

**Anticipating Students' Academic Achievements through Metacognitive Awareness and Learning Strategies**  
**Case Study of 3rd Year Students at the English Department**  
**Batna 2 University**

توقع الإنجازات الأكاديمية للطلاب من خلال الوعي المعرفي واستراتيجيات التعلم  
دراسة حالة لطلاب السنة الثالثة في قسم اللغة الإنجليزية - جامعة باتنة

**Dr. Hellelet Souhila**

Institution of work or study Batna2 university  
s.hellalet@univ-batna2.dz

**Received in: 08/02/2021 Accepted in: 11/05/2021**

**Abstract:**

Researchers from a range of disciplines, over decades, have been looking closely at learning mechanisms. Efficient learning processes require the development of specific abilities that help the one get adapted to the dynamic life change. Research has revealed that intelligence alone is not adequate to anticipate the efficiency of learning; it can rather be predicted by the appropriate selection and application of the learning strategies. Nevertheless, such strategies can be selected depending on the learner's level of meta-cognitive awareness, which permits the implementation of the suitable learning strategies. Some learners, like in our case study, show great readiness to develop these strategies by their own through time while others require special training of their metacognitive awareness and learning strategies in order not to remain at a suboptimal level of development. The actual research paper targets the investigation of the possible effects of learning strategies and metacognitive awareness on the academic performance of 3<sup>rd</sup> year students at the English Department-Batna 2 University. Such a training may contribute to the attainment of high academic achievements for learners. The study results obtained through quantitative and qualitative data have been analyzed and interpreted. Their outcomes show that some learning and meta-cognitive awareness strategies facilitate the attainment of academic success, while other strategies are counter-productive.

**Keywords:** metacognitive awareness; learning strategies; academic achievements

**ملخص:**

على مدى عقود قام الباحثون من مجموعة من التخصصات بالعديد من الأبحاث في آليات التعلم. تتطلب عمليات التعلم الفعالة تطوير قدرات محددة لتساعد على التكيف مع التغيير الديناميكي للحياة. وقد كشفت البحوث أن الذكاء وحده لا يكفي لاستباق كفاءة التعلم؛ بل يمكن التنبؤ به من خلال الاختيار المناسب وتطبيق استراتيجيات التعلم. ومع ذلك، يمكن اختيار هذه الاستراتيجيات تبعاً لمستوى المتعلم من الوعي المعرفي، الذي يسمح بتنفيذ استراتيجيات التعلم المناسبة. يبدي بعض المتعلمين استعداداً كبيراً لتطوير هذه الاستراتيجيات بأنفسهم عبر الزمن؛

ومع ذلك، يحتاج آخرون إلى تدريب خاص على الوعي المعرفي واستراتيجيات التعلم حتى لا يظلوا في مستوى دون المستوى الأمثل من التطور. وقد يسهم هذا التدريب في تحقيق إنجازات أكاديمية عالية للمتعلمين. تهدف الدراسة الحالية إلى دراسة تأثير استراتيجيات التعلم والوعي المعرفي على الإنجازات الأكاديمية لطلاب السنة الثالثة في جامعة باتنة 2 في قسم اللغة الإنجليزية. وقد تم تحليل نتائج الدراسة وتفسيرها لتبين أن بعض استراتيجيات التعلم والوعي المعرفي تسهل تحقيق النجاح الأكاديمي، في حين أن استراتيجيات أخرى لها نتائج عكسية. **الكلمات المفتاحية:** الوعي المعرفي؛ استراتيجيات التعلم؛ الإنجازات الأكاديمية.

## **INTRODUCTION**

There has been a shift over the last decades in Education and mainly in the field of foreign language teaching and learning from a teacher-centered approach to a learner centered approach. The main concern of educationists now is to consider more the learner as an independent entity and the whole focus is put on how to access the learner's mind and mental capacities.

Psychologists, language specialists, and practitioners seem to agree that the most effective way to help students learn is to understand first what mechanisms they apply to do so. They assume that understanding how students learn enables them to foresee the areas where they may excel and where they need reinforcement. One of their common beliefs is that cognition and metacognitive abilities can be raised to the students' awareness as one of the key strategies to learn better.

