead, they laze around in the university campus becoming indefatigable 'least-effort learners', acquainted with stereotypes and parrotry repetitions.

Thus intended objective is to try to see how one could possibly reframe in the minds of EFL learners the concepts of 'learning' and 'thinking' -which are central in this research. This can be achieved through practical application by trying to foster the learners' awareness of what they are doing, their desire and motivation to learn while they carry on with their F.L studies -with the *expectation* of the occurrence of 'an explosion of concepts' (Hawkins.1984). However, classroom observation and monitoring led to contend that precisely EFL learners seem to be unable to expect such an 'explosion' to occur, afraid to kick open an anthill (Honey.1998).

7.3. The Pilot Study and Questionnaires

To implement general plans for this research, the questionnaire as a method of data collection was selected. The questionnaire is a potent and an 'instrument that has questions or items(…) of the closed –or fixed-alternative type' (Kerlinger.1973:487) to which individuals respond. The questionnaire is easy to administer for it requires little time to administer and it always allows keeping the respondents anonymous to avoid bias which would bring about wrong conclusions.

Through the General Information, and a Motivation Pilot questionnaire are to probe the respondents' attitudes, how they think, feel, perceive, and behave vis-à-vis a referent, that is towards events, behaviors and even physical objects. The positive and negative attitudes of our learners will be inferred from their responses to schedule questions and items for the other questionnaires.

7.3.1. The General Information Questionnaire

Question 08 'How do you find your teachers?' The items 'fair' and 'indifferent' have been dropped because the item 'severe' influence the meaning of fairness and 'boring' could mean to some respondents 'indifferent' which is a repetition.

Questions 13 ‘How much do you read?’ The last item ‘‘don’t like reading’ was dropped because the item ‘only when I am asked’ already shows that even if the student does not like to read he nevertheless reads when the teacher asks him to read a novel or a play. This item is superfluous.

Questions 20 ‘If you answer question 16 y *no*, is it because you find homework?’ The item ‘not interesting’ has been dropped because again it represents a value judgment of the efficiency of why teachers give homework. Whether homework is interesting or not remains the value judgment of the teacher alone. The other items as they stand give freedom to students to say about his value judgments.

7.3.2. The Motivation Pilot Questionnaire

Questions 06 ‘When you go to the library, how long do you stay?’ The item ‘take all my time’ has been dropped because of the nuance. Indeed, ‘I stay long’ and ‘I take my time’ are two different items with two different meanings. In ‘taking his time’, a quick learner may stay shorter than a slow learner who may stay long. The items ‘long’ and ‘just the necessary time’ are plain and more direct to ask a direct and clear answer.

Questions 07 ‘The teacher is absent, are you?’ The item ‘try to know why he is absent’ first, looks like in meaning as ‘disappointed’, and second it presupposes that the learners are so keen on learning that they really ask about a teacher who is absent. This is an little span of exaggeration which we wanted to avoid, anyway.

Questions 08 ‘*What* you do in class, is it?’ The items ‘very difficult’ and ‘average’ have been dropped. For the first, how could a student really know the difference between something that is difficult and something else that is *very difficult.* The student might put *very difficult* to simply mean *difficult* and vice versa. What interests in this answer if the *difficult* or the *non-difficulty*, but not the degree of the difficulty. For the second item. For

the second item ‘average’, the same question of nuance is posed: how could possibly and *truly* for a student to see something ‘average’ out of something which is ‘difficult’. We believe that the remaining items are quiet enough for such an answer.

Questions 09 ‘Do you find 04 years for a BA degree?’ The item ‘too long’ has been dropped for the same reasons of degree as explained above. The item ‘long’ already means duration, and the other item ‘long enough’ means ‘not too long, not too short’ which could be a sufficient answer from the respondent.

7.3.3. Results of the Pilot Questionnaires

The pilot questionnaires revealed that the subjects who for the majority are holder of a Lettres baccalaureate have developed, after their first year in the university, their own [different] attitudes vis-à-vis the institution and their tertiary tuition (modules, teachers, program, etc.).

To sort out a Pilot Motivation Questionnaire as such was to probe the attitudes of the students towards the university as an infrastructure and then as an institution. Asking about going to university as in Q01 aims at trying To know whether the university environment (walls and programs) is inviting or not. Q02 goes also in the same direction as to try to see the extent to which our learners *live*, *behave*, *and positively or negatively vibrate* in such an environment as human beings not as *empty bottles waiting to be filled with a cocktail of education.* The results obtained from this questionnaire allow us to understand that, for example, on the level of educational level, some students are happy when the teacher is absent (Q07) but at the same time they find that what they do in class is interesting (Q08). The same students consider that the university is an important stage in their lives (Q10), and that they are happy to be students (Q11). Yet, the attitudes towards studying are

somehow contradictory. Almost the same proportions of students who are happy the teacher is absent (Q07) go to the library 'just for revising' (Q05) or they stay 'just the necessary time' [other than revision] (Q06). When the course starts they are interested (Q3), and they are happy the teacher is absent (Q07). Such changing attitudes allow us to understand who our students are and what type of experimental behavior they exemplify according to the interests of the present research.

7.3.4. The Experiment Questionnaires *per se*

As tools of research, three questionnaires were devised: One for teachers and two for students. The teachers questionnaire (cf. Appendix # 05 is for probe how tertiary tuition is handled in our department under the sword of Damocles of the compensatory system. For students, two questionnaires were administered, namely the General Information Questionnaire (GenInfQuest) (cf. Appendix #03) and the Motivation Questionnaire (*MotQuest)* (cf. Appendix # 04)

The questionnaires serve to investigate the learning-thinking situation to help plan courses hopefully to get 'the best of people' (Berties and Morris. 1990:24). The provision of hope here is that with the compensatory system things are more likely to deceive us for the many reasons which we enumerated in the previous chapters.

7.3.4.1. Teachers Questionnaire

With teachers, things were much easier. All of them (N=16) accepted to answer the questionnaire. They were enthusiastic in answering and in participating in the research carried out precisely in the department where they themselves teach. These two factors helped us very much in our enterprise as they allowed us to get data which are believed to

be are reliable. The teachers said they found all the questions to the point for they dealt with all the points that teaching and learning 'suffers from' in our institution. Such a positive attitude was but to leave the researcher confident about all what we were about to undertake the research.

7.3.4.1.1. Describing the Questionnaire

The seventeen items of the questionnaire are all meant to scan how the T.L is taught in the different classes [different modules] including what teachers do or wish to do with the content of the module, the time allocated for it, and the methodology they use, and other related facts.

7.3.4.1.2. Administering the Questionnaire

The questionnaire was administered by the researcher to teachers in the Teachers Room. The questionnaires were collected and the researcher made sure that teachers took their time answering the questionnaires. This allows answers to be more or less reliable.

7.3.4.1.3. Analyzing the Questionnaire

Q.1. The module teachers teach

The very first question asked was whether they teach their major subjects.

Yes	No	Total
11	05	16
69%	31.25%	100%

Table 43. On Whether They Teach Their Major Subject

In fact, 69% of the total respondents (N=16) said *yes*; against 31.25% who said *no*. This shows that they are still some teachers who do not teach what they want. This shows that many teachers teach their major subject which implies they do so with enthusiasm. Such an enthusiasm gives but good results on students.

Q.2. Teachers' reaction *par rapport* the given program

The question is the probe whether teachers teach following an established program or that they adapt it according to their own teaching materials.

Yes	No	Total
07	09	16
44%	56.25%	100%

Table 44. On whether They Stick to the Established Program

Of the total respondents, 56.25% said *no*; against 44% who said *yes.* This also shows improvise while teaching. This remains questionable whether they are not satisfied with the established program. The results show that most of the teachers adapt to program top their teaching materials which reveals that they make the efforts to suit their learners' needs.

Q.3. Reason for not following the established program

The researcher wanted to know the reason behind not following the established program.

Add more information	No additional information	Total
07	09	16
44%	56.25%	100%

Table 45. Reason for Not Following the Established Program

56.25% said they don't follow the established program but add nothing of their own; against 44% who said they decided to add more information; against 44% who said *yes.* This also shows improvise while teaching. This shows that probably teachers follow another different program brought probably from another university overseas.

Q.3. How is the teaching time (T.T.T) budgeted

With the next question is about knowing how much time they spend on explanation, oral participation, or classwork, if any.

Classwork and participation	Classwork	Total
09	07	16
56.25%	43.75%	100%

Table 46. To Which Activity They Devote More Time

The results show that 56.25% said they balance their teaching time between classwork, oral participation (drills); against 43.75% who said they give time solely to classwork. The latter might think that classwork is more important for it allows direct practice of what has been taught.

Q.4. Activities students respond to

In the same line of thought, teachers were asked about what they do in class.

Participation	Classwork	Both	Total
10	05	00	16
62.50%	31.25%	00%	100%

Table 47. Which Activities Students Better Respond to

Of the teachers respondents, 62.50% said that their students are likely to prefer participation; against 31.25% who said it is the classwork they like. This can tell that students prefer to speak more than to write. This shows that students are rather lively during the courses.

Q.5. On oral participation and students' achievements

The following question was to know whether teachers agree that classroom participation serves maximize the students' achievements.

Yes	No	It depends	Total
11	00	05	16
69%	00%	31.25%	100%

Table 48. On whether Oral Participation Helps Maximize Students' Achievements

About 69% of the respondents said they agree; against 31.25% who believe that it depends on the module taught. This gives an idea that teachers teach in different manners and students respond accordingly.

Q.6. Where do students show difficulties

The related question to the previous one was to know, according to classroom observation, in what do students show difficulties.

Classwork	Oral participation	Both	Total
11	00	052	16
25%	62.50%	12.50%	100%

Table 49. In Which Activities Do Students Show Difficulties

Of the total teachers asked (N=16), 62.50% said it is in participation, 25% said during classwork (buzz groups); against 12.50 who said in both. Despite the fact that they like more speaking than writing, students nevertheless have difficulties with speaking.

Q.7 Difficulties in Participation

A question about participation was necessary, and it is to know about the difficulties and what they were due to.

Difficulty with vocabulary	Lack of motivation	Shyness	Total
06	05	05	16
37.50%	31.25%	31.25%	100%

Table 50. Reasons for Difficulty with Speaking

37.50% of the respondents said it is because of difficulty in the vocabulary, 31.25 said because students are not motivated at all, and another 31.25% also said it is because of shyness. It seems that 'lack of motivation' comes from 'shyness'.

Q.7. Which feedback?

Whatever problems rise, feedback is necessary to try counterweight the effect of the problems, or at least to try to diminish it.

Variety	Reward	Don't know	Total
08	05	03	16
50%	31.25%	19%	100%

Table 51. The Suggested Feedback

The results show that 50% of the respondents said they include variety (to expose them to a varied vocabulary), 31.25% said they provide reward; against 19% who abstained. Proving feedback is all what teaching is about. Probably reward is one possible feedback teachers could provide their learners with is reward. The variety in feedback depends on teaches and how they view their learners attitudes vis-à-vis the mistakes they make.

Q.8. What is the role of the compensatory system in the progress of learning in students?

Teachers were asked about what think of such a system in the progress of their students' learning.

Good enough	Doing harm	Total
06	10	16
62.50%	37.50%	100%

Table 52. Teachers Belief of the Role of the Compensatory System in Education

62.50% said such a system helps students learn and succeed; against 37.50% who answered that such a system is doing harm to learning in general. It seems that teachers feel at ease with the compensatory system maybe because it allows all their learners to move from one year to another and maybe also that they do not like to see repeaters in their classes.

Q.9. What is to be done vis-à-vis such a system

For those would answer by *yes* the previous question, we asked them if they were for abolishing it or simply for revising it.

Revise it	Abolish it	Total
06	10	16
44%	37.50%	100%

Table53. On What Is to Be Done vis-à-vis Such a System

Of the total respondents, 44% are for revising it; against 37.50% who are for abolishing it. It seems that teachers are not well aware of such a system and how it is be in used. Teachers are split between keeping the system because it suits their learners but by revising it; while other are for dropping it as they see the harms it is doing to their learners.

7.3.4.2. Discussion of the Results

Teachers' answers have shed some light on an important issue regarding the learning and the thinking issues of interest in the present research such as the appropriate methodology (to adopt and/or to adapt one), the materials used, and most importantly the students' learning/thinking problems. The preliminary analysis of the data of the questionnaire reveals the following aspects.

01. Teachers do not count very much on, yet don't want to simply [blindly] follow *to the letter* an established program but rather on their students' needs and wants and adapt, invent, scratch their heads to try to find the solution (cf. Tables 51.52) Teachers are well aware of what is happening inside the classroom, aware of their students' problems and difficulties, and what best serve them to well accomplish their learning/thinking task.(cf. Tables 44, 45, 46, 47 & 48).

02. Last but not least, teachers understand that the [thinking] learning terminal behavior in impaired by the compensatory system (cf. Table 52). A certain number of teachers are for abolishing it and others are simply for revising it (Table. 53). Such different positions vis-à-vis these systems reveal that our teachers are well aware that something must be done with the system(s) governing our pedagogic realities. **7.3.4.1.3.**

7.3.4.3. Students Questionnaires

Two questionnaires were devised for students, namely the General Information Questionnaire (*GenInfQuest)* (cf. Appendix # 03) was on the learners' relationship with the university in general, and The Motivation Questionnaire (*MotQuest)* (cf. Appendix # 04) for knowing about the learners' way of learning and what they think of the program and their teachers.

7.3.4.3.1. The General Information Questionnaire

For the students questionnaires, one called General Information Questionnaire (*GenInfQuest)* (cf. Appendix # 03) was on the learners' relationship with the university in general, and the second called

7.3.4.3.1.1. Describing the Questionnaire

The General Information Questionnaire, the *GenInfQuest* contains sixteen items. It is intended to probe further all the possible students' reactions vis-à-vis their curricular and their extracurricular learning habits. This questionnaire also tries to investigate any other learners' attitude, namely towards the course density. For the present study, we are interested in studying how and why students respond to the compensatory system in their learning and thinking activities and tasks.

7.3.4.3.1.2. Administering the Questionnaire

The questionnaire was administered by the researcher during ordinary teaching sessions. The researcher made sure that students do not look at each other's papers to guarantee a bit of credibility in answers.

7.3.4.3.1.3. Analyzing the Questionnaire

Q.1. Baccalaureate and Access to University

The sample learners come from different streams 'Lettres', and 'Science'. It is expected that they had more or less the same background of G.E. English In that respect, the students of each stream is expected to have had enough English to choose to do English at the university. For the learners involved in the present research, the majorities (70%) come from the Lettres stream; others (30 %) come from the Science class.

Lettres	Sciences	Total
70	30	100
70%	30%	100%

Table 54. Baccalaureate Stream and Access to University

These figures indicate that 70% of students who were in the Lettres class, having 03 hours per week; against 30% who said they come from the Sciences stream. Such course difference does not seem to have any significant influence on students' involvement in learning the foreign language. In fact, sit has been found that Sciences students are more or evenly integrated in the English course than or as some Letters students.

Q.2 About going to University every day?

This question is about what students think about going to the university.

Very interesting	Tiring	Boring	Don't know	Total
85	05	10	00	100
85%	05%	11%	00%	100%

Table 55. On What They Think about Going to University *Every Day*

Of the total respondents, (85%) think it is very interesting, 10% see that it is boring, against 5% who believe that it is tiring.

Q.3. When do you arrive to University.

This question is to probe when student arrive to university.

On time	In time	Late	It depends	Total
41	09	00	50	100
41%	09%	00%	50%	100%

Table56. On When They Arrive to the University

Of the total respondents 50% said that *it depends* (because of transportation basically) 41% who said *on time* (The nuance between 'on time' and 'in time' has been explained to students to clear off any ambiguity); against 09% said they arrive *in time*, against only

Q.4. On how they frequently arrive to University.

About the frequency of arrivals, the question is to know how much they really like to arrive in time for not being late to the course.

Always	Sometimes	Never	Don't know	Total
52	38	00	10	100
52%	38%	00%	10%	100%

Table 57. On whether They Arrive to University Early

Of the total respondents, 52% said they always arrive in time, 38% said sometimes; against 10% who did not express any opinion. Students seem to be dedicated to learning as

many of them say they always arrive to the course early.

Q.5. What they do before going to the course

The other question was to see whether they think it is stimulating to go to the cafeteria [where students generally go] before they start the course to take a cup of coffee or tea or whatever.

Stimulating	Don't Go	Don't know	Total
35	65	00	100
35%	65%	00%	100%

Table 58. On How They Find Going to the Cafeteria before the Course

Of the total respondents, 65% said they do go; against 35% who said they don't. This shows that students at least know what it is to go to the cafeteria.

Q.6. Before the course starts

Now, students are in the corridor waiting to enter the classroom to take his first course. The purpose was to know about their feelings after they arrived (on time, in time) went to the cafeteria (if they went) and normally they are ready to start the courses.

A special person	Truly a student	Just a student	Don't know	Total
05	65	27	03	100
05%	65%	27%	03%	100%

Table 59. On How They Feel Before the Course Starts

65% of the respondents said that they feel as real student, 27% said they feel just like as any student; 05% said they feel as a special person; against (03%) who expressed no opinion.

