Guide to Reflective Thinking

on University Learning Strategies

Guide

Actualizing my Intellectual Potential

Université du Québec
en Abitibi-Témiscamingue

François Ruph

University Learning Strategies:
A Guide to Reflective Thinking

Actualizing my Intellectual Potential

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Services aux étudiants et aux diplômés

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Words importing the masculine gender are used to imply either gender.

Foreword

I am pleased to present ***University Learning Strategies: A Guide to Reflective Thinking***. This practical and effective guide will enable you to diagnose your learning difficulties and direct you to helpful advice found in the chapters that correspond to your needs. We trust that this guide will be of assistance to you throughout your university studies. In addition, if you wish to further your knowledge in the area of cognitive efficiency, you are invited to take the *Atelier d'efficience/Efficiency Workshop*, a personal development three-credit enrichment course, open to all UQAT students.

About the author: François Ruph is a UQAT Department of Education professor and director of the *Unité de recherche en éducation cognitive*. He was the recipient of the 2000 CAUCE Award (Canadian Association for University Continuing Education) and has a longstanding particular interest in cognitive efficiency. Professor Ruph also developed the *Atelier d'efficience cognitive*, which was the topic of his doctorial dissertation.

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…I would also urge that care be taken to choose a guide with a well-made rather than a well-filled head.
Michel Eyquem de Montaigne; Essays, Bk. I (1580)
The carpenter is not the best who makes more chips than all the rest.
Guiterman, Arthur (1871-1943)

Why Improve your Learning Skills?

In general, successful students have developed the following qualities:

1. *They know many study and learning strategies.*
2. *They know why these strategies are important and they know when to apply them.*
3. *They skillfully select and use these strategies, are reflective thinkers and plan their activities.*
4. *They view intelligence as a capacity that can be developed.*
5. *They believe in the importance of carefully deployed efforts.*
6. *They are intrinsically motivated, task-oriented and aspire to master their tasks.*
7. *They do not fear failure - in fact, they realize failure is essential to success and consequently, they are not anxious about tests but rather, view them as learning opportunities.*
8. *They can visualize what they may become in the short and long term future; equally, what they fear as what they desire.*
9. *They are knowledgeable in many subjects and have rapid recall of their knowledge.*
10. *They were supported in the development of these qualities in their homes, schools and by society in general.*

Students who have learned to self-regulate use more strategies with more flexibility. It is easier for them to find resources in their environment. They are more conscious of their personal functioning in learning situations. On the other hand, students who do not self-regulate tend to believe that it is their teacher's responsibility to regulate them and they rely on self-punishment to force themselves to override what they consider coercive and restrictive study environments[1].

My academic success requires more than a natural aptitude and good teachers. It also calls for initiative, perseverance and self-management, on my part. The acquisition of the ability to regulate my own learning is important to me if I believe that the ultimate goal of my studies is to prepare myself to learn on my own throughout my life and professional career.

But, like many others, I have dormant personal resources as well as faults that I am not aware of: it is this part of my intellectual potential that I am not yet conscious of and is in my best interest to discover and actualize.

In order to actualize my intellectual potential, I must attain the following three objectives:

1. *To enrich my understanding of human learning in general and of myself as a learner; to enrich my understanding of specific university level study requirements; and to enrich my understanding of strategies required for academic success.*
2. *To learn to better manage my motivation to study, in general as well as for individual assignments, by developing my abilities to set specific and realistic goals and to manage my expectations, attitudes, stress and impulsivity.*
3. *To develop my abilities to manage my intellectual functioning as needed (attention, concentration, comprehension, memorization, communication, problem-solving) and to adapt my learning strategies based on the task, teaching context and circumstances (time available, personal concerns, difficulty level of subject matter, teaching practices, evaluation methods, importance of work, etc.).*

[1]Zimmermann, B.J. (2000). Self-regulatory cycles of learning. *In* G.A. Straka (dir.), *Conceptions of self-directed learning. Theoretical and conceptional considerations.* Münster : Waxmann.

Guide Overview

In the first section of this guide, you will find a list of learning problem symptoms, typical to higher education study. This list provides you with easy reference to specific sections of the guide that most pertain to your particular case.

The remainder of the guide is divided into sections according to the main categories of fundamental learning strategies: affective strategies (sense of competence, self-motivation, stress management, impulse control); personal resources management strategies (attention and concentration control, memorization, planning and time management, study environment organization); and information management strategies (information processing, communication, problem-solving).

Each section includes a ***brief introduction*** to the list of strategies (*so that I know what I'm talking about and to develop my interest in further exploring the subject*); a ***guide to reflective thinking*** consisting of statements of understandings, attitudes and strategies associated with successful university studies (*to assist me with self-evaluation and to prescribe behavioral changes*); and more detailed ***explanations, advice*** and ***models*** (*to assist me with my better understanding and implementation of the underlying principles*).

Identifying my Potential to be Actualized

Below is a list of typical symptoms of affective and cognitive problems that students are likely to experience throughout their studies. If you recognize yourself in any of the following statements, refer to the corresponding chapter for useful advice.

Self-confidence

I lack of self-confidence - I doubt that I will succeed - I have defeatist thoughts - I blame myself for my problems and failures - I am extremely self-critical - I feel that I am not as good as the other students - etc.

Refer to Chapter 1 - Developing a Strong Sense of Competence

Motivation

I feel that I am in the wrong program – I don't really have a vocational orientation – My goals are unclear – I feel that I am wasting my time - I tend to neglect my studies – Studying is not a priority in my life - I let myself go – I find it hard to buckle down and get to work - I lack perseverance - I systematically put off working on my assignments until tomorrow - etc.

Refer to Chapter 2 - Increasing my Motivation to Enjoy Studying

Stress

I am very anxious about writing exams - I tend to panic during exams - I have mental blocks when confronted with problems – Assignments stress me out – I am shy to speak in front of the class – I fear having to make class presentations - I feel overwhelmed - etc.

Refer to Chapter 3 - Improving my Stress Management

Impulsivity

I don't always stop and think - I rush into things - I answer questions too quickly - I do things instinctively and often regret my actions - I make stupid mistakes - I act hastily without thinking of the consequences - I often have to restart my assignments - etc.

Refer to Chapter 4 - Learning to Better Control my Impulsivity

Attention and Concentration

It takes me a long time before I get into my work and become productive - I have difficulty concentrating for long periods of time - I am easily distracted by things such as noise, movement and other people chatting - I am often bothered by superfluous thoughts - My personal concerns keep me from concentrating – My mind wanders when I read - I tend to fall asleep in class - I easily get carried away, my mind buzzes with ideas and I tune everything else out – Intellectual work quickly tires me out - etc.

Refer to Chapter 5 - Improving my Attention and Concentration

Memory

I often have memory blanks - I find it difficult to retain what I study - After exams my knowledge vanishes into thin air - I often have the impression that I am relearning things that I thought I already knew - I quickly forget what I have just read - I memorize by heart otherwise I don't retain a thing – I confuse everything, especially during exams - Before exams, I have the impression that I cannot remember a single thing - etc.

Refer to Chapter 6 - Learning to Memorize Better

Time and Organization

I tend to put off things until tomorrow - I always study at the last minute - I find it difficult to adhere to my own schedule - I always feel that I don't have enough time - I often hand in my assignments late - I often botch-up my work due to lack of time – I am often late for class – I am always overwhelmed with work at the end of the semester – I'm often lost in all my paperwork – It takes me a long time to find a specific document - I often forget when my assignments are due – I am often ill-prepared for an exam I forgot I had - etc.

Refer to Chapter 7 - Improving my Organization, Planning and Resources Management

Understanding

I do read, but often I do not understand what I've read – I regularly overlook important details - I often misunderstand instructions - I find it difficult to discern the important information from a text – I am not sure about what notes to take in class - I find it difficult to write summaries - I have little capacity for synthesizing - I find it difficult to sort information - I often confuse concepts – I feel like I'm drowning in masses of material - I don't see the connections between subject matter and my own personal projects - etc.

Refer to Chapter 8 - Learning to Better Use Information

Communication

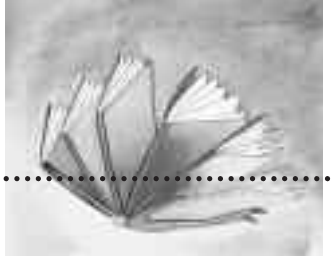
I find it difficult to make myself understood - I don't know how to choose between what I should and shouldn't say - I often say too much - I never say enough - My writings lack structure - I often repeat myself - I often omit essential information - I do not use the correct words - I tend to "drift off track" towards other subjects - I often forget parts of instructions - I mack noumerus spailing, grandmar, sintax and punktuation misteaks - etc.

Refer to Chapter 9 - Learning to Communicate my Ideas Better

Problem-solving

I don't know how to approach a problem - I don't always take into consideration all aspects of a given problem - My answers are often irrelevant - I make stupid mistakes - I get lost, I'm going nowhere, I go around in circles - I seize the first solution that comes to mind - etc.

Refer to Chapter 10 - Improving my Problem-solving Skills



Developing a Strong Sense of Competence

It is not because things are difficult that we do not dare,
it is because we do not dare that they are difficult.
Lucius Annaeus Seneca, Letters to Lucilius (circa 64)
Each day is the scholar of yesterday.
Publilius Syrus, Sentences (circa 100 BC)

Competence and University Studies

The feeling of being competent to successfully face a situation plays a fundamental role in my affective reactions, motivation, commitment and perseverance when confronted with a difficult situation. It influences my goals, the value I attach to the attainment of these goals and my expectations of success. It influences, for example, my orientation towards a field of study, my course selections, my expectations in terms of results, my anticipation of difficulties and my level of anxiety in the face of possible failure. It influences my initial motivation, intellectual effort and the strategies that I employ to attain the desired results.

However, my sense of competence is affected by circumstantial and variable factors such as my physical health and psychological availability. In addition, it is affected by more constant factors inherent to my personality that include my past experiences in similar situations, the causes that I believe to be the source of my failures and successes, my conceptions of university learning and my beliefs regarding the particular field of knowledge concerned.

Many factors that determine my perception of situations and sense of competence generally escape my attention and conscious control. My emotional reactions are controlled by memories and representations that are deeply buried in my memory and are more or less accessible to introspection. My fear triggers negative and defeatist thoughts, pessimistic or catastrophic images and scenarios and internal self-depreciating dialogue that prompts feelings of guilt, undermines my self-confidence and increases my feelings of vulnerability. Needless to say, the part of my attention devoted to controlling these thoughts, which has mobilized a good part of my working memory potential, is detrimental to my processing of information related to the situation at hand.

Fortunately, I can develop my abilities to learn and, by the same token, enhance my sense of competence to successfully overcome the challenges and requirements of university programs. Therefore, it is in my best interest to make an accurate as possible estimation of the skills required for, and set forth by, my chosen program of study. I must consider the development of these skills as one of the goals of my learning process in parallel with the acquisition of specific knowledge in the field that I chose to study. It is important, particularly during the first semester, that I give myself the time to adjust to university studies and to develop my abilities to learn.

Some advantages inherent to developing a strong sense of competence:

- **Increasing my self-confidence.**
- **Reducing my stress related to studies and exams.**
- **Developing my ambition and taste for challenges.**
- **Developing a strong motivation to study.**
- **Increasing my level of perseverance when facing difficulties.**

1

Guide to Reflective Thinking: My Study Skill Competency

Use the following statements to assess your sense of competence with regard to university studies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
• I like to have a large margin of leeway when it comes to my way of learning and demonstrating my competencies.	❑	❑
• I am confident in my ability to reach the academic results that I have set for myself.	❑	❑
• I make as close an estimation as possible of the skills required for academic success: knowledge base and study skills (note taking, reading, writing, knowledge of a second language), methodological skills (problem-solving, project management, research, computer processing), interpersonal skills (communication, team work), etc.	❑	❑
• I consider acquiring these skills as one learning goal, even though it is not explicitly mentioned in the study program.	❑	❑
• At the beginning of the school year, I devote a significant period of time to my adjustment and to developing my learning competencies.	❑	❑
• Performance evaluations do not worry me, regardless of the format.	❑	❑
• I consider the evaluation of my knowledge and skills necessary to my progress.	❑	❑
• I take pride in openly sharing my discoveries or achievements with the class.	❑	❑
• I enjoy taking on personal challenges and I have high, yet realistic, expectations for myself (no magical thinking).	❑	❑
• I challenge myself to do better than previously; to obtain better results.	❑	❑

Developing my Study Skill Competencies

There is no limit to my capacity to develop the way I learn. I can always increase my cognitive efficiency: to learn better, faster, more efficiently with less effort and more fun.

I can always increase the quality of my learning far beyond exam requirements and develop a solid background in my field of study, which will prove useful for my professional development.

Above all, I can improve my capacity to think and solve, by myself or as part of a team, problems inherent to my field of study and do so, with originality and creativity thus contributing to the collective development.

How can I develop my study skill competency?

By **referring** to this guide based on my needs, strengths and weaknesses.

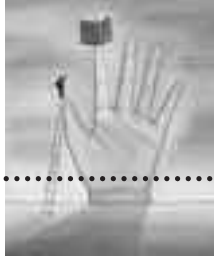
By taking the time to **observe** my attitudes and study habits.

By **evaluating** their effectiveness in terms of pleasure, time, effort, stress, results, quality of learning, comprehension, retention and the development of my professional competence.

By **comparing** my strategies, methods and tricks with those used by other students, in particular successful students.

By **seeking** advice from professors, tutors and services offered by the university (library, linguistic services, computer, learning assistance, modules, etc.)

By **consulting** specialized literature or writings on the subjects of improving higher education learning skills, brain function, problem-solving and creativity.



Chapter 2

Increasing my Motivation to Enjoy Studying

2

Whatever is worth doing at all is worth doing well.
Philip Dormer Stanhope, Letters to His Son (March 10, 1746)

Just as eating against one's will is injurious to health, so study without a liking for it spoils the memory, and it retains nothing it takes in.
Leonardo Da Vinci, Notebooks (circa 1500)

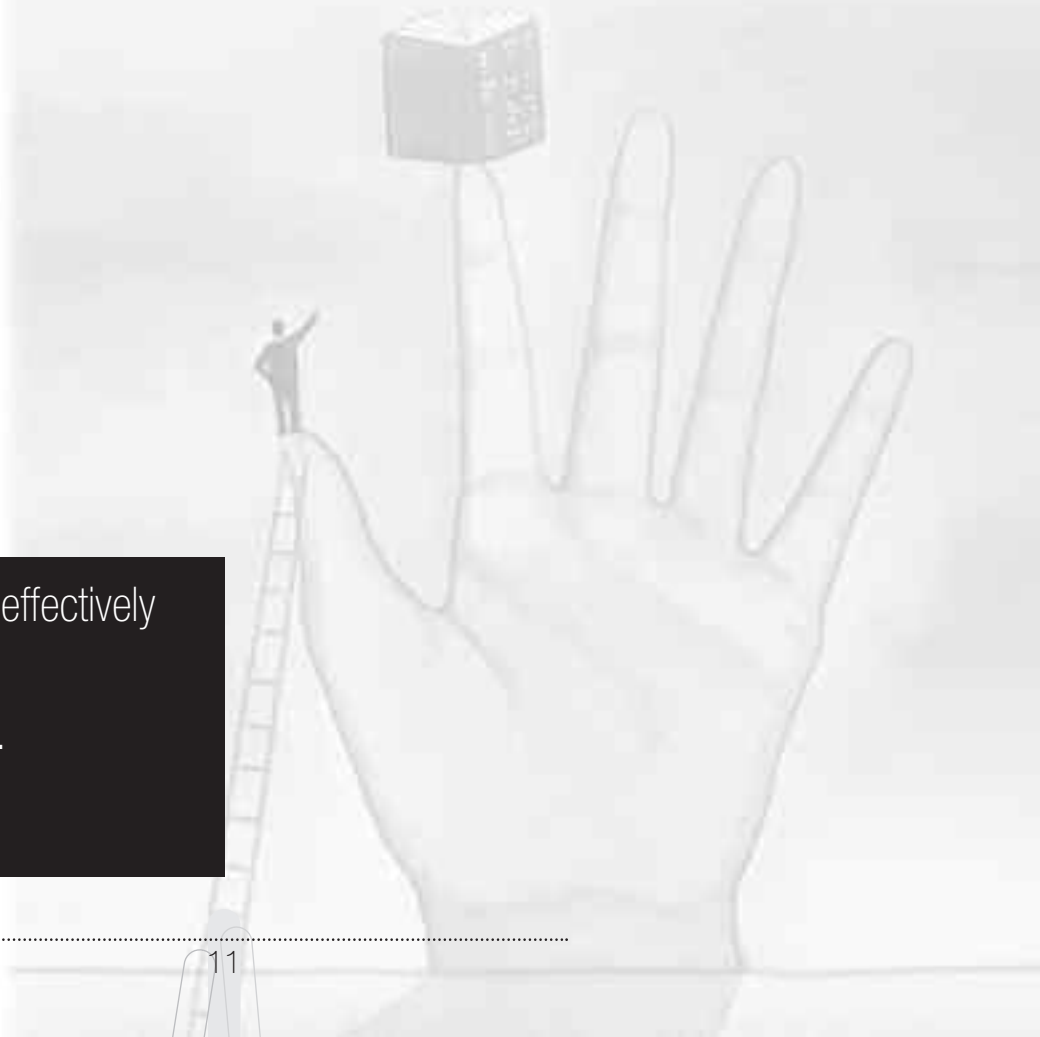
No tree stands firm and sturdy if it is not buffeted by constant wind; the very stresses cause it to stiffen and fix its roots firmly.
Lucius Annaeus Seneca, De Providentia (circa 54)

Motivation

Motivation is that inner force that moves me to act and forge ahead in life for reasons that are not always clear to me. Motivation focuses my attention on people, situations or specific tasks. Motivation is the source of energy that prompts me to carry out a task well. It is closely associated with my personality and personal background.

Motivation in university studies is related to my orientation to a specific field of study, to a personal project, to my commitment to learn, to the self-discipline I employ to reach my goals and to my perseverance when encountering difficulties and failures.

Motivation is a key factor in university success. Sustained motivation in advanced studies depends on several factors. Some are personal: my goals, the value I affix to my studies, my achievement expectations, my willpower, my self-discipline and my perseverance. Other factors are related to the study environment: quality of teaching, program requirements, teacher's perceptions and expectations, relationships between peers, available resources and welcome, assistance and student support policies. While I have no control over the latter category of factors, I do have control over the first.



Some advantages inherent to effectively managing my motivation:

- **Giving a personal meaning to my studies.**
- **Experiencing interest and pleasure in studying.**
- **Improving the quality of my learning.**
- **Persevering to overcome difficulties.**

Guide to Reflective Thinking: My Motivation Strategies

Use the following statements to assess your motivation strategies. Any weak assessment result indicates an attitude, ability or habit that may be worth developing.