### **Literature review**

Life-style processes presume the existence of specific strategies with which one can acquire, update, or enhance the knowledge-base required successfully to fulfill a certain work and the private-life-related tasks. These processes might be subsumed under the term of "learning". Learning, as a process, represents a quite important number of activities at different levels of life and in different contexts making of it a very broad term. (Feinstein, Vorhaus, & Sabates, 2010, p. 311).

The act of learning is an on-going process that occurs during an entire lifetime. In fact, it is not restricted to academic and work contexts, which is a frequent lay misconception. Learning experiences may take extremely different forms depending on the causes that promote learning and the expected consequences (Feinstein et al., 2010).

Learning processes rely on some personal and environmental elements such as interests, skills, age, gender, attitudes, and even culture. Any shortcomings at the level of these factors may be seriously compensated with appropriate learning and information management strategies. In other words, students endowing average levels of intellectual competences may still reach high levels of academic performances if they work on these abilities with specific learning strategies by which may optimize the learning process itself (Bloch, 2005).

The human being, by nature, tries to build a career that best fits his/her personal, environmental, and social conditions, characteristics, short and long-term needs,

simultaneously attempting to reduce to the maximum the eventual discrepancies within these domains (Amundson, Harris-Bowlsbey, & Niles, 2005; Amundson, Jang, & To, 2004).

The dramatic changes in the man's life require the reconsideration of specific processes. These latter may help the individual to efficiently adapt to the new work and personal life conditions. This fact imposes the need of lifelong learning which includes the occasional development of a totally new career. The efficient adaptation to these new conditions implies a considerable amount of learning processes. That is to say, new information will have to be acquired quickly and applied in appropriate manners (Amundson, 2006).

In the teacher based system of teaching, the students' learning processes have almost completely been under the instructor's effect. In an environment where the teacher centered approach ignores the students' capacities and learning styles, teachers design the leaning objectives, select the lessons' materials and structure the learning environment. In such conditions, students' self-determined learning strategies are eliminated (Slavin, 2006). However, more recent approaches have targeted the development of students' self-regulated learning through the stimulation and the active engagement of learners in different learning processes calling for the recalibration of educational objectives (Perry, Phillips, & Hutchinson, 2006; Boekaerts&Corno, 2005; Winne& Perry, 2000; Zimmerman, 1990).

*“Self-regulated learners are autonomous, reflective and efficient learners, and have the cognitive and metacognitive abilities as well as the motivational beliefs and attitudes needed to understand, monitor and direct their own learning”* (Wolters, 2003, p.189).

Students' self-regulation of the learning process helps in the efficient adaption of information-acquisition strategies depending on the requirements of the context or the task between hands. The good manipulation of the learning strategies became an imperative task for learners in order to cope with the dramatic changes of life (Wrugt & Oort, 2008).

The underlying mechanisms involved in effective self-regulated learning requires a deep study so as to provide a more accurate information that is needed to develop the training programs which target the increase of the learning processes efficacy. Many researchers agreed that the improvement of learning requires the contribution of metacognitive awareness and the learning strategies development (Schraw & Dennison, 1994; Zimmerman, 1999; Weinstein & Palmer, 2002; Pekrun, Goetz, Titz, & Perry, 2002; Bendixen & Hartley, 2003; Eshel&Kohavi, 2003; Dunning, Johnson, Ehrlinger, & Kruger, 2003; Young & Fry, 2008; Wrugt&Oort, 2008).

Memory and language skills that learners internalize throughout their learning

career are not sufficient in order to raise effective learners. Students must work on developing their own ways of learning. Students can master their mental processes more effectively throughout gradually controlling their learning processes; hence developing the high-level cognitive skills associated with meta-cognition.

### **Learning Strategies**

The effective choice and organization of information is referred to by the so called “learning strategies” which are demonstrated by cognitive plans that help perform successful tasks (Pressley, Woloshyn, Lysynchuk, Martin, Wood, & Willoughby, 1990; Weinstein & Mayer, 1987). Learning strategies are reflected in the foundation of connections between information already stored in memory, the efficient rehearsal of the material to be acquired, and the new acquired information (Schunk & Zimmerman, 2003).

