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METACOGNITIVE SKILLS, SELF-REGULATED LEARNING, AND ACADEMIC PERFORMANCE AMONG FIRST-YEAR UNDERGRADUATE STUDENTS AT FELIX HOUPHOUET BOIGNY UNIVERSITY IN ABIDJAN

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Abstract:

This study aims to understand the influence of metacognitive skills and self-regulated learning on the academic performance of first-year university students. With this in mind, a sample of 140 first-year undergraduate students was selected using cluster sampling at Félix Houphouët Boigny University in Abidjan (Ivory Coast). Two questionnaires relating to the different variables were administered to them. After the data were analyzed, the means obtained were compared using Student's t-test for independent samples in SPSS software. The results showed, first, that first-year undergraduate students who use metacognitive skills in their learning process have higher academic performance than their peers who do not use metacognitive skills in their learning process. Second, undergraduate students who apply self-regulated learning in their learning process perform better academically than their peers who do not apply self-regulated learning in their learning process.

Keywords: Self-regulated learning, undergraduate students, metacognitive skills, academic performance.

Résumé:

Cette étude vise à comprendre l'influence des habilités métacognitives et de l'apprentissage autorégulé sur la performance académique des étudiants de première année d'université. Dans cette optique, un échantillon de 140 étudiants de licence 1 a été sélectionné par la technique d'échantillonnage par grappe à l'Université Félix Houphouët Boigny d'Abidjan (Côte d'Ivoire). Deux questionnaires relatifs aux différentes variables, leur ont été administrés. Après le dépouillement des données, les moyennes obtenues ont été comparées avec le t de Student pour échantillon indépendant dans le logiciel Spss. Les résultats ont montré premièrement, que les étudiants de licence 1 qui impliquent des habiletés métacognitives dans leur processus d'apprentissage ont une performance académique supérieure à celles de leurs pairs qui n'impliquent pas d'habiletés métacognitives dans leur processus d'apprentissage. Deuxièmement, que les étudiants de licence 1 qui mettent en application l'apprentissage autorégulé dans leur processus d'apprentissage ont une performance académique supérieure à celle de leurs pairs qui ne mettent pas en application l'apprentissage autorégulé dans leur processus d'apprentissage.

Mots clés : Apprentissage autorégulé, étudiants de licence 1, habilités métacognitives, performance académiques.

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1 Introduction

Academic performance is today, the objective pursued by all the universities in the world. This is measured through the results produced each year by the students. However, the prevailing observation is the high rate of failure and dropout in these universities. In particular, among first-year undergraduate students. J-P. Vandamme et al (2006: 40) explain that : « In French-speaking universities in Belgium, 60% of first-generation students fail or drop out in the first year ». According to J-L. Dupont (2003: 39) :

> For the year 2002-2003, 46.2% of students who entered in 2001-2002 in the first year of undergraduate studies (including IUT and university engineering courses) were admitted in 2nd year, 29% repeated their first year and 24.8% left the university system,

permanently, temporarily or with a view to an orientation towards higher non-university courses (STS, paramedical and social training).

Thus, R.Bodin andM. Millet (2011 : 65) indicate that :

> The first university cycles are characterized by a particularly high evaporation rate in the first year, compared to other possible courses in hig her education. Each year, 25% of students enrolled in the first year of bachelor's degree do not re-enroll the following year.

Concerning first-year psychology students at Félix Houphouët Boigny University in Abidjan, « from 2013 to 2016 the rate of students who failed increased from 10% to 25% in the number of major teaching units » (K. A. Kouadio et al, 2024: 6).

In view of this alarming data indicating the problem of academic performance at the level of undergraduate students, it appears more than necessary to look into this phenomenon. Because anyone who enrolls in university for post-secondary studies must be able to continue their studies and graduate with a degree. This is where the term academic performance takes on its full meaning. M. A. Deniger (2004: 3) defines academic performance as « the achievement of learning objectives related to the mastery of knowledge specific to each stage of the school path taken by the studentand ultimately obtaining a diploma or integration into the job market ». All students must therefore be able to master the learning related to their specialties and their levels at each stage of their course. This allows them to obtain their various end-of-cycle diplomas and to enter the professional world. However, the observation made is that they have difficulty getting through the first year of university. Thus, this difficulty, experienced by the students of the bachelor's degree 1, has aroused our interest in this research.