2

	Seldom	Often
My long-term personal goals are clear and specific		
• I choose my field of study and future field of professional activity based on my profound affinities and skills.	❑	❑
• I am attuned to my deepest desires: mental images, physical reactions, personal dreams.	❑	❑
• I know exactly what I expect from my studies and how they can help me with my personal and professional development.	❑	❑
• I examine all available information on the careers offered in my chosen field of study.	❑	❑
• I have all available information on the skills required for my envisioned profession: explicit (know-how) and implicit (personality, respect and tolerance).	❑	❑
• I meet people involved in that profession and I am familiar with their work.	❑	❑
• I examine the occupational constraints inherent to the profession in relation to my preferences, wishes and tastes.	❑	❑
• I keep track of the competences I have acquired thus far, so that I know what I have left to cover.	❑	❑
• I do not hesitate to consult with guidance services.	❑	❑
• I have all available information related to the goals, objectives and requirements of my study program.	❑	❑
• I enjoy studying in the field within the discipline that I have chosen.	❑	❑
• I have high performance expectations.	❑	❑
• I am ready to make substantial efforts to attain these results.	❑	❑
• My studies are a priority in my personal life.	❑	❑
I set my personal goals for each course		
• I take on each course with a positive attitude and I am determined to get the maximum out of each course.	❑	❑
• I am proactive: before the course begins, I look over the course objectives and content and I set my personal goals.	❑	❑
• Whenever possible, I prefer to set my own learning goals and the means to achieve them.	❑	❑
• I set personal goals that far exceed the professor's requirements.	❑	❑
• When necessary, I negotiate the terms of my autonomy with goals that exceed the course requirements.	❑	❑
• For each course I select specific learning goals based on my long-term personal goals, pre-acquired knowledge and requirements inherent to the program, course and professor.	❑	❑

	Seldom	Often
• I make a list of my intentions and prioritize my learning objectives.	❑	❑
• I plan study activities that will help me to reach my objectives.	❑	❑
• I have my own system of self-evaluation that measures the efficiency of these study activities.	❑	❑
• Taking my skills into account, I set a minimum performance threshold.	❑	❑
• I have a specific personal project that is close to my heart and to which all my course assignments relate.	❑	❑
• My objectives go beyond performance evaluation. I aim to thoroughly understand all subject matter as well as its respective role in the development of my competences.	❑	❑
• In the meantime, I aim for maximum marks.	❑	❑
I tackle my challenges, problems and difficulties with a positive attitude		
• I try to combine an appreciation, pleasure in learning and deep understanding of the subject matter with the desire to excel.	❑	❑
• I find a positive way to approach and enjoy new subject matter regardless of the teaching method and quality.	❑	❑
• I persevere in the face of difficulties and never get discouraged.	❑	❑
• When my course results are below my expectations, I question my learning strategies rather than the subject matter, teacher or my intelligence.	❑	❑
• I consider failure as a source of opportunity to reflect upon my learning method.	❑	❑
• I make it a point to not give up, before I have tried my very best.	❑	❑
• I try to do impeccable work regardless of my personal interest in the work.	❑	❑
• I show a great deal of self-discipline. I do not need to be pushed to get to work.	❑	❑
• I am familiar with all learning assistance services offered by the university and feel no shame in using them (writing and editing assistance, computer assistance, library and Internet research, cognitive efficiency workshops, tutoring, etc.).	❑	❑
I have developed effective motivation strategies for tedious tasks		
• I try to find positive ways to view routine or tedious tasks.	❑	❑
• I focus on the indirect advantages of completing tasks I dislike: getting them over with first, cultivating my patience, reinforcing my self-discipline.	❑	❑
• I look at the situation with humor rather than complaining.	❑	❑

	Seldom	Often
• I try to find personal meaning in the task: professional development, practical application for a problem that concerns me personally.	❑	❑
• I keep my spirits up by focusing on my ultimate goal.	❑	❑
• I work in a comfortable place that has a pleasant atmosphere.	❑	❑
• I turn tedious tasks into games or contests.	❑	❑
• I do tedious tasks in the company of friends, over a fine meal.	❑	❑
• I reward myself after making a genuine effort regardless of the results.	❑	❑
• I congratulate myself when I achieve the results I wanted.	❑	❑
• I make a list of things to do and check them off once completed.	❑	❑
• I start with tasks I most dislike and finish with those that are more motivating.	❑	❑
• I schedule a day in my agenda for tasks I dislike and do not think about them until then.	❑	❑
• I perform tasks I like when I feel like it rather than adhering to a strict schedule.	❑	❑
• I set completion deadlines for tasks I dislike.	❑	❑

Learning to Control my Motivation

INTRINSIC, EXTRINSIC AND ACHIEVEMENT-ORIENTED MOTIVATION

Research on what motivates students differentiates three main types of motivation:

1) Motivation is said to be ***intrinsic*** when I find pleasure and satisfaction in performing the task. Learning through reading, attending class, imitation and trial and error can be sources of pleasure. This type of motivation is conducive to memorization of knowledge, curiosity, research and creativity. It is generally associated with real and sustainable learning that is oriented towards meaning and deep understanding.

2) Motivation is said to be ***extrinsic*** when it is driven by the desire to obtain a reward that is not related to the task, or by the fear of an unpleasant consequence. Pleasing my parents, having a good job, having a career in a well-paying profession, earning prestige and receiving honors, OR the fear of disappointing or failing and being called a nobody are examples of external motivations to my learning activities. Extrinsic motivation is not conducive to quality learning. It is a superficial learning method that is strictly oriented to passing exams and getting a diploma. Fear-driven motivation is also a good source of stress.

3) I am driven by ***achievement***-oriented motivation when I wish to demonstrate my mastery of a specific subject. To achieve high marks, to excel in my field of study and to have the recognition of my peers all help to maintain my self-discipline and support my efforts and perseverance. This type of motivation encourages me to obtain superior marks through quality learning. I gain satisfaction from achieving my anticipated goals, but keep in mind that effort for the sake of effort can be pernicious.

MOTIVATION AND PERSONAL GOALS

I learn more easily when I enjoy the subject and the way in which I am learning. I am more likely to succeed when I know exactly what I want (where, when, how and why), when my academic goals are meaningful, when I have a clear vision of my future, when my career choice is in line with my interests and aptitudes, when my studies are my priority in life and when I truly believe that I will succeed.

Since pleasure and passion are better guides than money and fame, it is in my best interest to pay attention to my most fervent wishes, personal dreams and ambitions.

I must make clear and realistic choices in order to achieve my ultimate goal: acquiring specific knowledge about the careers available in my field of study and picturing myself working in one of these careers. Consult available literature and obtain as much information as possible about the explicit and implicit skills that are required for the job by reading about the profession, meeting with people who work in the field and not idealizing the job. I must examine the constraints inherent to the profession, according to my preferences, wishes and tastes. List the skills I have acquired and then those I still need to acquire. Consult guidance services (they have information and competency tests).

The same applies for my intermediary goals, which include targeting realistic yet ambitious results for each course and choosing an approach that is compatible with my other pre-occupations such as family and employment. Develop a proactive approach to learning and avoid waiting or depending on teachers to schedule study activities. List my intentions and establish my personal learning priorities based on the study program requirements. Come up with a self-evaluation system to test my knowledge and assess my efficiency. Combine intrinsic motivation (pleasure, meaning, passion, interest) with achievement-oriented motivation (quest for excellence). Reduce the extrinsic motivations, particularly those that have a negative impact on my health, such as cigarettes, coffee and alcohol.

MOTIVATION AND ATTITUDES WHEN DEALING WITH DIFFICULTIES

I do not always have the ability to shape reality according to my wishes. However I can always change my perception of reality and how I respond to it. Naturally, I have the tendency to avoid unpleasant tasks and problematic situations. I can temporarily ignore them, I can use band-aid solutions that do not really solve them and do nothing more than aggravate the problem, I can continually delay finding resolutions and live with dark clouds above my head, I can complain, feel sorry for myself and have others pity me. But, on the other hand, I have the choice of dealing with my problems and considering them as an opportunity for personal development.

There is always a positive and optimistic way to consider a situation. A boring course: I read instead of listening. A demanding assignment: I find a topic that highly interests me. Failure: I analyze it to identify the cause and to change my study strategy. Too much work: I think about my priorities. Feeling isolated: I work with a team. An intimidating presentation: I concentrate on the clarity of my message.

But most importantly beware of defeatist thinking, self-criticism and guilt.

Improving my Stress Management

There is no gathering the rose without being pricked by the thorns. The Two Travellers (chap. ii, fable vi)
Valor grows by daring, fear by holding back. Publilius Syrus, Sentences (circa 100 BC)
If we don't see a failure as a challenge to modify our approach, but rather as a problem with ourselves, as a personality defect, we will immediately feel overwhelmed.
Anthony Robbins

Stress and University Studies

University studies are very demanding. Some subject material is difficult, end of semester workload is heavy, teachers are demanding or difficult to follow and exams are stressful. There are classroom presentations to prepare and assignments due, for which the evaluation criteria are not always clear. Besides this, there are personal responsibilities - family, part-time job, etc. All of these elements contribute to increasing my stress level during my university studies and are likely to generate a continual state of internal tension for susceptible individuals. If this state of tension persists it can lead to fatigue, dysfunction and health problems.

Thought and emotion are intertwined. My feelings related to advanced studies and my emotions are influenced by my personal goals and my feelings of competence to achieve them, the value I attach to success, the fact that success is important for my ego and any other psychological and economic stakes. Being too emotional can often be detrimental to learning: it impairs my concentration and my intellectual functioning becomes more erratic. Feeling inefficient in my completion of a task often has the effect of my feeling more emotional and consequently, even less efficient. During exams, for instance, stress can obstruct my intellectual faculties (memory blanks, perception problems, reduced mental-span, reasoning difficulties, confusion).

However, I can learn and train myself to control the negative effects that my emotions have on my intellectual functioning. Developing greater emotional control and knowing how to manage my stress are beneficial assets for my studies as well as for my professional practice, my family life and my overall well-being.

Some advantages inherent to improving stress management:

- **Having better control of my emotions.**
- **Being able to use my intellectual faculties regardless of circumstances.**
- **Reinforcing my ability to take on challenges.**
- **Developing my self-confidence.**

Guide to Reflective Thinking: My Stress Management Strategies

Use the following statements to assess your stress management strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I know my sources of stress and my usual reactions		
• I can foresee stressful circumstances and contexts.	❑	❑
• I know when stress can have a positive or negative influence on me.	❑	❑
• I know what I feel when I am stressed - excited, enthusiastic, frustrated, angry, aggressive, anxious, panicked, depressed, etc.	❑	❑
• I know what images and thoughts come to mind when I am under pressure.	❑	❑
• I am aware of the irrational beliefs that are at the source of my stress: if I am not the best, I am worthless; if I make a mistake, it is unforgivable; if I don't understand right away, I will never understand; if I find it difficult, I am incompetent; etc.	❑	❑
• I am familiar with my usual defense mechanisms: I deny being stressed, I repress my emotions, I blame others, I pity myself, I minimize the importance of the situation, etc.	❑	❑
I control my thoughts and internal dialogue		
• In difficult situations, I use encouraging self-talk.	❑	❑
• When I take on big challenges, I minimize the stakes.	❑	❑
• I have a personal arsenal of positive but realistic alternatives to my defeatist thoughts.	❑	❑
• I recognize the positive aspects of my actions; not only my mistakes.	❑	❑
• I congratulate myself after confronting a difficulty, regardless of the outcome.	❑	❑
• I examine and question my beliefs and values.	❑	❑
• I progressively desensitize myself using emotional distancing, minimization and humor.	❑	❑
• I view exams as opportunities to perfect my training and as learning experiences.	❑	❑
• I view exams as opportunities to validate my skills and have my achievements recognized.	❑	❑
I have full control over my body		
• I know several effective ways to relax before, during and after stressful situations.	❑	❑
• I know and regularly practice breathing exercises.	❑	❑
• In stressful situations, I calm myself by focusing on and controlling my breathing.	❑	❑
• In stressful situations, I focus on relaxing my tense muscles.	❑	❑
• I know how to relax zones where stress accumulates: hands, face, eyes, nape of the neck, feet.	❑	❑
• I know and practice a variety of stretching and flexibility exercises.	❑	❑

	Seldom	Often
• I have developed a short routine that can be used discretely during exams, classroom presentations and in team work situations.	❑	❑
• I drink sufficient amounts of water when in stressful situations.	❑	❑
• I make time to replenish my energy, relax and exercise after stressful situations.	❑	❑
• I never infringe upon my regular sleep time.	❑	❑
• I avoid or moderate smoking, coffee and alcohol consumption, eating sweets, etc.	❑	❑
I develop my capacity for academic discipline		
• I develop learning and problem-solving strategies.	❑	❑
• I control my agenda and study environment.	❑	❑
• When I study, I arrange it so that I avoid any time pressure.	❑	❑
• I choose favorable and pleasant work environments.	❑	❑
• I develop a personal support network: classmates, friends and recourse to specialized assistance.	❑	❑
• I start preparing for exams at the beginning of the semester.	❑	❑

Sources, Manifestations and Effects of Stress

STRESS AS AN ALARM RESPONSE

Stress is my body's alarm response that is set off in situations that I perceive, rightly or wrongly, to be threatening to my internal equilibrium. This reaction manifests itself in a series of physiological changes to my body as it prepares to deal with the threat, by fight or by flight: adrenaline secretion, muscle tension, accelerated heartbeat and respiration, slowed digestion, heightened attention, mobilization of intellectual functioning, etc. These physiological changes translate into physical symptoms ranging from a state of positive excitement to downright unpleasant manifestations such as perspiration, flushing, lump in the throat, trembling, blurred vision and psychologically translate into feeling a loss of control or a state of sheer panic.

These phenomena occur chiefly when I write exams, do class presentations or at the end of the semester. My cognitive-emotional reactions to this type of potentially threatening situation for myself, my future and my self-esteem, can take two forms: I deal with the situation by intensifying work efforts and by mental preparation; or I run away from the situation using magical thinking, recrimination, procrastination, false excuses and abandonment.

RESISTANCE TO STRESS

Reaction to stress is, in itself, natural and normal. It does not cause my body any harm nor is it the source of any psychological disorder as long as it is kept in check. Stress actually enhances my intellectual functioning and physical activity in challenging situations. However, if my reaction to stress goes beyond mere stimulation or for extended periods of time, my body will then start eating into my energy reserves in the effort to fight off the stress. When this happens, I may experience loss of appetite, stomach disorders, sleep disorders, nightmares, headaches, constant fatigue, apathy, a general lack of interest or reduced sexual drive. These physical discomforts can sometimes be accompanied by psychological disorders: anxiety, feelings of powerlessness, guilt, vulnerability or depression. Cognitive disorders include difficulty in making decisions, inability to concentrate, feeling confused and intellectual disorientation. Behaviors generally associated with such cognitive-emotional states include withdrawal, increase of tobacco, alcohol and drug use, chronic state of anger and the need to talk continuously.

EXHAUSTION

The exhaustion phase is characterized by my energy reserves no longer being able to adequately resist the agents of stress, my vital organs showing premature wear and my immune system becoming dangerously weak. These malaises transform themselves into physical illnesses and psychological and behavioral disorders, which can become serious. The phenomenon commonly known as "burnout" is a recurrent consequence of exhaustion.

Stress Management

For most of us stress is a matter of perception.

The same stressful situation can provoke different effects in different individuals, depending on their perception. Stress can prove positive and stimulating, or downright negative and disturbing. However, one can learn to improve control and better manage the inner sources of stress.

UNDERSTANDING THE PHENOMENON OF STRESS AND MY SOURCES OF STRESS

In order to effectively control my emotions and reduce the negative effects of stress on my intellectual functioning, I must first and foremost learn to recognize how I react to stress and accurately interpret that psychological process. Knowing about stress, its origins, functions, effects and management is a good starting point. However, everyone has their own way of emotionally reacting to a given challenge. Learning to identify the source of my stress, studying the way I react to stress and experimenting with several stress management strategies will prove useful.

There are various approaches to building resistance to agents of stress. Emotions have a direct impact on my physiological functioning: adrenaline secretion, increased pulse and respiration, muscle tension, etc. Paroxysmal conditions result in physical problems and can even result in fainting. One approach, characteristic of Yoga, consists of controlling my breathing and relaxing my muscles to calm myself down and drinking sufficient amounts of freshwater to reduce mouth and throat dryness and to maintain an optimal level of electrolytes in my brain.

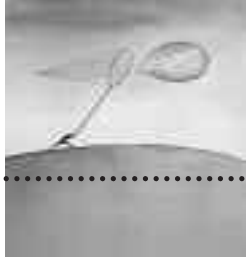
LEARNING TO CONTROL MY THOUGHTS

Emotions are also associated with thought content. A second approach, characteristic of cognitive therapies, consists of modifying my negative and defeatist thoughts by controlling my visualizations and internal dialogue, by reinterpreting the situation in a less threatening manner, by de-dramatizing the situation and by using optimistic visualizations and positive thoughts.

DEVELOPING MY LEARNING ABILITIES

Negative emotions such as fear, frustration, anger, and depression can be perceived as responses to problematic situations for which easy or readily available solutions do not exist. The feeling of being incapable of solving a given problem and the resulting negative emotions, feed one another (positive retroaction or snowball effect). A third approach consists of developing my learning competence, which means to better understand my intellectual functioning and to enrich my repertoire of learning strategies. This approach fosters the development of my abilities to deal with intellectual challenges.

But, in the end, a balanced combination of the three approaches is the best way for me to master durable control of my emotions.



Learning to Better Control my Impulsivity

Haste in every business brings failures. Herodotus, Histories, bk. VII, ch. 10
Once a word leaves your mouth, you cannot chase it back even with a chariot drawn by four horses.
Confucius, Sentences (circa 600 BC)
To a quick question give a slow answer. Proverb

Developing the Habit of Thinking before Acting

Impulsivity can have far-reaching consequences for the impulsive individual as well as their environment. In the workplace, impulsivity is a major source of mistakes and waste. It also frustrates employers, customers and employees. From primary school to university, impulsivity is often the source of wasted time and poor results.

Impulsivity generally affects all phases of a problem-solving situation: no or little assessment of the situation, partial perception and erroneous interpretation of the facts, no searching for solution-options, no foreseeing potential consequences, no follow-up of actions.

I can react impulsively under certain circumstances and be totally level-headed under others. If I have a natural tendency to react with promptitude, certain elements of my educational and professional environment, such as production under pressure, evaluation of my work, competition, exams, or job interviews, will prompt my impulsive behavior. However, the tendency to be impulsive can also be associated with passivity, lack of interest in a task and fatigue.

In any case, the tendency to act with impulsivity can be rectified. My acquisition of greater behavioral control is conditional upon my acknowledgement and inhibition of my natural tendencies and the deliberate use of a repertoire of cognitive and emotional problem-solving strategies.

Some advantages to thinking before acting:

- **Preventing silly mistakes.**
- **Behaving in a more rational manner.**

Guide to Reflective Thinking: Strategies to Better Control my Impulsivity

Use the following statements to assess your impulsivity control strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I know the sources of my impulsivity		
• I can recognize circumstances and contexts in which I have the tendency to act impulsively.	❑	❑
• I recognize forerunners of my impulsivity: eagerness to immediately jump into action, disorganized and superficial observations, the need to hurry, feeling rushed...	❑	❑
I know several ways to control my impulsivity		
• I can foresee effects of stress on my impulsivity.	❑	❑
• I know how to use my inner dialogue to hold myself back: "One minute! I need to think first." – "Calm down! Think about what you're doing!"	❑	❑
• I am cautious and visualize the step-by-step process of what I am going to do and how I am going to do it.	❑	❑
• I control myself by giving myself directives: "Clearly define your goal! Stop and think about what you are being asked! Read instructions calmly! Carefully write down all pertinent information! Look for the best starting point! Assess the situation right now! Try to find another way to do it! Take the time to verify!"	❑	❑
I give matters a great deal of thought before taking action		
• I take the time to define my goals before taking action.	❑	❑
• I take the time to clearly understand what is expected from me before responding.	❑	❑
• I take the time to observe all elements of a given situation.	❑	❑
• I take the time to think about how I will take action.	❑	❑
• I take the time to plan my actions before starting.	❑	❑
• I take the time to examine various solution alternatives and their respective potential consequences.	❑	❑
• I take the time to double-check my work before handing it in.	❑	❑
I know how to control my impulsivity during exams		
• At the beginning of an exam, I carefully read the instructions.	❑	❑
• I check how much time is allotted to write the exam.	❑	❑
• I attentively read each question and pay attention to the wording.	❑	❑
• I carefully check for key-words that may guide my answers.	❑	❑
• Before I start writing my answers, I assess the extent of the work and plan the order in which I will answer.	❑	❑
• For essay questions, I draft an outline before starting to write the essay.	❑	❑

	Seldom	Often
• At the end of an exam, I review my answers to make sure that I have not deviated from the subject or forgotten to add any important elements.	❑	❑
• At the end of an exam, I check for spelling and grammar mistakes.	❑	❑
• I improve my exam preparation and passing strategies based on my exam results.	❑	❑

4 Different Concepts, Different Meanings

IMPULSIVITY

Impulsivity is a non-deliberate and uncontrollable immediate response mode to stimuli. The impulsive individual does not evaluate all elements of a problem, they respond with their first impulse, which they control poorly and quickly give responses that may be erroneous.