Q.7. The course has started

After the course started, it was also interesting to know about students' other feelings.

Enthusiastic	Just interested	Don't know	Total
29	66	05	100
29%	66%	05%	100%

Table 60. On How They Feel Once the Course Starts

Of the total respondents 66% said they are just interested, 29% said they are enthusiastic; against 05% who abstained. Students do not seem to like to study and they said they are just interested. Had they the choice, it seems, they would not come at all!

Q.8. The feeling when the course is over

Of course, it is also interesting to discover if students felt happy once the course was over.

Yes	No	It depends	Don't know	Total
23	07	62	08	100
23%	07%	62%	08%	100%

Table 61. On How They Feel Once the Course Is Over

Of the total respondents, 62% said that it depends, 23% said *yes* (they are happy), 07% said *no*; against 08% who said they don't know. Once again, the feeling is that students seem to have a preference of the course, and probably of the teacher.

Q.9. What feeling about another course that starts

Related to the same question, this question was to know how students feel when another course starts.

Happy	Not happy	Don't know	Total
29	09	62	100
29%	09%	62%	100%

Table 62. On whether they Felt Happy When another Course Starts

Of the total respondents, 62% did not give any answer, 29% said they are happy; against 09% who said they are not happy. Equally the same, the preference of the subject and the teacher is visible in their answers.

Q.10. What is the feeling when the teacher is absent.

The other aspect about to know is when the teacher is absent.

Happy	Disappointed	Don't know	Total
34	42	24	100
34%	42%	24%	100%

Table 63. On How Students Feel When the Teacher Is Absent

Of the total respondents (N=100), 42% said that they are disappointed, 34% said they are happy; against 24% who abstained. This reiterates the idea that students react according to the teacher/course they have.

Q.11. Feeling about what student do in class.

This question is about what students do in class. They were asked whether they find what they do in class interesting, difficult, or otherwise.

Interesting	Difficult	Boring	Don't know	Total
71	08	13	08	100
71%	08%	13%	08%	100%

Table 64. On What They Think of What They Do in Class

Of the total respondents, 71% found it *interesting*, 13% found it *boring*, 08% said they find it *difficult*; and other 08% remained *silen*t. Whether classroom activities are boring or otherwise, it is the teacher who influences it. The answers reflect that, after all, the activities seem to be rather interesting.

Q.12. Students' point of view about the program.

Another question is to probe about what students think of the program.

Easy	Difficult	Boring	Don't know	Total
20	53	18	09	100
20	53%	18%	09%	100%

Table 65. On What Students Think of the Program

Of the total respondents 53% said it is *difficult*, 20% saw that it is *easy*, 18% believed that it is *boring*; against 08% who gave *no point of view*. This was to see whether they want the program to be *easified* or to be kept as it is. Although not directly concerned what the content of the program, students' answers reveal that they have a stand vis-à-vis the program.

Q.13. The modules they don't like to take

W.E	O.E	Gr.	Ling.	Ph.	Brit. Civ	Am. Civ	Brit. Lit.	Am. Lit.	Arabic	Don't know
00%	00%	09%	13%	07%	18%	18%	10%	10%	05%	10%
W.E*: Written Expression;* O.E*. Oral Expression;* Gr.*: Grammar;* Ph.*: Phonetics;* Ling. *Linguistics; Brit. Civ: British Civilization; Am. Civ: American Civilization; Brit. Lit: British literature; Am. Lit.: American Literature*										

Table 66. On the Module They Like to Take by Order of Preference

18% of the total respondents said they do not like to study British and American civilization, and American literature, 13% said they don't like linguistics, (10%) said they don't like British Literature, another 10% expressed no opinion, 09% said they don't like British Literature, 09% said they don't like Grammar, 07% said they don't like Phonetics; against 05% who said they don't like to study Arabic and finally another 10% expressed no opinion. However, it seems that the modules that obviously everybody (?) wants to study are Written and Oral Expression modules. Students' choices are dictated by the type of course they take and the type of teacher who provides the course.

Q.14. The respondents' justifications

The following question is about justification of their answers.

Difficult	Teacher not motivating	Boring	Total
30	35	35	100
30%	35%	35%	100%

Table 67. On Justifying Their Answers

So, according to the answers of the previous table, it can be seen that for their likes and

dislikes of the modules, 35% of the total respondents said that the *teacher is not motivating*, another 35% said that the modules are *boring*, against 30% who said that these modules are *difficult*. Students very confidently display what they truly think of whether the program suits them or they find difficult.

Q.15. About going to the library

This questions aims at knowing whether students are library-goers

Yes	No	Total
82	18	100
82%	18%	100%

Table 68. On whether Students Are Library-goers

Of the total respondents, (82%) said they go to the library; against (18%) who said they don't go. The question is when they do not go to the library, there must be another place they like to go to, but which they did not mention, not even in a commentary. Again, students seem to be conscious that the library is the 'ideal' place for preparing their learning.

Q.16. The frequency of going to the library

For those who said they go to the library, the researcher was interested to know about their frequency of going.

Always	Rarely	Just for revising	Total
34	10	56	100
34%	10%	56%	100%

Table 69. On Students' Frequency of Going to the Library

The results show that 56% said they go there *just for revising*, 34% said they *always go*; against (10%) who said they *rarely go*. According to the answers of the previous table, the results were expected to be much higher, especially tht with 'always' and 'rarely', it is not

as much as the yes's expression which is 80%. What is interesting is that students go anyway to the library even for not studying *per se* but what counts is that they go.

Q. 17. The role of university in students' life

This question was about knowing whether the university has a role to play in their lives

Yes	No	Don't know	Total
94	00	06	100
94%	00%	06%	100%

Table 70. On the Role the University Plays in Students' Lives

Of the total respondents, 94% said yes; against 06% who did not give a point of view. Such answers reveal that students at least know that coming to University is for something. Students are all aware of the importance of the university in their lives. Such an attitude is but encouraging since learners acknowledge that university plays a role in their lives.

7.3.4.3.2. Discussion of the Results

The different answers students gave in the *GenInfQuest* do really reveal about many aspects of their learning and thinking behaviors. The answers strengthened more the ideas we presented and developed in the present research, to develop more in the course of their tertiary tuition.

The respondents' answers, as in Table 33, show rather complaisance for, we think, they might just want to please the teacher-researcher. In this respect, we reckon, the questionnaire, as a tool of research, is [alas] sometimes a very unreliable tool of investigating.

About the homework, Table 39 shows that the 25% of the total respondents who 'abstained' (when compared with the other 25% who said *no*) have rather a negative attitude towards the homework. One may reckon that those who abstained have a negative attitude

vis-à-vis the homework otherwise they could have given a more direct answer, as to say *ye*s, for instance. Moreover, in Table 40, we still have respondents who abstain (30%) when another question is put on the homework. The answers in Table 41 are still more revealing of the attitude of learners vis-à-vis learning and making the effort of thinking which, after all, is what the homework is for.

However, the answers in Table 12; Table 14; Table 16, Tables 18 & 19; Tables 21 & 22; and finally Table 24, all indicate that students are more or less conscious of what they are doing. Yet, some other times, they are 'blinded' by [the effect of] the compensatory system. In effect, instead of having a system which entices them to work, participate, and read, do homework as a pleasure not as a chore (because it is meant to keep them abreast with learning and thinking), what actually happens with the compensatory system is that they 'learnt' not to learn, but rather to laze around in the university campus. They learn but in fact not because they are aroused and enthusiastic, but rather because they can't do otherwise (cf. Tables 16, 17 & 18) that the learning-thinking machine is not at a [complete] halt, waiting probably for better days, and better opportunities. The researcher aspires to such a bright[er] future.

7.3.4.3.3. The Motivation Questionnaire

The Motivations Questionnaire, or the *GenInfQuest* was administered after the The General Information Questionnaire

7.3.4.3.3.1. Describing the Questionnaire

The Motivation Questionnaire (*MotQuest)* (cf. Appendix # 04) has been devised for knowing about the learners' way of learning and what they think of the program and their teachers.

7.3.4.3.3.2. Analyzing the Questionnaire

Q.1. Impressions about university

This question was about their first impressions when they entered university for the first time (that is moving on to their second year).

Good	Bad	Don't know	Total
73	16	11	100
73%	16%	11%	100%

Table 71. On Impressions When First Entered University

Of the total respondents, 73% said they have good impressions, 16% said bad; against 11% said nothing. These results reveal that at least students had no apprehension vis-à-vis the university. They were, it seems, enthusiastic to move on to the second year.

The next question was whether it was their choice to study English or somebody else's.

Yes	No	Total
88	12	100
88%	12%	100%

Table 72. On whether Their Choice for English Was Their or Somebody Else's

88% of the total respondents said it was their choice, against 12% who said it was somebody else's. The results show again that learners were eager to choose to learn English and not anything else. This shows that students themselves have willingly chosen to study English.

Q.2. Feeling as being a student of English

Students were asked whether they still satisfied being a student of English.

Yes	No	Total
82	18	100
82%	18%	100%

Table 73. On whether Satisfied to Be a Student of English

82% of the total respondents said *yes,* against 18% who said *no*. For those who said 'no'. It is all likely that either they choice were not theirs or that they could not transfer to another stream.

Q.3. Whether they find learning English interesting

This question was to probe their interest in studying English.

Interesting	Very interesting	Don't know	Total
23	77	00	100
23%	77%	00%	100%

Table 74. Feeling of Interest about Learning English

77% of the total respondents find that it is very interesting; against 23% who see it interesting. The results show that many students seem to be genuinely interested in studying English.

Q.4. Standpoint about the courses

This question was to see whether students are sensible about the courses they get.

Easy	Difficult	Don't know	Total
40	45	15	100
40%	45%	15%	100%

Table 75. On whether Students Are Sensible about the Course They Get

Of the total respondents, 45% find them difficult, 40% find the course easy; against 15% who expressed no point of view. The results show that students are not particularly sensible about the courses they get. Although motivated as the previous results show, students now seem to face some difficulties learning English. This could be due to some teachers or to the program.

Q.5. Standpoint about the teachers

This question was to check the students' attitudes about their teachers, whether they consider them as knowledge providers or a bore.

Severe	Motivating enough	Don't know	Total
12	76	02	100
12%	76%	12%	100%

Table 76. On How Students Consider Their Teachers

76% of the total respondents find their teachers are motivating, 12% find them severe; against 02 % who abstained. It is interesting to know that many of the respondents find their teachers are encouraging. This shows that they are sensible in looking at their teachers**.**

Q.6. This question was to see how much students participate.

Yes, I participate	Only sometimes	Afraid to Participate	Total
35	45	20	100
35%	45%	20%	100%

Table 77. On How Much They Participate in Class

45% of the total respondents said they sometimes participate, 35% said yes; against 20% who confessed they are afraid to participate. Still with motivation, students look eager to show their participating capacities to their teachers.

Q.7. Learning better and participation in class

The question was to probe whether students know that participating in class leads to efficiently learn.

Yes	No	Don't know	Total
06	76	18	100
06%	76%	18%	100%

Table 78. On whether Participation Helps in Learning

Of the students asked, 76% answered by *no*; against 06% who said *yes*. For those who said *no*, they seem not to be intrinsically motivated at all. It also seems that indeed it is

by participating in the classroom ethos that students can learn efficiently learn. After all, being in the classroom is not for fun, and it is not a chore, either.

Q.8. Students and reading

This question is intended to know about the students' learning habits.

Yes, I read	No, I don't read	Sometimes	Only when I am asked	Total
20	02	56	12	100
20%	02%	56%	12%	100%

Table 79. On Students' Reading Habit

56% of the total respondents said they *sometimes* read, 20% said *yes* they read; 12% said only when they are asked; against 02% who said they no. It is all likely that these students are superficially motivated to learn. At any rate, there are among the respondents 80% who said they read, which is satisficing.

Q.9. The type of literature students read.

This related question is to probe the type of literature students read.

Novels	Poetry, drama	Magazines	Others	Total
58	02	32	05	100
58%	02%	32%	05%	100%

Table 80. On the Type of Literature Students Read

Of the total respondents, 58% said they read novels, 32% said magazines; 05% said magazines and newspapers (others); against 02% who said they read drama and poetry. For those who said other', it could be pamphlets, brochures, sports reports, and the like. It is interesting to know that students read a diversity of literature, all of which allows them to see the language they are ,learning in action through different genres.

Q.10. Do you read outside the wall of the classroom?

This question was about what students do outside the wall of a classroom.

Yes	No	Rarely	Total
96	00	04	100
96%	00%	04%	100%

Table 81. On whether They Do Their Homework

96% of the total respondents said *yes*; against 04% who said *rarely*. It is interesting to know that students read without being asked by the teacher, or doing a classroom task.

Q.11. On whether they like homework

This question is to see whether students like to have to do homework.

Yes	No	Don't know	Total
50	25	25	100
50%	25%	25%	100%

Table 82. On whether Students Like Homework

50% of the total respondents said *yes*, 25% said *no*; against another 25% who abstained. Those who abstained are among those are extrinsically motivated. Once again, many students seem to like to do homework which are part of the learning process.

Q.12. On homework and learning

This question is about whether students know that homework help them practice and perfect the language they are learning

Improve your English	Constantly practice English	Don't know	Total
30	40	30	100
30%	40%	30%	100%

Table 83. About whether They Consider Homework as Learning

The results in this table show that 40% said homework *help them constantly practice* their English, 30% said thus they improve their English, and another 30% abstained. 70% of the respondents seem to be well aware that practicing English outside the classroom is primordial for it keeps them always in contact with what they are learning.

Q.13. The negative attitude toward homework.

This question sought to see why students hold a negative attitude vis-à-vis homework.

Boring	Difficult to do	Don't know	Total
22	26	52	100
22%	26%	52%	100%

Table 84. About the Negative Attitude toward Homework

Of the total respondents, 52% abstained, 26% said maybe because they find homework *difficult to do* (a chore!), 22% find that it is boring to do homework. The respondents seem to all have a low motivation vis-à-vis doing anything outside the walls of a classroom. Such conflicting answers will allow to think of the nature of the homework students are given.

Q.14. Feeling about being a student

As an ultimate question, students were asked whether they feel happy to be a student.

Yes	No	Don't know	Total
73	12	22	50
73%	12%	22%	100%

Table 85. On whether They Are Happy to Be Students

73% of the total respondents said *yes*, 22% *abstained* (?), against 12% who said *no*. These answers reveal who students truly are. Many students expressed their feeling of happiness –motivation- being a student. Such an attitude is to teachers but encouraging.

7.4.3.3.4. Discussion of the Results

The different answers our population students gave in the *GenInfQuest* do really reveal about many aspects of their learning and thinking behaviors. The answers strengthened more the ideas presented and developed in the present research, to develop more in the course of their tertiary tuition.

The respondents' answers, as in Table 81, show rather complaisance for, we think, they might just want to please the teacher-researcher. In this respect, the questionnaire turned out to be an unreliable tool of investigating.

About the homework the results in Table 82, for example, show that the 25% of the total respondents who 'abstained' (when compared with the other 25% who said *no*) have rather a negative attitude towards the homework. We reckon that those who abstained have a negative attitude vis-à-vis the homework otherwise they could have given a more direct answer, as to say *yes*, for instance. Moreover, in Table 40, we still have respondents who abstain (30%) when another question is put on the homework. The answers in Table 83 are still more revealing of the attitude of learners vis-à-vis learning and making the effort of thinking which, after all, is what the homework is for.

However, the answers in Table 64; Table 66; Table 68, Tables 70 & 71; Tables 72 & 73; and finally Table 75, all indicate that students are more or less conscious of what they are doing. Yet, some other times, they are 'blinded' by [the effect of] the compensatory system. In effect, instead of having a system which entices them to work, participate, and read, do homework as a pleasure not as a chore (because it is meant to keep them abreast with learning and thinking), what actually happens with the compensatory system is that they 'learnt' not to learn, but rather to laze around in the university campus. They learn but in fact not because they are aroused and enthusiastic, but rather because they can't do

otherwise (cf. Tables 68, 69 & 70) that the learning-thinking machine is not at a [complete] halt, waiting probably for better days and opportunities which the researcher aspires to.

Conclusion

Throughout this estimation of the data of questionnaires, the following inferences were made. In moving to the second year, students have then decided to continue to study English. They remain, however, largely aware of the pedagogic tasks awaiting them both outside (before they enter) classroom and inside (after they enter) the walls of their respective classrooms, with their different teachers (cf. Tables 83, 84, 87, 91, 92, 93, & 95). Furthermore, teachers have also understood their students' needs and wants. They also displayed an awareness vis-à-vis their students' problems as related to an/the-established program of the compensatory system, the pivot of the present research.

Last, and as a global understanding of the questionnaire's results, one can understand with some relief that the learning-thinking machine is not at a halt, but simply waiting [confidently] for better days, and for better opportunities. The researcher aspires to such a brighter future.