Several studies have already been undertaken on academic performance and the factors likely to influence it. P. Saeed (2010 : 6) conducted,

> Research on the quality of learning and the academic performance of students. From the results, it appears that the student's perception of the university environment influences the meaning given to his act of learning. When the university environment is perceived as interesting, stimulating and relevant, the student is more mobilized for better learning, a richer more open educational relationship and a more important intellectual complicity with the teacher. So it is the quality of the tools and methods used in the work environment, which arouse in students the desire to learn. Academic performance

> is then a function of the perception that students have of their work environment and the opportunities offered by this environment.

However, while beingin a rich environment, students to be successful must become aware of their learning and engage in achieving the set objectives. G.Benoit-Chabot and P. L. Denis (2018: 129), indicate as a result that :

> The only preference for active experimentation moderates the relationship between the conscientiousness factor and academic performance. For them, conscientious students obtain the best results on the final exam when they have a preference for learning through active experimentation. Then, the integration of pedagogical methods that can promote learning through active experimentation (practical work, internships, stimulation work and experimentation work) is a contribution to improving academic performance among these students.

All these studies have explored the academic performance of first-year university students and the factors likely to influence it. However, none of them mentioned the effect of metacognition and self-regulated learning on this performance.

However, students really understand and take ownership of the content of learning, when they use their metacognitive skills to successfully complete learning tasks. According to R. C. Pianta et al (2008: 6), « the development of metacognitive skills and understanding of one's own thought processes play a crucial role in the child's progress ». Thus, these elements are put in place at the level of the learners, through an internal organization and a well-defined structuring of the tasks to be performed. Students mobilize problem-solving strategies based on the knowledge they have and the methods they use to obtain satisfactory results. In this way, they engage in the pursuit and achievement of set performance goals. This approach involves self-regulated learning. B. J. Zimmerman and D. H. Schunk (2011: 1) define self-regulated learning as « processes through which learners activate and sustain their cognitions, emotions, and behaviors that are systematically directed toward the achievement of a personal goal ». Therefore, it is not only about using metacognitive skills, but the student must be able to regulate them and direct them with motivation towards the achievement of an expected performance goal. Metacognitive skills and self-regulated learning therefore appear as variables that can influence the academic performance of first-year university students. Thus, the concern that legitimizes this study is to know howthe involvement ofmeta-cognitive skills and the application of self-regulated learning in the learning process, can influence this academic performance? The general objective of this study therefore aims to understand the

influence of metacognitive skills and of self-regulated learning on academic performance among first-year undergraduate students. In order to achieve this objective, we put forward the following hypotheses:

H1: first-year undergraduate students who involve metacognitive skills in their learning process have a higher academic performance than their peers who do not involve metacognitive skills in their learning process.

H2: First-year undergraduate students who apply self-regulated learning in their learning process have a higher academic performance than their peers who do not apply self-regulated learning in their learning process.

To establish the veracity of our hypotheses, our study will be based on the research methodology, the results and their discussion.

2 Research methodology

The methodology section allows us to describe and analyze our different variables, to indicate the sampling technique used for the selection of the sample, the data collection tools and the statistical processing of these data.

2.1 Description and analysis of variables

The first independent variable is metacognitive ability. According to L. Lafortune et al (2000: 12-13):

> a metacognitive skill is the ability to mobilize one's knowledge and know-how, with the explicit intention of planning the execution of a task, in order to better supervise, evaluate it, and make a critical judgment on the effectiveness of one's approach with regard to the strategies put in place and the goal pursued. This judgment not only enriches one's metacognitive knowledge, but also develops a conscious knowledge that can be deployed in increasingly complex situations. The main manifestations of a metacognitive skill are the control and regulation of the learning process because they are the result of a constant and conscious evaluation and thus promote reuse.

This makes it possible to put in place adapted metacognitive strategies, to be more effective during learning. In this work, we define metacognitive skills as the actions and strategies developed by students to precisely select, use, control and regulate information adapted to a problem situation to be resolved. It is a qualitative variable. These modalities are the students

who involve metacognitive skills in their learning process. These deploy a set of strategies to effectively integrate, understand, regulate and restore their different learning. On the other hand, students who do not involve metacognitive skills in their learning process stick to note-taking, rote learning and the accumulation of knowledge.

The second independent variable is self-regulated learning. For D. H. Schunk and P. A. Ertmer (2012: 644), « self-regulated learning refers to all the processes by which subjects activate and maintain cognitions, affects and behaviors systematically oriented towards achieving the goal ». B. J. Zimmerman (1989: 329) specifies that « learners are self-regulated when they actively participate in their own learning process from a metacognitive, motivational and behavioral point of view ». Self-regulated learning therefore refers in this article to the ability to put in place metacognitive strategies, while having the motivation to regulate them and direct them towards the achievement of a fixed performance objective. This variable is qualitative. These modalities are students who apply self-regulated learning in their learning process. The latter use metacognitive strategies, depending on the learning tasks to be carried out, engage with motivation in the production of self-regulated intellectual work, while taking into account the management of time and materials. Students who do not apply self-regulated learning in their learning process limit themselves to returning the knowledge learned by heart and no longer have resources when they forget part of their knowledge.