SPONTANEITY

Spontaneity is a tendency to act deliberately and without being urged-on by anyone else (inner self-regulation) or is a tendency to voice feelings or thoughts without any ambiguity (sincerity).

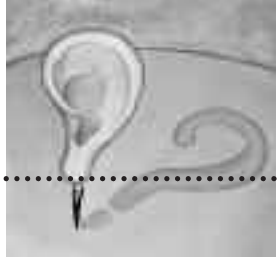
IMPULSES - REFLEXES - AUTOMATISMS - HABITS

An impulse is a psychic-organic force that propels me to act in a given manner, in response to sudden internal pressure. The pressure generally originates from a combination of circumstantial factors, memory of past experiences and basic needs. For instance, certain people have the immediate and irrepressible urge to respond to verbal aggression with verbal aggression, while others tend to shrink away or still others may physically lash out. If I find it difficult to control my impulses, I can learn to resist them and to respond differently and more intelligently to situations that trigger them.

A reflexive response is an incoercible behavior that is totally out of my control and triggered by a stimulus. I can however, modify or re-train certain reflexes by using appropriate conditioning.

An automatism is an acquired behavior that requires less vigilance, effort and execution time. The initial ability-learning period requires an important investment of my attention, concentration and mental energy. As my abilities improve, a large part of the operation is taken over by brain circuits, by-passing my conscious awareness; a kind of auto-pilot. But unlike reflexes, the automatic processes remain accessible to conscious control as soon as something goes wrong. For instance, I can decipher letters and words without thinking about them, but if I encounter a problem understanding a word, I go back and consciously re-examine the word that I am struggling with or cannot decipher.

A habit is a complex pattern of behavior, a way of thinking, doing and living, which is acquired after repeating the same behavior in the same circumstances. My habits can be considered as ready-made action plans employed in response to normal situations in my everyday life. Anything that disturbs one of my well-established habits contributes to creating a momentary, stimulating or frustrating imbalance, depending on the case and degree. Changing a habit requires more energy than learning something new. The resistance to change, that I may feel when facing something new, is largely due to the presence of deeply rooted habits.



Improving my Attention and Concentration

The reason we have two ears and only one mouth,
is that we may hear more and speak less.
Zeno (335 BC - 263 BC), Greek Philosopher
To do two things at once is to do neither.
Publilius Syrus, Sentences (circa 100 BC)

Attention, Concentration and University Studies

My brain does not function like a computer. It does not have an ON/OFF switch. It has its very own whims and fancies. To better know my capacities of concentration and functioning of my attention, I must experiment with several different study and work methods at different times of the day in different places and in a variety of ambiences.

Attention is a psychological process that guides my senses to a specific aspect of my external reality (visual, auditory, olfactory and other signals) or of my internal reality (feelings, emotions, physiological condition) that could be of importance to me. It ensures my maximal reception of pertinent information. However I do not always have full control over my attention. Attention is an essential reflex necessary for the survival of all animal species and involves the mobilization of body resources to eventual action (muscles, heart, lungs, liver). My attention can be attracted by external stimuli (unusual sounds, sudden movements, familiar names overheard in a conversation) or internal stimuli (persistent thoughts, a preoccupation that I cannot shake).

While attention guides my intellect towards receiving specific sensory signals, a complementary process concentration turns my attention off to other things that may distract me from the task at hand (inhibition). Concentration fosters maximum use of my working memory and cognitive processes when I seek, analyze, process or store specific information and when I make plans or decisions. Attention works like a brain insulator: it blocks incoming information that may interfere with my reflective thinking.

Whether it is a question of understanding what I read, listening to a class presentation with interest or solving complex problems, controlling my attention and concentration is an essential prerequisite for studying well. Note that attention and concentration are two different energy-consuming psychological processes. My concentration effort depends on the task involved, the time I need to complete it, the presence of internal and external sources of distraction and my level of fatigue. The more complex, new, or difficult a task is, the greater the effort I must use. The longer the task lasts, the greater the effort I must make to maintain my concentration. Studying (acquiring new knowledge) requires more of my concentration than problem-solving (actually applying acquired knowledge) and written homework (transferring memorized and assimilated information onto a page).

I can develop and enhance my attention and concentration abilities. My capacity to maintain my attention and concentration on a task, or quickly regain my concentration after a distraction, will result in easier and certainly more efficient studying.

Some advantages inherent to improving my attention and concentration:

- **Being able to rapidly concentrate on a task.**
- **Becoming more resistant to distractions.**
- **Requiring less effort to concentrate for longer periods of time.**
- **Maximizing the use of my intellectual resources.**

Guide to Reflective Thinking: Strategies for Improving my Attention and Concentration

Use the following statements to assess your attention and concentration strategies. Any weak assessment result indicates an attitude, ability or habit that may be worth developing.

	Seldom	Often
I am aware of conditions that improve my attention and concentration		
• I know the extent of concentration required in order for me to perform different tasks.	❑	❑
• I know when and where to study in order for me to concentrate over a long period of time without tiring.	❑	❑
• I recognize and respect my limits so that I can be efficient without tiring or making myself sick.	❑	❑
• I know which ambient conditions best suit my concentration depending on the task (solitary vs. surrounded, silent vs. noisy, calm vs. turbulent).	❑	❑
• I know which work rhythm is conducive to my concentration (alternating work with breaks, maximum work duration, daily work rhythm).	❑	❑
I prepare myself before class and check my degree of concentration during class		
• Before class, I mentally prepare myself by re-reading previous course material, reading today's material and by organizing my note taking in advance.	❑	❑
• During class, I regularly check my concentration level so that I can re-engage quickly if I happen to disconnect.	❑	❑
• I actively participate in class by taking notes, asking questions, following along in the textbooks, etc.	❑	❑
I choose work and study times that are conducive to my concentration		
• I apportion my work periods based on the concentration requirements of the tasks (best times of the day or week).	❑	❑
• I study (reading, writing, creating memory tools) when my concentration is at its best and leave more routine work (sorting, documentation search, planning) for other times.	❑	❑
• I carefully apportion my work, break and rest times in order for me to maintain my concentration for longer periods of time.	❑	❑
• I choose which task to do, based on my priorities and interest at that particular time.	❑	❑
• Before I start working, I estimate my current capacity to concentrate and determine my study objective accordingly.	❑	❑
• I take my other needs into consideration: physical activity, balanced diet, sleep, relaxation, recreation, social life, home life.	❑	❑
I choose a work environment that is conducive to my concentration		
• I choose my work environment depending on the task and my concentration needs at that particular time.	❑	❑
• I choose a visual and auditory environment that corresponds with the task and my concentration needs at that particular time.	❑	❑

	Seldom	Often
• Before a work session, I prevent possible disturbances (I take the phone off the hook, turn off the television and minimize sources of noise and distraction).	❑	❑
• Before a work session, I gather all resource material and documents that I will need so that my concentration will not be interrupted.	❑	❑
I control superfluous thoughts		
• As soon as I start working, I "cocoon" myself from the outside world.	❑	❑
• When my concentration is disturbed by a recurrent personal concern, I write it down and book a later time in my agenda to address it.	❑	❑
• When I'm brimming with ideas, I note them down as they come and return to my work.	❑	❑
I choose a working pace that fosters my concentration and intellectual efficiency		
• When I start working, I immediately concentrate on my task.	❑	❑
• I foresee and take breaks at pre-scheduled intervals.	❑	❑
• I coordinate my breaks with blocks or stages of work.	❑	❑
• When I return to work, I quickly review the work that was completed before my break.	❑	❑
• I limit the duration of my breaks so that I don't stray from my work or study objective.	❑	❑
• I avoid using my breaks for activities likely to divert me from my goal.	❑	❑
• I make the most of my breaks by physically moving and relaxing (brief exercise, stretching, short walk) instead of drinking coffee or smoking cigarettes.	❑	❑
• I modify my work environment according to my need for mental stimulation (musical stimulus, change of position, place, or lighting).	❑	❑
• I stop studying when I feel tired or when my performance level drops.	❑	❑
• I change or alternate activities during an extensive study period (I read, prepare summary sheets, revise, produce schemas, memorize, complete practical exercises, etc.).	❑	❑
I set limits and reward myself		
• I respect my personal commitments and I do not extend my work periods even if I still feel good.	❑	❑
• I congratulate and reward myself after work periods.	❑	❑
• Before starting another task, I give myself some break time.	❑	❑

I study actively	Seldom	Often
• When I read, I usually use a pencil to guide my gaze in order to more easily follow along and limit my perceptual efforts.	❑	❑
• When I read a dense text containing few titles or subtitles, I note the main components in the margins, add titles and summarize the salient ideas in order to make the text easier to understand.	❑	❑
• When I read, I take notes, summarize, create memory tools, etc.	❑	❑

The Functioning of Attention and Concentration

5

ATTENTION, CONCENTRATION AND MOTIVATION

Intrinsic motivation helps me concentrate and stay focused on a learning task. Certainly, my interest in the activity facilitates my quickly getting started and resistance to external distractions, while fostering an in-depth approach to the material. Achievement-oriented motivation, i.e., without real interest in a task, does not help my concentration because my thoughts are focused on the anticipation of results and their consequences (good marks, pride, professional achievement) rather than on task performance per se. Intrinsic motivation fosters self-discipline, perseverance when facing difficulties and a strategic approach to learning. Lack of motivation or extrinsic motivation gives rise to resistance, anxiety and a superficial learning approach that is focused mainly on passing exams and strictly adhering to course-plan requirements.

Therefore it is in my best interest to adopt attitudes that most favor intrinsic motivation or, failing that, achievement-oriented motivation: long-term perspective, finding personal meaning and purpose in the task, the love of a job well done, positive attitudes and anticipation of success. Certain techniques of positive conditioning can be very helpful if my motivation wavers: respecting planned study periods (prevents discouragement), a reward system. My subconscious records unpleasant experiences and offers more resistance each time I fail to keep the commitments that I have made to myself.

ATTENTION, CONCENTRATION AND STRESS

University studies are demanding. Learning efforts sustained over long periods of time result in intellectual and physical fatigue. The more a task is complex, new, abstract, tedious and of poor perceptual quality (small font, dense, without divisions, etc.) the more attention and concentration efforts are required and the more quickly I become fatigued. The various sources of pressure (lack of time, exam-related anxiety, personal worries) demand additional efforts on my part to maintain my attention on the task. Therefore, it is particularly important to, as much as possible, limit my sources of stress by carefully choosing my work times, places and environments and by scheduling specific times to address my personal problems.

It is preferable to adapt my work environment to the nature of the task. Routine, repetitive and tedious work requires a stimulating atmosphere and high level of cerebral activation. On the other hand, study and problem-solving requires a calm and relaxed atmosphere as well as a lower level of mental activity.

ATTENTION, CONCENTRATION, LEARNING PATTERNS AND IMPULSIVITY

To learn takes time. My learning is measured by the knowledge stored in my memory and my capacity to activate it at the right time and in the right place. The development of a competence is a process of progressive construction and re-construction that necessitates frequent thinking and re-thinking. Inadequate learning patterns (linear or cumulative), extrinsic motivation and a tendency towards impulsivity incites my wanting to finish before I even get started. In such cases, essential information is not always perceived and registered accurately or processed thoroughly. My attention will be focused on speed and the number of pages I need to read. I read but retain little.

ATTENTION, CONCENTRATION, TIME MANAGEMENT AND ORGANISATION

Good use of time takes into account my personal concentration and attention capacities. A general principle is to plan concentration-demanding tasks (study, reading) for the best times of the day and week. Less concentration-demanding tasks (sorting documents, looking for books in the library) can be performed during other times of the day and week that are less conducive to intellectual work.

My ability to efficiently concentrate for hours varies according to my energy reserves and the task difficulty. I can extend my concentration time with training. Regular breaks (10 minutes per hour of continuous work) are best for my recuperation and information assimilation. My minimal capacity of sustained concentration (without breaks), which is required for advanced studies, should not be less than 20 minutes in duration. Any capacity below this minimum indicates a need for training.

FACTORS BENEFICIAL TO MY CONCENTRATION

- ***An appropriate environment:*** noise and other disturbances demand increased concentration efforts. When they are present, concentration duration will be less and fatigue will set in more quickly. Therefore it is particularly important to give a great deal of attention to choosing my work times, locations and ambiences (auditory, visual, lighting, etc.).

- ***A quick start:*** training oneself to concentrate quickly (within less than one minute) increases efficient use of available time and the inner satisfaction that results. Motivation comes with feeling productive and efficient.

- ***Work organization:*** if a large part of information processing is automatic, less energy and effort is required. In developing a personal study organization system (ex. summary sheets and sorting system, in-class or reading note taking method), I can more immediately get to work and minimize my energy output in terms of concentration efforts.

FACTORS DETRIMENTAL TO MY CONCENTRATION

- ***Physical and nervous fatigue:*** it is not recommended to study after intensive sports, at the end of a day of intensive intellectual activity or after prolonged hours of study.

- ***Imbalanced lifestyle and personal habits:*** insufficient physical activity, improper nutrition, insufficient or inappropriate recreational activities or hobbies. It is wise to plan daily and weekly relaxation, physical and recreational activities and to reward myself for fruitful work periods.

- ***Personal problems:*** financial concerns, emotional distress, and material preoccupations rank among the most common sources of concentration disability. I can train myself to temporarily free myself from these endogenous distractions by allotting specific time for them in my daily schedule.

- ***Pessimistic expectations:*** anxiety, fear of failure and high levels of stress are detrimental to my concentration. Again in this case, I can train myself to change the way I view events and to better resist psychological pressures.

- ***Negative attitudes:*** lack of interest in a task, demobilizing inner dialogue and slow starts render attention and concentration difficult. The more I dislike a task, the longer it seems to take.

Strategies to Control Attention and Concentration

MOBILIZING MY ATTENTION

To control my attention, I must learn to recognize those times when I am about to disconnect so that I can reconnect right away. Certain situation characteristics are effective in mobilizing my attention, such as discussions and problem-solving groups. I have the tendency to disconnect while reading tedious material or during tough, abstract courses where the content solicits little of my attention (monotone voice, no visual supports). Some tactics that can help me to stay focused on the subject include taking lots of notes, organizing ideas using outlines or note mapping, following along in the text, noting ideas evoked by the presentation, noting distracting thoughts, purposefully disconnecting (look out the window, become aware of my position and breathing, relax) so that I can better reconnect a few moments later.

FOCUSING MY ATTENTION

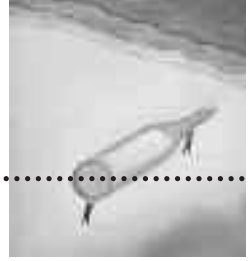
The more selective my attention, the easier it is to process incoming information. When I focus on one aspect of the task at a time, I limit the risk of confusion. In order to do this, I must divide the task into smaller units. For instance, reading a chapter is a task that can be split into several successive periods: first, I do a preview of the titles and subtitles in order to get a general idea of the content, then I carefully read the introduction and conclusion in order to understand the author's intentions and orientations and finally, I read the chapter section by section, taking notes, summarizing the author's ideas, using mnemonic reminders and then I revise. Between the task sections, there are natural break times and opportunities for me to briefly relax and physically move. Although these breaks are very short (a few minutes), they allow me to recover my capacity to concentrate. They also help me to assimilate and store essential information in my memory long-term, so that I can rapidly recall the main points of the previous work unit.

USING MY INTERNAL DIALOGUE

Negative, demeaning and pessimistic internal dialogue distracts my attention from the task and shifts it to its affective and motivational context. This shift is detrimental to the task and contributes to my lack of motivation, weakens my resistance to distractions and encourages my disconnection. Self-talk about the task; the best way to organize its completion, articulation of my questions and reasoning, either out loud or silently to myself, helps to maintain my focus. Talking about the task, whether internally or out loud, will often increase my understanding.

USING MENTAL IMAGERY

Similarly to internal dialogue, all cerebral activity spontaneously generates a constant flow of images and scenarios. The use of drawings, diagrams, graphs, schemas or models keeps my mental imagery focused on the learning task, while facilitating my understanding.



Learning to Memorize Better

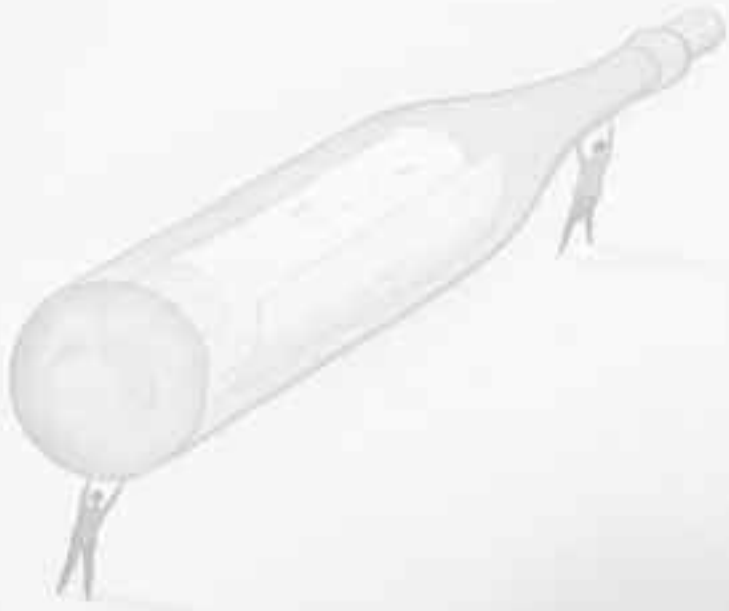
What we do not understand we do not possess. Goethe (1749-1832), German Author
The secret of a good memory is attention, and attention to a subject depends upon our interest in it. We rarely forget that which has made a deep impression on our minds.
Tryon Edwards (1809 - 1894)
Drawn wells have sweetest water. Iranian Proverb

Memorization and University Studies

Scientific and technical knowledge have experienced a true logarithmic explosion in modern societies. Life-long learning, continuous training, learning enterprises and the development of high-level field-specific expertise all require a capacity to keep and accumulate information stored in an individual memory and the ability to rapidly retrieve information stored in a collective memory. In advanced studies, such knowledge multiplication has dramatic consequences on my learning, development and maintenance of my competences: I not only have to assimilate an increasing volume of knowledge, but I must also frequently update my understandings and abilities as this knowledge tends to quickly become obsolete if I am studying and working in a state-of-the-art sector.

The origins of many difficulties in university stem from inappropriate memorization strategies: difficulty selecting what is essential to remember, to summarize, to synthesize; insufficient information organization; rote learning of material that we poorly assimilate; the belief that understanding is sufficient to retaining; the lack of concrete and personal examples, lack of reference to our own reality; absence of rehearsal or revision exercises; tardy revision exercises, etc.

