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# **Learning Strategies in Relation to Academic Performance in a Nursing Degree: A Study Case**

**Maritza Acevedo Rodríguez <sup>a</sup>, Noelia Moreno Morales <sup>b</sup> and María Teresa Labajos Manzanares <sup>b</sup>**

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**Abstract:** This study analyzes the association between learning strategies, academic achievement and time to reach university degree for nursing students. Learning strategies studied were cognitive, meta-cognitive and motivational. Academic achievement was evaluated through the following variables: academic credits, attempted credits, approved credits and cumulative academic index. The questionnaire (CEA-U, for its Spanish acronym) was used to explore how these learning strategies are associated with greater academic achievement. Pearson's coefficient was calculated to evaluate the association between the CEA-U score and academic achievement. The sample was composed of 82 students from a university institution in Puerto Rico. The results of the study revealed significant differences between the use of learning strategies and gender, and between the use of strategies and academic achievement. The association between academic achievement and meta-cognitive strategies was positive and statistically significant. No statistically significant association was found between the use of learning strategies and time to reach university degree in nursing. These results demonstrate the pertinence of this study in university teaching to fortify curricula, improve academic achievement and reach academic goals in an established time frame using learning strategies which increase effectiveness in students.

**Key-Words:** Learning Strategies, Academic Achievement, Gender, Nursing Students, Study Time.

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<sup>a</sup> Universidad Metropolitana (Puerto Rico, United States). <sup>b</sup> Universidad de Málaga (Spain).  
Correspondence: Maritza Acevedo Rodríguez, Universidad Metropolitana, PO Box 21150, San Juan, PR 00928 (Puerto Rico, United States) [um\\_maraceved@suagm.edu](mailto:um_maraceved@suagm.edu).

## 1. Introduction

The major interest of universities during the last few years has been to offer the best academic programs with emphasis on the implementation of student learning evaluation to help students achieve their goals. This process in the university context has turned into a constant and irreversible one, as pointed out by Martin, García, Torbay and Rodriguez (2008). Evidence of this is the recent study published by J. Calderon Soto (2012), who studied the university student profile in Puerto Rico and found that factors like gender, age, retention rate, attempted credits and academic index, among others, influenced the achievement and time necessary to obtain a degree; which constitute the variables of interest in this investigation in relation to nursing students' use of different learning strategies. Learning strategies are multidimensional and complex constructs, for which reason different authors have differing definitions. Weinstein and Mayer (1986) define *strategies* as conducts and thoughts students apply during learning with the purpose of influencing their coding process. Fernández (2008) defines *learning* as the individual's preference when it comes to studying and learning. Brunner (2001) states that students learn by discovering in an active and constructive manner. We learn by observing through stimuli and emphasizing the way thoughts are stored and transformed in the mind, and how the latter infers and adapts to new contexts. Other authors agree that individuals have their own way of learning, which is not the same for everyone (Demirbas & Demirkan, 2007; Hernández-Pina, García-Sanz & Maquilon, 2004; Lashley & Barron, 2006). When we connect these concepts, we can interpret that learning strategies are the processes or mechanisms the individual uses to gain knowledge.

Recent investigations reflect that students' learning is often by rote instead of through the use of strategies, and consequently their level of achievement is deficient (Gonzalez & Diaz, 2006). These results point towards the need to investigate the learning strategies university students use. In our study, we have analyzed three types of learning strategies, according to the Learning Strategies Questionnaire in University Students (CEA-U): cognitive, meta-cognitive and emotional.

The theoretical focus in relation to *cognitive strategies* emerged around 1970 and has been studied by different investigators. Beltrán (1995) defines them as intentional procedures which allow the subject to make appropriate decisions to face the processes which characterize the cognitive system. Ausubel (1981, 2002), exposed the Cognitive Theory of Significant Learning, in which we can see the individual student as a reactive processor of the information through organized systematic learning. The author establishes that learning is attained when the significance is found in itself within the structure of knowledge which allows for establishing relationships. The

cognitive theorist Brunner (2001) uses the theories of Vygotsky and Piaget as points of reference, who state that interaction is fundamental for learning, which is acquired starting at the preoperational phase, from age 2 to 7, and in a successive manner until age 11 to 15, at which point formal operations can be developed. Based on these theories, at age 16 the student has developed learning strategies to attain academic achievement.