An efficient learning implies an important aspect of the individual’s creativity, monitoring and maintenance of the atmosphere that improves both the quality and the quantity of learning processes. (Weinstein & Mayer, 1986). In order to exert a better control over learning, learners need to develop self-efficacy and maintain the level of motivation. Time management and optimizing the levels of task and test anxiety help learners keep the expectations regarding the outcomes of learning (Schunk & Zimmerman, 2003).

*“Cognitive learning” which is known as the use of critical and reflective thinking so as to improve the individual’s learning styles whose importance resides in developing the conscious control of learning and the ability to plan and monitor the learning behaviors (Schunk & Zimmerman, 2003).*

Entwistle & McCune, (2004), Garcia & Pintrich, (1996) suggested several theories that distinguish between two major cognitive learning strategies.

- **Surface cognitive learning strategies:** The act of memorizing new information through repetitive rehearsal techniques without making any profound connection with information that have already been memorized.

- **In-depth cognitive learning strategies:** This deep level of cognitive learning strategies includes the elaboration and the organization information with critical thinking; in addition to integrating the new information in the learner’s existing knowledge base.

Wrugt and Oort (2008) pinpointed that long-term retention of knowledge requires adopting in-depth cognitive learning strategies. The learner’s proximal and distal goals shape the utility of surface and in-depth cognitive learning strategies.

If the goal of learning is to reach higher educational level, memorization of great amounts of information is probably the best solution; thus, surface cognitive learning strategies would be a good strategy for better results. Nonetheless, the major negative

aspect of this technique is that the retention of information does not last long, and very rarely is transformed to in-depth knowledge which is necessary to solve complex problems.

On the other hand, when the main objective is one of the following, comprehension, problem – solving, organization, writing, or reasoning, i.e proficiency and mastery, in-depth learning strategies are favored over surface learning (Pintrich, 2000; Ames 1992).

Learning strategies assessment has haunted researchers for decades so as to enhance self-regulated learning. Henceforth, developing valid instruments was a major goal under scrutiny. Weinstein & Mayer, (1987) created one of the most reliable, valid and frequently used scales called 'the Learning and Study Strategies Inventory'. Subscales are further included in LASSI which meant to assess the most important learning strategies.

### **Metacognition and Metacognitive Awareness**

#### **According to Perry, Phillips, & Hutchinson, (2006):**

“Meta-cognition enables students to be more active in their learning, i.e., to mobilize all of their resources in order to have successful learning experiences. In order to do this, they must know how they learn and be aware of the steps that are followed and the means that are used to acquire knowledge, solve problems, and perform tasks” (p. 128).

Schraw and Dennison's (1994), defines meta-cognition in relation to learning as “the ability to reflect upon, understand, and control one's learning” (p. 460).

According to Edgar Morin (2014), meta-cognition is the process of "thinking about thinking." A good reader uses his/her meta-cognition before reading when he/she clarifies the purpose for reading before previewing the text. This is to say, meta-cognition is the awareness of the personal cognitive process in order to facilitate the process of learning and make of it more efficient in face of life circumstances. Students are cognitively aware when they when they learn about things that may help them retain information, learn about their own learning style, and learn about which strategies are most effective for solving problems.

The concept “meta-cognition” was further split into two basic aspects namely *knowledge about cognition* and *regulation of cognition* (Paris & Winograd, 1990; Flavell, 1987).

Knowledge about cognition includes *declarative meta-cognitive knowledge* which resides in the one's knowledge about own abilities and strategies; *procedural meta-cognitive knowledge* reflects the knowledge about how to use the one's abilities and strategies; *conditional meta-cognitive knowledge* refers to the knowledge about why and when to use certain strategies. On the other side, regulation of cognition represents a

number of leaning control processes; *planning, evaluation, regulation* (Hacker, 1998).

According to a number of research studies (Hacker, 1998, Paris et Lindauer, 1982, Paris et al., 1988; Persely et al., 1985), through the implementation of meta-cognitive strategies, students can become increasingly autonomous learners as they determine their strengths and weaknesses. By doing so, meta-cognitive abilities and self-perception increase throughout the learner's managed performance on a task.

Meta-cognition entails reflection before, during and after a learning task. It begins when the learner thinks about the appropriate and the most effective strategy to adopt in order to perform a task (Edgar Morin, 2014).