The success of my studies largely depends on the intellectual abilities that I develop in order to adequately acquire, retain and apply my knowledge when necessary. At this level, memorization is not an easy or automatic process. On the contrary, it is part of reflective thinking and intelligence. I must have the deliberate intention to learn a specific thing that makes sense to me, I must mobilize a sufficient level of attention and concentration, I must make an intellectual effort to understand and assimilate information and I must possess a practical repertoire of information memorization and retrieval strategies.



Some advantages inherent to better managing my memorization:

- **Recording more easily and better retention.**
- **Being able to remember what I need, when I need it.**
- **Reducing exam-related stress and anxiety.**
- **Building long-lasting knowledge.**

Guide to Reflective Thinking: My Memorization Strategies

Use the following statements to assess your memorization strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I plan my memorization efforts		
• I determine the specific elements that I must memorize.	❑	❑
• I estimate the time required to memorize something well (selecting the material to retain; preparing a checklist; interiorization; rehearsing; revision).	❑	❑
• I set aside time for rehearsal and revision exercises in my agenda and on my list of tasks to do.	❑	❑
I appropriately format material to memorize		
• First and foremost I make sure that I understood and assimilated the material.	❑	❑
• I can make clear links between the material and concrete reality.	❑	❑
• I use words and images when appropriate.	❑	❑
• I reduce texts to main ideas and key notions.	❑	❑
• I organize the material by sets and subsets and in hierarchical and logical groups.	❑	❑
• I condense the elements I must learn by heart onto personalized summary sheets and in the format of resumes, syntheses, tables, schemas, models, diagrams, or any other appropriate format depending on the case.	❑	❑
• I design summary sheets that are highly visual: one page per summary, clear layout, graphics, colors, easy reference.	❑	❑
• I use a system of study-material related codes, symbols and abbreviations to facilitate content perception and retention.	❑	❑
• I practice by re-writing these summary sheets while explaining them to myself.	❑	❑
I make an effort to mentally visualize what I have learned		
• After a study session, I review and recite to myself the essential of what I have just learned (after a 10-minute break).	❑	❑
• In the days to come (after a day, week, month), I make repeated efforts to remember what I have learned.	❑	❑
• I regularly practice refresher and overall revision exercises.	❑	❑
• I formulate my own questions and find their responses in order to better memorize the knowledge.	❑	❑
I review the material prior to and after a course		
• I only note the essential and, as much as possible, in my own words.	❑	❑
• I review previously covered material before each course (the day, night or hour before).	❑	❑
• I complete and organize my notes and review the course material as soon as possible after the course (the same night or following day).	❑	❑

	Seldom	Often
• Each month, I set aside time in my agenda to look over the material covered and left to cover.	❑	❑
I prepare for exams well in advance		
• Right at the start of a course, I obtain information about the nature of the exams: multiple choice questions, essay questions, problem-solving, case study, other.	❑	❑
• For each exam, I determine what I must know by heart.	❑	❑
• I develop memory tools that are appropriate to the exam format.	❑	❑
• Several times during the semester, I verify my understanding and memorization.	❑	❑
• I test myself and ask peers to test me.	❑	❑
• I turn exam preparation into quiz games that I play alone or with peers.	❑	❑
• The night before an exam, I stop studying and revising and I relax.	❑	❑
• I avoid last minute cramming.	❑	❑
• When I write exams, I quickly read each question and note all that spontaneously comes to mind, to unload my memory, and then I take each question one by one in a more relaxed manner.	❑	❑

Functioning of the memory

WORKING MEMORY AND LONG-TERM MEMORY

External and internal stimulations leave impressions in the zones of the brain, where they are received in the form of electrochemical signals. Though evanescent (a few tenths of a second), these impressions last long enough for their source to be identified and to decide whether it is worth a closer examination. This process takes place without my conscience knowing it. But if an unusual sound, a flash, a vivid color, a brisk movement, an interesting object or an attractive face draws my attention, I notice, examine and respond to it.

This conscious phase of thinking is associated with my working memory. This memory is ***limited in capacity and duration***. It plays an ***intermediary*** role between stimuli and my long-term memory, where my personal memories, general knowledge and know-how are stored. It is associated with the conscious recognition and interpretation of the world around me and with the assimilation of new experiences.

Long-term memory, on the other hand, has a virtually ***unlimited*** retention capacity that ranges from several months to a lifetime. Long-term memory works like an ***immense network*** in constant reconstruction where many elements are inextricably linked together by meaning, logic, hierarchy and surprisingly, by association with emotions, sounds and other forms of very personal impressions. Just like the hard disc on my computer, the ease and speed to retrieve specific information depends on my indexing system and its frequency of use.

But unlike computers, which save things without understanding them, my memory retains what makes sense to me. I can only clearly understand that which is familiar to me. Too many new things are confusing for me. I find it difficult to initially understand them because I do not have sufficient points of reference when I enter a domain that is totally new to me.

Working memory limitations are also sources of many understanding, reasoning and learning difficulties. I am not equipped to simultaneously process lots of new information. Therefore, I must resort to using strategies such as time saving strategies and temporary memorization tools that include writing down the information, hypotheses and reasoning.

All professional competences are composed of great amounts of knowledge, concepts, methods, procedures, rules and specific abilities. Although, some learning is done with little apparent effort, the acquisition of most high-level intellectual knowledge and abilities requires motivation, attention, concentration, perseverance and regular practice.

Memorization Strategies

Memorization strategies can be grouped into four main categories:

To ensure that I retain what I learn, I must:

1. Be motivated, have a clear purpose and plan my study approach accordingly.
2. Thoroughly study and appropriate target knowledge.
3. Reduce the material to be learned by heart, to the essential.
4. Remember, revise and use acquired knowledge.

Be motivated, have a clear purpose and plan my study approach

I more easily retain what I like, what interests me and what makes sense to me. On the other hand, I tend to put off until tomorrow and study at the last minute that which interests me less.

MEMORY, MOTIVATION AND PURPOSE

My motivation plays a key role in the acquisition, retention and retrieval of my knowledge. I can also develop my intrinsic motivation by working on my attitudes, if negative, on my feeling of competence, if weak, on my goals and objectives, if absent or unclear and on my learning approach, if superficial. Success generates motivation, which in turn generates success, which in turn generates motivation and so on (See Chapters 1 and 2).

MEMORIZATION, ATTENTION AND CONCENTRATION

My purpose must also translate into the careful selection of the study time, location and ambience. Selective attention and sustained concentration are fundamental for acquiring new knowledge or implementing new intellectual abilities. Studying with the goal to memorize knowledge is a very demanding learning activity in terms of concentration. Therefore, it is in my best interest to reduce this effort by identifying the content that I must memorize, the references where I can find more information as needed and that which I may forget (See Chapter 5).

MEMORIZATION AND PLANNING

Memory is a function that forgets: if I do not use it frequently, my intellectual knowledge and abilities blur and become tainted. New knowledge progressively replaces old knowledge. Memory storage of school-related knowledge is a process that is planned well in advance and not the day before an exam. Time is a key factor in all complex intellectual learning: to understand, thoroughly study, make connections, transform and condense the material to facilitate memorization and to review the material frequently are elements of a step-by-step process that occurs over time. Contrary to what one may think while reading these words, this process does not require a great deal of mental energy: a few well-placed minutes of revision are more efficient than hours of cramming on the eve of an exam and the knowledge will likely be retained longer. Remembering and revision are two processes by which knowledge is consolidated in the long-term memory. Rhythm is also a factor beneficial to efficiency in this remembering and revision work. My purpose must translate into specific objectives, which must be attained according to a pre-determined schedule involving study and revision periods (See Chapter 7).

Thoroughly study and appropriate target knowledge

I forget more quickly if I cannot make links between what I learn and the things that are concrete and make sense to me.

MEMORIZATION, LEARNING CONCEPTION AND LEARNING APPROACH

Superficial learning tends to focus on rote memorization using successive repetition of elements of knowledge in the exact format that they are presented in class or in textbooks. The emphasis is placed on detail, to the detriment of the whole. Concepts are learned word for word rather than understanding their significance and implication. The acquired knowledge is stored in a rigid form that is often inappropriate for its use, except in the case of exams requiring learn-by-heart content. On the other hand, a thorough approach founded on understanding and personal appropriation of the material contributes to the embedding in memory of more versatile and applicable knowledge.

MEMORIZATION AND UNDERSTANDING

To memorize without understanding is an absurdity, but to understand without retaining is not much use either. Memorization and understanding are often perceived as opposites, they are in fact integrated processes that are essential to each other for quality learning. Understanding a text is not enough to ensure retention but, it is an important condition that is indispensable to the building of knowledge. Memorization complements learning by ensuring the consolidation of essential elements in the long-term memory.

MEMORIZATION AND APPROPRIATION

I deepen my knowledge of a subject when:
I ***explore*** information in a ***complete***, ***precise*** and ***methodical*** fashion and I ***select*** what is pertinent (See Chapter 8).

I ***organize***, ***compare*** and ***classify*** essential information by sets and subsets. The human memory can be compared to a large library: we can more easily find information that is well ordered and indexed according to its degree of importance than information that has been strewn about. A good organization of knowledge allows us to pass from general-to-specific and from preview-to-detail (See Chapter 8).

I ***establish links*** between what I already know and reality; I make ***sense*** of what I learn. Even if I can deliberately memorize lists of names, objects or numbers using powerful mnemonics, this type of memorization has limited utility in life. However, it can be useful for retaining formulas, nomenclatures or technical terms.

I ***appropriate*** the new knowledge. Since I can better retain things that make personal sense to me, I re-word the knowledge based on my personal projects, preferences, learning style and needs, I associate it to personal images and give it my own emotional slant (See Chapter 2).

Reduce the material to be learned by heart, to the essential
It is not necessary that I learn everything by heart. A few notions, principles, key words and images well ingrained in my memory are enough for me to remember the majority of related information. With a good summary, reference table or schema, I can store a wide range of knowledge in my memory that I can reconstitute by association or logic, when required. Textbooks contain tables, models and summaries that we can use as is. But it is even more efficient to produce our own summary sheets, syntheses, resumes, schemas, graphs, tables and other memory tools. The attention and understanding efforts I put forth to develop my own memory tools strongly contribute to the acquisition of knowledge.

The general principle is to limit the volume of information to retain by re-grouping, condensing and schematizing; to memorize only the essential, by leaving out the details and the anecdotal; by identifying or creating concrete reference points such as titles or a numbering system. I must make a rigorous ***selection*** of key elements and choose a ***presentation*** format that is easily visible at a glance: key words, formulas, tables, schemas, symbols, etc. One word, one image, one concept can be considered as key references in that they open up a certain memory space that contains the information that we are seeking. An essential idea, a definition or a theory can be reduced to one or two words, a formula or a simple schema. The memorization effort will then focus on these key elements, from which my mind can retrieve or reconstruct the overall knowledge, as needed.

However, this selection process is not easy to complete. It requires my having a good overview and understanding of the material. To know what to underline, what to note, in which circumstances and how to do this efficiently stems from having a specific purpose and a reflection upon the specific learning content and context.

Remember, revise and use acquired knowledge
Memory is a faculty that contemplates the future rather than the past.

INTERIORIZATION OF KNOWLEDGE

To interiorize is to keep the acquired knowledge in one's mind alive for future use. A good way to construct a sound mental representation of my knowledge is to imagine how I intend to use it: I can hear myself explaining the knowledge to someone else, I picture myself answering an exam question or I see myself putting my knowledge into practice in a professional situation. The more this mental representation is clear, detailed, dynamic and vivid, the more deeply it will be embedded into my long-term memory.

To interiorize, I must first make the effort to ***evoke*** the material I wish to retain, after concealing the original material (memory tool). To review, I then verify the accuracy of my recall and relearn what I have forgotten. It is this effort that helps me to constitute a long-lasting mnemonic impression while tracing the path to my memory that allows me to later recall this information. In order to consolidate this path, I must then make the effort to repeatedly ***recall*** and ***review*** the knowledge in the minutes and days that follow and over intervals that are spread out (approximately ten-minute, then once a day, week, month). However, the best way to embed the knowledge and abilities in my memory is to ***use*** it as often as possible and in various formats (writing, discussions, practice). The use of more than one sensory methodology fosters this interiorization and subsequent retrieval.

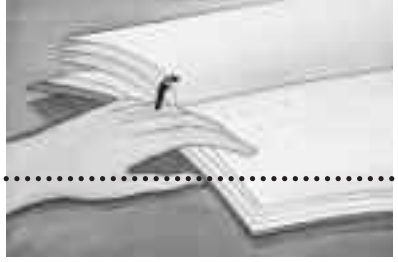
In addition, we can better retain the beginning and the end, redundant information, strange facts, striking examples and spicy anecdotes. This spontaneous retention can be detrimental to basic ideas and principles, which are more abstract and less attention-grabbing than the examples used to illustrate them. It is in our best interest to spread out the efforts spent to compensate for these effects and memorize less striking information by starting from the middle or the end and moreover, by distinguishing the anecdotal from the essential and by placing more emphasis on the memorization of the main ideas.

MEMORY AND STRESS

Stress can have as devastating effects on memory and the capacity to acquire new information as on the capacity to retrieve acquired knowledge. In situations of high emotional pressure such as exams, one can become more susceptible to misperceiving or misinterpreting important information like instructions or the meaning of a question and have difficulty to evoke the knowledge required for the answer. I can prevent stress-related effects by reflecting upon strategies ahead of time (See Chapters 3 and 4).

MEMORY, SPONTANEITY AND IMPULSIVITY

Impulsivity consists of answering without thinking. But organizing my knowledge too much in advance hampers the knowledge retrieval process. When asked to respond to a question, my memory spontaneously retrieves both pertinent and non-pertinent information in the order and format that may not be suitable for what was asked. Therefore, it is prudent to split the process into three phases consisting of: first writing down all that spontaneously springs to mind; secondly, making an additional effort to add to the information that has already been retrieved and finally, selecting and organizing all this information into a constructed response.



Improving my Organization, Planning and Resources Management

Haste is productive of injury, and so is too much hesitation. He is the wisest man who does everything at the proper time. Proverb

Nine-tenths of wisdom consists in being wise in time. Theodore Roosevelt (1858-1919), President of United States of America.

What is once well done is done forever. Henry David Thoreau (1817–1862), U.S. philosopher, author, naturalist.

A man who does not think and plan long ahead will find trouble right at his door. Confucius BC 551-479, Chinese Ethical Teacher, Philosopher.

Organizing, Planning and Managing my Studies

The ability to organize, plan and manage my resources, including time, is one of the most important factors to successful university studies.

ORGANIZING MY RESOURCES

Organization is a mental process. The degree of organization and planning depends on the very nature and importance of the task. It is not necessary to plan everything and in some cases, it is unadvisable. If, for example, when traveling we like adventure and surprise, it may be better not to fully plan our itinerary in advance. If we wish to keep a certain amount of spontaneity in our love lives, it may be better not to over "program". On the other hand, if we wish to have time for ourselves, to relax, have fun, it may be preferable to identify the "time-consuming" activities and quickly rid ourselves of the daily hum-drum tasks. In the case of studies, it is important to identify our priorities and the study tasks that require efficient planning.

PLANNING: THINKING BEFORE ACTION

Planning an activity consists of clarifying the goal I wish to attain, gathering all pertinent information, seeking efficient means to attain that goal on the basis of resources available, and concretizing the goal with the support of an appropriate action plan and organization.

MANAGING: THINKING IN ACTION

Planning is one thing, but adjusting one's plan and organization to a changing reality is another. In most cases, the unexpected is no exception. Proper action management while in the action requires follow-up and constant operations adjustment.

Some advantages inherent to strategic organization

- **Always knowing exactly where I am headed and never being caught off guard.**
- **Using my time and resources optimally.**
- **Avoiding overloads and bottlenecks.**
- **Improving my productivity and intellectual efficiency.**
- **Increasing my satisfaction while minimizing my stress and anxiety.**

Guide to Reflective Thinking: My Organization, Planning and Resources Management Strategies

Use the following statements to assess your organization, planning and resources management strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I plan my entire semester at the start of classes		
• I give top priority to the planning of all my courses, as a whole.	❑	❑
• I make an accurate, detailed and comprehensive task inventory and assess the level of difficulty of each task.	❑	❑
• I take note of tasks for which the guidelines will be given later on in the semester.	❑	❑
• I describe complex tasks in detail.	❑	❑
• I plan my long-term assignments and elaborate step-by-step schedules as soon as I know the assignment requirements: topic, document research, reading, work plan, writing, verification and presentation.	❑	❑
• I accurately and realistically estimate the time required to complete each task.	❑	❑
• I make an accurate and comprehensive inventory of available study time.	❑	❑
• I establish an order of priority for my tasks based on their deadlines and my personal goals.	❑	❑
• I reserve comfortable blocks of work time for assignments for which instruction is forthcoming.	❑	❑
• I record all of the above in a realistic schedule overview that is readable at a glance (synoptic overview).	❑	❑
I evaluate and adjust my plan on a weekly basis		
• I keep my agenda handy and note things to do as soon as they come to mind.	❑	❑
• I keep my agenda up-to-date and use it as a daily and weekly guide.	❑	❑
• As soon as I know assignment requirements I plan my work and quickly get started.	❑	❑
• I allow at least one hour at the beginning or end of each week to take stock of the situation and plan my activities for the following week.	❑	❑
• I list my daily and weekly tasks according to their number and complexity: study, documentary research, reading, purchasing books, appointments, etc.	❑	❑
• I schedule a realistic amount of time for each task.	❑	❑
• I schedule regular sessions for long-term advance exam preparation: developing memory tools, interiorization of knowledge, recall, revision and practical exercises.	❑	❑
• I schedule course-material study time close to the time of the corresponding course (on the eve, on the following day).	❑	❑
• I use any brief free periods of time to review my notes or prepare for the next course.	❑	❑

	Seldom	Often
• I organize myself so that my work is completed well in advance of the deadline.	❑	❑
• I regularly assess the progress of my study plan.	❑	❑
• I schedule sufficient time for relaxation, recreation, physical activities and sleep.	❑	❑
I plan each study and work session		
• Before I start working, I take a few minutes to set clear objectives for my work or study session.	❑	❑
• I plan an alternating work-break rhythm based on the degree of difficulty of the material and my concentration capacity at that particular time.	❑	❑
• I prepare each course and ensure prompt follow-up: preparatory reading, pre-formatting and reorganizing notes, developing memory tools, practical exercises.	❑	❑
I organize my course handouts		
• I file documents in a functional order rather than piling them in the order that they were distributed.	❑	❑
• I organize it so that I have quick access to all my handouts.	❑	❑
• I use my computer as a classification tool.	❑	❑

Principles of Organization, Planning and Management

There is not one universal organization, planning and management method. On the contrary, there are many situations, goals, objectives, methods and means; but proper organization, planning and management rest on a few simple principles.

GIVING MYSELF THE TIME NECESSARY TO PLAN

When I am pressed for time, I tend to devote less time to operational organization and planning. Stress prompts me to take immediate action. This has contrary effects to expectations: instead of saving time, I lose a great deal of time and consequently become anxious and stressed as I panic at seeing the time pass.

SPECIFYING MY IMMEDIATE AND LONG-TERM GOALS

When I know exactly where I am headed, I can efficiently plan and schedule the functional organization of my work.

DETERMINING MY PRIORITIES

Unfortunately, due to lack of time, I must sometimes choose between objectives and in doing so, sacrifice one or two. If I do not have enough time to do them all well, it is preferable to decide in advance which activities I should choose based on a set of decision making criteria: personal interests, academic value, possibility of later recuperation, etc. The comparison of the various goals that I am pursuing facilitates the determination of priorities: in the case of a schedule conflict, I will know in advance which objectives will be first, second and third and which objectives I will have to set aside.