In cognitive strategies, we pinpoint four factors (*organization, generative elaboration, anchor elaboration* and *memorization*). Organization refers to specialization, structure and study elaboration (Sternberg, 1986). Here, looking for principal aspects of the text and separating them from irrelevant parts is emphasized to construct informative units (Hernández García, 1998). The factor of *generative elaboration* refers to achieving deeper text comprehension in order to amplify and generate new information. The factor of *anchor elaboration* focuses on information in the text which connects to previous knowledge, based on experience, without elaborating further. The other factor is *memorization*, which includes strategies centered on the signifier rather than the signified, considered as a cognitive process when working with the text (González, Valle, Rodríguez & Piñero, 2002).

The second group of strategies we studied was meta-cognitive. Burón (1997) defines them as knowledge and regulation of our own cognition and mental processes: perception, attention, memorization, lecture, writing, comprehension and communication. Kurtz (1990) adds that these cognitive and mental processes participate significantly in the learning process. This strategy stresses knowledge of the objectives and relevant content, self-monitoring and evaluation of results. Among meta-cognitive strategies, *planning* refers to the use of control strategies prior to studying, and *reviewing* to actually performing the process when finished.

The third group is made up of motivational strategies. According to Beltran (1995) and Shulman (1989), effective learning depends on the existing conceptual structures of selected information on individual motivation. Additionally, we cannot continue to measure learning only by what we teach, but according to what the student interprets, comprehends and constructs based on what we teach. Motivation is a group of processes involved in the activation, direction and persistence of behavior (Valle et al., 2007). In this strategy, five factors were analyzed. The first factor is *implication*, which centers on research and focus on the activity. The factor of *focus on the positive* centers on the struggle against lack of enthusiasm and against stress, and attempting to associate studying to relaxing and pleasing settings. The factor of *applicability* seeks functionality and the application of studied content. The factor of *effort* is based on establishing goals and rewards associated to the area of study. Lastly, the factor of *gradual approximation* focuses on successive approximation to the studied area, both physically and mentally.

Another variable studied in our investigation, is *academic achievement*. This is defined as the progress the students achieve in terms of courses in the study program (*academic success*), whether they successfully achieve the required credits (*attempted credits and approved credits*) and graduation index according to trends in their area of concentration. Other analyzed variable was *the gender* (female and the men). Also analyzed *the students* who completed their college degree in nursing. The last variable studied is *time to complete nursing degree*, examined according to the time established by the institution of 4 to 6 years from initiation to culmination of studies.

The literature shows different ways to evaluate learning strategies and academic achievement. Investigations have studied learning strategies in university students at risk of dropping out in the first year (Romero, Martínez, Ortega & García, 2013; Escoliza, 2009 and Muñoz, 2005). Others authors have investigated the relationship between learning strategies and academic achievement in university students (Martin, García, Tobay & Rodríguez, 2008), as well as how this relationship differs according to gender (Rossi Casé, Neer, Lopetegui & Doná, 2010). These studies reveal that inadequate use of learning strategies result in low academic achievement, and the lack of learning strategies is the fundamental cause of academic failure.