Chapter 08

Experiment # 01

Experiment Two

Chapter 08

Fieldwork and Experiments

Experiment 01
Building Awareness for Working without Considering the Compensatory System

Rationale

For this tentative exploratory type of research, one is to first think of the bad effects of the compensatory system and its long conditioning, and think of the possible ways and means wherewith to reduce its effects. This chapter is consecrated to the description and the analysis of two experiments representing a study of the effects of building awareness in our students in order to bring them about to think and behave otherwise than if there was a compensatory system so as not to totally rely on it. Such awareness is expected to bring substantial influence on learners' performance.

For the experiments, two related questions were put *First,* 'can we possibly with a short conditioning (of four months and then six months, as we will see) possibly reduce the 'catastrophic' effect(s) of the [long conditioning] compensatory system?' *Second,* 'can we [abruptly] pull out the student from such a long conditioning where so many unwanted [for our research] variables are so difficult to control?'

8.1. Research Design

The following description and analysis of an experiment represent a study of the effects of building awareness in our students in order to bring them about to think and behave otherwise than if there was a compensatory system so as not to totally rely on it. Such awareness is expected to bring substantial influence on learners' performance.

In the experiments both the observations of the behaviors of the subjects and the analyses of the results have been carried out according to the empirical assumption that the sampling has been randomly chosen. The overall age-range of the students of the experiment is between 20 and 21. However, the groups have not been divided into equal sized age-groups because the difference in age, which is not a glaring one, does not constitute a confounding variable.

The first experiment is conceived around the idea of trying to bring evidence that the compensatory system is doing irreparable harm for it keeps our learners' performance impoverished. In their fourth year, and even after they graduate, many of our students are not capable of writing a good and correct essay.

8.2. Population and Sampling and Null Bias

The samples selected from the target population are from the classical system 2nd-year students preparing their B.A (traditional system 4 years) in the Department of English, University of Constantine. Choosing to work specially with 2nd-years comes from the conviction that moving on the second year, these students have decided to carry on with English as their major subject (cf. Tables 02; 03; 07; 10 & 12).

To guarantee to some extent reliability and validity of the experiment, the criteria of *absence of bias* has been of chief interest. Bias, or the experimenter bias, is an aspect of the test that 'might distort the performance of a group –either for better or for worse' (Woolfork.2004:524). Furthermore, bias is also feared to unfairly penalize a group of students to the detriment of another group because of intellectual status, or language, for example. For that purpose, if any difference surfaces, we will try to show that this difference results from the condition or treatment which is on building an awareness of not counting on the compensatory system (cf. Fig. 15 & 16 below).

Therefore, for the sake of the experiment control and for the representativeness of the population, the sample has been randomly selected, where every one subject from the parent population has an equal chance to be taken in the random sample.

However, in dealing with human minds and not dead matter, the experimenter has to consider that differences [but not peak differences] may intervene in the experiment and are expected to greatly skew the results. Such a sampling error is expected to occur and it is basically due to chance selection of different individuals from the same parent population.

Still, for experiment worries, it was ensured that irrelevant variables like changing mood, fatigue, or boredom would not negatively interfere. Although a complete obliteration of such unwanted variables could not be guaranteed, it was that avoided, for example, to administer our questionnaires during the teachers' strike or on days near the week-end, or in the beginning of the week where students would not well concentrate.

8.2.1. Procedure and Design of the Experiment

Subjects are now ready to receive the test. The guiding principles of the experiment, according to which the hypotheses were formulated are as follows.

1. Are learners going to develop their true thinking (reasoning, creativity, etc.), and learning capacities if they are made aware of not to consider the compensatory system as a 'savior'?
2. Could students be made aware of the importance and the usefulness of using learning strategies to acquire a solid knowledge to be able to face any learning situation instead of taking recourse to rote learning [and cheating]?

For this first experiment, two groups of twenty five students (*N=50)* were chosen, one for the Experimental Group and the other for the Control Group. For the preparation of the

experiment, a period of time of about four months was taken to inculcate in the subjects of the Experimental Group the idea that they should not count [entirely] on the compensatory system because it causes them irreparable harm.

The argument has been sustained that indeed the compensatory system trains students not to work hard, and thus they do not accomplish –with effectiveness- their learning and thinking for achieving their aim which is to learn a language and make it their own. In effect, the argument presented was that such a system undoubtedly keeps them 'inactive' for they would not see it necessary to make the [least] effort to acquire the language, to develop their learning pattern (learning to learn) which would serve them for their future further learning needs and otherwise. This idea was continuously and insistently reiterated while inculcating the experiment treatment all the way throughout.

However, they were made aware that since such a system exists, it should be 'utilized' but that they should rely on it or take recourse to it *only when a problem unexpectedly surfaces*. The claim is that learning and thinking should be activated to the maximum so as to learn to build a pattern for learning (which is expected to be personalized by the learner), together with activating and constantly keeping abreast thinking capacities and thinking act in the learner.

Inside the classroom, it was noticed during classwork activities elaborated on the grounds of expecting to obtain results to sharpen their reasoning, creativity, thinking and problem solving (learning to learn and learning to think), that students have started to demonstrate some rigor while doing the tasks they were assigned to do. The following are examples of such exercises administered as classwork.

Example One

Girl: Mummy, can I have an ice cream? Mother: No,
certainly not, not before lunch.
Girl: (goes upstairs to father) Daddy can I have an ice-cream?
Father: Have you asked your mother?
Girl: Yes, Daddy, I have.
Father: OK, then, I suppose you can have one.

- Did the little girl say anything that was untrue?
- Did she intend to tell a lie?

If you were this little girl's Parents and you found her out, what would you do and why?
(Frank et al.1987:62)

If this exercise looks easy, however its objective is not to make students answer by a 'yes' or 'no', but rather to make them consider with care all the aspects and details in the text. The consideration of all these details will allow a better and a clearer understanding of the text, and especially to be able to answer rightly the questions. The questions put (by the author) demonstrate that such a text is certainly prepared to be administered to advanced learners (not even to intermediate) for it opens up to true thinking and effective utilization of problem-solving strategies as discussed in the previous chapters.

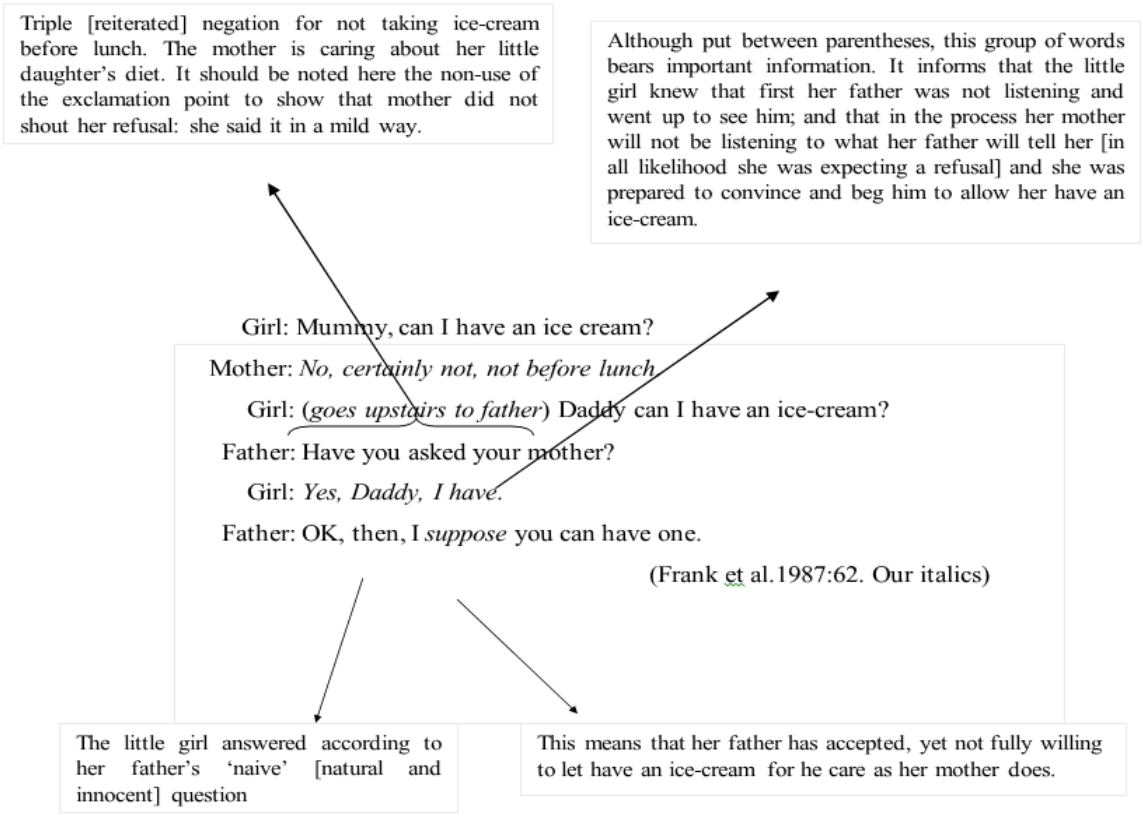
The nature of the questions, especially if we consider the first one 'Did the little girl say anything that was untrue?' reveal how poignant the question was for the "*untrue*" was used. If the question was put as: "Did the little girl lie", this would have put the students in a position to answer by *yes* and/or by *no*, and the exercise would be finished in a short time. The questions were to allow the learners to brainstorm and then answer to possibly *unearth treasures of pure reflection*.

For that students are expected to consider:

1. The important and the less important.
2. The clues, if any, that help them well understand the text, *and*
3. To paya closer attention to the wording of the questions.

Analysis of the Text

The analysis of the text will reveal many important details around which the text has precisely been constructed.



What students did with the next exercise leaves us contend that students should be made aware of the importance of thinking -and that *they should learn to think*). The example is as follows.

Example Two

I live in a city. I love growing vegetables but I haven't got a garden. Where else could they be grown?

a. They could be …

b. You could …

c. You might …

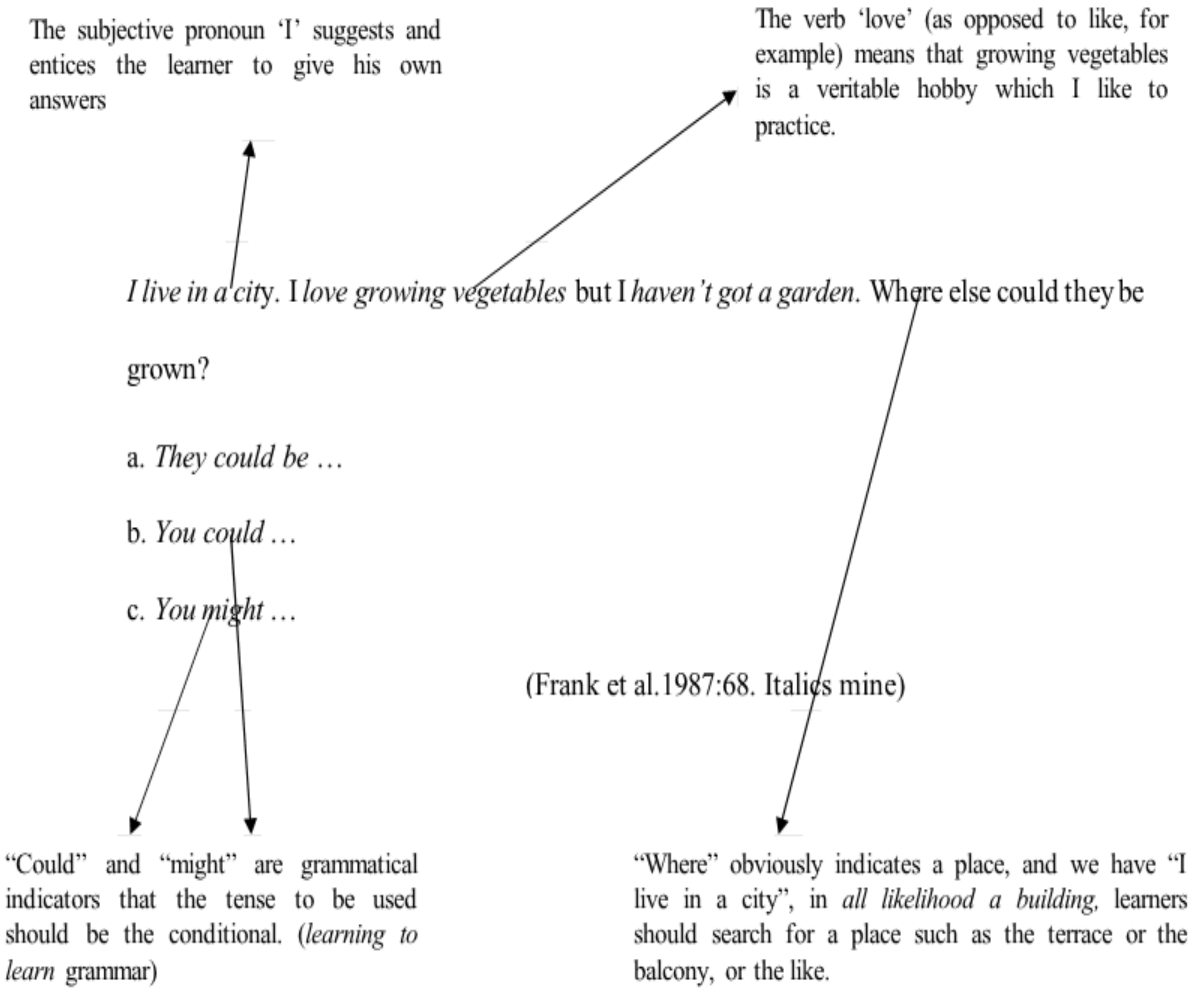
(Frank et al.1987:68)

For this exercise, students were asked to try to sort out all the important elements, key words and group of words that would enable them to truly understand the text and possibly give original and personal answers. The suggestions made at the bottom of the text are meant to direct the learners not to go far away from the overall idea of the text.

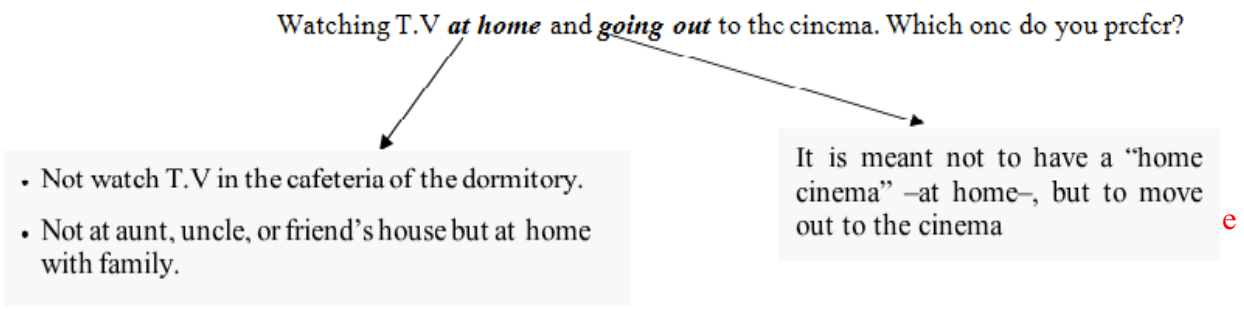
Analysis of the Text

Highlighting the important elements of the text gives us the following. The different learners' answers were written on the board and discussed. In general, the majority answered as follows. To 'love growing vegetables' means that it is my favorite hobby and I do everything I can to practice it. I do not surrender when 'I haven't got a garden', I must find where to grow my vegetables. They could be grown, for example, on the terrace. A terrace, as a matter of fact, provides three important and vital elements: *sun, air*, and *water*. This entails to consider the following seven points to grow my vegetables. They could be grown, for example, on the terrace. A terrace, as a matter of fact, provides three important and vital elements: *sun, air*, and *water*. This entails to consider the following seven points

1. Choose the best place
2. Make the appropriate pot (dimension, type of wood, color, etc.)
3. Bring dark black fertile earth
4. Bring manure from a farm and mix with the earth.
5. Bring the best seeds and sow them in the ground
6. Water the seeds.
7. Take regularly care of the vegetables.



Example Three: (own choice)



I. Watching TV at home

1. Advantages of watching T.V at home: there is comfort

-Clad in pajamas

-Sit in soft armchair/sofa

-Lay on carpet

-Take whatever position I like

-Eat while watching T.V

-Drink (lemonade, tea, coffee, juice, etc.)

-Eat sandwich, burger

2. Disadvantages of watching T.V at home: there is not comfort

-Sitting on the sofa makes me feel sleepy, I miss the film.

-Little brother, sister make noise.

-Can't watch my favorite program

-Programs are all the same, not interesting

II. Going out to the cinema

1. Advantages of going out to the cinema: there is romanticism

-I love complete darkness

-I love complete and dead silence

-I love full-size screen

2. Disadvantages of going out to the cinema: not comfortable

-I'm scared to go out alone in darkness
-I hate smoke, it creates a smoke screen.
-I hate to see a tall man sitting in front of me.

The other topics discussed were of an existentialist nature (not philosophical ones), that is chosen with the idea that students could possibly find something to say. In other words, such topics are not difficult, but they simply necessitates that our learners cogitate over them. The topics are

-The only way to travel is on foot.

-Holidays are never long enough.

-I wish there were more than twenty four hours in the day.

-If you make people think they think they'll love you, but is you make them think they'll hate you.