The effective control over the learning sources plays a major role in the relationship between meta-cognitive abilities and learning strategies. A general consent among researchers revealed the existence of a positive correlation between the use of learning strategies and academic achievements (Pintrich & DeGroot 1990; Elliot, McGregor, & Gable, 1999; Wolters, 2004). Studies also have confirmed that differences in intellectual abilities do not make effective strategy use; it is rather strongly related to the distinguished meta-cognitive abilities (Schraw & Dennison, 1994).

Henceforth, the investigation of the learning patterns in third year students is the major aim of this research paper. That is, to what extent does the selection of learning strategies and meta-cognitive awareness affect the students' academic achievements.

### **Research Design Methodology**

**Participants and Procedure:** The research sample under investigation consists of 150 third-year students of English language at Batna 2 University, Algeria. Random selection was the main technique of the sample choice. The mean age of participants was 20 years (SD=1.21). The sample represents 45% of the whole population and asserts the representativeness of the results. Students were evaluated in a collective, single assessment session lasting 45 minutes.

**Hypothesis:** The development of meta-cognitive strategies and learning strategies could enhance the learners' academic success.

**Research Instruments:** We asked students to start completing the instrument battery with their exact age, gender, and mean of grades (the grading interval ranging from 0-minimum to 10- maximum) received in the first year of study.

**Learning strategies** were assessed with the Learning and Study Strategies Inventory (LASSI), developed by Weinstein, Zimmerman, and Palmer (1988).

The LASSI consists of 77 items, and is a 5-point self-report scale; with suggestions ranging from *strongly agree* to *strongly disagree*.

Table 1 presents the sub-scales of the LASSI

## Anticipating Students' Academic Achievements through Metacognitive

Table 1. *Subscales and reliability coefficients for LASSI*

		Cronbach's $\alpha$	
		Original scale	Translate d version
<b>Skill</b>	<b>Information processing:</b> use of: imagery, verbal elaboration, organization strategies, reasoningskills and connect information already stored in memory with what they are trying to learn.	.84	.83
	<b>Selecting main ideas:</b> identify important information	.89	.74
	<b>Test strategies:</b> test preparation and test taking strategies	.80	.84
<b>Will</b>	<b>Anxiety:</b> worry about school and academic performance	.87	.81
	<b>Attitude:</b> attitudes and interests in learning and achieving academic success	.77	.76
	<b>Motivation:</b> diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements	.84	.81
<b>Self-regulation</b>	<b>Concentration:</b> direct and maintain attention on academic tasks	.86	.85
	<b>Self-testing:</b> use of reviewing and comprehension Monitoring in order to determine level of understanding of the information/task to be learned	.84	.79
	<b>Study aids:</b> use of support techniques, materials or resources that facilitate learning and remembering	.73	.69
	<b>Time management:</b> use of time management principles for academic tasks	.85	.86

**Meta-cognitive awareness** was assessed by the Meta-cognitive Awareness Inventory (MAI), developed by Schraw and Dennison (1994).

The MAI is a 52-item, 5-point self-report scale; with suggestions ranging from *strongly agree* to *strongly disagree*.

Table 2 presents the sub-scales of the MAI presented in (Schraw& Dennison, 1994, p.474-475):

Table 2. *Subscales and reliability coefficients for MAI*

		<b>Cronbach's <math>\alpha</math></b>	
		<b>Original scale</b>	<b>Translated version</b>
<b>Knowledge of cognition</b>	<b>Declarative knowledge:</b> knowledge about one's skills, intellectual resources, and abilities as a learner.		
	<b>Procedural knowledge:</b> knowledge about how to implement learning procedures (e.g., strategies).	.88	.81
	<b>Conditional knowledge:</b> knowledge about when and why to use learning procedures.		
<b>Regulation of cognition</b>	<b>Planning:</b> planning, goal setting, and allocating resources prior to learning.		
	<b>Information processing:</b> skills and strategy sequences used on-line to process information more efficiently (e.g., organizing, elaborating, summarizing, selective focusing).	.88	.85
	<b>Monitoring:</b> assessment of one's learning or strategy use.		
	<b>Debugging:</b> strategies used to correct comprehension and performance errors.		
	<b>Evaluation:</b> analysis of performance and strategy effectiveness after a learning episode.		
<b>Entire scale</b>		<b>.93</b>	<b>.95</b>



**Discussion of the results :**

The obtained data were processed with SPSS 26.0 for Windows. We started the analysis of the obtained data by measuring the mean of grades, learning strategies, and meta-cognitive awareness in our sample.