Other investigations have shown that among first-year students, superficial focus, extrinsic motivation and rote learning predominate as learning strategies, and cognitive and meta-cognitive strategies are less common (Salim & Lotti, 2011; Cardozo, 2008). In another investigation, Sanjuán Quiles & Martínez Riera (2008) studied the construct of teaching-learning with regards to the interrelation of knowledge and clinical/community formation. Menderes (2010) studied the relationship between meta-cognitive learning strategies and academic achievement in university students. The results these investigations contribute are important because they confirm that the students see themselves as constructors of their learning process and fomenters of significant learning. Effective learning can become a reality if the students know the strategies they use to learn. Supervision helps students use meta-cognitive strategies, which allows students to be more successful in their academic career. Another authors report university students who use profound learning, with the ability to regulate their learning, intrinsic and meta-cognitive motivation, which helps them plan, revise and supervise the study process and attain significant learning (Almerich, Garfella Fernández, García & Rodríguez, 2011; Esquivel, Rodríguez & Padilla, 2009).

According to our review of literature, there is a consensus in different studies regarding the importance of learning strategies to attain academic achievement. However, there is disparity in some studies which have analyzed these variables. Cartagena (2008) states that academic achievement is the result obtained in relation to proposed objectives; while Díaz (2007) and

Santiago (2009) concur that the development of good study habits is slow and gradual, but is a road that leads to success.

Our study pretends to contribute to the proposal of Otero, Nieves and Pérez (2007), who recommend the use of learning strategies not only in intellectual development, but also for personal development. Their study referred to constructivism, which focuses on three basic elements for the teaching-learning process: the student, the professor and the content. These authors state that learning depends on the student's mental activity, which requires a level of maturity between theory and methodology. Moreover, they established that the professor helps construct meaning.

The goal of our investigation is to provide valuable information about the use of learning strategies in relation to academic achievement. We seek to encourage the inclusion of teaching strategies demonstrated to be effective in primary levels of university curriculum, given their contribution to better academic achievement. With this in mind, the specific objectives established were: to describe and compare learning strategies used by university students in relation to gender; to know, identify and compare differences in academic achievement in relation to learning strategies used by nursing students in their fourth year, and analyze the association between strategies and time to complete a university degree in nursing.

Studying learning strategies used by university students allows for strengthening academic curricula, revising support services for the students, improving academic achievement, and helping students reach their university degree in the time established by the study program. Specifically, the results of our investigation provide bases to propose curricular revisions consonant to the actual needs and characteristics of students, contributing to andragogical enrichment and proposing additional academic action.

## **2. Methodology**

This is a descriptive investigation with a transversal design. The analysis was descriptive, using frequency and percentage measures. We analyzed whether there was a significant relationship between learning strategies, academic achievement and time to complete the nursing degree. This relationship was measured using Pearson ( $r$ ) correlation coefficients for achievement rates.

### **2.1. Participants**

The sample was composed of 105 students enrolled in a nursing program of a university institution in Puerto Rico. 78% of university students ( $n = 82$ ) of both genders (63 female = 76.8% and 19 male = 23.2%). As inclusion criteria, participants had to be enrolled in concentration courses in the process of completing a nursing university degree in May 2014. Once

authorization by the Committee for the Protection of Human Beings in Research (IRB, using the Spanish acronym) was received, we proceeded to collect data for the study. The variable age followed this distribution: 37 subjects aged 26 or older (45.1%), 33 subjects under 24 years (40%), 6 subjects between ages 20 and 21 (7.3%), 27 subjects between ages 22 and 23 (32.9%) and 12 subjects between ages 24 and 25 (14.6%).

## 2.2. Instruments

For this study, we used the *Learning Strategies Evaluation Questionnaire for University Students* (CEA-U, for its Spanish acronym) by Martín Cabrera, García, Torbay and Rodríguez (2007), which is a reduced version of the following three tests: the *Motivational Habits and Study Strategies Questionnaire*, HEME; the *Cognitive Learning Strategies Questionnaire*, ECA and the *Questionnaire of Control Strategies during Studying*, ECE, by Hernández and García (1995), and developed after the NOTICE model (Hernández and García, 1991, 1994, 1998). The CEA-U is composed of a total of 57 items (Likert Scale) in a format of answers which range from 0 (*not at all*), 1 (*seldom*), 2 (*sometimes*), 3 (*frequently*) and 4 (*always*). We evaluated three scales: motivational strategies (27 items), cognitive strategies (22 items) and meta-cognitive strategies (8 items). The reliability analysis of the CEA-U and the three scales which composed it revealed an acceptable index, according to Nunnally and Burnstein (1994), who propose a minimum score of .70 as an acceptable reliability level. The results of the reliability index were high, with coefficients above .70 in the three strategy scales: cognitive ( $\alpha=.87$ ), motivational ( $\alpha=.85$ ) and meta-cognitive strategies ( $\alpha=.83$ ).