-Should students be modest?

Except members of your family, which person(s) make(s) you happy?

For example, a topic as 'I wish there were more than twenty four hours in the day' could be easily applied to the learner's environment. The learners were made to understand that, for example, twenty four hours in a day are never enough to do all they want to do and that they had to imagine a longer day. In some of their answers, some students simply said I wish they were 36 and other said 72 hours in a day. Again, they were made to understand that the difference between 24 and 36 or 72 is not that much. They then understood to completely unlock their imagination and say for example: 'I wish there were 200 hours in a day' and then try to divide these 200 hours into different activities they wish to do such as to say 60 hours for sleeping, other 60hours for eating, and like this.

Furthermore, developing their thinking and their *learning to think* and *learning to learn,* and for the sake hopefully keeping our learners motivated and desiring to learn, we have brought novelty and variety into the classroom and played with the caricatures.

Different from texts but still push learners to *think* and *learn to learn and think* are caricature and pictures in general. As a classwork, we have also used caricatures and have showed to students an example of, how to 'read' a caricature and understand its message (generally, caricatures always have messages to transmit).

For that matter, we saw it fit to introduce our learners to the notion of what a caricature is, and to how to 'read' a caricature and to possibly decipher its meaning(s). A caricature can be 'read' in three basic ways: 1. in a clockwise fashion; 2. in an anti-clockwise fashion; 3. or it can be divided into four basic parts and every one part meticulously looked at to hunt for details as shown below.

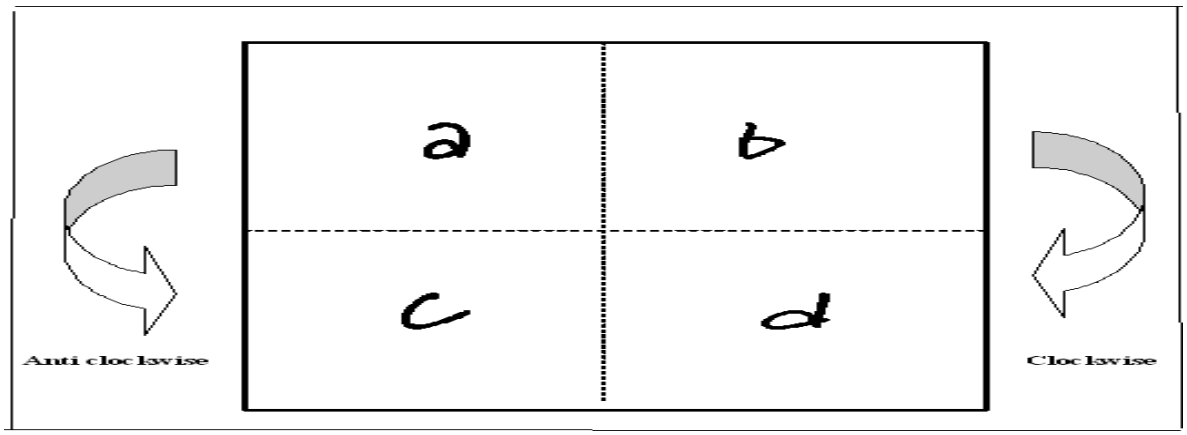


Figure 14 bis. Division and Multi-directional "Reading" of a Caricature

For such a classroom practice, students were asked to consult English newspapers or magazines to select caricatures, and bring them for discussion into the classroom. For practical matters, learners were also asked to do enlarged Xerox copies and pin them on the board, or do Xerox copies for their comrades. The treatment which was inculcated to the

experimental subjects can be summarized in the following figure.

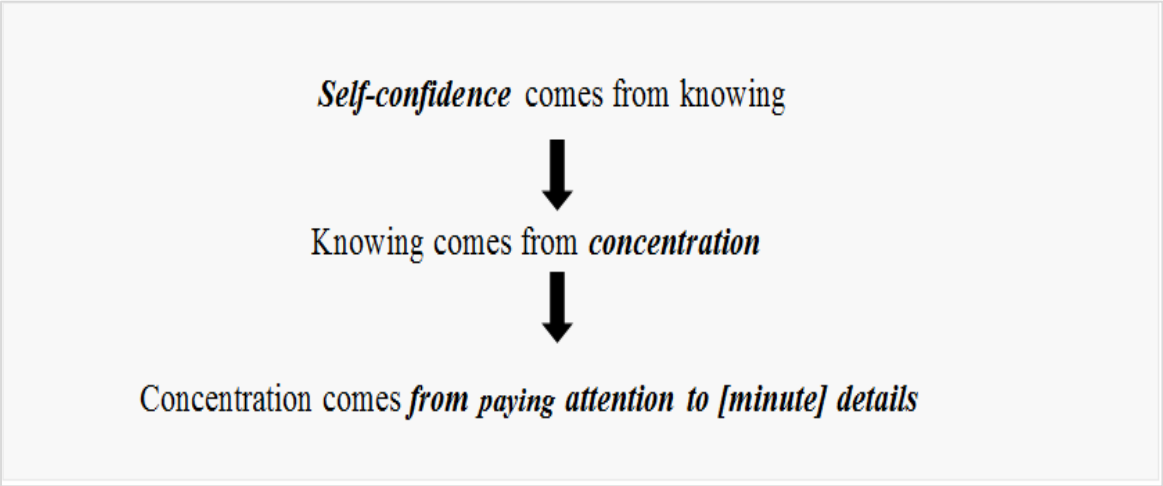


Figure 15. Diagram of the Experiment Treatment

The tri-advice panel could also be reversed upside down and they continue to make sense. Thus to read

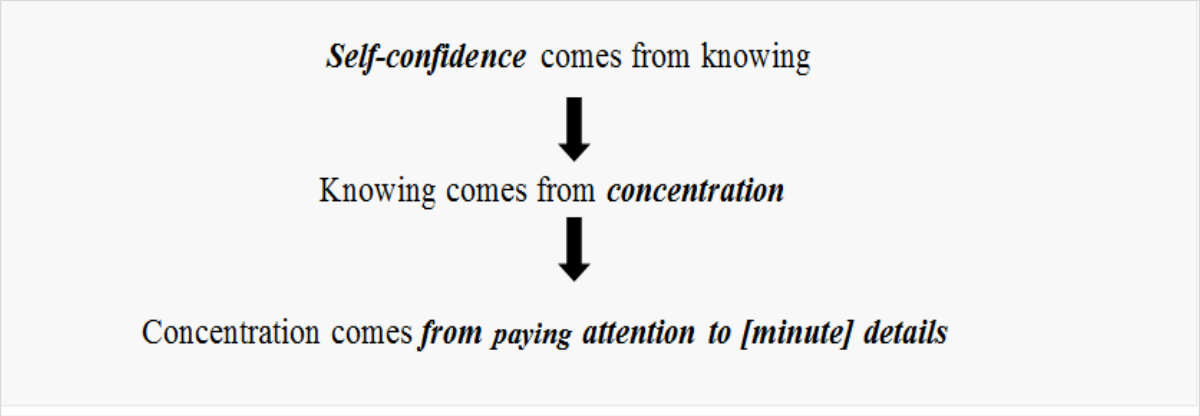


Figure 16. The Upside-down Diagram of the Treatment Condition

However, the only difference to the sample subjects is that to get 'self-confidence' on the first line as to see how to arrive to achieve it *better than* putting self-confidence as a result of ***a***. paying attention to minute details, then ***b***. concentration, and finally ***d.*** self-confidence and knowing.

For the experiment, the diagram (Fig.15) was adopted, for which the impact was on the first line when student read first and foremost. This was exclusively meant to draw the full attention of our learners to the following facts

01. *Concentration* is *thinking*: how can one learn things without paying full and due attention to how these things are/have been presented.

02. *Paying attention to minute details* is both *learning* and *thinking*: one has to go beyond *simply* paying attention –which could be incidental- but one learns when he fully concentrates to the atomistic features of a problem, lesson, or the *Knowing* is *learnin*g: one cannot pretend to know things without effectively learning these things.

3. *Concentration* is *thinking*: how can one learn things without paying full and due attention to how these things are/have been presented. Besides, *Paying attention to minute details* is both *learning* and *thinking*: one has to go beyond simply paying attention – which could be incidental- but one learns when he fully concentrates to the atomistic features of a problem, or a lesson, or the like.

4. Likewise, the subject is expected to *improve* and *sharpen* his intellectual abilities for he learns to utilize such abilities to find out the relationship(s) existing between the different elements of a given problem whenever he faces one. (cf. Chap.02, 05 & 06)

8.3.3. Materials and Scoring

For this experiment, a caricature has been administered. It consists of elements which help observe the effects of such a material on students' *reasoning* and *creativity* (and *ordering*). In fact, an abstract activity as 'reasoning' cannot be controlled. One can only condition (by using incentives, techniques or modes of reasoning, using appropriate materials, etc.) students to learn effectively to *learn* and *think* **but** there are thousands of things which go unnoticed while to teach how to think, and which cannot be controlled.

For scoring we used a 7-point rating scale, 3 points for *reasoning* (getting the answer), 3 points for *creativity* (also another way of reasoning), and 01 point for ordering the answers (cf. Tables A1 & A2, Appendix 07). *Ordering* means that respondents may suggest different answers, one of which is the right answer which they are expected to put first. If they do not do so, this means that they are not sure of their answers, and they are not as yet accomplishing their complete effort of reasoning which is reasoning in a logical way.

There were, however, fears that the subjects would understand that they are in an experiment, and avoid the *Hawthorne effect* which refers to the fact that one's performance is affected by knowledge of the fact that that one is in an experiment (this knowledge can affect the performance, i.e. what we measure as independent variable), (cf. Turney and Robb.1971). The other closely related fear is the *Halo effect*, when subjects may understand what the study is about, they try [naively] to help the researcher towards achieving his aim –which is to bias the results (cf. Brown.1988). To dissipate such fears, the experiment was done as a mere exercise of argumentation in the Written Expression class.

For the experiment, the choice of a caricature has been motivated by the fact that an image represents a context, characters, and visible and salient elements which the learner is expected to see and to act upon in trying to understand it. Such a test aims at probing how respondents would answer, and what would be the elements that would help them to do so, i.e. how they would reason, -*reasoning,* and how they would formulate their answers that are *creativity*[1], as our analysis will show. The caricature (cf. Appendix # 6) shows two young men in the forest talking about preparing a good meal when the cellphone of one of them rang. Without taking his cellphone in his hand, the young man, because he assigned a particular tone to the number of his mother knew it was her. In the caption, the young man

says '*oh, no, that's my mom calling again!*'[2]. For the requirements of the experiment, the following question was asked: 'How does the young man know it's his mother?'

The choice for such a caricature was consolidated by the fact that since the cellphone has become nowadays pervasive and very popular among students, and as most of learners possess one –a fact that has been verified before the experiment- they were, then, more expected:

1. To find the solution than those who don't possess one.
2. To find the solution because the test in itself is not *too demanding* or *very hard* –it has a face validity.

Basically it is for these two reasons that we have conducted the experiment only after four months of awareness building. The other reason is to verify whether the element of time is important as far as how much it is required to truly allow us to speak about an 'effective' awareness building.

3. Still another closely related reason is that having noticed in the corridors, and elsewhere how much our students seem to expertly manipulate the cellphone, we have

expected an 'upsurge in creative talent(…)inductive reasoning and certain perceptual tendencies in reactive behavior' (Anastasi. 1982:383). Respondents we expected to find out the answer by utilizing inductive reasoning, i.e. reasoning from a specific observed fact to reach a general conclusion. The commonly known fact that all the cellular are provided with the option of assigning a tone, and reasoning from a specific observed fact to reach a general

1. 'Creativity' and 'reasoning' cannot be taken as independent variables in the sense of variables that we can manipulate. We influence positively, in the long run, reasoning and creativity, which does not mean we manipulate both of them. We hopefully think that we can condition the students in the long run to reason positively.

2. Elrod, Jack In *The Washington Post*, 2003, p C11

conclusion: the commonly known fact that the cellphone is provided with the option of *assigning a tone*, and thus, in the caricature, the young man understood that it is his mum who was calling because he *assigned a particular ringtone* to [the number of] his mum, as we sketched above.

For *creativity* (which is narrowly related to intelligence and reasoning abilities), it was also expected that subjects would present descriptive and argumentative details on how/why we assign a particular ringtone to a particular person; and the different ringtones available (music, chant, song, national anthems, etc.). So, giving such an answer (reasoning) and a description of what happened (creativity) requires a particular jargon proper to the 'world' of the cellphone. It also requires that they have expectedly tuned their cellular to the English mode which could represent an indirect [or direct] way to learn English.

Last but not least, and as a technical element in our experiment, while administrating the experiment item, it was made sure that students did not speak or peep at others' papers to guarantee collecting personal and individual answers. In such a way, the obtained data will be invalidated.

8.3.4. Choice and Justification of the Test

The main interest in the present research is to activate in learners the desire *to think* and *to learn*. They were expected to learn to project their values, opinions, needs and wishes upon objects and behaviors outside their own behavior; to express verbally –as well as in writing- what they have internalized. In other words, the interest is focused on the *product* of the learner. For the experiment, a t-test (t-statistics) was carried out. The reasons underlying the choice of this test are as follows.

First, it is a parametric test that makes strong assumptions about the data; it shows that each sample of population and sample of scores are drawn from a normal population. In other words, it shows that the differences obtained do not suggest glaring deviations from normality in the parent population.

Second, the t-test deals with scores and ratios, i.e. figures and values, not with qualitative behavioral categories (to which a test using a nominal scale of measurement, as in questionnaires with yes/no answers and no numerical scores, better fits).

Third, using the statistical test, together with the appropriate statistical tables (t-tables) allow us to find the exact probability that the difference obtained between two means (of two independent samples) is due to chance factors ***or*** to the effects of the independent variable, as we will see below.

8.4. Results and Discussion: Preliminary Considerations

8.4.1. The Scores

On the face of it, the Experimental Group recorded better scores, compared to the Control Group which recorded lower scores. The frequency distributions of the score above average of the Experimental Group are significantly better than those of the Control Group. The Experimental Group was sensitive to the effects of the conditioning, i.e. building up awareness of working without considering the compensatory system and outscored the Control Group. The hypothesis (prediction) was that making students understand that learning to construct their own *learning* and *thinking* patterns is far more important and beneficial than to simply [and blindly] rely on a compensatory system which has turned them into least-effort subjects since they know that they can pass from one year to another with an incredible easiness! (cf. Labed. 2001).

As a preliminary consideration, this was proved correct. In effect, the Control Group having not been made aware of such a fact did not record high scores; although the Experimental Group did not record glaring scores but recorded much higher scores than of the Control Group (cf. Table A3. below).

8.4.2. Quantity

All the subjects of the treatment group all performed the task, a task to which they were accustomed for they have seen in class *picture and caricature interpretation*. For time considerations, students were not restricted but were let to finish the task and hand in their answers whenever they finished.

Both Experimental and Control Groups were given the same working conditions of time. We did not want to allow any other confounding and unwanted variable, namely a difference of time allocated; tiredness, or any other confounding variable of the sort to interfere so that we can attribute the results obtained only to the independent variable, i.e. receiving the awareness treatment, *but not* to any other variable. As much as possible it was aimed to 'strive for greater precision in depicting the relationship between two variables.' (Anderson.1990:24).

Experimental Group		Control Group	
Score x	Frequency f	Score x	Frequency f
1	1	1	1
2	2	2	3
3	1	3	9
4	4	4	4
5	6	5	2
6	10	6	3
7	1	7	3
	N=25		N=25

Table A3. Data of Tables A1 & A2 Reorganized in the Form of Frequency Distributions of the Experimental and the Control Group of the 1st. Experiment (Tables A1 & A2, cf. Appendix 07)

8.5. Results and Interpretation

An analysis was carried out on the data obtained. For the interpretation and, the experimental group recorded a mean $\bar{x}$ 4.84; and the Control Group $\bar{x}$ 3.96 (cf. Tables A4 & A5 below).

The causal inferences to draw from the differences between the two samples are that indeed the experimental group was *sensitive* to the effects of our conditioning i.e. receiving the awareness treatment and students' level of proficiency.

The frequency polygons and histograms of Fig.17 & 18 (which allow to draw preliminary considerations of the results) and the data of comparative frequency distributions of the Experimental and the Control Group show the difference between the two sets of scores. This can be summarized as follows:

1. Scores above average (The average is 7÷2= 3.5) as 04, 05, 06, and 07 having respectively frequencies of *four*, *six*, *ten*, and *one.* The experimental group recorded more scores above average with high frequencies in comparison to the control group.

2. The experimental group recorded three significant frequency peaks (scores above average): the scores 05, and 06, with respectively *six*, and *ten* frequencies. The control group recorded one 'peak' 04 with *four* frequencies.

3. The only frequency peak for the control group is with the score 3 which is below average. The other above average scores 4, 5, 6 & 7 have low frequencies of *two, three,* and *three*.