HAVING A GLOBAL OVERVIEW AND FORESEEING WHAT'S TO COME

Proper planning should enable me to have a global overview of the work to complete (the forest) and a detailed view of each stage that is involved (the trees). Proper planning allows me to foresee potential problems well in advance and to respond in due time. It also allows me to ensure proper integration of the various stages of work and activity. The worst way to manage work is by short-sighted and emergency-based management.

SHORT AND LONG TERM DETAILED PLANNING

Proper planning begins with breaking down the work into smaller pieces and describing in detail the stages involved in each, with as a precise as possible time frame. This work break-down enables me to judiciously distribute the work over time, based on the semester's overall deadlines and time available and prioritize specific activities, should conflicts arise.

ESTIMATING TIME FOR EACH TASK AND STAGE OF WORK

The time required to complete each task and work stage varies considerably from one individual to another, from one course to another, from one assignment to another. My familiarity with the course material, the content volume, the quantity of new concepts, the documentation available, the type of exam and the performance requirements, to name just a few, are variables I must consider when I evaluate the time I need to complete a specific task. If I am unsure, it is best if I make a conservative forecast: minimum time (should everything go well) and maximum time (should everything go wrong).

7

IDENTIFYING MISSING INFORMATION

It is very difficult for me to plan everything ahead of time, once and for all. Certain information is unknown to me at the beginning of the semester: work evaluation requirements and criteria, the type of exam, difficulty level of the reading material, etc. Readjustments will be necessary throughout the semester. Therefore, it is best if I complement my planning for the semester (global overview and co-ordination of all my courses) with a weekly plan (detailed and readjusted view).

EXPECTING THE UNEXPECTED

The unexpected is the major cause of disruptions to my schedule and work plan: some tasks take me longer than expected (unrealistic preliminary estimation), my availability was reduced (family events, health problems), etc. Therefore, it is wise to not overbook and be sure to leave myself some leeway, to more realistically estimate my work capacities, to allow time for research of missing information and to expect possible changes to my goals or objectives.

ESTABLISHING A REALISTIC AND FLEXIBLE TIME FRAME

Setting a time frame for a given activity does not necessarily mean that I have to confine myself to that tight schedule, but more that I must set a time limit beyond which, I know I am starting to fall behind. Instead of self-imposing a rarely-respected tight schedule where specific tasks are done at fixed times, it is preferable that I plan a flexible schedule that allows me to shift from one task to another depending on my mood and availability. This is a more flexible management tool that respects natural human functioning.

EVALUATING MY ACTUAL AVAILABILITY

It is one thing to estimate the time needed to accomplish each task and it is another, to actually have that time. Health, the realities of my family, part-time work or professional life are such that my availability does not always necessarily coincide with the study time I need to achieve high marks. It will be necessary for me to make decisions regarding the number and choice of courses, priorities and time allocated for each task.

TAKING MY CAPACITY INTO CONSIDERATION

My mind is not a computer. It works well under certain favorable conditions but can become particularly inefficient with fatigue or prolonged periods of stress. I must therefore adjust my planning and management to my motivation at that particular time (taste, availability), my capacity to concentrate (place, time, ambience) and my memory function (recall, revision).

ASSESSING AND READJUSTING MY PROGRESS

Throughout the semester, my predictions are likely to be overthrown due to many factors: family events, learning problems, tasks taking longer than expected, new information concerning an assignment, etc. A readjustment of my use of time becomes necessary. It is best that I reserve a brief period of time at the beginning or end of the week to assess and decide which tasks need to be done in the coming week and to prioritize them in case I cannot complete them all.

KEEPING TRACK OF MY PROGRESS

I must always know exactly where I stand. It is equally important for me to know how my time was used (evaluation of my progress, justification of how my time was used, development of an expertise in time estimation).

FILING MY DOCUMENTS IN A FUNCTIONAL ORDER

The value of any given order is dependent on the goal you wish to attain. The main quality of order must be functionality. In the case of university studies, the order I choose to follow reflects the conception that I have of learning. We can sum up the two poles using two metaphors. The first is strata: I perceive my learning to be a progressive accumulation of knowledge, layer upon layer, course after course. It resembles a binder where documents and notes pile up in the order they were received regardless of their category or utility. The second metaphor is architect: I perceive my learning as a constant personal reconstruction of concepts and subject material. The order I choose will be one that allows for a more logical information mobility and association by sets and subsets.

ENABLING READY ACCESS TO ALL MY DOCUMENTS

A functional order should allow me to have quick and ready access to essential information and filed documents. There is no exemplary filing method: the method should be designed to fit the project. Each university course has very specific requirements. The methods used to file and index handout material should be practical. It is generally more functional to group handout material, memory tools, document sources and work into their own separate folders.

SEPARATELY FILING COURSE MANAGEMENT DOCUMENTS

All of the documents that serve to plan my courses (syllabus, deadlines, schedules, assignment guidelines, evaluation criteria, etc.) should be grouped together and filed separately for easy reference.

Organization, Planning and Management Tools

COMPUTERS

A computer is an organizational tool. Unfortunately it remains almost uniquely used for word processing. While this tool is in the process of changing professions and communication, its under-use in the context of university studies is something to ponder. A computer well-used to store and manage learning content allows me to triple or quadruple my university output, while preparing me for my future professional practice. Therefore, it is not an investment that I should barely consider, but rather, it is an area of personal development in which I should invest the necessary time.

FOLDERS, FILES, FILING CABINETS, ARCHIVE BOXES

In addition to binders and school bags, there are tools that are used to file and efficiently manage my course and work content. A computer has a set and subset filing system (folders, files) that facilitates my information access. It also has a word processing outline view mode that allows me to file course content, lecture notes, bibliographic elements all into the same file and to draft my work and simultaneously develop the structure as a whole and part by part.

I can also adopt, at little cost, an equivalent document classification system that uses sheets of paper classified in files, folders, filing cabinets or archive boxes. A system like this allows for great mobility of handout material.

SYNOPTIC OVERVIEW

A "synoptic" overview is a sheet of paper that gives me an at-a-glance global overview of each of my courses spanning the entire semester (see model in appendix). This tool ensures my long-term panoramic view. It helps me to foresee what's coming up, anticipate bottlenecking problems, give myself some leeway, distribute my efforts overtime, define true emergencies and schedule my study activities at the most opportune times. To preserve this document's legibility, it is best not to overload it with too many details.

CALENDARS

There are also monthly calendars. These calendars can serve the same purpose, but with a shorter time perspective (and the risk of losing sight of the months to come).

AGENDAS

Agendas exist in a variety of formats: electronic, on computer, notebook, etc. It is a short-term management tool. In the case of university studies, it is preferable to opt for weekly agendas instead of daily agendas. Used with a daily list of things to do, agendas allow for a flexible management of my tasks. They have the basic advantage of freeing my memory from small details and lists of things to do, which contributes to stress reduction. Like my shadow, my agenda should always be with me.

SCHEDULES

Schedules are short-term planning tools. They indicate when and how much time I must allocate to each activity. But be careful that they do not become too confining or a source of guilt. Schedules are like New Year's resolutions: once you realize you can not stick to them, you let them fall to the way-side and unfortunately, along with these, go all planning and management intentions as well.

TASK LISTS

Task lists are short and long-term management tools. They can be daily task lists (many small tasks), weekly task lists (with or without a set day for each task) or global task lists (list of projects to complete during the semester with no specific deadlines).

Task inventories, task-by-task, step-by-step enable me to decide from week to week which tasks or parts of tasks I must complete in order to be on time without rushing.

A completed-task file is made up of the collection of these daily and weekly lists. Once the tasks are completed and crossed off the lists, it might be of self-interest to keep them in a separate file. Using these lists, I can easily reconstruct how I used my time. This option offers a variety of advantages: I can justify the time I spent on a task and present it to a professor; realize the time necessary for certain operations; complete an assessment of my semester.

Chapter 8

Learning to Better Use Information

That is a good book which is opened with expectation,
and closed with delight and profit.
Amos Bronson Alcott (1799-1888), American Educator, Social Reformer

Using Information to Service Learning

To search, find, compare, sort, select, interpret, understand and communicate information. My brain processes information: it is bombarded with sensorial data from which it extracts a personal meaning, thanks to knowledge from past experience that is built into my memory, and it responds to the situation as it perceives and understands it according to my personal needs and goals, which are more or less conscious.

The information processing theories seek to explain and model operations that an intelligent system must use in order to understand and appropriately respond to a variety of solicitations from external (situations) and internal (needs) environments. In human beings, these operations are both internal (mental) and exteriorized in the form of behaviors. They work on fundamental psychological processes, including perception, acquisition and memory recall, planning and control of action. While some perception-response patterns are quasi-reflexive (instincts) and automatic (acquired habits), others require conscious thinking efforts (new and complex problematic situations) that automatically turn into learning opportunities.

To be conscious of the mental operations that I complete in order to understand and master learning situations empowers me to assess their efficiency and to modify and refine them. In a nutshell, it enables me to develop a broader and more elaborate repertoire of learning strategies, adjust my own intellectual functioning when in action and improve my performance. Given the volume of subject material covered at university, the high level of performance and efficiency required, my success and pleasure in studying are factors that enhance the wealth of my repertoire of learning methods and techniques and improve my competence to reflectively and strategically adapt them to circumstances and conditions inherent to each course and semester.

Guide to Reflective Thinking: My Use of Information Strategies

Use the following statements to assess your use of information strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I explore sources of information in a methodical manner		
• I know all of the places where I can find documentation relevant to my courses: libraries, documentation centers, archives, etc.	❑	❑
• I know how to operate Manitou and how to find useful references.	❑	❑
• I know how to access publications directly, or on the Internet.	❑	❑
• I take indispensable notes: bibliographical references, interesting web-site addresses, tables of contents, abstracts, lists of key word descriptors, etc.	❑	❑
• I have a well thought-out and functional information classification system.	❑	❑
• When the semester starts, I explore pertinent and available resources for each one of my courses: catalogues, periodicals, manuals, specialized dictionaries, encyclopedias, Internet sites, etc.	❑	❑
• I continually look for the most up-to-date documentation on a given subject.	❑	❑
• I continually look for leading and recognized authors in the field concerned.	❑	❑
• I continually verify the validity and reliability of my resource material.	❑	❑
I plan my readings		
• I choose a place, time of day and ambience conducive to efficient reading.	❑	❑
• Before I start reading, I clearly establish my reading purpose.	❑	❑
• Before I start reading, I do a preview of the text.	❑	❑
• I identify text sections by using titles and other text organization cues.	❑	❑
• I think about the reading method that best suits my purpose: skimming, thorough reading, simultaneous note taking, etc.	❑	❑
• I plan my reading time and determine my breaks based on the text sections.	❑	❑
I read methodically		
• I read actively, having a pencil and paper handy for note taking.	❑	❑
• I highlight significant elements of information: I underline, outline, use asterisks in the margins, etc.	❑	❑
• I know and use a variety of note taking techniques.	❑	❑
• I summarize essential ideas as I read them.	❑	❑
• I write reading summaries on a regular basis.	❑	❑
• I transfer essential information to my computer as soon as I can.	❑	❑
• I create summary sheets containing information that is essential for me to keep.	❑	❑

	Seldom	Often
I look for meaning in my study content and carefully interpret it		
• When I study new material, I start by identifying what I already know.	❑	❑
• Then I focus on aspects that are new to me.	❑	❑
• I identify key notions and check my understanding of important concepts.	❑	❑
• I try to establish links between concepts and real-life or concrete situations.	❑	❑
• I visualize the practical implications and applications of the study material.	❑	❑
• I take more than one thing into consideration at a time.	❑	❑
• I try to catch the coherence and internal logic of the topic.	❑	❑
• I notice gaps and discrepancies.	❑	❑
I compare similarities and differences		
• When relevant, I compare similar concepts, theories and problems in order to better differentiate them.	❑	❑
• When relevant, I bring together different concepts, theories, and problems in order to understand their commonalities.	❑	❑
• I compare the similarities and differences of the view points of leading authors specializing in a given field in order to clearly understand their respective streams of thought.	❑	❑
I identify the structure of a document (subsets, sections, parts)		
• As soon as a course begins, I situate it within the discipline and within the sum of all my training.	❑	❑
• As soon as a course begins, I identify the major sections of the domain and main topics covered.	❑	❑
• When I study a text, I start by identifying the parts, sections and links between ideas.	❑	❑
• When I study a text, I identify the guiding idea, main ideas and secondary ideas.	❑	❑
• When I study a text, I differentiate statements of ideas from statements of fact, arguments, reasoning and examples used to defend and illustrate the ideas.	❑	❑
• When I take notes in class, I use a code system to differentiate main and secondary ideas from facts, arguments, reasoning and examples used to defend and illustrate the ideas.	❑	❑

	Seldom	Often
I classify information in sets and subsets		
• I sort and differently classify the instruction material from each course (syllabus, deadlines, assignment guidelines) my course notes, handout material, assignments, documentary tools (bibliographies, periodicals, key word descriptors) and my learning tools (reading notes, summary sheets, flash cards and mnemonics).	❑	❑
• When I study a topic, I group together the main problems, ideas and concepts and classify them, according to their order of importance, in summary sheet format.	❑	❑
• When I finish studying, I group and classify my reading notes and handout material into sets and subsets.	❑	❑
• During my revisions, I organize all of my study material into summary sheet or learning card format (notes mapping, flash cards, resumes, tables, etc.).	❑	❑
I pay particular attention to assignment guidelines and test questions		
• I take time to clearly understand the meaning of each question and instruction before I start working.	❑	❑
• I underline important words and think about their implications.	❑	❑
• During exams, before I start writing I double-check the questions and instructions to make sure that I have not missed any important information.	❑	❑

Chapter 8

Learning to Better Use Information

Wisdom and understanding can only become the possession of individuals by traveling the old road of observation, attention, perseverance, and industry.
Samuel Smiles (1812-1904), Scottish Author.

I Methodically Explore Sources of Information

Quality learning relies first and foremost on accurate and detailed information. Reasoning with incomplete data results in misinterpretation and faulty knowledge. Methodical exploration consists of systematically collecting data. In university, this strategy applies mainly to library research, Internet research, reading and note taking. It consists of reflecting upon the most appropriate method for gathering information necessary to building my knowledge in the specific contexts of each course: written assignments, research, complementary reading, exam preparation, etc.

BENEFICIAL ATTITUDES

Curiosity, critical thinking, tolerance of uncertainty, questioning preconceived ideas, attraction to the unknown, taste for risk, sense of humor, perseverance and self-confidence are the attitudes that will benefit my discovery of meaning and learning.

METHODICAL EXPLORATION, STRESS AND IMPULSIVITY

In emergency situations or when important matters are at stake, acute stress prompts me to explore impulsively. This impulsivity has noxious effects on my information perception and retention, by my omission of important data or by my faulty memorization. The ingrained habit of properly planning and systematically conducting my exploration activities is the best antidote of all.

METHODICAL EXPLORATION AND CONCENTRATION

Precise and comprehensive exploration requires that I be vigilant in my quick detection of omissions, mistakes or lack of precision. In methodically reading a text, for example, I will be careful to not skip over important information, to detect and resolve ambiguities in language, to determine the nuances and subtleties in the author's ideas and to evaluate my degree of understanding.

METHODICAL EXPLORATION, ORGANIZATION AND MEMORIZATION

To learn is to retain and retain in such a way that I can apply what I learn when the occasion arises. Here again, the quality of my exploration method benefits not only the recording, but also the long-term retention and retrieval of my knowledge.

Some advantages inherent to the methodical exploration of information sources:

- **Obtaining precise, complete and valid information on a topic.**
- **Assuring myself that no essential information has escaped my investigation.**

Learning to Better Use Information

I am Precise, Complete and I Select the Essential

THE PARADOX OF BEING PRECISE AND COMPLETE, YET SELECTIVE

To be precise and complete is to perceive all and in detail. To select is to choose. The quality of selection depends on the precision and exhaustivity of the data exploration. By pre-determining the level of precision and exhaustivity required, I am more able to select pertinent information. The time I spend on this reflection will be largely regained later on in the treatment of the information. For example, in taking the time to clarify my reading purpose, I know in advance what I am looking for. I concentrate my efforts and reading time, my understanding and memorization of the parts of the text that are important for attaining my objectives. This can only improve my performance: reduced effort, saved time, better understanding and retention.

OBSERVING IN A PRECISE AND COMPLETE WAY

Within the framework of university-level studies, precise and complete reading refers to seizing the author's nuances, subtleties and thoughts, following their reasoning and examining the value of their arguments. Within the framework of documentary research, it is assuring me that I have all information and that the information is sufficient and precise before starting to select the most pertinent to my project. Within the framework of a professional intervention, it is finding the most complete and precise information possible before interpreting and diagnosing a client's case. Within the framework of writing exams, the understanding of what answer is expected calls for precision and exhaustivity in my observations of the statements and listening to the instructions.

SELECTING IMPORTANT INFORMATION

Selecting pertinent information involves keeping some and rejecting other. For example, bold characters, italics, underlining or framing certain words and sentences in an educational manual serves to attract the reader's attention and to give an indication of importance that the author accorded to these elements. It is one form of selection by hierarchization. But all good texts are also texts in which superfluous information and useless digressions have been purged and the level of precision and detail has been selected according to the public for which the text was destined. It is a form of selection by elimination.

PRECISE AND COMPLETE OBSERVATION AND UNDERSTANDING

Precise and complete observation of available information is a necessary condition (but not sufficient) to understanding. The more my observation is erratic, vague and partial, the greater the risk of my misinterpretation and misunderstanding. My brain dislikes vague messages and its capacities for imagination will fill in the gaps. This remarkable property is both an asset (creativity) and weakness (perceptive illusions, interpretation errors and hallucinations).

SELECTION AND SELECTIVE ATTENTION

Selective attention facilitates understanding by reducing the volume of information that my working memory has to simultaneously process. This selection can be definitive or temporary. For example, when a study text is complex, rich in new information and difficult to understand, I can start by grasping the main ideas, concentrating on one part at a time, and pulling out the essential in the form of a succinct resume. Then, I progressively continue through the text in successive stages and finally return to the text as a whole to better integrate and assimilate all parts.

INFORMATION SELECTION AND MEMORIZATION

Reducing the information to memorize to keywords in a written format (resumes, flash cards) or visual format (schemas, cognitive maps, diagrams, tables), significantly facilitates my interiorization work and retrieval of information stored in my memory long-term. By reducing the volume and arranging it into a network of keywords, I increase my capacity to retrieve this information when in out-of-school situations: problem-solving, professional applications, cultural heritage, etc.

Some advantages inherent to processing data in a precise, complete and selective way:

- **Avoiding my coming back to the same information several times.**
- **Ensuring that no important detail has been omitted.**
- **Ensuring my proper understanding.**
- **Avoiding errors of interpretation.**
- **Facilitating the memorization of important information.**

Chapter 8

Learning to Better Use Information

I Compare Similarities and Differences

This strategy allows for drawing out much more information by observing things comparatively, rather than observing them separately, even in a precise and complete way. Within the framework of university studies, the comparison of similarities and differences between concepts, theories and authors is particularly pertinent, given that the advances in scientific fields are largely attributed to this comparison of ideas.

COMPARISON AND SELECTION OF PERTINENT INFORMATION

A methodical comparison consists of comparing several realities, concepts, authors, theories, approaches, solutions, etc., on the basis of carefully selected relevant criteria. The concept of intelligence, for instance, has given rise to a multitude of opposite, complementary or unrelated statements. A comparative table of the most characteristic positions and representative authors help to give me a better idea of the richness and complexity of a particular concept.

COMPARISON AND PERCEPTION OF SETS AND SUBSETS

An efficient comparison is done part by part, element by element. It is supported by a preliminary analysis of the components of the subject being studied.