Additionally, we designed a questionnaire we called Template to Obtain Data from University Students who finished their University Degree in Nursing. In this template, we collected the data according to: student number (ID), gender, age, time to complete nursing degree, student's academic achievement (academic success, attempted credits and approved credits, as well as the cumulative academic index) during his/her university career up to the attainment of a nursing degree. This data was provided by the Official University Study Register, considered a provider external to this study. They were not provided by the student but by an institutional official, which helps avoid mistakes and minimizes the common variance method effect.

## 2.3. Procedure

The CEA-U Questionnaire was administrated to nursing students from the selected sample that fulfilled the inclusion criteria and agreed to willingly and freely participate in the study during May 2014. We maintained privacy and confidentiality standards according to the provisions of the Informative Sheet. The designated official in the Registry provided academic achievement

data, and the investigator paired this data with the questionnaire of the 82 participant students. The data was entered into SPSS 20. The reliability of the instrument and scales were measured using the Cronbach Alpha coefficient. Absolute distributions and percentages for each variable were prepared, as well as contingency tables by gender, age and time to complete nursing degree.

We used the data in the Registry file to evaluate the variable of academic achievement using correlated analyses. Academic achievement in our investigation is defined by four study variables. In the first place, *academic success*, measured in terms of approval of nursing curriculum courses with a grade of A, B and C, from which data we made a distribution sample for this variable. *Credits attempted* are all of the credits the student enrolled in, notwithstanding program or grade received. *Credits approved* are all course credits passed with grades A, B, C, D, or P. To analyze the total *attempted and approved credits* by university grade nursing students, a distribution was first made classified in two rows: one for 60 to 125 credits and one for more than 125 credits. To attain a deeper analysis, we calculated the percentage ratio between the number of approved credit and the number of attempted credits as part of the study program. This was called the achievement range (AR), and we interpreted that the closer the resulting value was to 1.00, the greater the student achievement. In the fourth place, the analysis of the academic achievement variable incorporated the *cumulative academic index* by students upon graduation in May 2014, which fluctuated between 2.00 to 2.49 = C, 2.50 to 3.49=B and 3.50 to 4.00 = A. For the purposes of this study, the student's academic achievement was considered high when all program courses were approved with outstanding grades or qualifications, his/her AR was close to or equal to 1.00, and he/she had an academic index of 3.50 or higher.

### 3. Results

According to the operationalized variables in the study as described in the previous section, 49 university students (59.8%) were classified as attaining high academic achievement. The other 33 participants (40.2%) were grouped into the low academic achievement column. Then, the items in the cognitive, motivational and meta-cognitive learning strategies scales were correlated with academic achievement in students. Table 1 shows the correlation between academic achievement and meta-cognitive strategies, which proved to be statistically significant ( $r=.235$ ,  $p<0.05$ ). However, no significant correlation was found between academic achievement and the other two learning strategies (motivational with  $r=.172$ ,  $p>0.05$ , and cognitive with  $r=.043$ ,  $p>0.05$ ).