Score X	Frequency	Frequency x x Score	Frequency x Score²	
1	f	fx	fx²	
2	1	1	1	Mean
3	2	4	8	$x = \sum fx/N$
4	1	3	09	=121 / 25
5	4	16	64	= 4.84
6	6	30	150	
7	10	60	360	Variance
	1	7	49	$s^2 = (\sum fx^2/N) - \bar{X}^2$
	$\overline{N}$= 25	$\overline{\sum fx}$ =121	$\overline{\sum fx^2}$ 641	= 641/25 -(4.84)² = 25.64 – 23.42 = 2.22 Standard Deviation $s = \sqrt{s^2} = \sqrt{2.22}$ =1.48

Table A.4. Computation of the Mean, the Variance and the Standard Deviation of 25 Scores on the *Portable Caricature* of 25 Students of the Experimental Group Based on a Frequency Distribution of the 1st. Experiment

Score	Frequency	Frequency x	Frequency x	
X	f	Score fx	Score² fx²	
1	1	1	1	Mean
2	3	6	12	$\bar{X} = \sum fx/N$
–3	9	27	81	=99 / 25
4	4	16	64	= 3.96
5	2	10	50	
6	3	18	108	Variance
7	3	21	147	$s^2 = (\sum fx^2/N) - x^2$
				= 463/25 -(3.96)²
	N= 25	$\overline{\sum fx}$ =99	$\overline{\sum fx^2}$ 463	= 18.52 – 15.68
				= 2.84
				Standard Deviation
				$s = \sqrt{s^2} = \sqrt{2.84}$ =1.68

Table A.5. Computation of the Mean, the Variance and the Standard Deviation of 25 Scores on the *Portable Caricature* of 25 Students of the Control Group Based on a Frequency Distribution of the 1st. Experiment

1. The experimental group recorded the same number of scores above average and below average as the control group. For the total 25 scores, as follows

The Experimental group	**04 scores**	>	**3.5**
	03 scores	<	**3.5**
The Control group	**04 scores**	>	**3.5**
	03 scores	<	**3.5**

Yet, concerning the frequencies, the experimental group outnumbers the control group for the same results obtained as shown in Table A3. Besides, from the histograms (Fig. 19), we notice that for the experimental group, the data are packed around the central value 6 (which is the mode, i.e. the most frequently occurring value) with a standard deviation (a measure of dispersion, an average of all the deviations from the mean) s= 1.48 (cf. Table A4 above).

On the other hand, and for another consideration of the results, the Experimental Group, after receiving the experiment treatment (awareness building) recorded a mode of 06. This highlights that in -all likelihood- the difference between the Control and the treatment (or the Experimental) groups is significant and which is due to the effects of the independent variable, namely the awareness building. The distribution peaks around the mean, and this could explain that the experiment treatment helped

1. *homogenize* the class.
2. get most people *better* and *around the mean*.

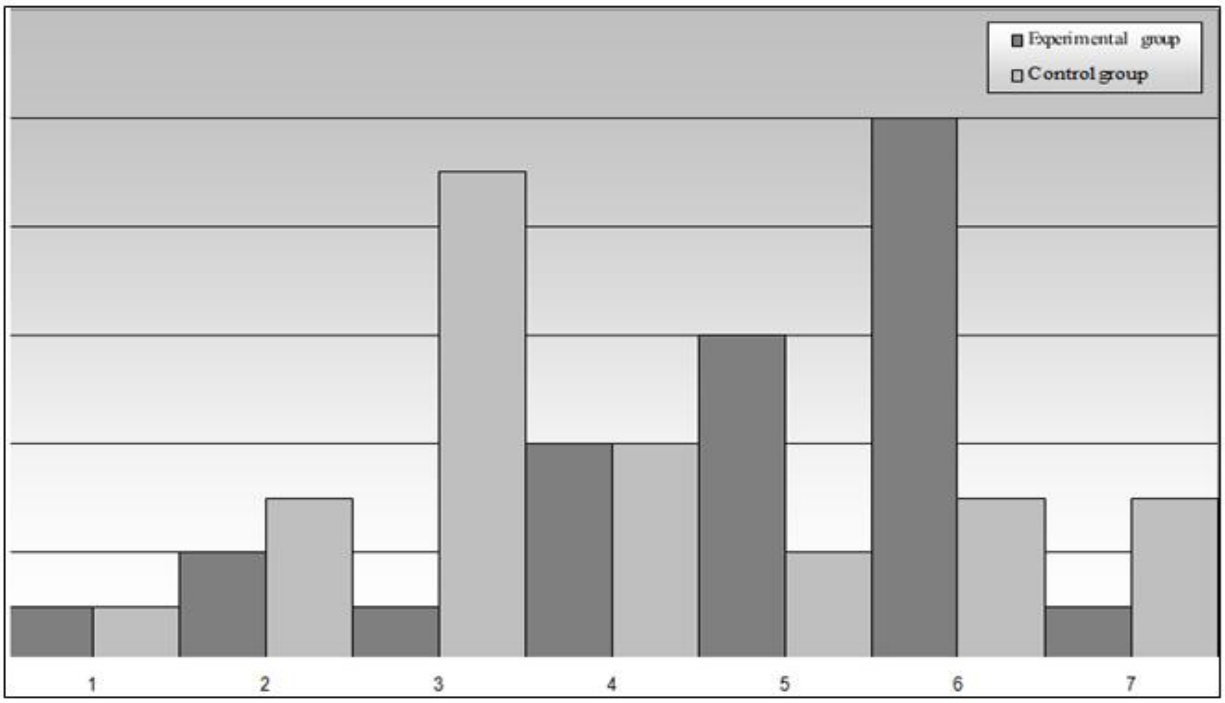


Figure 17. A Frequency Histograms of the Test Scores of the Experimental and the Control Group in the Awareness Building Treatment of the First Experiment

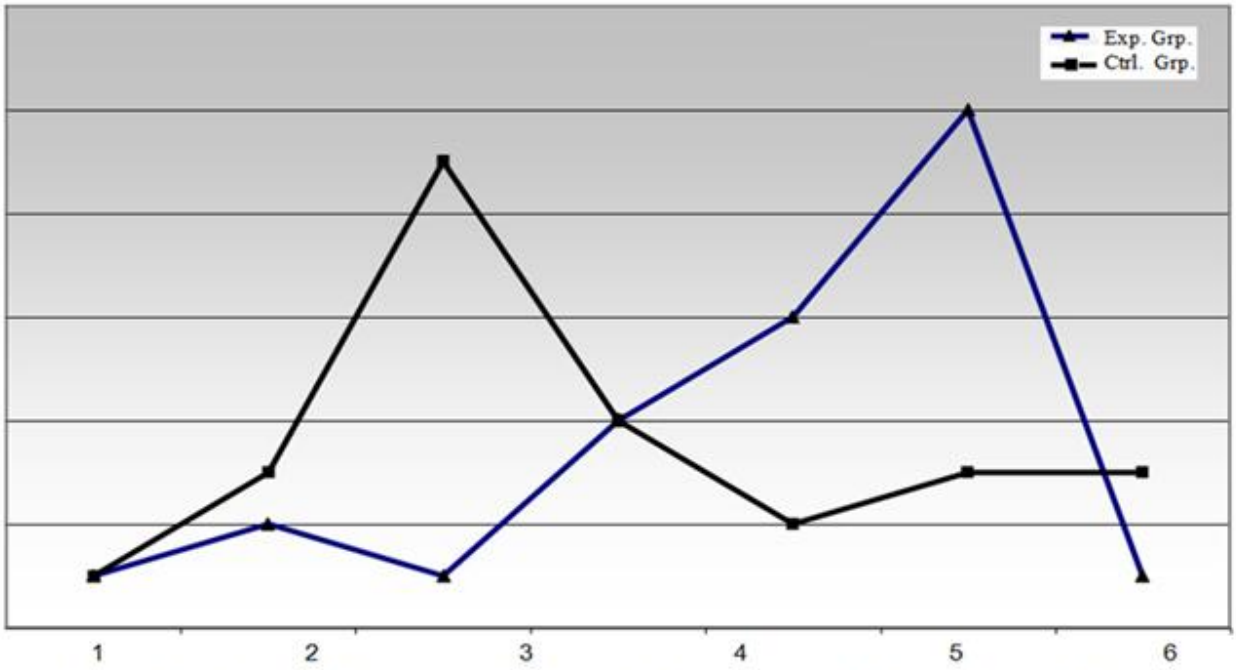


Figure 18. Frequency Polygons of the Test Scores of the Experimental and the Control Group in the Awareness Building Treatment of the First Experiment

Such a treatment has the merit to erase differences between students. It keeps students on the same keel except some. Indeed, there are 'lost' people who still hang behind. The left-the-mean places are taken by the Experimental Group subjects; the rest are all absorbed in the peak which recorded 16 frequencies -high frequency scores, that is 125% of the results are obtained by the subjects of the experimental group (marks above average *5 & 6* have recorded together 16 frequencies), with an interval of 6.05 rightward the mean ($\overline{x}$=4.84). The [full] score of 7 (recorded one [low] frequency, which is almost one time and a half the mean, with an interval of 7.26 rightward the mean, giving a *positive* skewness, as Figure 19 below shows.

By contrast, the Control Group has a data with low frequencies -is not packed (much more dispersed) around the negative below average central value 03 -which received *nine* frequencies- which is at the same time the mode and the median (the median means the value which has many scores above it as below it), with a standard deviation s=1.68 (cf. Appendix 08). In other words, the Control Group has scattered values for the distribution does not peak around the mean. This certainly means that differences between students matter: having not received the experiment treatment has not allowed making a difference between students.

On the other hand, the Control Group subjects have obtained three scores around the mean -100% which are *4*, *5*, and *6* (which have recorded together 09 frequencies), and 125% of results around the mode (mark *4* obtained 04 frequencies) with an interval of 4.95 rightward the mean. The other values –for both groups- are scattered around the mean and the mode, as Table A6 below shows.

%	Intervals Xp	Frequencies Xp	Intervals Cltr	Frequencies Cltr
0%	0	0	0	0
25%	1.21	1	0.99	0
50%	2.42	2	1.98	1
75μ	3.63	1	2.97	3
100%	4.84	4	3.96	9
125%	6.05	16	4.95	4
150%	7.26	1	5.95	2
175%	8.47	0	6.93	3

Table A6. Intervals and Frequencies of the Scores of the Experimental and Control Groups in the Awareness Building Treatment of the First Experiment

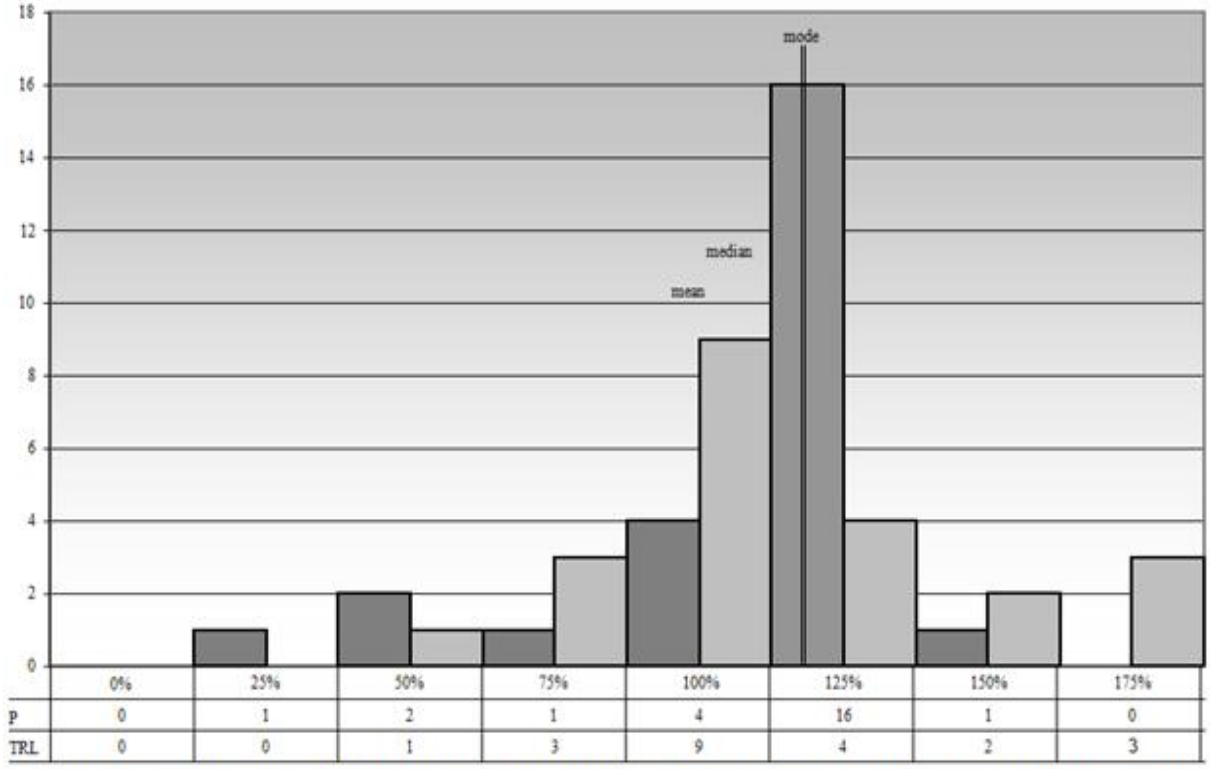


Figure 19. Histograms of the Frequency Percentages of the Test Scores of the Experimental and the Control Group in the Awareness Building Treatment of the First Experiment

Indeed, one could suppose beforehand that in the randomization process, the confounding and unwanted variables did not quite balance out. Those irrelevant variables might have caused some intelligent subjects to perform better, or that the differences are only due to chance factors.

8.6. Putting It Altogether

As a first probative result, and contrary to the Experimental Group, the Control Group, recording a mode of only *03* means that working with the belief of relying entirely on the compensatory system does not help students in getting well acquainted with the language they are learning. Such a belief keeps learners far below the prerequisite of learning to adopt a certain pattern of learning to learn and learning to think as suggested by the hypothesis and appears to be more and more confirmed through these results yielded by the data.

This means that the compensatory system is for students one of the major causes for the lack of genuine efforts to try to learn and think effectively. Over the years, this system, contributed in turning students into subjects who furnish the least effort to learn to think, since many of them are convinced that they can pass to the next class easily.

As a third result is the difference between the standard deviations of the Experimental and the Control group, respectively 1.63 and 1.56. This justifies the dispersion and the concentration of the scores around the mean, or the central value. The standard deviation (the square root of the variance) is a measure of dispersion, or more technically it is, as Guilford and Fruchter (1978) 'the square of the arithmetic mean of the squared deviations of measurements from these means' (p. 66), as it is computed in Table B7 below.

Through this discussion, it is to understand whether the difference between the two groups is due only to our independent variable, or maybe (an)other variable(s), more than the independent variable, could have possibly interfered in our results.

In fact, in the randomization process, the confounding and unwanted variables did not balance out (cf. 8.2.1). Those irrelevant variables might have caused some intelligent* subjects to perform better, or that the differences are only due to chance factors. Thus, to verify whether our hypothesis is right or wrong, according to the data obtained, the belief is that the element of chance was to a great extent ***not responsible*** of the difference in the results. This can be explained by comparing the means of the two groups which led to the following inferences.

1. *As a first stance*, the unwanted variables did balance out for the experiment item was not difficult, and so, the variable of difficulty has not had any effects. As a matter of fact, a task on the cellphone (which has become very pervasive) does not represent, in our view, any difficulty.

2. *As a second stance,* we believed that *the* element of chance could not *reasonably* be responsible for the differences between the two groups. Naturally, we think that it is *unlikely* that such a difference is caused by chance and that it is only the independent variable which is responsible of the difference.

For this, the difference has been computed between the two groups using Fisher's t formula. The difference is: 1.19. The supposing idea is that a *p* value of 1.19 which is considered to be significant needs to be checked. To verify this, a level of significance of 0.05 or 1/20 was set with a directional test (i.e. we predict a positive result due to the

* For the table of levels of significance, cf. Guilford and Fruchter. 1978, p. 514

treatment or the I.V). The t-tabulated at 0.05 level of significance is 1.68, and the t-obtained is 1.19, this result is not significant, i.e. the t-tabulated or required is higher than the t-obtained with 40 df (degree of freedom)* (cf. computations below).

According to this, we reject our alternative (experimental) hypothesis, i.e. that the difference is caused by our independent variable and accept the null hypothesis (H0) which states that the difference is due to chance.

Furthermore, to still ‘‘exorcise’’ the element of chance and to consolidate our experimental hypothesis (H1) and findings, a second similar experiment was carried out, with a different sample. More will be said about this in our next section.

$$t = \frac{(4.84 - 3.96)\sqrt{(25 + 25 - 2)(25 \times 25)}}{\sqrt{(25 \times 4.92 + 25 \times 8.06)(25 + 25)}}$$

$$t = \frac{(4.84 - 3.96) \times (173.20)}{\sqrt{16225}}$$

$$t = \frac{(0.88) \times (173.20)}{127.37}$$

$$t = \frac{152.41}{127.37}$$

$$t = 1.19$$

Computation of the t-test of the Experimental and the Control Group in the Awareness Building Treatment of the 1st. Experiment

Conclusion

It has become clear that indeed learning and thinking should not be atomized in just making the learner only think to obtain a pass mark, keeping him away from thinking to make the least effort of ‘truly’ learn by developing effectively his mental capacities.