8

Some advantages inherent to comparing differences and similarities:

- **Avoiding confusion between notions that appear similar.**
- **Avoiding confusion of closely related formulas (statistics, accounting, etc.).**
- **Having a better perception of the commonalities of different notions.**
- **Facilitating classification work using sets and subsets.**

Chapter 8

Learning to Better Use Information

You can't see the wood for the forest.
English Proverb

I Perceive and Classify Information by Sets and Subsets

An object, even a simple one, is made up of a set of simple components and elements, some of which are concrete and others are abstract. A tennis ball, for instance, displays a set of perceptual features (matter, shape, texture, color, and dimension), physical properties (elasticity, resistance, bounce), variety of uses (tennis, squash, massage) and ethnological characteristics (history, user, manufacturer). Most of these characteristics can be broken down into simpler elements (for example, the typical user's age, sex, socio-economic environment, nationality and personality characteristic). The analysis of any manufactured object, even familiar and banal objects, reveals a multitude of things about the culture and technology of the civilization that produced it.

Beneath the diversity and disorder of appearances, lies organization. In professional life, for example scientific research, the analysis of the underlying workings of organization is indispensable to the deep understanding of objects, phenomena and systems. The analysis of the diverse components allows for the discovery of all elements that make up the object being studied, through the identification of their relationships, detection of the flaws and planning of corrective measures.

COURSES ARE ORGANIZED LIKE A SET OF BOXES USED TO CLASSIFY KNOWLEDGE AND IDEAS

Each university discipline is like systematized research in the understanding of a facet of physical and human reality. Each discipline is made up of a multitude of fields and sub-fields and each field of study is broken down into various streams of thought, points of view, theories and practical applications and each point of view often has its own concepts. Each course is also divided into large sections, which are in-turn divided into parts and themes. To have a global overview of my discipline and the material of which it is composed, as well as the role that each course plays within the discipline, helps me to make sense of my learning. The perception of the different sections, parts, orientations, themes or problems within a course, facilitates my perception of the relationships that exist between them. It also facilitates my understanding of the whole. Finally, the perception of the role played by each concept and theory within each larger part of the course facilitates my selection and my hierarchization of information and especially, facilitates my memorization.

PERCEPTION OF SETS AND SUBSETS AND METHODICAL OBSERVATION

My perception of the various components of an object, phenomenon, subject material, problem and text must rely on a complete and precise observation of all available information. Their grouping and classification by sets and subsets must in turn rely on the analysis of their relationships, comparison of their relative significance and the selection of the most significant. The more complex a phenomenon is that I am studying, the more systematic and methodical my observation must be.

SET AND SUBSET CLASSIFICATION AND INFORMATION SELECTION

This strategy consists of sorting selected information into sets and subsets, according to an order and classification system that facilitates their understanding and use. The reflective effort I exercise in order to find the best way to sort this information according to my purpose generally helps me to build my knowledge.

All knowledge does not have the same value. All course material is made up of some fundamental and some secondary problems, theories and concepts. These essential components are "drowned" (in the eye of the novice, at least) in a flood of explanations, facts, illustrations and critical considerations. Therefore, it is in my interest to decipher the message and separate the essential elements before reorganizing and classifying them.

8

Some advantages inherent to perceiving and classifying my information in sets and subsets:

- **Feeling less confused by the overwhelming volume of incoming data.**
- **Facilitating my understanding of what I observe, read and learn.**
- **More easily acquiring and better retaining important information.**
- **Retrieving the information I need, more quickly.**

Learning to Better Use Information

Do not judge from mere appearances; for the lift laughter that bubbles on the lip often mantles over the depths of sadness, and the serious look may be the sober veil that covers a divine peace and joy. The bosom can ache beneath diamond brooches; and many a blithe heart dances under coarse wool.
Edwin Hubbel Chapin (1814 – 1880)

I Look for Links between Information and I Interpret Them with Care

THE SEARCH FOR LINKS, UNDERSTANDING AND ANTICIPATION

Understanding a new situation or solving a problem, is like a puzzle. The more complex they get, the more methodically I need to proceed. The resolution depends on my perspicacity. It is a matter of attitudes and strategies: methodical observation, questioning, searching for links, hypotheses, verification.

While in daily life I have learned to muddle through in relatively familiar and recurrent situations, university studies and professional life frequently presents new and complex problems. The search for and perception of visible and virtual links, real and potential, as well as the detection of missing elements of information are indispensable conditions to a nearly correct interpretation.

INTERPRETING

Interpreting consists of deriving a meaning from a set of incongruous information. I do this quite naturally. But an accurate interpretation is essential to producing suitable answers. Errors in interpretation can be the source of important setbacks. Interpreting an event always includes a certain level of uncertainty. This mental operation involves past knowledge, beliefs and logical and pragmatic inferences. Therefore, there are many potential sources of error: error in reasoning, insufficient knowledge, erroneous preconceptions or false beliefs. To these sources of error we can add incomplete observation and initial imprecise data.

When I realize that I do not understand something, I either give up or take on the challenge and continue my search. If, for example, while I'm reading, I lose the meaning of what I have read, I will use one or more strategies to reestablish my understanding: I continue reading in the hope that the next lines will clarify things for me, I go back and try to find the exact meaning of a concept or sentence, I reinterpret an ambiguous passage, I ask for help, etc.

Advantages inherent to looking for links between information and interpreting them with care:

- **Facilitating my understanding of the situation.**
- **Giving meaning to what, at first glance, seems meaningless.**
- **Avoiding misinterpretations and misunderstandings.**

It is more when I think that I understand, but in reality I do not, that thing get tough. We have a natural tendency to jump to conclusions, often too quickly and to our disadvantage. Judging from appearances, settling for the first explanation available, limiting ourselves to one aspect of a situation, exaggerating certain parts to the detriment of others, giving a relation of cause and effect to that which is coincidental are all very common interpretation errors. They are sources of serious perceptual distortion and misunderstanding.

That is why it is preferable that I be wary of spontaneous interpretations, challenge appearances, remain vigilant, maintain my critical thinking and take the necessary step back. I am particularly vulnerable to perceptual distortion in situations where I have a deep emotional involvement. I must never lose sight of the fact that my perception is likely to be biased by my beliefs, prejudices, values, expectations, memories and personal motives. Without my knowing, these factors often affect the way I interpret situations, phenomena, events and individuals.

Applications to University Studies

Applications to Documentary Research

Documentary research is often the starting point of assignments. I must be vigilant while I conduct my research to prevent my missing the most valuable sources of information about my topic. By methodically exploring bibliographical repertoires, periodical indexes and databases, I am guaranteed of sufficiently complete and precise information. In my first year of university I should invest in the creation of a list of documentary tools that best corresponds with my orientation: a list of key word ***descriptors*** that are frequently used in my field of interest, a list of the main ***reviews*** and ***periodicals***, a list of principle ***authors*** with reference to their most notable publications, as well as references to specialized ***dictionaries*** and ***encyclopedias***. Knowing that these documentary tools will be useful to me not only for my studies, but equally later in my professional life, it is worth investing the time now and important that I conserve this bank of tools so that it is both long lasting and expandable. By entering this data into my computer, I will be able to keep and modify it at will. This will also allow me to save a great deal of time in the composition of bibliographies for later assignments.

Applications to Course Note Taking

Taking course notes serves many purposes. For courses that are unpublished innovations with no handouts available, my notes are indispensable to my learning. In courses where there already is a textbook and numerous references, note taking completes these references with complementary explanations, examples and clarifications. Note taking also helps me to stay focused on the material during class. Note taking techniques are diverse, but the underlying strategic principles are the same.

Taking precise and complete notes: lectures provide me with information, knowledge, explanations and examples that complement my text-reading and study. They also give an indication of what teachers find important (after all, teachers do define evaluation criteria). Consequently, it is in my best interest to take notes that are as precise and complete as possible.

Restricting note taking to keywords: to increase the efficiency of my notes and at the same time prevent wrist fatigue, it is not necessary or desirable to write, what is being said, word for word. I simply need to use keywords that I can understand when I read my notes.

Using a uniform note taking system: my use of a predetermined note taking system allows me to take more and better notes while concentrating on the importance and role of each word, rather than concentrating on writing word for word. I can, for example, bring out a new concept, theoretical statement, hypothesis, opinion, argument, demonstration, example or fact using notes in the margins, codes, symbols or color. I save time, and writing fewer pages makes essential content more visible. The part of my attention required for writing decreases and my listening attention increases.

Applications to Reading

It is easy to be swamped by information, articles and publications. Therefore, it is in my best interest to develop efficient reading strategies.

Choosing a reading strategy adapted to my purpose: previewing the text allows me to quickly define the difficulty, complexity, richness and interest of a text. Depending on whether I need to read the text for a course, exam preparation, or to write an assignment, my reading method, number of passages to read attentively and the volume of information to retain may vary substantially. It is recommended to first read the introduction (to learn the author's intent), then read the conclusion (where I generally find what the author considers as essential in his text), before starting my thorough read. Depending on the structure of the text, it is not always necessary to start from the beginning. I can, for example, start with the parts that I find easy or more interesting.

Previewing strategy: the goal of this strategy is to select the passages to read thoroughly and the order in which to read them. This strategy consists of examining a very limited quantity of information about an article, chapter or complete book. If my purpose is to evaluate the pertinence of a text in preparation for an essay or presentation, previewing will allow me to identify the nature of the text (popularization, thesis, introductory, specific research, recension, meta-analysis, brief, etc.) and determine which parts deal with my topic and how (orientation). The previewing strategy consists of identifying the author, date of publication, table of contents (book) or abstract (article), orientation (introduction and conclusion). This strategy helps me to quickly decide which texts to read thoroughly and which to skip. It also allows me to decide which text I should read first. Most scientific fields regularly publish books that summarize a domain and do a synthesis of the most recent research initiatives, discuss problem issues and bring out gray zones. The publication date is therefore important. Furthermore, each field of research is influenced by several recognized authors, who are important to identify so that my study can be supported by the works of authors who are considered as authorities in their field. By starting my study of a subject with works that are more general, synthesizing and recent, I will more quickly have an overall view of my subject,

which will allow me to more quickly define it and narrow down my later readings to those that thoroughly cover the research aspects that most interest me. At the very beginning of a semester, previewing the structure and content of my textbooks (if any) gives me an overall picture of the material to study. Browsing through the table of contents, chapter and section titles, subtitles and various tables or illustrations, facilitates my reading planning, organization of my note taking and the conception of efficient memory tools.

Breaking down the text for better analysis: a text is an organized whole. In order to understand it well, I must disassemble it, component by component. Each part, each paragraph, each sentence has a specific function and role. I can begin the study of the text by finding the links, starting with titles and subtitles, headings and subheadings, finding relationships between and within paragraphs, structure markers (firstly, first of all, then, etc.) and relationship markers (on the contrary, furthermore, in addition, however, etc.). These markers indicate links between ideas, facts, and arguments and underline nuances. Therefore, I must pay close attention to these words if I want to ensure my precise and exact understanding of what is stated.

Several techniques facilitate text analysis: ***annotations in the margins*** of structure markers (numbers, arrows) facilitate my perception of the text structure. The ***titling of paragraphs*** emphasizes the main idea of each paragraph, helps me to follow the flow of the text and summarize lengthy blocks of text without having to re-read them.

Selecting keywords and statements to retain: the goal of word and statement selection is to reduce the information that corresponds with my reading purpose, to a minimum. A frequent error is to underline as we read a text for the first time. It is absurd to select words or sentences before having a sufficient global understanding of the paragraph and the section into which the paragraph fits.

Several selection techniques serve to draw the reader's attention to important key points only: main notions and statements. Their function is to prepare and orient my second read to these pertinent points, thus a gain in efficiency.

A well known but often over or misused technique is ***underlining*** words or text passages. This technique is useful only to the extent that it draws my attention to a limited volume of essential information that is necessary to understanding the text and pertinent to my personal project. I should restrict the use of this technique (for example, 10% to 15% of the text) in order to abridge the time for re-reading and to reduce the required memory effort. If the words or passages I select are key elements, they will be enough for me to reconstruct the meaning of the text. But if I underline too many words or passages (50% of the text and more), the technique loses its interest. I may as well re-read the whole text again.

Which information is preferable to emphasize? Fundamental ***concepts*** inherent to the domain (one word), the statement of the ***main idea*** in each paragraph (one sentence or sentence part), a ***theoretical statement***, a fact, formula or important numerical information, the names of leading ***authors***, etc. The text's guiding idea, the author's resume and conclusion are other key passages that I should eventually frame in order to stress their specific function within the text as a whole.

Developing my own reading notes: Tthis strategy consists of solely extracting the text elements that I will require for such things as writing an essay, doing a summary, preparing a presentation or studying for an exam. Writing reading-notes has the advantage of condensing important information into a practical and compact format. This transfer operation also has the advantage of adding a complementary information-processing practice. Writing, in itself, forces me to further reflect upon my understanding (in-depth thinking) and my objective.

These notes should be complete enough so that I can avoid having to return to the original text, unless I need to return to validate specific points. They take time to write but in the long run, allow me to save time when it comes to writing my assignments and preparing for exams. Depending on the needs, these notes can take a variety of forms: the summary of one text or several, quotations, text structure, list of concepts and their definitions, theoretical statements, copy of a model, schema or table. A practical note taking technique is summary sheets: summary sheets are visually coherent recto only, single sheets of well spaced information. For maximum efficiency and flexibility, summary sheets must be mobile (I can photocopy them, move them or file them in another folder as needed) and they should be titled (I can see the content and reference at a glance).

A computer is a remarkable tool for note taking and notes management, as it stores all information in one place in a very succinct and rapidly accessible format. Computers enable me to save time on rewriting and allow me to enrich and modify my notes at any time.

Elaborating comparison tables: methodical comparison helps differentiate data that appears similar thus minimizing potential confusion and group's data that has common points. The

comparison of theoretical positions, element-by-element, helps me to shed light on specific points where these positions diverge. Setting up comparative tables proves to be an excellent method for visualizing similarities and differences between concepts, theories, formulas, etc. It makes data encoding and memory retrieval in the long-term much easier than a separate study of each element.

Applications to Exam Preparation and Writing

Creating summary sheets and mnemonics represents a very powerful means for the memorization of a given subject matter. This material helps me to review for subsequent exams because it covers a reduced volume of the most essential information, which is structured in such a way that my recall of the material is made easier, particularly in cases of stressful situations, such as writing exams.

All exams, regardless of the discipline, are made up of statements: instructions, essay questions, multiple choice questions, comments, statements of problems, case studies, etc. It is in my best interests to take the time required to carefully and methodically read them before I start to answer them. This single resolution has a tranquillizing effect on me and reduces my tendency towards impulsivity. I can immediately start to draft the elements of my response that spring to mind. The time spent on this attentive reading is often time saved in the long run, in that I avoid errors of statement interpretation and I strictly stick to what is asked of me.

The writing procedure for essay exams is the same as that for term assignments, except that it spans a much shorter period of time and is more demanding on my memory. There are typical response plans that exist for the type of question asked. They can be found in the multitudes of works that discuss communication. With this type of plan in mind, I can easily draft the major points of my essay, anticipate the necessary content development and quickly move to writing my answer, once these main ideas and links have been sketched out.

Chapter 9

Learning to Communicate my Ideas Better

Whate'er is well conceived is clearly said, And the words to say it flow with ease.
Nicolas Boileau-Despreaux (1636 – 1711), The Art of Poetry (1674), canto1, 1.153
The pen is the tongue of the mind. Miguel de Cervantes Saavedra (1547–1616); Don Quixote. Part ii. Chap. xvi.
It takes less time to do a thing right than to explain why you did it wrong.
Henry Wadsworth Longfellow

Written and Oral Communication in University

In university, written work (reading summaries, observation reports, lab reports, essays, essay questions) is fundamental to the construction and verification of knowledge. Students who know how to present their ideas clearly and guide the reader's attention to the main points of their topic have a great advantage. In professional life, all responsible job positions come with requirements related to formulating and communicating ideas. In particular, education-related professions are very demanding in all that relates to the quality of explanations.

My level of precision, exhaustivity and concision must take into account the party to whom my message is being addressed. I would not formulate a message in the same way if I were addressing an evaluator, a colleague, a superior, students, the general public or a small group. My verbal presentation must respect rules that are different from those that apply to writing. It is therefore essential, to ensure a proper level of precision and selection, that I understand the expectations of my audience and that I take into consideration what they know and do not know. In general, it is better to adopt a direct style: to express my ideas and position on the subject and to avoid detours and digressions, whenever possible. It is also better if I avoid complicated formulations and run-on sentences.

Some advantages inherent to being strategic in my communication:

- **Producing answers that satisfy the demander's requirements.**
- **Producing clear, complete and non-superfluous answers.**
- **Communicating in a precise, organized and coherent manner.**
- **Facilitating my audience's understanding.**

Guide to Reflective Thinking: My Communication Strategies

Use the following statements to assess your communication strategies. Any weak areas indicate an attitude, ability or habit that may be worth developing.

	Seldom	Often
I have a clear vision of what I want to communicate and why		
• I only intervene when I have a clear understanding of what I want to say.	❑	❑
• I will not ask a question before I figure out precisely what I want to know.	❑	❑
• I start writing a text only when my audience, purpose and ideas are clear and precise.	❑	❑
• I differentiate the various forms of written communication (essay, report, memo, letter, dissertation, etc.) and know when and why to use each.	❑	❑
• I am familiar with various writing formats (descriptive, dialectic, argumentative, comparative, etc.) and I choose the one that best corresponds with my purpose.	❑	❑
I take my audience's expectations into account		
• I adapt my words and images to my audience.	❑	❑
• I formulate my explanations according to my audience: I take their knowledge, vocabulary and expectations into consideration.	❑	❑
• I take time to clarify my teacher's expectations concerning the development and formatting of my assignments.	❑	❑
• I seek information about the performance criteria for an assignment.	❑	❑
• I ask for clarification of an exam question, when needed.	❑	❑
• I am attentive to any audience signs of misunderstanding, impatience and disagreement.	❑	❑
I am complete, precise and exact		
• I ensure the exactitude and exhaustivity of any facts that I report.	❑	❑
• I ensure that essential elements have not been omitted.	❑	❑
• I ensure having the level of precision required for the goal that has been set.	❑	❑
I carefully select the elements of my communication		
• I go straight to the point: I eliminate useless or redundant information, cut out jumbled ideas and avoid complicated detours and digressions.	❑	❑
• I am coherent in my arguments.	❑	❑
• I use convincing arguments to win over my audience.	❑	❑
• I base my arguments on facts and logical reasoning.	❑	❑

	Seldom	Often
I structure my communication using sets and subsets		
• I note my ideas as they come and classify them, as soon as possible, according to their importance and probable order.	❑	❑
• When I write a text, I start with determining my guiding idea, main ideas, secondary ideas and I classify the facts, my arguments, reasoning, examples and opinions based on each idea.	❑	❑
• I establish the order of my ideas and arguments before speaking or writing.	❑	❑
• When I write, I clearly define the different parts of my text: paragraphs, titles, subtitles, structure markers, etc.	❑	❑
• When I prepare a class presentation, I indicate all of my objectives and my plan and underline the transition from one idea to another, from one part to another, so that my audience can easily follow me.	❑	❑
• I often rely on tables, schemas, figures and other succinct and visual means to present information.	❑	❑
I do a quality check of my work before I submit it		
• I know the difference between borrowing and plagiarism.	❑	❑
• I make sure that my purpose corresponds to assignment requirements before and while working on it (I answer the question asked, I remain on topic, I meet all requirements).	❑	❑
• I make sure that my answers are complete and sufficiently precise and that all information and necessary explanations of my view point are included.	❑	❑
• I check my work for any mistakes or flaws, once it is finished.	❑	❑
• I do not hesitate to have a competent and neutral individual check my work.	❑	❑
• I am careful about the presentation of my work: formatting, graphic design, spelling, syntax.	❑	❑
• I systematically refer to my grammar and dictionary to check for syntax, spelling mistakes and word definitions.	❑	❑
• I am familiar with and use a university-level writing guide.	❑	❑
• I do not hesitate to seek assistance from the specialized linguistic services offered by the university.	❑	❑

Communication Strategies

I take my audience's expectations into account: the clearer my audience's expectations are, the better my communication is. I put myself in their shoes, I understand their point of view, I know their frame of reference. These are crucial conditions of quality communication. When I know the details of the performance criteria for an assignment, it is easier for me to verify if I fully meet these criteria and, if necessary, make adjustments. On a professional level, when my assigned mandates are clear and the performance criteria are known, it is easier for me to adjust my course of action, or in the worst case scenario, be able to justify why the criteria have not all been met. In university, it is the teacher who is the recipient of my final work: trying to explain to him that I know what I mean is not the most convincing argument for the quality of my assignment.