		<i>Learning Strategies</i>		
		<b>Motivational</b>	<b>Cognitive</b>	<b>Meta-cognitive</b>
Academic Achievement	<i>r</i>	.172	.043	.235
	<i>p</i>	.123	.704	.034*
	<i>n</i>	82	82	82

Table 1. *Pearson's correlation coefficient between nursing student's academic achievement and use of learning strategies.*

To elaborate on these results, contingency tables were drawn between nursing student's academic achievement and the use of learning strategies. The distribution results in this exercise show that practically the complete sample that attained high academic achievement (93.9%) used meta-cognitive strategies frequently or always. However, a smaller percentage of students with low academic achievement (75.8%) used meta-cognitive strategies frequently or always. Additionally, we observed that the order of strategy use among high achievement students was: meta-cognitive (95.9%), motivational (88.7%) and cognitive (83.7%).

To identify the learning strategy with the most important relationship or association to greater academic achievement, we used statistical correlation based on Pearson's coefficient (see Table 2). The correlation was low in some cases. Only one of the correlations was statically significant, between meta-cognitive strategies and cumulative GPA ( $r = .228, p < 0.05$ ). This result proves that there is a significant but low correlation between meta-cognitive learning strategies and academic performance in participating nursing students.

<b>Academic Performance Indicators</b>		<i>Learning Strategies</i>		
		<b>Motivational</b>	<b>Cognitive</b>	<b>Meta-cognitive</b>
Academic Success	<i>r</i>	.068	-.028	.204
	<i>p</i>	.545	.803	.066
	<i>n</i>	82	82	82
Cumulative GPA	<i>r</i>	-.021	-.048	.228*
	<i>p</i>	.852	.667	.040
	<i>n</i>	82	82	82

Table 2. *Analysis of statistical correlations between academic performance indicators and use of learning strategies.*



A detailed examination of the cumulative GPA distribution and the use of meta-cognitive learning strategies found that a higher percentage of the students with a cumulative GPA of 3.50 or higher, which represents a grade of A, often or always used meta-cognitive strategies. Only three students from this group (7%) indicated having used this strategy sometimes or never, while in this same category, eight students (20.5%) were found with grades of B or C (a GPA below 3.5).

To examine the use of learning strategies in greater detail, first order factors in the learning strategies were analyzed. In the meta-cognitive strategies or control scale, two factors are distinguished (planning and revising); these were included in a statistical correlation analysis by the academic performance indicators present in the study.

From Table 3, it can be seen that the meta-cognitive strategy factors had a statistically significant correlation with variables that measure academic performance. The planning factor of the meta-cognitive strategies scale had a significant correlation with academic performance ( $r=.232, p<.05$ ), and the other factor, revision, showed a significant correlation with cumulative GPA ( $r=.225, p<.05$ ). Specifically, the results point towards the fact that meta-cognitive strategies based on control strategies used before, during and after studying are significantly related to the academic performance and cumulative GPA of participating nursing students.

<i>Meta-Cognitive Scale Factors</i>		<i>Academic Success</i>	<i>Performance Rate</i>	<i>Cumulative GPA</i>	<i>Academic Performance</i>
Planning	<i>r</i>	.211	-.052	.176	.232*
	<i>p</i>	.057	.646	.113	.036
	<i>n</i>	82	82	82	82
Revising	<i>r</i>	.144	.002	.225*	.191
	<i>p</i>	.196	.989	.042	.086
	<i>n</i>	82	82	82	82

Table 3. Analysis of statistical correlations between factorial structures of meta-cognitive strategies and academic performance indicators.

Another objective involved analysis of the use of *cognitive* strategies based on the first order factors of this scale and academic performance indicators. From Table 4, two cognitive strategy factors were drawn which had a statistically significant correlation with performance rate. These were: *Memorization* ( $r=-.247, p<.05$ ) and *Anchor Elaboration* ( $r=.236, p<.05$ ). The analysis also showed that the memorizing factor had a significant correlation with cumulative GPA ( $r=-.294, p<.01$ ).