Next, we began the analyses for descriptive statistics for all the targeted variables. Table 3 presents the results of the descriptive statistics for grades, LASSI, and MAI subscales.

Table 3. Descriptive statistics for grades, LASSI, and MAI subscale scores

N = 150		M	M	SS	D	M	SD
<b>Grades</b>		7.67	..95	MAI Declarative knowledge		30.10	3.32
LASSI Information processing		34.21	5.36	MAI Procedural knowledge		15.97	2.84
LASSI Selecting main ideas		14.96	2.78	MAI Conditional knowledge		18.25	2.86
LASSI Test strategies		15.88	6.15	MAI Planning		25.71	3.80
LASSI Anxiety		24.44	6.85	MAI Information processing		39.20	5.19
LASSI Attitude		14.18	5.29	MAI Monitoring		25.25	4.98
LASSI Motivation		24.58	3.17	MAI Debugging		20.89	3.79
LASSI Concentration		24.35	5.43	MAI Evaluation		21.66	3.90
LASSI Self-testing		25.77	5.16	MAI Knowledge of cognition		63.33	9.42
LASSI Study aids		27.41	4.62	MAI Regulation of cognition		134.00	18.63
LASSI Time management		22.69	4.82				

A correlation analyses between our variables was conducted since our major aim was to identify the learning strategies and meta-cognitive awareness strategies that best predict academic success. Results are shown in Table 4 which contains the correlation matrix between grades and LASSI, respecting MAI subscales.

Table 4. Correlation matrix for: grades, LASSI, and MAI subscales

Scales	Grades
LASSI Information processing	.39**
LASSI Selecting main ideas	.52**
LASSI Test strategies	.53**
LASSI Anxiety	-.16**
LASSI Attitude	-.41**
LASSI Motivation	.26**
LASSI Concentration	-.35**
LASSI Self-testing	.49**
LASSI Study aids	-.02
LASSI Time management	-.39**
MAI Declarative knowledge	.45**
MAI Procedural knowledge	.26**
MAI Conditional knowledge	.29**
MAI Planning	.29**
MAI Information processing	.31**
MAI Monitoring	.20**
MAI Debugging	.19**
MAI Evaluation	.16**
MAI Knowledge about cognition	.39**
MAI regulation of cognition	.29**

In order to see if there is effect of such strategies and meta-cognitive awareness on learner' overall objective attainment, an analysis was needed on the light of the students' reported performances to the self-report. To see to what extent there is academic success, we have introduced in the first model as sub-scales of the LASSI the items information processing, selecting main ideas, test strategies, attitude, motivation, concentration, self-

## Anticipating Students' Academic Achievements through Metacognitive

testing, and time management. In the second model all the subscales of MAI are added. The Results are presented in Table 5.

Table 5. *Summary of hierarchical multiple linear regression analysis, (N=150).*

	Adjusted R <sup>2</sup>	ΔR <sup>2</sup>	B	SE B	β
<b>Model1</b>	.49** .48**				
LASSI Information processing			.02	.01	<b>.19*</b>
LASSI Selecting main ideas			-.10	.03	<b>-.29**</b>
LASSI Test strategies			-.01	.01	-.02
LASSI Attitude			.01	.01	.00
LASSI Motivation			.01	.02	.06
LASSI Concentration			-.01	.01	-.06
LASSI Self-testing			.05	.02	<b>.25**</b>
LASSI Time management			-.00	.02	-.02
<b>Model 2</b>	.64** .19**				
LASSI Information processing			.09	.01	<b>.50**</b>
LASSI Selecting main ideas			-.12	.01	<b>-.39**</b>
LASSI Test strategies			.01	.18	.16
LASSI Attitude			-.00	.01	-.08
LASSI Motivation			.02	.02	.07
LASSI Concentration			-.01	.01	-.11
LASSI Self-testing			.11	.01	<b>.69**</b>
LASSI Time management			.01	.01	.12
MAI Declarative knowledge			.06	.02	<b>.30**</b>
MAI Procedural knowledge			-.19	.03	<b>-.39**</b>
MAI Conditional knowledge			.88	.02	.11
MAI Planning			-.02	.02	-.12
MAI Information processing			.02	.04	<b>.29*</b>
MAI Monitoring			-.02	.02	-.14
MAI Debugging			-.11	.01	<b>-.41**</b>
MAI Evaluation			.06	.01	<b>.29**</b>