This is exactly what the effects of the compensatory system do and continues to do to our learners for, instead of going to the source of the knowledge, they prefer to laze around in the university campus making the least effort simply because their entirely rely on the Samaritan compensatory system.

However, *we do not think* that a conditioning which lasted approximately four months could indeed have a sensitive influence on students in the direction of *more effective learning and thinking*. In effect, more effective learning and thinking can only be the result of a long and intensive preparation, i.e. building awareness which will involve pedagogic materials, motivation, teachers' competence and patience, and many other 'sensitive' ancillary elements. This requires not less than two to three years (and even more) of positive conditioning [simply] because the compensatory system is so diluted in the students' minds that it reverberates –and it has- reverberated for so many years- so insidiously on their cognitive and affective factors. This has made of it a highly complex phenomenon to be circumcised by a researcher in such a short time (roughly seven months) and treated as an independent variable!

At any rate, this being said, the attempt was to draw the circumference line of such a problem and endeavored to discuss it at length. More importantly, the risk is to kick open an anthill, to use again John Honey's words.

Fieldwork and Experiments

Experiment # 02
Building Awareness for Working without Considering the Compensatory System:

Experiment # 02
Building Awareness for Working without Considering the Compensatory System:

9.1. Research Design

This second experiment aims at showing that our first experiment with assets and objectives, could be replicated, and could lead to other [similar] results which are expected to consolidate the results of the first experiment. In the same vein, the results of the first experiment are also expected to confirm the results of the second experiment.

The following is the description and analysis of the second experiment on the effects of building awareness about working without considering the compensatory system, or at least not entirely relying on it. The expected results are that such an awareness building might incite our learners to become good learners and thinkers.

The second experiment is conceived around the idea of trying to bring further evidence that the compensatory system provides our learners with a poor foreign language competence, and ultimately an even poor performance. It has indeed been noted that students, -be it in their third, fourth years, and even beyond are not capable of writing or speaking well and in a convening way the language they are learning.

For the second experiment, fifty students (N=50) have been chosen, twenty five for the experimental group, and the other twenty five for the control group. For this experiment, too, the same empirical assumptions about sampling, null bias, age and homogeneity have been considered.

Furthermore, and for other empirical considerations, the consideration is that the experiment deals with human minds and not dead matter makes that the differences may

intervene in the experiment and may perturb the results. In an attempt to reduce such unwanted variables we carefully chose the moment (a nice day) to administer the test. However, it remains far unable to ascertain that the results obtained are due to the 'observance' of such a measure.

9.2. Subjects and Situation

The test was administered after all the experiment procedures have been carefully observed. The test item –the caricature- is administered to both the Experimental and the Control groups as a common exercise of caricature interpretation to ensure that the students would not understand they were undergoing an experiment, to which they might respond positively and thus would bias the answers, i.e. to avoid both the Halo and the Hawthorn effects (cf. 8.2.4. above). This second experiment has also been conducted according to our hypotheses that our learners are expected to

1. Be aware of developing their veritable capacities of learning and of thinking (reasoning, creativity, etc.), when they really become aware (after conditioning) of not considering the compensatory system as a 'savior' while taking their tertiary tuition.

2. To develop awareness about how salient it is to know and use learning strategies to acquire the necessary knowledge to help them face any learning/ thinking situation instead of taking recourse to rote learning, [and probably also of systematic cheating]

9.3. Procedure and Design of the Experiment

For the preparation of the experiment, a period of about six months (two months more than with the subjects of the first experiment) was devoted to inculcate into the Experimental Group (who received the treatment) the idea that they should not consider the compensatory system as a 'means' for passing from one year to the other. The argument was that if they do so they would remain 'inactive' for they wouldn't

think to make any effort to acquire the language, and thus they wouldn't develop any *learning-to-learn* pattern of their own, or their own *thinking* (metacognitive) capacities. To ensure that such an awareness building be effective, and the merits of such ad idea were shown with the other idea that if such a system exists, it should *exclusively* be used as a 'way out' when a problem unexpectedly surfaces.

However, it is important to note that if fact, it was not easy to check whether students –while engaging in the classroom activities– have forgotten the compensatory system. In effect, the multifaceted human mind with its thousands of psychological underpinnings (cf. Chapter V) does not allow us to be as sure as to say that one can control the working of the mind in one direction, and not another. Despite all this, students did work on the activities assigned to them, and they allowed to record results for the experiment which will be analyzed below in somedetails.

9.3.1. Materials and Scoring

For the second experiment, a caricature was selected and administered which contains elements which allow to observe and control* the subjects' capacities in *reasoning*, *creativity,* and *ordering*. For this second experiment, too, we wanted to avoid the Halo or the Hawthorne effects, as explained above, and the experiment item was administered as an ordinary exercise in argumentation in an ordinary Written Expression class.

For scoring, the same 7-point rating scale was used, 3 points for *reasoning* (getting or that they *are not accomplishing* their complete effort of reasoning in a logical way, and

* It is important to note, one more time, that we cannot be sure to have an effective experimental control on the many unknown variables (as receiving extra teaching sessions, not following the instructions, anxiety –the list is much longer!) all through the sessions of awareness building.

the two are evenly important to discover. Put in other words, through such an exercise of caricature interpretation, we could observe and analyze how students looked at the caricature; if they paid enough attention to the details, and if yes, how far did they help them understand the caricature, as fleshed out in Fig. 15 & 16 (pp.314-315). The subjects are expected to observe the following minute details of the caricature (cf. Appendix #08) which are as follows:

- The young lady has a certain smile on the name of the restaurant –as it appears on the Menu book 'Le coq d'or' which is in all likelihood a French restaurant.
- The young man, according to the zigzag drawn above his head is looking a little embarrassed.
- His is holding the menu upside down.
- In from of him, a young lady, supposedly his girlfriend who m he invited to a French restaurant.
- Her face.
- In the caption we read 'I wish I could read French like you, George' which is a mocking and sarcastic remark.

For the other independent variable of *creativity*, the respondents to were expected to find out the answer by utilizing inductive reasoning, (reasoning from a specific observed fact to reach a general conclusion) that:

01. That George does not understand French *because* he is holding the menu upside down.

02. That George is in an embarrassing situation if we consider the lines above his head that show that.

03. That the young lady who has understood all that if mocking at him by telling him that she wished she could understand French like him, a deliberate mockery which has added to the embarrassment of George.

Furthermore, with the second hypothesis of *creativity*, we expected our subjects to present descriptive and argumentative details on

01. How and why people go to restaurants.

02. The menu and the language in which it is written. For example to understand that it is written in French because the name of the restaurant is 'Le coq d'or', and because the lady is saying something about French (and not English, for example).

03. To understand and explain why George is embarrassed, and to pay attention to other similar minute details.

Last but not least, to make sure to collect individual answers, the subjects were prevented from talking to talk to one another or to risk a peep at each other's papers. This would likewise guarantee to some extent reliable and plausible results.

9.3.2. Choice and Justification of the Test

For this second experiment, too, THE main interest is to try to instill in learners the idea of the necessity *to make use of their thinking and learning capacities* which –with the continuous conditioning, for years, of the compensatory system– have become *dormant*. In other words, it was to see a student who is an active participant in the making of his own learning, and in the sharpening of his thinking and his wits by:

01. Learning to project their values, opinions, needs and wishes upon objects and behaviors outside their own behavior,

02. To learn and know how to express in a written form (as well as verbally) what they have internalized, that is their *product*

For this experiment, too, and for the same statistical and empirical reasons, a t-test was carried out. Equally important, and since in this second experiment it is a matter of figures, using the statistical test, together with the appropriate statistical tables (t-tables) allows to find the exact probability that the difference obtained between two means (of two independent samples) is due to the effects of the independent variable, as we will see below.

9.4. Discussion of the Results: Preliminary Considerations

Scores and quantity are discuss below

9.4.1. The Scores

As a first consideration of the scores, it appears that the subjects of the Experimental Group have recorded better scores, compared with the subjects of the Control Group. The frequency distributions of the score above average (especially of the scores *5, 6 & 7)* of the Experimental Group are significantly better than those of the Control Group. On *averag*e, the Experimental Group outscored the Control Group and we can say it was sensitive to the effects of the independent variable. In effect, the Control Group having not received the experiment treatment did not record high scores, as Table B3 below shows.

9.4.2. Quantity

The subjects of the treatment group and of the Control Group were given the task of interpreting the caricature, a task which they practiced in class (an exercise on *picture and caricature interpretation)*. To ensure that restriction of time does not interfere in their answers (as an unwanted variable), students of both groups were given all the time to finish the task. If was feared that being restricted by time would allow the other unwanted independent variable of stress or anxiety might have an effect on their thinking and reasoning behaviors. Just as for the first experiment, the aim is to strive to depict as accurately as it could be possible the relationship between the two variables, namely the awareness building vis-à-vis the experiment subjects thinking and reasoning achievements.

Experimental Group		Control Group	
Score x	Frequency f	Score x	Frequency f
1	1	2	2
3	4	3	8
4	4	4	9
5	7	5	3
6	3	6	1
7	6	7	2
	N=25		N=25

Table B.3. Data of Table B1 and B2 Regrouped in the Form of Frequency Distributions of the Experimental and the Control Group of the 2nd Experiment
(cf. Tables B1 & B2 Appendix 10)

9.5. Results and Interpretation

The analysis of the data obtained gave us the following results. The Experimental Group has recorded a mean $\bar{x}$=4.96; and the Control Group a mean $\bar{x}$ =3.96 (cf. Tables B4 and B5 below).

The first inferences made is that, in effect, the subjects of the Experimental Group responded to the experiment treatment, our independent variable. The data of comparative frequency distributions of the Experimental and the Control groups in Table B3 above and the frequency polygons and histograms of figures 20 & 21 below show the difference between the two sets of scores which can be summarized as follows:

1. Scores above average (The average is 7÷2= 3.5) as *4*, *5*, *6*, and *7* having respectively for the Experimental Group *four*, *seven, three,* and *six* frequencies. For the Control Group and for the same above average scores, the frequencies are *nine, three, nine,* and *two*. The

experimental group recorded scores above average with more frequencies, especially for scores *5*, *6*, and *7*.

Score X	Frequency f	Frequency x Score fx^2	Frequency x $Score^2$ fx
1	1	1	1
2	0	0	0
3	4	12	36
4	4	16	64
5	7	35	175
6	3	18	108
7	6	42	294
	N= 25	Σfx =124	Σfx^2 678

Mean

$\bar{x} = \Sigma fx/N$

=124 / 25

= 4.96

Variance

$s^2 = (\Sigma fx^2/N) - \bar{x}^2$

$= 678/25 - (4.96)^2$

= 27.12 – 24.60

= 2.51

Standard Deviation

$s = s' = \sqrt{2.51} = \sqrt{1.58}$

Table B4. Computation of the Mean, the Variance and the Standard Deviation of 25 Scores on the Restaurant Caricature of 25 Students of the Experimental Group Based on a Frequency Distribution of the 2nd Experiment

Score X	Frequency f	Frequency x Score fx	Frequency x $Score^2$ fx^2
1	1	1	1
2	0	0	0
3	4	12	36
4	4	16	64
5	7	35	175
6	3	18	108
7	6	42	294
	N=25	Σfx =124	Σfx^2 678

Mean

$\bar{x} = \Sigma fx/N$

=124 / 25

=4.96

Variance

$s^2 = (\Sigma fx^2/N) - \bar{x}^2$

$= 678/25 - (4.96)^2$

= 27.12 – 24.60

=2.51

Standard Deviation

$s = \sqrt{s'} = \sqrt{2.51} = 1.58$

Table B5. Computation of the Mean, the Variance and the Standard Deviation of 25 Scores on the *Restaurant Caricature* of 25 Students of the Control Group Based on a Frequency Distribution of the 2nd Experiment

2. The Experimental Group recorded -with scores above average- three frequency peaks, namely the scores *5* and *6*, with respectively *seven*, and *six* frequencies. On the other hand, the experimental has *good* scores above average with *high* frequencies, as for *4*, *5* & *6* with respectively *four*, *seven*, and *six* frequencies.

3. The Control Group recorded one high frequency only with the score *4*. Score *6*, for example recorded a very low *one* frequency. The other above-average scores such as *5*, *6, &* *7* have poor frequencies of respectively *three*, *one*, and *two.*

4. The Experimental Group recorded the same number of scores above average and scores below average as the Control Group, with the exception of the Experimental Group who has not recorded the score *2*; similarly the control group has not recorded the score *1*. For the total 25 scores, we have the following scheme.

The Experimental Group	**04 scores >**	**3.5**
	02 scores <	**3.5**
The Control Group	**04 scores >**	**3.5**
	02 scores <	**3.5**

Besides, from the histograms in Fig. 22 we notice that for the experimental group the data are more or less dispersed around the central value *5* & *6,* the *mode* and became; a standard deviation (a measure of dispersion, an average of all the deviations from the mean) s=1.58 (cf. Table B1. Appendix 09). Some scores as the score *1* and *3* which recorded respectively *one* and *four* frequencies lack behind. (cf. Fig 22).

Seen from a different perspective, the experiment treatment tends to group students rather to do disperse them, except for some. Indeed, there are ‘lost’ people who still drag behind occupying the left-the-mean places, however with low frequencies, and with intervals *leftward* the arithmetic $\overline{x}$=4.96, respectively of 1.24 for the score 1; and an interval of 3.72 for the score *3*.

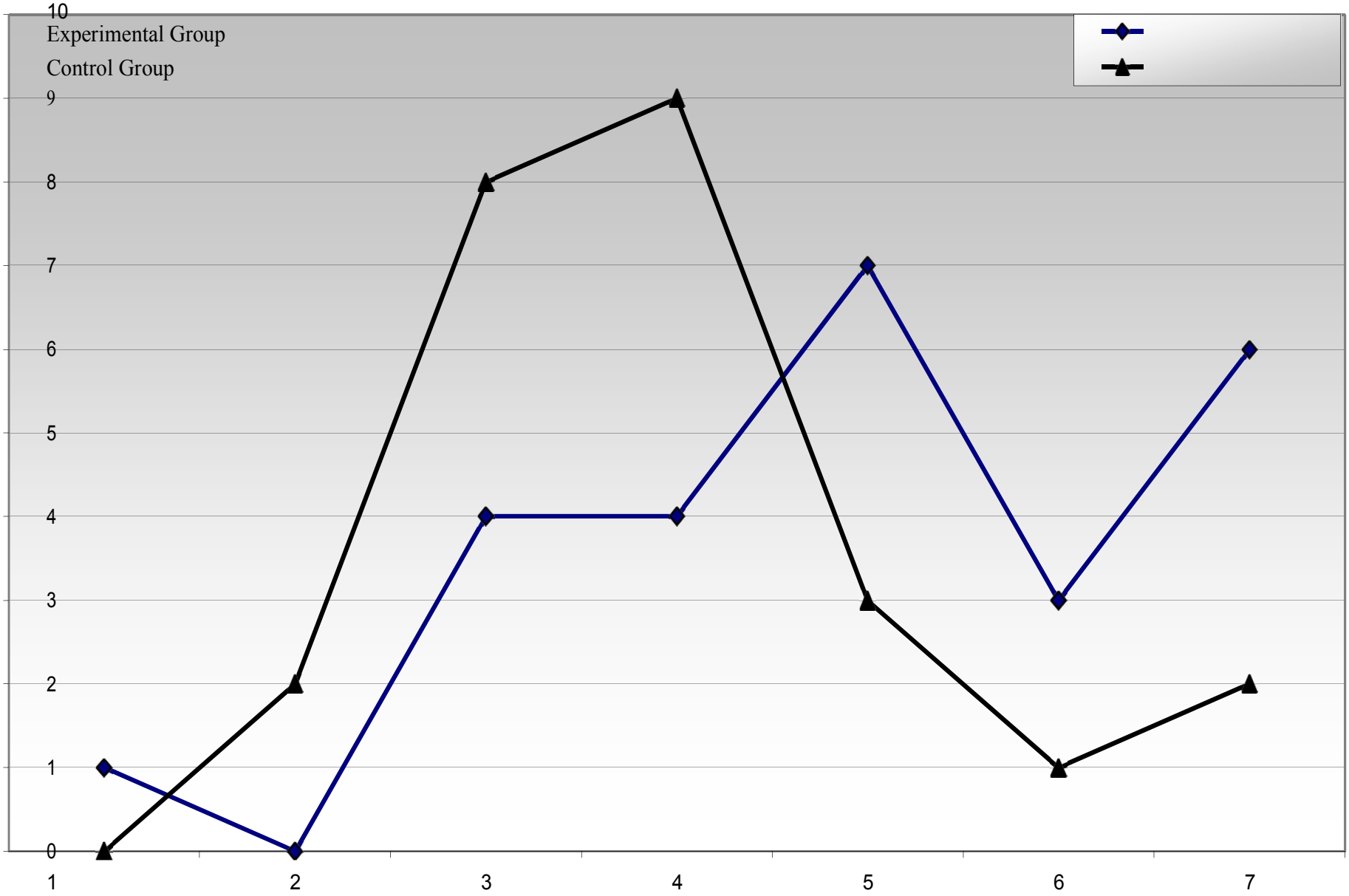


Figure 20. Frequency Polygons of the Test Scores of the Experimental and the Control Groups in the Awareness Building Treatment of the Second Experiment