<i>Cognitive Strategy Scale Factors</i>		<i>Academic Success</i>	<i>Performance Rate</i>	<i>Cumulative GPA</i>	<i>Academic Performance</i>
Organization	<i>r</i>	.002	-.016	-.011	.053
	<i>p</i>	.987	.887	.921	.635
	<i>n</i>	82	82	82	82
Generative Elaboration	<i>r</i>	.055	.019	.099	.165
	<i>p</i>	.623	.862	.376	.138
	<i>n</i>	82	82	82	82
Anchor Elaboration	<i>r</i>	.153	.236*	.172	.186
	<i>p</i>	.171	.033	.122	.094
	<i>n</i>	82	82	82	82
Memorization	<i>r</i>	-.209	-.247*	-.294**	-.188
	<i>p</i>	.059	.026	.007	.091
	<i>n</i>	82	82	82	82

Table 4. Analysis of statistical correlations between cognitive strategy scale factors and academic performance indicators.

The other objective included was to identify and examine the association between the use of motivational learning strategies based on the five specific first-order factors of the scale with relation to the academic performance of participating nursing students. Correlations based on the Pearson coefficient were used. Table 5 shows that the only factor among the motivational strategies that showed a statistically significant correlation with the students' academic performance was applicability ( $r=.229$ ,  $p<.05$ ). Specifically, this points toward the fact that motivational strategies based on the search for the functionality and applicability of the contents studied correlated significantly with the global academic performance of participating students at the end of their last year. There was no significant correlation among the self-reinforcement, implication, association and gradual approximation factors.

<i>Motivational Strategies Scale Factors</i>		<i>Academic Success</i>	<i>Performance Rate</i>	<i>Cumulative GPA</i>	<i>Academic Performance</i>
Self-reinforcement	<i>r</i>	.030	-.018	-.146	-.065
	<i>p</i>	.791	.870	.195	.564
	<i>n</i>	82	82	82	82
Implication	<i>r</i>	.087	.048	.184	.205

	<i>p</i>	.441	.667	.100	.066
	<i>n</i>	82	82	82	82
Association	<i>r</i>	.046	-.066	-.066	.067
	<i>p</i>	.682	.558	.558	.554
	<i>n</i>	82	82	82	82
Applicability	<i>r</i>	.035	.113	.184	.229*
	<i>p</i>	.756	.314	.100	.040
	<i>n</i>	82	82	82	82
Gradual Approximation	<i>r</i>	-.039	-.023	-.075	.044
	<i>p</i>	.727	.836	.504	.692
	<i>n</i>	82	82	82	82

Table 5. Analysis of statistical correlations between motivational strategies scale factors and academic performance indicators.

With the intent of corroborating the identification of the learning strategies scale factors that are being correlated with academic performance, a regression analysis was conducted. From this exercise, a single model was obtained, with a determination coefficient of  $R^2 = .265$ . The results of the Analysis of Variance (ANOVA) carried out to evaluate the significance of the model ( $F= 2.266, p=.020$ ), reveal a value of  $p<.05$ , indicating a significant correlation between the variables. Specifically, the cognitive strategy of *Memorization* ( $t= -3.296, p<.01$ ) and the meta-cognitive strategy of *Planning* ( $t= 2.049, p<.05$ ) were the only two factors that correlated significantly with academic performance. The relationship between memorization and academic performance was negative, which indicates that academic performance increases as memorization decreases. Meanwhile, the relationship between planning and academic performance was positive, which suggests that when this studying control strategy is implemented, the odds of improving academic performance increase.

Also, we sought to describe and compare the learning strategies used by college students according to gender. A descriptive analysis of median scores was conducted for each of the strategy scales included in the CEA-U. These scores were approximated to 3.00, which indicates that students often use the three learning strategies (motivational, cognitive and meta-cognitive). However, different patterns in the use of these learning strategies are observed with respect to gender (see Table 6). In light of the higher arithmetic medians, females use meta-cognitive learning strategies ( $\bar{X}= 3.30$ ) more often, while males regularly preferred cognitive strategies ( $\bar{X}= 3.11$ ). However, this difference was not statistically significant ( $p>.05$ ).