As demonstrated in model 1; information processing, selecting main ideas, test strategies, attitude, motivation, concentration, self-testing, and time management account for significant 49% of the variance in academic achievement. Noticeably, the best predictors of academic achievements are mainly the capacity to test one's knowledge, the capacity to accumulate lots of information without concentrating on the selection of main ideas, and information processing abilities

Model 2 shows that the combined effect of the selected learning strategies and meta-cognitive awareness explaining 64% of the variance in academic success, meta-cognitive awareness accounts for another 19% of the variance of academic achievement. In model 2, the best predictors proved are information processing strategies, the capacity

to accumulate lots of information without concentrating on the selection of main ideas , self-testing strategies ( $\beta = .69, p < .01$ ), declarative knowledge , reduced levels of procedural knowledge , the regulation of information processing strategies , the reduced ability to correct comprehension and performance errors (debugging) ,and refraining from analyzing performance and strategy effectiveness after each learning session .

Table 6. ANOVA results for regression models

<b>Model</b>	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
1 Regression	89.848	7	10.621	23.246	.00
Residual	91.606	186	.894		
Total	198.541	199			
2 Regression	122.564	15	8.686	21.161	.00
Residual	59.491	198	.432		
Total	185.187	199			

**Conclusion :**

The present study aims at identifying the degree to which learning strategies and meta-cognitive awareness affect academic success. The obtained results seem to support our initially stated hypothesis and demonstrate that 64% of the academic achievement of our sample (third year students) could be anticipated by learning strategies and meta-cognitive awareness with learning strategies explaining 49% of the variance.

Results also showed that information processing strategies and self-testing abilities are predictors of true learning and indicate high academic success. Learners who demonstrate abilities such as elaboration and organization of information, using prior knowledge, reasoning skills, experiences, attitudes have also the skill to acquire and store faster and larger information. Besides, they are able to recall these information more efficiently. Other contributors of the academic success are represented in the ability to mentally review one’s understanding of the studied material, as well as constantly monitor the quantity to the acquired material.

On the other hand, contrary to the findings in the literature (Weinstein & Palmer, 2002), learners with well improved abilities in the choice of the main ideas imply negative anticipators of academic success. A considerable reason might be the fact that students need to acquire and store lots of information to reproduce it back at the exam day. This reason in favor of reproduction of the taught material on the detriment of the selective reproduction might be due to the school systems. Indeed, as witnessed through long teaching experience, students tend to memorize information and neglect the selection of the main ideas.

Results revealed that meta-cognitive awareness is a significant contributor of

---

## **Anticipating Students' Academic Achievements through Metacognitive**

academic success. Knowledge about one's skills and intellectual abilities are positive predictors of academic success; while, procedural knowledge that is the way to implement learning strategies apparently hinders academic success.

Meta-cognitive regulation strategies which refer to the different information processing techniques like organization, elaboration and summarizing are also considered as positive predictors of success. Another significant predictor is the ability to analyze one's performance.

Results also showed that the meta-cognitive strategy "debugging" is a negative predictor of academic success. Strategies used to correct the learner's comprehension and performance hinders reaching high learning achievements; therefore, debugging strategies, once they are not well managed, may be extremely time consuming; this makes of it a paradoxal finding.

Environments in which learning objectives are to develop self-regulation in students could develop successful learners who find a way to excel; contrary to the claims of Dembo (2004), where less is said about the importance of the instructor, the textbook, the test difficulty, the learning circumstances.

All in all, the results obtained through this research paper demonstrates that academic success is still affected by the traditional academic systems which favor the methods of assessment that measure the quantity of the taught material on the detriment of its depth (understanding). This fact hinders the development of meta-cognitive awareness reducing the ability to select the appropriate learning strategies favoring surface learning. This is what makes us in position to assert that research in this field does not correspond to our teaching reality. It has to keep going on, involving both partners (learners and teachers) reconsider the most appropriate way in which knowledge will not be only transmitted in a one way model , but also thought of , constructed and regenerated by the learner himself.