I structure my communication with sets and subsets: the best ideas never come spontaneously. Neither does their wording. I generally have an overall idea of what I wish to express. Where it starts to fall apart is when I have to go from this general vision to the sentence by sentence writing of the text. The feeling of initial chaos is a normal condition of explanatory and scientific writing. In the same way as doing a puzzle, we start with the corners, then the borders and the easily identifiable pieces, we can elaborate our communication by first freeing up all of the ideas that we wish to express (the pieces of a puzzle), then classifying them into categories and subcategories (guiding idea and main and secondary ideas), next developing each of these ideas (statements of ideas, facts, arguments, examples, opinions, etc.), following this, linking one to the other with the most appropriate connectors (transitions) and finally, writing the introduction and the conclusion.

Word processing using a computer has an indisputable advantage over other writing instruments. Using the outline view mode, I constitute and evolve my ideas and plan at the same time that I collect the information that will feed my final work. It facilitates the simultaneity of two writing processes that are generally difficult to conciliate: expressing ideas as they spontaneously emerge and organizing them within a progressive plan. It certainly avoids my painfully rewriting by hand. Its memory capacity also allows me to construct and manage a veritable personal bank of data and information on the subjects that are close to my heart. Also, all previous work can be retrieved, enriched, developed and integrated, semester after semester, around the central themes that are the core reasons for my studies and centers of my professional interest.

I am complete, precise and exact: precision and exactitude are two important qualities of good communication. But the precision and exactitude of my communication are directly related to the precision with which I have defined my purpose and the precision and exactitude with which I have collected my information. When I write an exam, for instance, the evaluator expects to find concepts and theoretical elements that relate to the test question and that were included, explained and discussed in class. My choice of vocabulary and explanations should reflect the learning of these notions and their correct use.

I select the elements of my communication: quality communication should include all of the elements required, and only the elements required. Saying too much or too little results in answering only part of the question or, veering off track. Work that only answers part of the question, that treats only part of the subject, or on the contrary, work that is in excess of the request, reveals my incomprehension of the problem, my forgetting the original instructions in the midst of my work, my incomplete research of pertinent information, or my insufficient selection of pertinent information to the subject. Questioning the pertinence is in part the solution, in that this questioning guides me to confront each idea or piece of information with the initial statement of the problem and intended goal. Language that is direct and simple yet precise and complete is the desired qualities of scientific writing. These qualities are eminently appreciated in team work situations and during professional meetings.

I control the quality of my work before submitting it: the best way of ensuring the quality of my work, is to frequently verify it while it is in progress and then, once completed. This involves regular re-reading of the initial instructions in order to verify if I am on the right track, verify the quality of my ideas while I work on them (organization, pertinence, correctness, precision) and the final proofreading. The verification of my progress is an essential habit to develop. It requires little time, once acquired and automatic.

Finally, a quality of work aspect not to neglect: the presentation. After the content, comes the packaging. We are all sensitive to the presentation of a product, independent of the intrinsic qualities. A well presented product creates favorable first impressions. A well printed and formatted text, with titles, leaves an impression of order and care that would not be the case with a pencil-written manuscript that has no margins or titles, is full of crossed-out words, traces of erased text and stains of unknown origin, on paper torn from an exercise book and held together by ripped and folded corners. In the professional world, no report like this would be accepted. Right from my first year of university, I must develop the habit of paying close attention to all of these details, big and small. It is not only a question of respect for my audience, but also my own self-respect and not to mention, the importance I accord to my projects.

Applications to University Studies

TERM ASSIGNMENTS

The art of extracting the essential from texts and lectures combined with an efficient classification system for these notes is the basis for a rich and quality written product. I can group my reading summaries (important ideas, quotations, bibliographical references, brief resumes, facts, graphs) together in sets and subsets until they form the skeleton of a logical and satisfactory plan. With a computer, the word processing outline view mode allows me to integrate all pertinent information directly into my writing plan. Thus, the structure of my plan evolves as ideas come and new information is integrated.

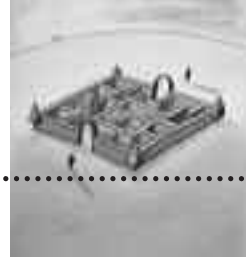
CLASS PRESENTATIONS

Preparing a class presentation calls for roughly the same method as written work. The difference lies in the mode of presentation. The listener must be able to understand the structure of my presentation while they are listening to my arguments. Therefore, it is necessary that I make my purpose and plan clear from the start and that I emphasize the links between the various parts of my presentation by regularly recalling which part I am in.

WRITING EXAMS

An individual who chooses to answer an essay question and assess the content of their answer uses a certain amount of objective and subjective criteria in order to judge their quality. Generally, these criteria are explicit, although some may be implicit. In these cases, my knowledge of university culture and good perception of the teacher's expectations serves to guide me in the elaboration of my answers.

During essay-question exams, my ideas do not necessarily come to me in the best order of statement. This is the reason why it is better that I divide my response composition work into three distinct steps. First, in an abridged form, I jot down my ideas as they spontaneously come to mind, as well as all information that I can easily remember. Secondly, I fill in the blanks, I sort and organize my ideas and I put together a response plan (still in abridged form). And finally, I start writing my answer in its final format, taking the time to verify and check for any omissions or English mistakes (at least making as few as possible) before I submit my work. This way of doing things has the advantage of not being contrary to the natural movement of my memory, as is often the case when we want to jump right into doing the final copy. This also allows for my quick assurance of what I know and diminishes my level of stress.



Improving my Problem-solving Skills

The pessimist sees difficulty in every opportunity. The optimist sees the opportunity in every difficulty.
Winston Churchill (1874 - 1965), United Kingdom Statesman

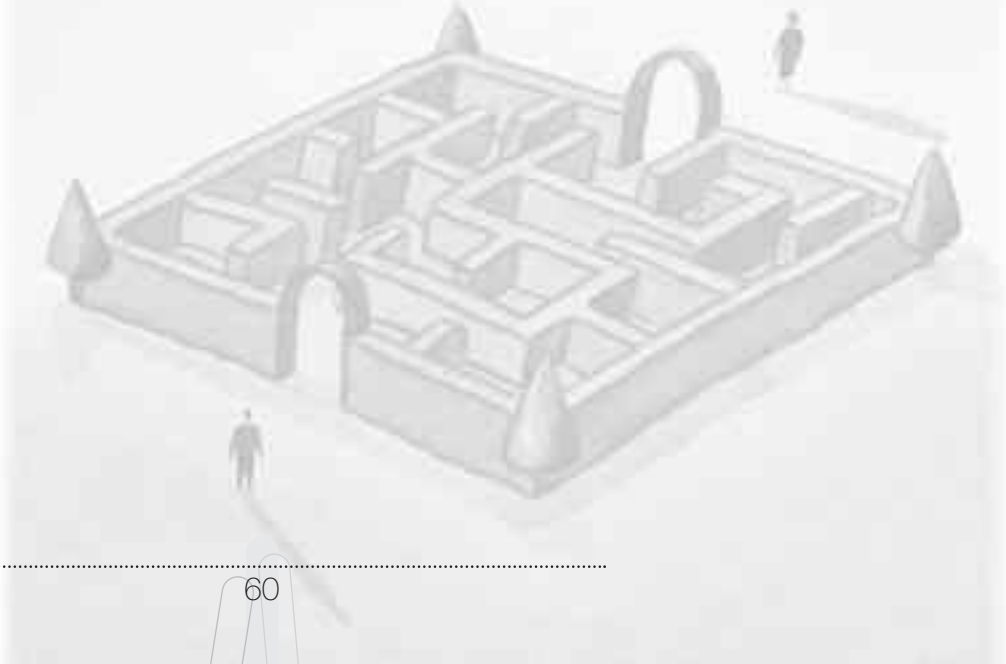
Learning Through Problem-solving

Solving problems of minor complexity is like walking through a maze: certain paths lead to dead-ends. I have no choice but to retrace my steps and try another path. If I am not attentive or methodical, the risk of my getting lost is great. In order to solve a problem with style, as emerging from a maze safely, a solid knowledge base related to the problem field is a necessary but not sufficient condition. I must also have a good repertoire of strategies and reflect upon which would be the best for this particular case. In addition to high-level field specific strategies, I must also rely on a group of more fundamental strategies:

- Observing problem-related data attentively and methodically.
- Noting, comparing, sorting and remembering all pertinent data.
- Methodically exploring options and verifying solution hypotheses.
- Drawing a mental map of my path so that I always know where I am.
- Comparing solution options to make sure I choose the best possible.

However, I am made up of more than just reasoning. When I am confronted with a significant new and complex problem, I react both affectively and intellectually. The frustration, fear of the unknown, intolerance of uncertainty, eagerness to solve what is worrying to me often propels me to hastily seize the first idea that comes to mind. Instead, I should use affective strategies to control my motivation and stress (see Chapters 1 to 4).

- Changing my perception of the problem: instead of seeing it as a threat to my peace of mind, I should see it as an opportunity to develop my intelligence, knowledge and wisdom.
- Taking pleasure in exercising my intellectual faculties on an arduous problem.
- Working with others in an emulative climate to solve the problem.
- Perceiving failure as a source of learning and learning lessons from it.
- Congratulating and rewarding myself when I work hard to overcome a challenge.



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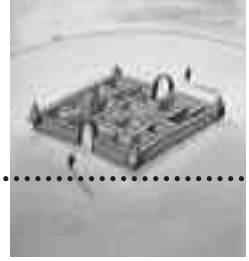

Improving my Problem-solving Skills

Muddy water, let stand becomes clear.
Lao-tse (circa 600 – 500 BC), Chinese Philosopher

Problem-solving: A Five Step Process

Here is a simple nonlinear five-step model:

PERCEIVING AND DEFINING PROBLEMS

Problems related to mathematics, physics, learning, understanding, memory, love, finances, time, health, family, computer… A problem stems from ***dissatisfaction***, whether technical or psychological, affective or intellectual, personal or social, internal or external constraints: disequilibrium, need, desire, malfunction, lack, quest for coherence, questioning, desire to understand, curiosity, etc. We often use the term problem when confronted with a ***barrier***, if the solution or ***courses of action*** to solve it are not known or evident. This step consists of clarifying the problem and identifying the ***goal*** to attain so that the problem can be considered resolved (satisfaction criteria) and identifying the ***constraints***, those which are permitted and obligatory to resolving it (resolution framework).

LOOKING FOR AND ANALYZING PROBLEM-RELATED DATA

A problem is characterized by its data. This step consists of seeking, observing and gathering all facts, information and knowledge relative to this type of problem and retaining only the information pertinent to its resolution. This step is often done alternately with the previous: knowledge of the facts helps to understand the nature of the problem; the definition of the problem facilitates the selection of pertinent information.

SEARCHING FOR POSSIBLE SOLUTIONS

This step consists of searching for and producing solution-ideas that are likely to satisfy a list of desired criteria: re-establishment of equilibrium, need fulfillment, desire accomplishment, coherence, understanding, answer to the question, etc. A problem can be closed (only one possible solution) or open-ended (multiple solutions but of unequal value). This second type of problem leaves room for creativity (innovative solution).

CHOOSING A SOLUTION

Most problems in daily or professional life are complex, for which we do not have all the pertinent information and, solution options are many. We must evaluate and compare these options according to numerous criteria and make a decision that relies partly on reason and partly on intuition.

IMPLEMENTATION OF THE SOLUTION

The solution concept is not the solution. The concept must be concretized and developed, eventually communicated and defended before being implemented.

Guide to Reflective Thinking: Problem-solving Strategies

Use the following statements to assess your problem-solving strategies. Any weak assessment result indicates an attitude, ability or habit that may be worth developing.

	Seldom	Often
I define my problem with precision		
• When I am facing a problem, I take the necessary time to fully understand what it consists of.	❑	❑
• I define my goal and determine the satisfaction criteria of a good solution.	❑	❑
• I take time to establish the constraints that need to be respected, limitations and obligations.	❑	❑
I plan and manage my course of action		
• I take the time to think about how I will proceed rather than immediately jumping into action.	❑	❑
• When I am facing a complex problem, I break it into more simple sub-problems.	❑	❑
• When I am on the path to a solution, I explore in an ordered, complete and systematic way.	❑	❑
• When I proceed by successive trials, I take the time to note information about each trial to avoid going around in circles.	❑	❑
• During my course of action, I keep in mind the yet to be explored paths, in case the one that I am on, does not lead to a valid solution.	❑	❑
• When I am unsure of exactly where I stand, I pause to take stock of the situation and to summarize the accomplishments thus far.	❑	❑
• I persevere even when having serious difficulties.	❑	❑
I elaborate and verify all solution hypotheses		
• I resist the temptation of using the first solution that comes to mind.	❑	❑
• I look for all possible solution options.	❑	❑
• When I have more than one solution, I give myself the time to compare them according to a variety of pertinent criteria.	❑	❑
• Before opting for a particular solution, I evaluate the eventual consequences.	❑	❑

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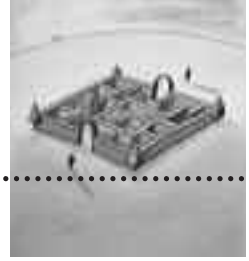


Improving my Problem-solving Skills

When an archer misses the mark, he turns and looks for the fault within himself.
Gilbert Arland

I Clearly Define my Problem

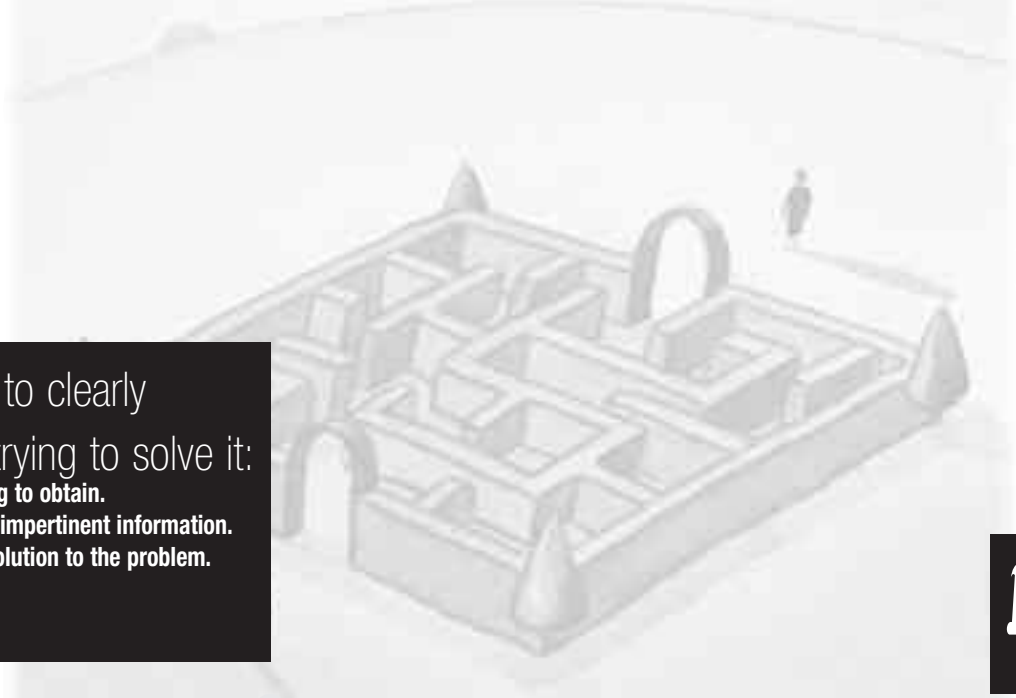
Until I have a clear idea of what exactly the problem is and a sufficiently precise vision of the goal I wish to attain, it is inadvisable for me to follow a course of action and risky to adopt the first solution that comes to mind.

There are two types of learning problems that arise in university:

1) Well-structured problems, where expected results are expressed in specific questions, data is complete, pertinent, and similar in nature, where constraints are clearly established and where problem-solving approaches have been tried and are supposedly known (here again, I must make it a habit to closely read questions and data and to keep it in mind without distortion!);

2) Open-ended problems, like case studies present more realistic and complex situations, with partial or superfluous data of varying nature and where solution options are many. This type of problem is more demanding and requires a good repertoire of fundamental and field-specific strategies.

Problems encountered in professional or everyday life (technical, organizational, financial, health, relational, etc.) are open-ended problems. I must examine if the apparent problem is not hiding a deeper problem, define the problem situation and describe what about it, is problematic. I must do an inventory of available, missing and inaccessible information in order to better understand both the initial and desired situation. I must also define the limits in which I can propose solutions and the constraints that come into play with the problem-solving operations. The quality of the chosen solutions will largely depend on the initial definition and analysis of the problem.



Some advantages inherent to clearly defining a problem before trying to solve it:

- **Having a precise idea of what I am looking to obtain.**
- **More easily distinguishing pertinent from impertinent information.**
- **Bringing a satisfactory and long lasting solution to the problem.**

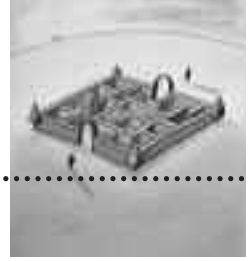
Applications to Learning Problems

When I read a scientific, technical or informative text, defining my problem consists of clarifying my purpose before I start to read, in other words, that which I am looking to obtain from my read. If necessary, I can write down my purpose or prepare specific questions.

When I draft a report (reading, lab, field work), defining my problem involves identifying for whom the report is intended and why (their position, expectations, level of knowledge in the subject) and defining the effect on the audience that I hope to achieve (to impress, inform, prove my competence).

When I conduct a research project, clearly defining my problem involves formulating the precise question to which my research is supposed to provide an answer. If the formulation of my question is vague, chances are that my research will quickly stray from the track.

And finally, when I prepare and write an exam, defining my problem involves first clearly defining my performance objectives and secondly taking the time to understand exactly what is being asked and its implications.



Chapter 10

Improving my Problem-solving Skills

Any man may make a mistake; none but a fool will stick to it.
Second thoughts are best as the proverb says.
Marcus Tullius Cicero, Philippicoe (XII, 2)

I Select Pertinent Data

The selection of data is as important for understanding the problem as, understanding the problem is for the selection of important data. This is why it is common for me, when I am facing a problem, to have to return to my initial understanding of the original problem. A new definition of the problem provides me with data that I had not previously selected and leads me to discarding data that has become obsolete.

This strategy consists of keeping data that is absolutely necessary to the problem resolution and eliminating useless or obsolete data, once the nature of the problem is clearly understood. A good tactic is writing down the important data on a separate sheet of paper so that I will not lose sight of it and it facilitates the data handling and processing. This way of doing things relieves my memory work and helps me to avoid going off track.