<i>Learning Strategies Scale</i>	<i>Gender</i>	
	<b>Female</b>	<b>Male</b>
Motivational	2.98	2.84
Cognitive	2.97	3.11
Meta-cognitive	3.30	3.00

Table 6. Median score of learning strategy scales by gender among nursing degree college students, 2014.

Another of our objectives was to compare and describe the academic performance of students according to gender. To analyze the data concerning *academic performance*, three variables were used: academic success, performance rate and cumulative GPA. As indicated at the beginning of this section, the distribution of students in each one of these variables, allowed for their classification as either high or low academic performance students. As can be seen in *Graphic 1*, the majority of students from both genders showed a high level of academic performance (high performance) and passed all program courses with outstanding grades; their AR was close to or equal to 1.00, attesting to their success attaining attempted credits. 61.9% of the female group had a GPA of 3.5 to 4.0, compared to 52.6% of the male group. However, statistical analysis revealed that this difference is not statistically significant ( $r = -0.80, p > .05$ ).

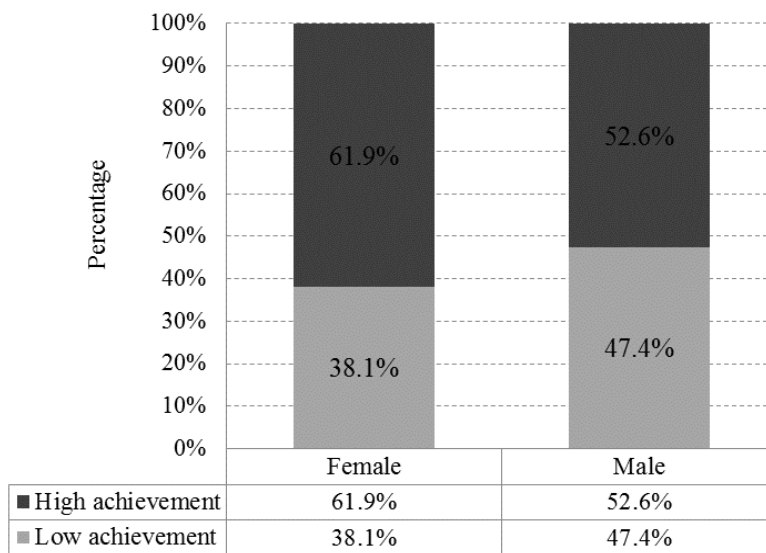


Figure 1. Academic performance by gender of participating nursing students

Regarding *academic success* by gender, there was a practically similar distribution between both female and male participants, revealing that around 42% of each group managed to approve all nursing program courses with grades of A, B or C (females with 42.9% and males with 42.1%). Comparing these results, academic performance based on course approval did not change with respect to gender.

To examine the academic performance rate by gender, a percentage distribution was prepared where both genders classified with high scores. However, the percentage of female was slightly higher at 85.7%, in comparison with males at 84.2 %. Upon examining the distribution of performance rate without segregating for any variable, it can be seen that 70 of the 82 individuals (85.4%) attained a high performance rate, while 12 individuals (14.6%) showed a low performance rate.

Cumulative GPA distribution by gender was analyzed and found to be higher in female than males. In 54.0% of the cases, females reached a cumulative GPA of 3.50 or higher, while for males the figure is 47.4%. This difference was not statically significant,  $r = -.025$ ,  $p > .05$ . Upon examining total sample distribution, it was observed that 43 of the participants, or 52.4%, had a cumulative GPA of 3.50 or higher. Meanwhile, 39 participants, or 47.6%, had a GPA under 3.50.

Another of our objectives was to analyze the association between degree program completion time and the use of learning strategies. This was examined using statistical correlations based on the Pearson coefficient (see Table 7). This analysis revealed that there was no statistically significant relationship between the use of learning strategies and nursing degree completion time. Notwithstanding the time it took students to complete their nursing degree, the majority of the participants in the study tended to use the motivational, cognitive and meta-cognitive learning strategies appropriately when using them often.