**References:**

- Ames, C. (1992). Classrooms: goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261–271.
- Amundson, N. (2006). Challenges for career interventions in changing contexts. *International Journal for Educational and Vocational Guidance, 6*, 3-14.
- Amundson, N. E., Harris-Bowlsbey, J., & Niles, S. (2005). *Essential elements of career counseling*. Columbus, OH: Pearson Merrill Prentice Hall.
- Amundson, N. E., Jang, A., & To, N. (2004). *Trends in today's Canada: Food for thought document number 12*. Ottawa: Canadian Career Development Foundation.
- Baumeister, R. F. (1991). *Meanings of life*. New York: Guilford Press.
- Bendixen, L. D., & Hartley, K. (2003). Successful learning with hypermedia: the role of epistemological beliefs and metacognitive awareness. *Journal of Educational Computing Research, 28*(1), 15-30.
- Bloch, D. P. (2005). Complexity, chaos, and nonlinear dynamics: A new perspective on career development theory. *The Career Development Quarterly, 53*, 194–207.
- Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology: An International Review, 54*(2), 199-231.
- Dembo, M. H. (2004). *Motivation and learning strategies for college students. A self-management approach*. Mahwah, NJ: Lawrence Erlbaum & Associates.
- Dunning, D., Johnson, K., Ehrlinger, J., & Kruger, J. (2003). Why people fail to recognize their own incompetence. *Current Directions in Psychological Science, 12*(3), 83- 87.
- Elliot, A. J., McGregor, H. A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91*, 549–563.
- Entwisle, N., & McCune, V. (2004). The conceptual bases of study strategy inventories. *Educational Psychology Review, 16*, 325–345.
- Eshel, Y., & Kohavi, R. (2003). Perceived classroom control, self-regulated learning strategies, and academic achievement. *Educational Psychology: An International Journal of Experimental Educational Psychology, 23*(3), 249-260.
- Feinstein, L., Vorhaus, J., & Sabates, R. (2010). Learning through life: future challenges. In C. L. Cooper, J. Field, U. Goswami, R. Jenkins, & B. J. Sahakian (Eds.), *Mental capital and well-being* (pp. 307-342). Chichester: Wiley-Blackwell Publishing.
- Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), *The nature of intelligence* (pp. 231–235). Hillsdale, NJ: Erlbaum.
- Flavell, J. H. (1987). Speculations about the nature and development of metacognition. In F. Weinert & R. Klowe (Eds.), *Metacognition, motivation, and understanding* (pp. 21- 29). Hillsdale, NJ: Erlbaum.
- Garcia, T., & Pintrich, P. R. (1996). Assessing students' motivation and learning strategies in the classroom context: The Motivated Strategies for Learning Questionnaire. In M. Birenbaum, & F. J. R. C. Dochy (Eds.), *Alternatives in assessment of achievements, learning processes and prior knowledge* (pp. 319– 339). New York: Kluwer/Plenum.
- Garner, R., & Alexander, P. A. (1989). Metacognition: Answered and unanswered questions.