The dependent variable is academic performance. Referring to M. A. Deniger (2004: 3), « academic performance corresponds to the level of mastery of knowledge specific to each stage of the school career of the learner. It is crowned by obtaining a diploma or integration into the job market ». It is a quantitative variable. It is measured from the average obtained by students in the first session.

2.2 Sampling method

In our research, we need license 1 students from the Félix Houphouët Boigny University of Abidjan, who follow the same teaching programs and who have the same evaluations. So, to constitute a sample adapted to our study, we will use the cluster sampling method. According to S. Beavogui (2012: 9),

> This method involves dividing the population into groups or clusters. Then, one or more clusters are randomly selected to represent the total population. The sample then consists of the units within the cluster or clusters selected. The purpose of this type of

sampling is to reduce costs by creating pockets of individuals instead of extending the sample over the entire territory.

Our sample therefore consists of 140 first-year undergraduate students from the Psychology Department of Félix Houphouët Boigny University for the year 2024-2025.

2.3 Data collection tools

Our data collection instruments are questionnaires. The measurement of metacognitive skills in the learning process will be carried out with the Metacognitive Awareness Inventory (MAI) by G. P. Schraw and R. S. Dennison (1994: 472-475),

> This questionnaire is composed of two main parts. Each of the dimensions included in the two parts contains items. The first focuses on knowledge about cognition and includes three dimensions. We have declarative knowledge (8 items), procedural knowledge (4 items) and conditional knowledge (5 items). The second part focuses on the regulation of cognition and has five dimensions. These are planning (7 items), information management strategies (10 items), monitoring comprehension (7 items), debugging strategies to correct errors (5 items) and evaluation (6 items). The first part consists of 17 items and the second part of 35 items, with the possibility of answering, true or false and for each answer, scores of 1 for true and 0 for false are assigned.

The questionnaire to be sent to students does not contain the dimensions and parts mentioned. It is only composed of items which are around 52 in number.

To measure the implementation of self-regulated learning in the learning process of first-year students, we will use the French translation of the questionnaire by L. Barnard et al (2009: 3-6), the Online Self-Regulated Learning Questionnaire (OSLQ).

> This questionnaire was developed by these authors to measure the self-regulation of student learning during online courses. It is composed of 6 sub-scales, namely goal setting (5 items), environment structuring (4 items), task strategies (4 items), time management (3 items), help-seeking (4 items) and self-assessment (4 items). This gives a total of 24 items. The possible answers and the scores assigned range from strongly agree (5) to strongly disagree (1).

We have adapted this tool to our study, to measure the self-regulation of learning during face-to-face courses. For this purpose, some items have been modified. Then, we carried out a pre-survey on a sample of 20 participants. With the data collected, we carried out the tests of the normal law, factor analysis and Cronbach's alpha in the Spss software, to verify the reliability

of our tool. The results of the law normal allowed us to remove items 1, 5, 11 and 20. The factor analysis allowed us to retain 3 dimensions which take into account 11 items, namely items 3,6,9,10,13,14,16,18,19,21 and 23. These are numbered from 1 to 11 in the new scale. The Cronbach's alpha obtained is equal to .870. The new instrument is reliable and includes 11 items. The header of these various questionnaires administered to students is marked with the student's name and first names, as well as instructions inherent to the completion.

2.4 Administration of data collection material

The questionnaires were completed in the tutorial room. We received the students in groups of 35 and gave them the questionnaires which they completed, indicating their names and first names. The instructions given for each questionnaire are to tick the box of the items that best correspond to their choice of answer. We also explained to the students that we need information on their different working methods and that the answers are individual and personal. We also guaranteed the anonymity of their answers. Each of the groups proceeded to complete the first questionnaire, then the second. At the end of the exercise, we made sure that the questionnaires were filled out properly and collected them. The different group sessions lasted 7 to 10 minutes for completing the two questionnaires.