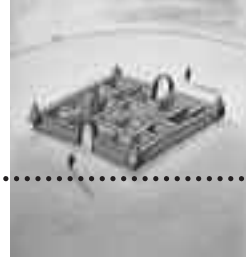
Some advantages inherent to selecting data that is pertinent to the problem:

- **Reducing the volume of data to process.**
- **Facilitating memory work.**
- **Reducing the risk of going off track.**

Applications to Learning problems

The most frequent learning problems that arise in university are related to difficulty understanding the material and difficulty remembering a large volume of new knowledge. A large part of these problems, stem from insufficient or unskilled information selection. The clarification of information that is not understood is the prerequisite condition of elucidation and all requests for assistance. Concerning the selection of key information and its organization into an efficient memory tool format, clarification is the only means to circumvent difficulties related to the assimilation of masses of knowledge within a relatively short time frame.

Chapter 10



Improving my Problem-solving Skills

The man who removes a mountain begins by carrying away small stones.
Chinese proverb

I Break my Problem into Sub-problems

All major personal or professional projects present themselves like a series of overlapping multi-dimensional problems to be solved (technical, financial or social) with numerous constraints (competences, time, resources). Their apparent complexity can be disheartening. By breaking a complex problem into smaller and simpler sub-problems and stages, I can take on one piece at a time.

Some advantages inherent to breaking a problem into sub-problems:

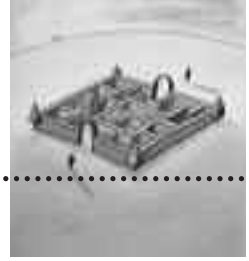
- **Reducing complex problems into a series of more simple problems.**
- **Avoiding discouragement when facing the greater dimensions of certain problems.**
- **Reducing the volume of data to be simultaneously processed.**
- **Planning more easily and proceeding step by step.**

Applications to University Studies

Proper planning of a university semester relies upon breaking learning activities into digestible pieces. Each course is a set that can be broken into smaller subsets and each subset into smaller parts, from which I can more realistically determine the time and effort required in order to learn them. And, if I cannot do it all, determine the priorities. It is better to learn less, well, than it is to learn more, poorly.

Applications to Changing Learning Habits

We do not easily change a bad habit on our first attempt. Sometimes becoming aware of my habit suffices to definitively modify it, such as hastily and superficially reading exam questions, for example. Other changes will be more gradual and initially require my vigilance and sustained effort. If, for example, I have never created summary sheets or any personal memory tools, my first attempt will be time consuming and I may not be very efficient. My efficiency for this type of work will increase quickly if I stick with it. In the medium-term, my effort will be well rewarded. Therefore, it is preferable that I experiment with new strategies with a reduced portion of my work (one course, for example), by setting my effort-to-change priorities. Once a new strategic habit is acquired, it becomes less demanding in vigilance and execution time and it is more easily integrated into my routine.



Improving my Problem-solving Skills

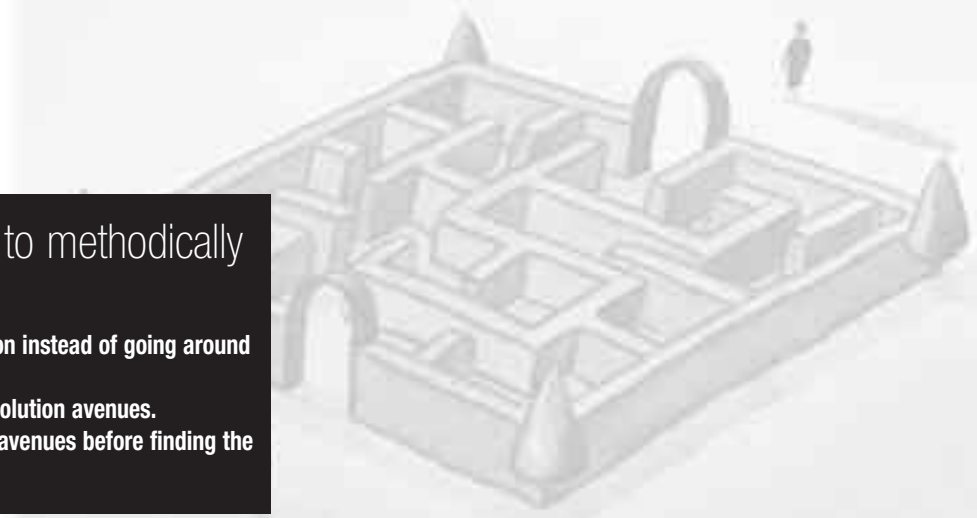
Set the cart before the horse.
John Heywood (1497–1580), English Dramatist and Epigrammatist,
Proverbs. Part ii. Chap. vii.

I Methodically Explore Possible Solutions

Facing a problem that is new to me is like entering unknown territory: if I do not have reference points or cannot map the locations as I explore them, my risk of getting lost or going around and around in circles is high.

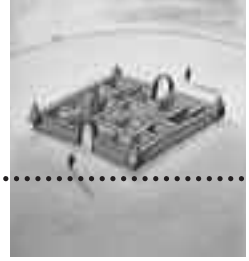
There is no all-purpose problem-solving method, that is to say, a method that ensures a straightfoward, successful, course of action every time. Given this, a computer and human intelligence do not use the same processes: the processing speed of computers allow them to verify, one by one, all possible solutions, while human intelligence can only look at a limited number of possible solutions, which are determined based on acquired knowledge and experience in that particular field, by way of initial mental processes. In addition to logical reasoning, human intelligence uses other problem-solving modalities including memorized experience, intuition and successive empirical trial and error exploration.

Regardless of the problem-solving mode employed: logic, experience, intuition, empirical trial and error, or a combination of these modes, my path to a solution must be organized if I want to limit useless steps such as random operation applications, going backwards without realizing, repeatedly using fruitless and ineffective reasoning or heading towards a dead-end. Each trial and avenue explored brings me new information and contributes to the construction of my goal path. But this, only on the expressed condition that my trials are done in an ordered and systematic way, that I note and remember my results and that I do not give up prematurely on the solutions I am exploring.



Some advantages inherent to methodically exploring solution avenues:

- **Progressing towards a satisfactory solution instead of going around in circles.**
- **Better remembering previously explored solution avenues.**
- **Ensuring that I have explored all solution avenues before finding the right one.**



Improving my Problem-solving Skills

Genius is one per cent inspiration and ninety-nine per cent perspiration.
Thomas A. Edison (1847 – 1931), American Inventor

I Elaborate on and Verify the Utility of Various Solutions

The first problem-solving idea that comes to mind is not necessarily the best. On the majority of problems for which only one solution exists (closed or convergent problems), I elaborate and successively verify several potential hypotheses until I find the one that works. Since most problems occurring in daily or professional life are problems that have multiple solutions (open-ended or divergent) and since their solutions are not necessarily equal in value, the valid solution choice depends on a variety of considerations.

But, for me to make a real choice, I must have a wide range of possible solutions to choose from. The first idea that comes to mind may be valuable, but is rarely the most original. Before I opt for it, I should give myself the time to allow alternatives to emerge.

Some advantages inherent to elaborating and verifying solution hypotheses:

- **Ensuring that I do not over-look the right solution.**
- **Choosing the best solution possible.**
- **Having the satisfaction of making an informed choice.**

10

1. Synoptic Overview: Example

COGNITIVE EFFICIENCY WORKSHOP

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Course	06/01	13/01	20/01	27/01	03/02	10/02	17/02	24/02	03/03	10/03	17/03	24/03	31/03	07/04	14/04	21/04
ORGANIZATIONAL BEHAVIOR																
Reading *Case study (2)* *Term-assignment* *Exam*	Ch.1, 2	Ch. 3 c Study	Ch. 4 c Topic	Ch. 6 Scase 1 Study	Ch. 5 Doc.	Ch.7, 8 c Study	Ch. 9 c **Ex 1**	Ch. 10 **S**case 2	Study	Ch. 14 Read	Ch. 11 Study	Ch. 12 Write	Ch. 13 Check Study	Ch. 16 Subm it	**S**ass Study	**Ex 2**
BUSINESS LAW																
Reading *Summary* *Case study* *Term-assignment*		Ch1,2 c	Ch. 3	Ch. 4 c Topic	Ch. 5 s	Ch. 6 c Doc.	Ch. 7 c	Ch.8, 9 s **S**case	s	10-12 **S**sum.	13,14 Read	15,16	19,20 Write	21 Check	22 Subm it	**S**ass
HUMAN RESOURCES MANAGEMENT																
Reading *Term-assignment* *Exam*		Ch.1, 2 Study	Ch3-5 Topic	Ch. 6 Study	Ch. 6 Doc.	Ch. 9	Study		Read Study	Ch. 8	Ch. 11 Write	Ch. 14 Check Study	Ch. 12 Subm it	13-15 **S**ass Study	Study	Exam
LEADERSHIP AND TEAM WORK																
Reading *Experience Reports*		Doc1	Exp1	Doc2	Exp2	Doc3	Exp3 Write	Doc4 **S**1-3		Exp4	Doc5	Exp5	Doc6	Exp6 Write	**S**4-6	
COGNITIVE EFFICIENCY WORKSHOP																
Reading *Logs* *Assessment*		l	l	l	Ch1 **S**l1	Ch2 l	Ch3 l	Ch4 **S**l2	l		l	Ch5 **S**l3	Ch6 l Write	l Check	l Subm it	**S**ass

C, s, l = work period spent on cases, summaries, logs

N.B.: step-by-step planning of term assignments: (choosing the topic, documentary research, reading, writing, checking, submitting); task distribution throughout the semester to prevent work overload; variety of tasks (reading, experimentation, study, documentary research, writing) to prevent boredom and maintain motivation; emphasizing (bold and underlined) unavoidable deadlines (exams, assignment submission).

2. Essay Term-assignment Task Planning: Example

STEP-BY-STEP PROCEDURE

Principle: I determine the basic steps of my assignment and estimate the time required to complete each.

- **Exploratory reading and topic choice:** *1-2 weeks*
- **Documentary research** (identifying sources and obtaining documents): *1-2 weeks*
- **Documentation exploitation** (reading, selecting, summarizing): *3-4 weeks*
- **Assignment writing** (basic ideas, planning, drafting, writing the introduction and conclusion): *2-3 weeks*
- **Proofreading the text and making corrections:** *1 week*
- **Submitting the assignment** (formatting, printing, making copies and final corrections): *1 week*

TIMEFRAME

Principle: I schedule time to complete each step of my assignment according to my other assignments and tasks.

I determine the final deadline (second Monday in December).

I determine a deadline for each intermediary step in the reverse order. For example, if I have to hand in my assignment on the second Monday in December and if I need one week to make sure that I am satisfied with its quality, I must finish writing it on the first Monday in December. In order to meet that deadline, I must finish reading my reference material near the second week in November or, by the third week at the latest, and so on. This is how I determine when I need to start and complete every step so that I feel comfortable with the deadlines.

The creation of a synoptic overview allows me to spread out the deadlines for this specific assignment according to my other assignments, thus preventing work overload and bottlenecks.

3. Course Material Organization: Example

Principle: I separate handout material according to their purpose.

FILE 1

Syllabus, deadline, task list, instructions, guidelines, detailed deadlines for each assignment, etc.

FILE 2

Lecture notes, reading notes

FILE 3

Texts, articles, complementary reading material

FILE 4

Bibliographies, index of course-related periodicals
Keyword descriptors for computer research

FILE 5

Memory tools: summary sheets, schemas, resumes, comparative tables, plan overviews and other fast-reference material

FILE 6

Assignments in progress: research, essay, class presentation
One file per assignment (or more if necessary)

4. Note Taking Organization: Example

EDU xxx
Theory of learning

10/02/03
3rd period - p. 2

Reading vs recitation

1- Passive reading

- Reading + recitation > reading several times (M. and D. 1969)
- * !!! Organized material = less time for better learning
  - learning unbound material ≡ 80% of study time (ex. second language vocab.)

2- Active Recitation Methods

2.1 learning cards - Cognitive maps

(ID) draw structure - thought is organized around it
→ group of clues

2.2 Questions

(ID) organize question-answer periods with comrades (small groups)

⇒ students actively organize what is perceived ; learning + efficient

3- Active reading and Note taking

5. Stress Management Internal Dialogue Memory Tool: Example

Rational Emotive Therapy (Ellis, 1973)

Basic axiom: Thoughts are at the origin of feelings, and vice-versa.

Human beings are not affected by reality, but by the way they perceive that reality. Irrational beliefs induce irrational internal dialogue, which are at the source of inadequate behaviors.

Rational-emotive therapy provokes changes in individuals: it allows them to clearly identify, understand, discuss and turn negative internal dialogue into more rational dialogue.

The three main categories of irrational thought and their alternatives

Example of Category 1 – *"I am not allowed to make any mistakes; if I do, it's terrible."*
Alternative: *"I do my best; I don't want to make mistakes, but if I do, I can deal with it. It will be a shame, but it won't be terrible."*

Example of Category 2 – *"Everybody should approve of me and if not, it is horrible."*
Alternative: *"It's nice to get everyone's approval, but it's ok if I don't."*

Example of Category 3 - *"People should be the way I want them to be."*
Alternative: *"People are the way they are: I can't change them, but I can change the way I interact with them."*

Internal Dialogue Control (Helmstetter, 1986)

77% of our internal dialogue can be counterproductive.

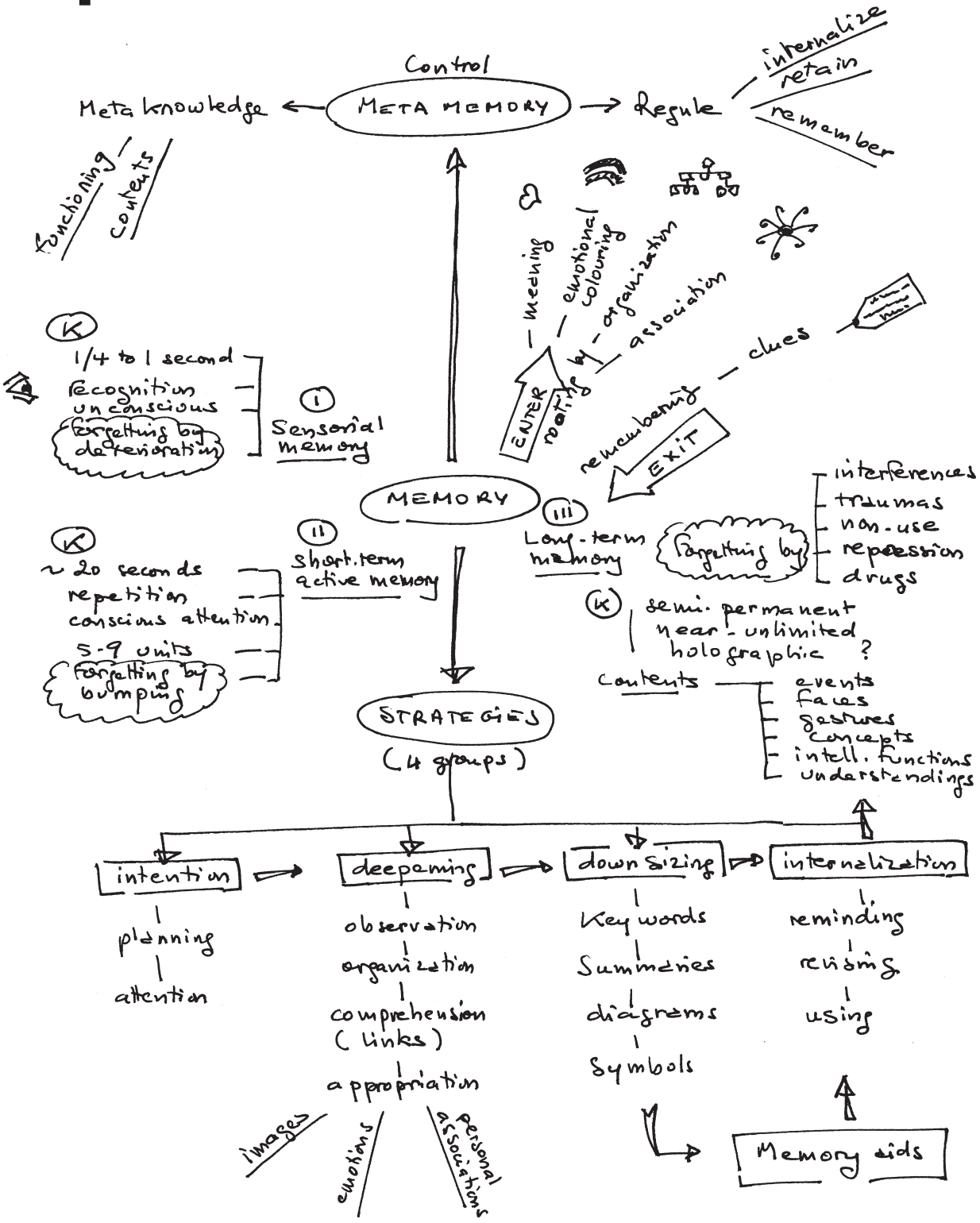
According to Helmstetter, children raised in ordinary family environments are told no or that they should not do this or that approximately 148,000 times before they reach the age of 18. These messages, received by the young child, are stored in a part of their brain that in adulthood they are generally unable to choose, evaluate or discuss.

Five levels of internal dialogue:

1. Resigned acceptance: *"There's nothing I can do about it; If only I could be otherwise…"*
2. Recognition of the need to change: *"I should change the way I do things, the way I am."*
3. Decision to change: *"I will never do this again. From now on, I'll be like that."*
4. Improved self-perception: *"Now, I am able to do this, be like that."*
5. Universal statement: *"This is the way it has to be done and the way I must be."*

Levels 1 and 2 have never helped anyone change. Level 2 opens the way to excuses, guilt, and disappointment. Levels 3 and 4 encourage change and perseverance. Level 5 corresponds to the statement of a universal principle.

6. Memory Function Notes Mapping: Example



7. Written Assignments: Methodological Checklist

Generating ideas: ***the material***
Organizing ideas: ***the structure***
Putting ideas into words: ***the finishing touches***
Conveying ideas according to the audience: ***the style***

Understanding my assignment

- Determining the type of work: goals, format, volume and limits. Writing style: report, minutes, resume, analysis, critique, investigative, experimental, dissertation, essay, thesis, etc.
- Choosing my subject: personal interests, time, documentation and resources available.
- Specifying my subject: choosing aspects to be covered, main idea to be communicated.
- Having a clear idea of the reader's expectations: specifying the desired effect.

Planning my assignment

- Choosing a work method.
- Determining the stages and setting a deadline for each.

Documentary research

- Identifying sources of information and writing down the complete references.
- Reading and analyzing the most pertinent documentary material.
- Taking notes and writing reading summaries: resumes and syntheses.

Creating a detailed plan (logical organization of ideas)

- Choosing the type of plan that is most appropriate to my purpose: linear, oppositional, concentric, in sets, conventional (thesis, antithesis, synthesis); universal plan (facts, causes, remedies; purposes, powers, means; problem, solution, results).
- Delineating major blocks (parts, sections). Writing titles and subtitles.
- Formulating the guiding idea and main ideas.
- Organizing and developing my argumentation.

Writing the assignment

- Writing the first draft: links between ideas and paragraphs; introduction of guiding idea, secondary ideas, arguments, examples, transitions; writing the conclusion; writing the introduction.
- Revising the text, correcting the style and language: accessible, impersonal, simple, specific, concise, clear, concrete and dynamic.
- Proofreading, having it proofread and corrected: grammar and spelling; punctuation; style errors and awkwardness: repetitions, excuses, etc.

Presentation

- Choosing a presentation format (font, spacing, page set-up, etc.) respecting the presentation standards in effect at the university.
- Adding the references.
- Adding the appendix.

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