---

## Anticipating Students' Academic Achievements through Metacognitive

- Educational Psychologist*, 24, 143-158.
- Greenberg, M. T., & Rhoades, B. L. (2010). Self-regulation and executive function: what can teachers and schools do? In C. L. Cooper, J. Field, U. Goswami, R. Jenkins, & B. J. Sahakian (Eds.), *Mental capital and well-being* (pp. 377-382). Chichester: Wiley-Blackwell Publishing.
- Hacker, D. J. (1998). Definitions and empirical foundations. In D. J. Hacker, J. Dunlosky, & C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 1–23). Mahwah, NJ: Erlbaum.
- Jacobs, J. E., & Paris, S. G. (1987). Children's metacognition about reading : Issues in definition, measurement, and instruction. *Educational Psychologist*, 22, 255-278.
- Kirkwood, T., Bond, J., May, C., McKeith, I., & The, M.-M. (2010). Mental capital and wellbeing through life: future challenges. In C. L. Cooper, J. Field, U. Goswami, R. Jenkins, & B. J. Sahakian (Eds.), *Mental capital and well-being* (pp. 3-53). Chichester: Wiley-Blackwell Publishing.
- Luwel, K., Torbey, J., & Verschaffel, L. (2003). The relation between metastrategy knowledge, strategy use and task performance: findings and reflections from a numerosity judgment task. *European Journal of Psychology of Education*, 18, 425–447.
- McCormick, C. B. (2003). Metacognition and learning. In W. M. Reynolds, G. E. Miller, I. Weiner (Eds.), *Handbook of psychology (Vol. 7) Educational Psychology* (pp. 79-102). Hoboken, NJ: John Wiley & Sons.
- Morin E. (2014). *Enseigner à vivre*. Arles, Paris : Actesud, Play Bac.
- Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning and instruction. In B. Jones & L. Idol (Eds.), *Dimensions of thinking and cognitive instruction* (pp. 15–51). Hillsdale, NJ: Erlbaum.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, 37(2), 91-105.
- Perry, N. E., Phillips, L., & Hutchinson, L. R. (2006). Preparing student teachers to support for self-regulated learning. *Elementary School Journal*, 106, 237-254.
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 452–494). San Diego: Academic.
- Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33–40.
- Pressley, M. (1995). More about the development of self-regulation: complex, long-term and thoroughly social. *Educational Psychologist*, 30, 207–212.
- Pressley, M., & Ghatala, E. S. (1990). Self-regulated learning: Monitoring learning from text. *Educational Psychologist*, 25, 19-33.
- Pressley, M., Woloshyn, V., Lysynchuk, L. M., Martin, V., Wood, E., & Willoughby, T. (1990). A primer of research on cognitive strategy instruction: The important issues and how to address them. *Educational Psychology Review*, 2, 1–58.

- Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology, 19*, 460-475.
- Schunk, D. H., & Zimmerman, B. J. (2003). Self-regulation and learning. In W. M. Reynolds, G. E. Miller, I. B. Weiner (Eds.), *Handbook of psychology (Vol. 7) Educational Psychology* (pp. 59-78). Hoboken, NJ: John Wiley & Sons.
- Slavin, R. E. (2006). *Educational psychology. Theory and practice*. Boston, MA: Pearson Education, Inc.
- Sperling, R. A., Howard, B. C., Staley, R., & DuBois, N. (2004). Metacognition and self-regulated learning constructs. *Educational Research and Evaluation, 10*, 117-139.
- Weinstein, C. E., & Mayer, R. E. (1987). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3<sup>rd</sup> Ed., pp. 315-327). New York: Macmillan.
- Weinstein, C. E., & Palmer, D. R. (2002). LASSI. *User's Manual for those administering Learning and Study Strategies Inventory* (2<sup>nd</sup> Edition). Clearwater, FL: H&H Publishing Company.
- Winne, P. H. & Perry, N. E. (2000). Measuring self-regulated learning. In P. Pintrich, M. Boekaerts, & M. Seidner (Eds.), *Handbook of self-regulation* (p. 531-566). Orlando, FL: Academic Press.
- Winne, P. H. (1996). A metacognitive view of individual differences in self-regulated learning. *Learning and Individual Differences, 8*, 327-353.
- Winne, P. H. (2005). A perspective on state-of-the-art research on self-regulated learning. *Instructional Science, 33*, 559-565.
- Wolters, C. A. (2003). Regulation of motivation: evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist, 38*, 189-205.
- Wolters, C. A. (2004). Advancing achievement goal theory: using goals structures and goal orientations to predict students' motivation, cognition and achievement. *Journal of Educational Psychology, 96*, 236-250.
- Wrugt, A., & Oort, F. J. (2008). Metacognition, achievement goals, study strategies and academic achievement: pathways to achievement. *Metacognition and Learning, 3*(2), 123-146.
- Young, A., & Fry, J. D. (2008). Metacognitive awareness and academic achievement in college students. *Journal of the Scholarship of Teaching and Learning, 8*(2), 1-10.
- Zimmerman, B. J. (1999). Self-regulated learning and academic achievement. *Educational Psychologist, 25*, 3-17.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*, 3-17.