2.5 Data analysis

The purpose of using these questionnaires is to have comparable groups within our sample. Thus, the analysis was done by completed questionnaire. For each subject, the scores were added up to find the total obtained. Regarding the questionnaire measuring metacognitive abilities, when first-year undergraduate students have a score lower than 26, they do not involve metacognitive abilities in their learning process. However, when they have a score greater than or equal to 26, they involve metacognitive abilities in their learning process. As for the questionnaire on self-regulated learning, first-year undergraduate students who obtain a score lower than 28 do not apply self-regulated learning in their learning process. On the other hand, those who have a score greater than or equal to 28 apply self-regulated learning in their learning process. Therefore, after the data analysis and based on the scores obtained by the students, our sample is composed of 78 students who involve metacognitive abilities in their learning process and 62 students who do not involve metacognitive abilities in their

learning process; 75 students who apply self-regulated learning in their learning process and 65 students who do not apply self-regulated learning in their learning process.

2.6 Statistical data processing

The statistical data processing consists of comparing the averages of academic performance obtained by these first-year undergraduate students in the first exam session between these different groups. This comparison is performed using Student's t-test for independent samples in the Spss software. The results will allow us to either confirm or disprove our hypotheses.

3 Study results

3.1 Result of hypothesis 1

Table I: Results of the comparison of academic performance averages between first-year undergraduate students who involve metacognitive skills in their learning process and first-year undergraduate students who do not involve metacognitive skills in their learning process

Group Statistics

	Metacognitive skills	N	Mean	Standard deviation	Student's t-test	Df
Academic performance	First-year undergraduate students who involve metacognitive skills in their learning process	78	14,4147	,58559	13,657	138
	First-year undergraduate students who do not involve metacognitive skills in their learning process	62	12,9524	,68055		

Source : Results obtained from SPSS software

In this table, the average academic performance of first-year undergraduate students who involve metacognitive skills in their learning process is 14.415. This is significantly higher than the average academic performance of first-year undergraduate students who do not

involve metacognitive skills in their learning process, which is 12.952. The calculated t-value of 13.657 is also higher than the theoretical t-value read in the table, at 138 degrees of freedom and at the probability threshold of P.05. This confirms our first hypothesis, which states that first-year undergraduate students who involve metacognitive skills in their learning process have a higher academic performance than their peers who do not involve metacognitive skills in their learning process.

The explanation for this result is based on Flavell's model of cognitive monitoring (1979: 906). This model shows that the first-year undergraduate student who is aware of the different categories of metacognitive knowledge puts in place metacognitive strategies to organize them, benefits from their metacognitive experiences to set goals that are achievable, and takes effective and precise actions to achieve these goals. This cognitive monitoring allows them to implement metacognitive skills to guide and regulate their cognitive approach. This promotes, in the latter, a reflection on their own cognition, the development of appropriate strategies, and the implementation of actions to engage competently in university work. This makes them more performant compared to their peers who simply remain at the level of cognition by recording the information received and memorizing it as they have acquired it without additional effort.

3.2 Result of hypothesis 2

Table II: Results of the comparison of academic performance averages between first-year undergraduate students who apply self-regulated learning in their learning process and first-year undergraduate students who do not apply self-regulated learning in their learning process

Group Statistics

	Self-regulated learning	N	Mean	Standard deviation	Student's t-test	Df
Academic Performance	First-year undergraduate students who apply self-regulated learning in their learning process	75	14,4548	,56081	14,220	138
	First-year undergraduate students who do not apply self-regulated learning in their learning process	65	12,9737	,67154		

Source : Results obtained from SPSS software

The results in this table indicate an average academic performance of 14.455 for first-year undergraduate students who apply self-regulated learning. This is significantly higher than the average academic performance of 12.974 for first-year undergraduate students who do not apply self-regulated learning. The calculated t-value of 14.220 is also higher than the theoretical t-value read in the table, at 138 degrees of freedom and at the probability threshold of P.05. This information confirms our second hypothesis, which states that first-year undergraduate students who apply self-regulated learning in their learning process have a higher academic performance than their peers who do not apply self-regulated learning in their learning process.

The explanation of this result is based on the cyclical model of self-regulatory feedback by B. J. Zimmerman and A. R. Moylan (2009: 300). The latter high lights the influence of self-regulated learning on the academic performance of first-year undergraduate students by showing that the preliminary reflection phase allows students to link their strategic learning plans to short- and long-term goals in a sequential system where they can practice effectively on their own over long periods. This process involves intrinsic motivation that leads the student to believe in their abilities, to engage personally in learning tasks, and to galvanize themselves in the pursuit and achievement of set goals. The performance phase guides and improves the student's metacognitive activity and allows them to select, control their metacognitive activity, and reliably record each result-achieving procedure. Finally, the self-

reflection method promotes in students the analysis and self-regulation of their metacognitive activities. This procedure increases, during learning and assessments, the academic performance of first-year undergraduate students who apply it compared to those who are content to accumulate the information received, to cram it by heart, and to render it as they obtained it.