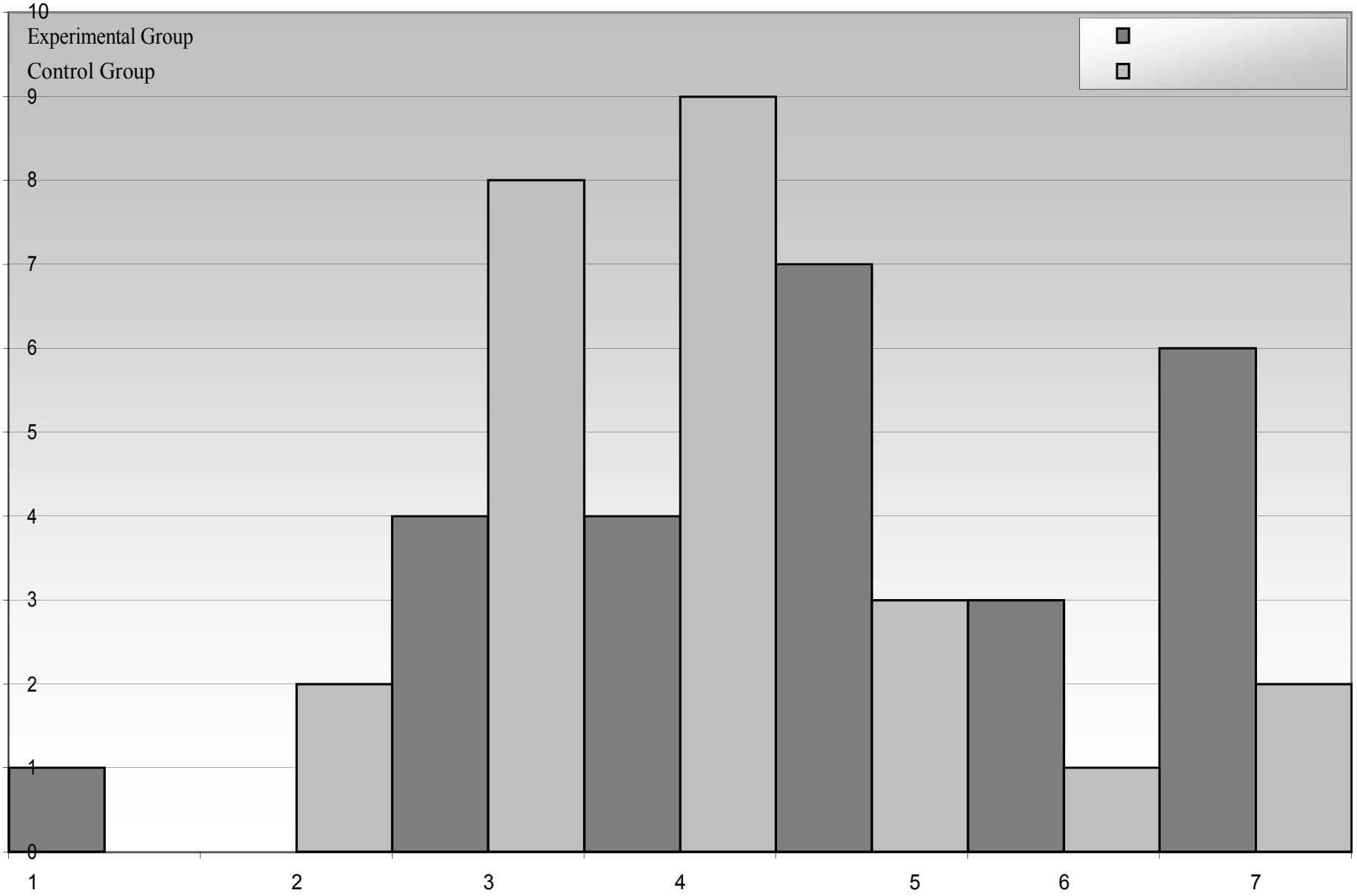
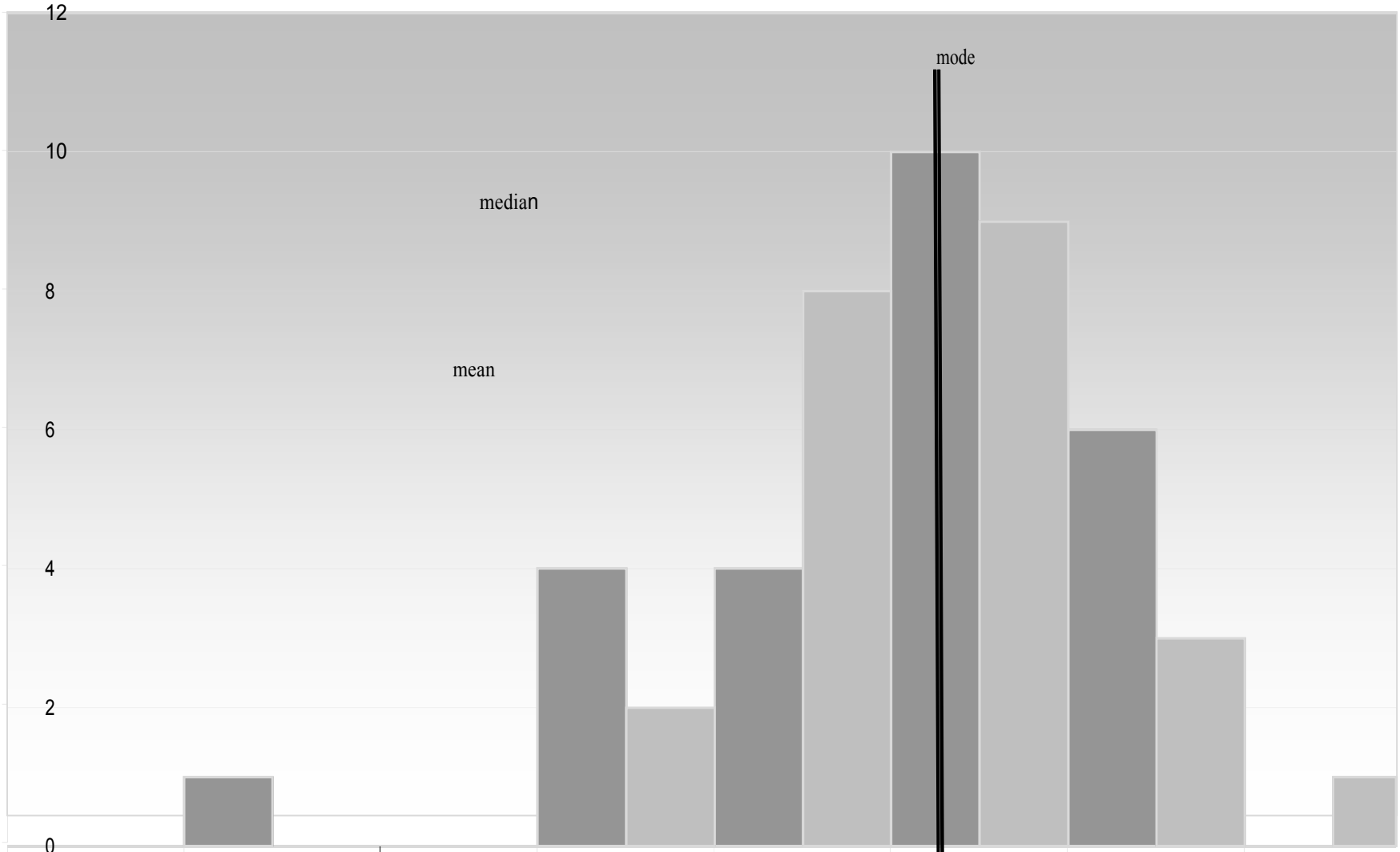


Figure 21. Frequency Histograms of the Test Scores of the Experimental and the Control Groups in the Awareness Building Treatment of the Second Experiment

The rest are more or less absorbed around the peak/mode where the scores *5* and *6* have recorded together 10 frequencies, or 125% of the frequencies, with an interval of 6.2 *rightward* the arithmetic mean (cf. Table B6 below).

%	Intervals Exp.	Frequencies Exp.	Intervals Ctrl	Frequencies Ctrl
0%	0	0	0	0
25%	1.24	1	0.99	0
50%	2.48	0	1.98	0
75%	3.72	4	2.97	2
100%	4.96	4	3.96	8
125%	9.2	10	4.95	9
150%	7.44	6	5.94	3
175%	6.68	0	3.93	1

Table B6. Intervals and Frequencies of the Scores of the Experimental and Control Groups in the Awareness Building Treatment of the First Experiment



	0%	25%	50%	75%	100%	125%	150%	175%
X	0	1	0	4	4	10	6	0
P	0	0	0	2	8	9	3	1

Figure 22. Histograms of the Frequency Percentages of the Test Scores of the Experimental and the Control Groups in the Awareness Building Treatment of the Second Experiment

C
T
R
L

On the other hand, the Control Group has a data above average (with low frequencies) which is rather packed around the around the arithmetic mean $\overline{x}$ =3.96 (~ 4), with a standard deviation s=1.28 (Table B5 above). Although the group has not received the experiment treatment, the values are not exactly scattered and the distribution tends to peak around the mean (cf. Fig. 22).

9.12. Putting It Altogether

After using different computations of it appeared that the experimental group has deviations, rather scattered from the arithmetic mean ($\overline{x}$=4.96), it recorded 02 scores below average and 04 scores above average. On the other hand, the control group has a less dispersed deviations vis-à-vis the mean ($\overline{x}$=3.96), it recorded 02 scores below average and four scores above average (cf. Fig. 21, 22 & 23).

The different computations and the analysis of the data allowed us to try understand whether the difference between the two groups is due to our independent variable only or rather to other unobserved variables.

First and foremost, the unclad evidence is that since the two groups did not receive the same treatment makes it all obvious to get a [random] variation of scores. Second, it also appears that the confounding variables as having more motivated and/or concentrated students; the easiness of the subjects to some of the subjects –who did not receive the experiment treatment– did intervene in the results, and that the element of chance was not responsible of the difference of the results.

Third, the belief is that the element of chance has been discarded as being a possible intervenient in the results. To make sure of such a posit, the difference between the two means using Fisher's t-formula has been computed. The difference is: 2.41.

The *p* value of 2.41 needs to be checked for its significance. For the results of this experiment, and with a directional test (predicting that the positive result is due to the independent variable) and a set a level of significance of 0.05 or 1/20 was set. This means that if chance alone was operating, the results would occur by one time in twenty, or five times over a hundred replications of the experiment. The following was obtained. The t-tabulated at 0.05 level of significance is 1.68, and t-obtained is 2.41. This result is significant, i.e. the t-tabulated or required is lower than the t-obtained with 40 df (degree of freedom), as the computations below show.

This finally allows to reject the null hypothesis (H_0) which states that the difference is due to chance, and to accept the alternate hypothesis (H_1) that the difference between the groups is caused by our independent variable, i.e. awareness building for working without considering the compensatory system.

As the t-obtained is higher than the t-tabulated (the difference is 0.73), the results of the second experiment are thus significant and allow to say that they are is the direction of the research hypothesis, i.e. building an awareness in students for working without [greatly] considering the compensatory system -only when problem surface- as insistently explained it above.

$$t = \frac{(4.96 - 3.96)\sqrt{(48)(625)}}{\sqrt{(62.25 + 40.75)(50)}}$$

$$t = \frac{(4.96 - 3.96)\sqrt{30000}}{\sqrt{(103.50)(50)}}$$

$$t = \frac{(4.96 - 3.96) \times (173.20)}{\sqrt{5150}}$$

$$t = \frac{(1) \times (173.20)}{71.76}$$

$$t = \frac{173.20}{71.76}$$

$$t = 2.41$$

Computation of the t-test of the Experimental and the Control Group in the Awareness Building Treatment of the 2nd. Experiment

Furthermore, the real positive effect of the treatment (awareness building) is shown and it appears in the 2nd experiment rather than the first one. In effect, this could be explained by the fact that the subjects of the second experiment received 02 months more of awareness building.

Such a longer awareness has, in all likelihood, triggered the desired sensitiveness in our subjects who have finally understood the merits of working without (completely] considering the compensatory system as their unique savior. However, it remains within the researcher's prudence not to systematize such results for many different elements should be taken into consideration and should be carefully weighed. Indeed, the nature of the second caricature itself might have pushed the subjects of the second experiment to perform better, although the caricature of the first experiment was not so difficult, as clearly explained.

Conclusion

As suggested above, the difference between the two means correspond to the effect of the awareness building for better preparing learners to construct and consolidate their own learning and thinking abilities. As a matter of fact, learning and thinking should not be atomized in just making the learn think of a pass mark, away from thinking to make the least effort of 'truly' learning and thinking by developing effectively his mental capacities.

This is what the effects of the compensatory system do to learners for, instead of going to the source of the knowledge; they prefer to laze around in the university campus making the least effort possible simply because they rely on the Samaritan compensatory system. Instead, students need to be presented language learning as an activity for which they should deploy unmeasured efforts in *learning to learn* and in *learning to think* to truly become active members in the environment in which they are living, and not let the *compensatory system environment* change them into passive learners.

For another perspective, it would be too early to claim that six month of [intensive] awareness building suffice to erase the effects of a 25-year long conditioning of the compensatory system. A pivoted picture representing the *Leaning Pisa Tower* to make it look erect does not erect the Pisa Tower, yet it means that someone has thought of making it look erected. The analogy is that of a period of roughly six months is not enough to show how bad the compensatory system is. The exploratory attempt remains nonetheless worth consideration for further and more appropriate implementation.

With perspicacity and more time, the experimenter wishes to be among educators and *learning-and-thinking* enthusiasts to conduct further research on the issue of interest in this research. The research evenly hopes to arrive to better and more effective results so as to have the bold claim that indeed the compensatory system is the gravedigger of pedagogy in Algerian universities and that is high time the decision makers did away with it!

General Conclusion and Recommendations

qThe best treatment of the problem of learning and thinking that learners have must be confined within the framework of a well thought language policy. First and foremost, no language policy will have its practical implications only if we consider the type of thinking, awareness and motivation for learning students have to develop at the university level while they carry on with their foreign language studies. In fact, there is a language policy that allows any student from any stream (cf. Appendix 03) to register in the department of languages. When this is done, a compensatory system again allows those students to move from one year to another with an incredible easiness!

The basic view adopted in this dissertation, and which was expanded throughout the eight chapters, is that the construction of learning and thinking patterns come from the perspective of building awareness about working and succeeding without considering too much such a compensatory system. Motivating students, showing them how to employ or develop their learning strategies; understanding and solving their own learning problems by themselves, becoming thinkers and innovators, enhancing their memory capacities, together with developing their intelligence potentials are the main constituents of the learning and thinking global enterprise. *Learning* and *thinking* were described as the fundamental milestones of the cognition act to be developed for effectively learning the T.L.

In the light of this, what actually happens within the walls of the confined classrooms is that instead of aiding students to finish off their tertiary tuition in a mild and soft manner, the compensatory system does in fact distort their *learning* and

thinking behaviors. For that, students have ended up being mainly apprehensive of two things:

1. That language is in a constant change and flux (Honey.1998). Apprehensive of any change that could occur in the classroom when the teacher breaks the routine classroom ethos by bringing in change in the form of active and substantial, and classwork. They do not expect themselves to truly behave intellectually, not just to obtain a pass [average] mark.

2. Of taking initiative and engage into creative works and activities. In fact, the self-access opportunities that the university offers (as Internet) represent for them real crucibles simply because they challenge their stereotypes and misconceptions. Which is more is that more realistic perspective will start to surface (cf. Gardner.1993). As a consequence, any attempts to bring about change are expected to be, this time, a real challenge for teachers for the aforementioned reasons.

In this study, six chapters were devised to the review of the literature on the adopted views of *learning to learn* and *learning to think*, together with their other sub-constituents. *Motivation,* for example, has been substantiated within Chapter Two; *learning strategies* in Chapter Three; *memory* and how *to effectively enhance it in students* has been highlighted in Chapter Four. Chapter Six comes to consolidate the idea that intelligence serves as a back up to thinking and that consequently it has to be improved in our students. In Chapter Seven, an analysis of our students' situation has also been substantiated mainly through questionnaires. The collection and the preliminary analysis of data of learners and teachers, allowed us to discuss that the inadequate learning/thinking situation in the Department of English is mainly due to *the*

compensatory system. A language policy consisting of such a system does not enable students to have the necessary readiness to conveniently learn English. What is essentially feared is that *learning* and *thinking* would become their Rubicon and no one 'will dare to cross it' (Harris. 1987:09).