4 Discussion of results

The results of this study showed firstly that first-year undergraduate students who involve metacognitive skills in their learning process have a higher academic performance than their peers who do not involve metacognitive skills in their learning process. In the same vein, D. Escorcia (2010: 63) :

> Conducted research aimed at determining the relationship between metacognitive processes and student performance in the field of writing production. To this end, two surveys using questionnaires and explanatory interviews were conducted with a sample of 57 psychology and education science students from the University of Paris Ouest-Nanterre La Défense. The analyses highlight the importance of metacognitive knowledge and the ability of students to use this information to plan and guide their written productions.

Thus, the student's ability to use metacognitive knowledge to plan and guide their daily written production is likely to improve their performance in the field in the long run. E. Mangione (2017: 24) showed that : « the learning of metacognition by learners and its practical application through tools, allows them to solve problems more effectively, that is, without blockage or with limited blockage ». The introduction of metacognitive skills in learning practices therefore improves student performance. These studies thus align with ours.
Secondly, the result obtained stipulates that first-year undergraduate students who apply self-regulated learning in their learning process have a higher academic performance than that of their peers who do not apply self-regulated learning in their learning process. In this perspective, S. Da Silva (2025: 3) has :

> Evaluated the effectiveness of a targeted intervention aimed at strengthening the knowledge of a group of students from the University of Fribourg regarding motivational self-regulation strategies and skills to self-regulate their learning. The intervention includes two interactive work shops and a system integrating various tools

> designed to support students in their motivational self-regulation process. A mixed methodology, combining closed and open questionnaires and focus groups, was used to measure the effects of the intervention and the perception of the participants. The results show the effectiveness of targeted interventions to streng then motivational self-regulation and suggest that they can play a crucial role in supporting students facing motivational challenges in their academic careers. They also highlight the importance of promoting the development of self-regulation skills for students evolving in learning environments where autonomy is highly valued. Such skills allow students to better manage their goals, motivations, and strategies, there by increasing their ability to adapt and succeed in demanding academic contexts.

Self-regulated learning thus appears as a factor positively influencing the academic performance of students. Therefore, L. Cosnefroy (2011: 42-43) specifie that:

> The application of self-regulated learning to adult education seems promising, as it enriches the understanding of learning processes. By high lighting the importance of goals related to the valorization of self-esteem and the defensive strategies that these goals can create. In addition, it draws attention to the need to have an extensive repertoire of volitional strategies to bring learning to completion.

In light of these studies, it is clear that self-regulated learning plays a vital role in the learning process and in the acquisition of good performance among students. These go, in this way, in the same direction as ours. We contribute in this way to the enrichment of the work carried out on the academic performance of first-year university students.

5 Conclusion

The general objective of this study is to understand the influence of metacognitive skills and self-regulated learning on the academic performance of first-year undergraduate students. To achieve this goal, we have put forward two hypotheses. The first stipulates that first-year undergraduate students who involve metacognitive skills in their learning process have a higher academic performance than those of their peers who do not involve metacognitive skills in their learning process. According to the second, first-year undergraduate students who apply self-regulated learning in their learning process have a higher academic performance than that of their peers who do not apply self-regulated learning in their learning process. The data were collected using two questionnaires, from a sample of 140 first-year

undergraduate students from the Félix Houphouët Boigny University of Abidjan (Côte d'Ivoire), selected by the cluster sampling technique. After processing the data, the averages obtained were compared with Student's t for independent sample in Spss software. The results confirmed our two hypotheses. We therefore make these suggestions. Teachers should further encourage first-year undergraduate students to be autonomous and responsible for their learning. This will allow them to detach themselves from dependence on the teacher, do more research and put in place metacognitive skills, to build and deepen their learning. In this way, they will be able to go themselves to the contact of information, reformulated courses to better identify them and set up metacognitive strategies, from the metacognitive knowledge they acquired during the teachings and metacognitive experiences resulting from these learnings. All this in order to produce an intellectual, structured and personal work. It is through these exercises that they will improve their academic performance. However, the latter should not limit themselves to setting up metacognitive skills. But they must also engage in self-regulated learning with motivation, by coordinating these metacognitive skills and self-regulating them to correct erroneous information, in order to achieve the set learning goals. Nevertheless, the academic performance of first-year university students, being a complex data, this study cannot alone give it an explanation. Further research can therefore emerge to better explain it.

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