From the above (theoretical) perspectives, the suggested awareness building for the implementation of the two fundamentals *learning to learn* and *learning to think* have been pointed at repeatedly and insistently throughout the whole dissertation, and presented more practically in Chapter VIII. As a matter of fact, a particular attention - pertaining to one important hypothesis in the present dissertation- is put on the experiment carried out on a sample of 100 students drawn randomly from the population of interest. The researcher's expectation was that the results of the experiment will be in the direction of one important research hypothesis and the other related hypotheses which is to make students work without thinking to completely rely on the compensatory system (the independent variable).

The results of two experiments showed a significant effect of the awareness building of working without a consideration of the compensatory system upon our students' achievements. In the light of all these results, the aim was to point out that to learners; the compensatory system is doing irreparable harm for it undoubtedly keeps them far from even thinking about making the least effort to accomplish the necessary effort of *thinking* about a language and *learning* it. It has been pointed out that the compensatory system is definitely the gravedigger of pedagogy in our universities!

In the light of the finding, the following recommendations are made for implementing both the learning and the thinking acts for future learners in the Algerian universities. The recommendations could be summarized as follows.

01. The position vis-à-vis such a compensatory system should be addressed at the highest levels of the Ministry of Higher Education and the Ministry of Education. However, and for lengthy bureaucratic hindrances, such a request might not be taken into consideration as swiftly as we would wish; therefore some work at the level of the classroom should be anticipated.

02. Indeed, we have to make our students always be aware that if such a system lingers on, they will, every year, add their names to the swelling ranks of students leaving the university with an impoverished language competence. This is so because instead of truly participating in the classroom ethos (Widdownson.1990), they would rather consider the university as a 'pedagogic Eldorado' where the only effort to make is to wait for the year to pass counting on a compensatory system to help them go through the ever open-wide doors of success!

03. For such an awareness building, *more time* for building an awareness of working without considering the compensatory system is direly required. Indeed, in a short period of time of six months could manage somehow inculcate in learners an awareness of working without considering such a system *whenever necessary*, that is to use it as a "fire exit" in times when difficulties surface. It is important to mention that a period of six is never enough for implementing the idea of interest in the present research. A further and more appropriate implementing would be, in our view, more promising if *much more time*, as well as *more efforts and devotion* both on the part of the teacher and the students would be consecrated. In effect, if from the first year *on to* the third year, if teachers would heartily indulge their students into working with a methodology which they would accommodate to their students' needs and wants (as opposed to need, a *want*

is what a student needs and doesn't know he needs cf. Widdowson. 1978 and elsewhere). This could be done according to a pre-set timetable of classwork and homework wherewith the teacher, with his hard-earned experience, keeps his learners always in a constant touch with *language*, *learning* and *thinking*.

04. This could be through three distinct and important phases or stages: paraphrasing, summarizing and synthesizing, drafting and editing. As a freshman year, the student is made aware of what the aforementioned stages and how to implement them.

a. Paraphrasing: beginning with a one-page long text, the learner is asked to paraphrase it into another text, including the details as of the original, and of the same length as of the original version. By so doing, he will first discover the thrill of doing such a work, i.e. somebody else's work into writing it into his own words. As a matter of fact, the one-page text could be, according to the teacher's own appreciation and judgment, be extended to three / ten-page text, up to a whole chapter.

b. Summarizing and writing synopses: The student learns how to condense a long text into one page, learning to differentiate between a summary, which tells only the salient points, and is generally much shorter than the original. The teacher, as for the paraphrasing, could play on longer texts.

c. Synthesizing: that is at this level of learning and understanding, the students can scan different literatures and then try a synthesis or an amalgamation of the different salient

d. Points of their different reading into one bulk. Such association will show how sharp their intelligence is. By doing genuinely a synthesis of different works, they understand how poignant it is to find out the similarities as well as the correspondences between different printed works.

e. Drafting and editing: at this [final] stage, the learner is now able to draft his own essay after he has [learnt] how to gather material through the above mentioned stage *a*, *b*, *c*, &, *d.* For editing, that is to rephrase sentences that are not clear or precise the learner is then capable of proofreading his own writing seeking a better style and clear meaning.

05. Having the learner to do all this requires from the teacher to be himself an expert motivator (cf. Chapter on Learning and elsewhere) to maintain a vivid class in which participation becomes genuine. The classwork, for that purpose should not be restricted to mere question-answer drills that might not entice the learner to work by considering the tasks and activities presented by his teachers as pleasurable activities. For this, the teacher should always fear that the activities he presented in class be considered by the students as a chore, and thus the latter wouldn't do them because there is a benefit behind but rather because he is forced to do them. In fact our awareness building turns around this concept.

The teacher with his hard earned expertise should put to the fore his true capacities of not simply s transmitting knowledge, but rather a someone who teaches his learners how to genuinely build they own capacities for learning and for thinking so that they can manage their own learning and thinking. If one gives a fish to someone, this will feed him for one day, if one teaches him to fish, he can feed himself all his life.

06. Going to the library is primordial in the enterprises of learning and thinking. What we discussed in ***3*** above can be implemented only if the learners are taught how and why he should be library-goers to understand that in learning one should be go-getter, i.e.; someone who goes to the source of knowledge opposite to someone who –passively-

waits for knowledge to come to him (spoon feeding).

07. Students need a flexible and appropriate methodology which is compatible with their needs. For that, the teachers have to disentangle themselves from following a well-rounded strait-jacket program of language study, especially when they see that such a program does not fit their objectives/expectancies. In many times, program tends to be very demanding particularly when the means, the techniques are [generally] incommensurate with what the program aims at.

Last but not least, it is not inappropriate to consider that the polarization *Learning to Learn and Learning to Think* a bona fide deal. The guiding commitment of such a polarization, which to consider as the stepping stone for the [suggested] language policy, is that a student can enrich his knowledge about language only from action and not by relying on the compensatory system for success.

The experimenter wishes that this research be rooted in the cognitive movement. One more wish is that the findings of the present study will contribute to the designing of true and effective language policy. With industry enough, single-mindedness and enthusiasm to lead it, the final hope is to be among educators and language enthusiasts of the model of Pitman, Crystal, Honey, and the other striving few.

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A P P E N D I C E S

Appendix # 01

The Pilot
General Information Questionnaire

Please, circle the letter corresponding to your answer.

01. General Information
a.Bac b. Sciences c. Letter d. Maths

01. Your first impressions when you first entered university:
a. good b. bad c. don't know

02. Was it *your choice* to register in the department of English, or was it somebody else's?
a. yes b. no

03. After your first year, are you really satisfied being a student of English ?
a. yes b. no

06. Do you consider learning English
a. interesting b. very interesting c. not really special d. don't know

07. In general, do you find the subject of the courses:
a. easy b. very easy c. difficult d. don't know

08. How do you find your teachers?
a. severe b. motivating c. boring d. other

09. Do you ask questions in class/ Do you participate?
a. yes b. sometimes c. never

10. Do you think you learn better especially when you ask questions?
a. yes b. no c. don't know

11. Do you feel that your teacher does not like you to ask questions?
a. all teachers b. some teachers c. just one teacher d. don't know

12. If the teacher doesn't like you to ask questions, do you feel:
a. frustrated b. angry c. don't know
13. How much do you read?
a. intensively b. averagely c. only when I am asked
d. don't like reading

14. When you read (averagely), what do you usually read?
    a. novels b. poetry drama c. other

15. Reading helps you improve your English.
    a. yes b. no c. not really d. don't know

16. If you answer *yes* question 15 above, can you say how?

vocabulary		don't know	
spelling			
grammar			
ideas			

17. Do you teachers give you homework?
    a. yes b. no c. rarely

18. Do you like homework at all?
    a. yes b. no c. don't know

19. If you answer *yes* question *18* above, is it because you find homework
    a. improve your English b. practice your English c. don't know

    20 If you answer *no* question *16* above, is it because you find homework
    a. boring b. difficult to do c. don't know

Appendix # 02

The Pilot Motivation Questionnaire

01. Do you think that going every day to the U. is:
a. very interesting b. refreshing c. tiring d. boring

02. Do you always arrive to the U.
a. in time b. on time c. late d. it depends

03. Once the course starts, are you:
a. enthusiastic b. bored c. interested d. don't know

04. The course is about to finish, are you happy it finishes?
a. yes b. no c. don't know

05. How many times a week do you go to the library?
a. always b. just to revise c. never d. rarely

06. When you go to the library, how long do you stay?
a. long b. a little time c. just the necessary time

07. The teacher is absent, are you:
a. happy b. disappointed c. don't know

08. What you do in class, is it:
a. easy b. interesting c. difficult d. boring

09. Do you find 04 years for a BA degree:
a. long b. short c. long enough

10. Do you think that the university is a necessary stage in your life?
a. yes b. no c. don't know

11. All in all, are you happy to be a student?
a. yes b. no c. don't know

Thank you for your answers!

Appendix # 03

General Information Questionnaire
GenInfQuest

A. General information
Year

BAC ☐ Sciences ☐ Letters ☐ Maths ☐

01. Your first impressions when you entered university:
good b. bad c. don't know

02. Was it *your choice* to study English, or was it somebody else's?
a. yes b. no

03. After your first year, are you satisfied being a student of English?
yes b. no

04. Is learning English
a. interesting b. very interesting c. don't know

05. In general, how do you find [the subjects] of the courses:
b. easy b. difficult c. don't know

06. How do you find your teachers?
a. severe b. enough motivating c. indifferent d. boring

07. Do you participate in class?
c. yes b. sometimes c. afraid

08.Do you think you learn better especially when you ask questions?
d. yes b. no c. don't know

09. Do you read at all (outside the classroom, for example)?
a. yes b.no c. sometimes d. only when Iam asked

10.If *yes* above, do you usually read?
a. novels b. magazines c. poetry drama d. other

11.Do you teachers give you homework?
a. yes b. no c. rarely

12. Do you like homework at all?
a. yes b. no c. don't know

13. If *yes* above, do you think regular homework helps you
b. improve your English b. constantly practice your English c. don't know

14. If *no* in *16*, is it because you find that homework
c. boring b. difficult to do c. don't know

15. All in all, are you happy to be a student ?
a. yes b. no c. don't know

Thank you for your answers!

Appendix # 04

The Motivation Questionnaire
The MotQuest

01. General information

BAC: year ☐ Sciences ☐ Lettres ☐ Maths ☐

2. Who do you think you are?
a. a future intellectual b. an ordinary person c. the future elite

3. Do you think that going every day to the U. is:
a. very interesting b. tiring c. boring d. don't know

4. Do you always arrive to the U.
a. in time b. on time c. late d. it depends

5. When you arrive *in time*, is it:
a. always b. sometimes c. never d. don't know

6. Going to the cafeteria before going to the courses is:
a. stimulating b. don't go c. don't know

7. A moment before the beginning of the course, do you think of yourself as:
a. a special person b. a real student c. any student d. don't know

8. Once the course starts, are you:
a. enthusiastic b. just interested c. don't know

9. The course is over , are you happy?
a. yes b. no c. it depends d. don't know

10. If *no* above, are you happy because another one will start?
a. yes b. immensely c. don't know

11. The teacher is absent, are you:
a. happy b. disappointed c. don't know

12. What you do in class, is it:
a. interesting b. difficult c. boring d. don't know

13. What do you think of the program you follow?

a. easy b. difficult c. must be changed d. don't know

14. In the table below, mark the modules you don't like to study:

	Written Expression		Phonetics		British Civ.		Arabic
	Oral Expression		Linguistics		American Lit.		Don't know
	Grammar		American Civ.		British Lit.		

15. Please, justify your answer in *14* above?
……

16. Do you go to the library?
a. yes b. no

17. If *yes* above, how frequently do you go there?
a. always b. rarely c. just for revising

18. When you go to the library, how long do you stay?
a. long b. a little time c. just the necessary time

19. In winter time, is the library warm?
a. yes b. no c. only sometimes

20. In hot seasons, it is
a. cool b. hot c. bearable

21. Do you think that the university is a necessary stage in your life?
a. yes b. no c. don't know

Thanks for your participation!

Appendix # 05

Teachers Questionnaire

'Two heads are better than one,' so goes the proverb. Your answers will prove it again. *Please circle the number to provide an answer that best reflects your view for each item.*

01. Is/are the modules you teach your major subject(s)?
a. yes b. no
02. Do you stick to an established program when you teach?
a. yes b. no

03. If *no* above, why? (*If need be, please answer on additional sheet*)
……

04. Do you devote more time to:
a. classwork b. oral participation c. explanation d. balance

05. Which, do you think, are more effective to work with?
a. classwork b. oral participation (drills) c. explanation d. balance

06. Where do students better respond to?
a. classwork b. oral participation c. both

07. Do you think that participation serves maximize students' achievements?
a. yes b. no c. it depends on the topic being taught

08. Which, according to you, are more effective to work with?
a. classwork b. oral participation c. balance d. other(s)

09. Do your students show difficulties in :
10. a. participation b. classwork (buzz groups) c. both d. none *If* in participation, is it because of?
a. difficulty with vocabulary b. not motivated at all c. shy d. afraid e. other

11. What feedback do you utilize/suggest remedy to?
……

12. What is the role of the compensatory system in the progress of learning in students??
a. good [enough] b. bad [doing harm]

13. If your answer is *bad* in 12 , are you for:
a. abolishing it b. revising it c. don't know

Many Thanks!

Appendix # 06

The Cellphone Caricature
of the 1st experiment

(Elrod, Jack In *The Washington Post*, 2003, p C11)

Appendix # 07

	Reasoning	Creativity	Ordering of the answers	Scores x
	0	3	1	**4**
	0	2	0	**2**
	0	3	0	**3**
	0	1	0	**1**
	3	0	3	**6**
	3	1	1	**5**
	3	2	1	**6**
	3	0	1	**4**
	3	2	1	**6**
	3	2	1	**6**
	3	0	1	**4**
	0	2	0	**2**
	3	3	1	**7**
	3	2	1	**6**
	3	1	1	**5**
	3	1	1	**5**
	3	0	1	**4**
	3	1	1	**5**
	3	2	1	**6**
	3	2	1	**6**
	3	1	1	**5**
	3	1	1	**5**
	3	2	1	**6**
	3	2	1	**6**
	3	2	1	**6**

Table A1. 25 Scores of the Test on the *Cellphone Caricature* of the Awareness Building Treatment of the Experimental Group of the First Experiment

	Reasoning	Creativity	Ordering of the answers	Scores x
	3	0	1	**4**
	3	0	1	**4**
	3	2	1	**6**
	2	2	0	**4**
	0	3	0	**3**
	0	3	0	**3**
	0	3	0	**3**
	0	3	0	**3**
	0	1	0	**1**
	0	3	0	**3**
	0	3	0	**3**
	0	3	0	**3**
	0	2	0	**2**
	0	2	0	**2**
	3	2	1	**6**
	3	3	1	**7**
	3	0	1	**4**
	3	2	1	**6**
	3	3	1	**7**
	3	1	1	**5**
	3	1	1	**5**
	3	3	1	**7**
	0	2	0	**2**
	0	3	0	**3**
	0	3	0	**3**

Table A2. 25 Scores of the Test on the *Cellphone Caricature* of the Awareness Building Treatment of the Experimental Group of the First Experiment

Appendix # 08

The French Restaurant Caricature of the 2nd Experiment

(In Aspden, et al. (1977: 229)

Appendix # 09

	Reasoning	Creativity	Ordering of the answers	Scores x
	3	3	1	**7**
	3	3	1	**7**
	0	2	1	**3**
	2	2	1	**5**
	1	2	1	**4**
	1	2	1	**4**
	1	3	1	**5**
	0	3	1	**4**
	3	3	1	**7**
	2	3	1	**6**
	2	3	1	**6**
	2	2	1	**5**
	2	3	1	**6**
	2	2	1	**5**
	2	2	1	**5**
	1	2	1	**4**
	0	2	1	**3**
	2	2	1	**5**
	1	1	1	**3**
	0	1	0	**1**
	3	3	1	**7**
	3	1	1	**5**
	3	3	1	**7**
	0	3	0	**3**
	3	3	1	**7**

Table B1. 25 Scores of the Test on the *Restaurant Caricature* on the of the Awareness Building Treatment of the Experimental Group of the Second Experiment

	Reasoning	Creativity	Ordering of the answers	Scores x
	1	1	1	**3**
	2	2	1	**5**
	2	1	1	**4**
	1	1	1	**3**
	2	1	1	**4**
	1	2	1	**4**
	1	1	1	**3**
	1	1	1	**3**
	0	1	1	**2**
	1	2	1	**4**
	0	2	1	**3**
	0	1	1	**2**
	1	1	1	**3**
	2	1	1	**4**
	1	2	1	**4**
	1	1	1	**3**
	3	3	1	**7**
	0	2	1	**3**
	1	2	1	**4**
	1	2	1	**4**
	3	1	1	**5**
	3	2	1	**6**
	0	3	1	**4**
	2	3	0	**5**
	3	3	1	**7**

Table B2 **25 Scores of the Test on the *Restaurant Caricature* on the of the Awareness Building Treatment of the Control Group of the Second Experiment**

Appendix # 10

The Road Not Taken

Two roads diverged in a yellow wood,
And sorry I couldn't travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way.
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a yellow wood, and I-
I took the one less traveled by,
And that has made all the difference.

Robert Frost
(In Cury.1978:217)