		<i>Learning Strategies</i>		
		<b>Motivational</b>	<b>Cognitive</b>	<b>Meta-cognitive</b>
Completion Time	<i>r</i>	.100	.089	.132
	<i>p</i>	.373	.428	.237
	<i>n</i>	82	82	82

Table 7. Analysis of statistical correlations between time to complete nursing degree and use of learning strategies.

#### 4. Conclusions

We concur with some research that had sought to explain the relationship between learning strategies and academic performance in college students. Firstly, we found that meta-cognitive strategies had a significant relationship with academic performance, as opposed to the cognitive and motivational strategies. Two factors were present in the use of meta-cognitive strategies: planning and revision. A significant relationship was found between planning and academic performance as well as between revision and cumulative GPA. This relationship points toward a student profile with characteristics centered on self-regulation before the learning process and one focused on how to use strategies and when to use them. These findings can be linked to the chosen sample, as it consisted of students finishing their college degree who have been able to develop more structured strategies and to reflect on their own learning process.

Our study showed that a student with high academic performance uses control strategies during and after studying. According to Kurtz (1990), it is possible to observe the effectiveness of the chosen strategies and change them according to the demands of the task.

In the cognitive learning strategies scale, a significant relationship was found between memorization and anchor elaboration with performance rate (PR). The profile of a high academic performance student shows more signifier-centered than signified-centered characteristics, since there was a negative or inverse relationship between the memorization strategy and the approval of attempted credits (PR).

Regarding the elaboration factor, information was found to be centered on data present in the text, and students more often related it to previous knowledge and also gave it personal significance. In a certain way, our study responds to what was exposed by Ausubel (2002), who argues that, when cognitive strategies are used, the individual is processing the information in a reactive manner through an organized and systematic learning process.

Among motivational strategies, only one factor takes in the applicability strategies that showed a significant relationship with global academic performance. This points toward the search for the functionality and applicability of the contents studied. According to Symons, Snyder, Cariglia-Bull and Pressley (1989), inefficient strategies are abandoned in favor of more suitable ones.

Our study found a profile of students who highly emphasize meta-cognitive strategies, highlighting the use of planning and revision strategies. We infer that the student established his/her studying goals and self-regulates him/herself in the process in order to achieve significant learning, as per Ausubel (2002).

Regarding the cognitive strategies, rote-centered factors and elaboration show a systematic and organized profile that relates previous knowledge with personal meaning. Finally, among motivational strategies, strategies involving applicability were observed, which implies application in order to learn.

Analysis of the use of learning strategies by gender revealed different usages, but these differences were not significant. Females showed a greater use of meta-cognitive strategies, while the males showed a preference for cognitive strategies. Although the observed differences by gender were not significant, they suggest that there is still space to strengthen the use of learning strategies, particularly motivational strategies among male students.

Finally, the students that participated in the study demonstrated having used all three types of learning strategies to some degree. However, results indicate higher median scores in meta-cognitive and motivational strategies among females, in comparison to higher median scores in the cognitive strategies scale for males, while motivational learning strategies were associated to the lowest median score.

The results indicate that a successful nursing student is one who centers on meaning, relating it to previous knowledge, and who uses meta-cognitive strategies that help him/her plan, supervise and revise his/her own studying process, facilitating the achievement of significant learning.

With respect to academic performance, regression analysis showed that distancing oneself from rote learning and instead emphasizing planning leads to better academic performance.

One of the limitations found when conducting this study was that it intended to study the entire student population that would finish the nursing degree program on May 2014. However, we found that not all students who requested graduation fulfilled the necessary requirements by the established date, which caused a reduction in the sample. By the time the questionnaire was administered, not all of the students were present in class, which prevented the participation of the whole sample selected. We are aware of the limitations that self-report format questionnaires have. Among them, the student answers retrospectively, meaning that he or she recollects information about the way he/she works, and no direct measurement of actual task performance can be obtained. This study helps us identify the needs, areas to improve in the process of continuing education, and learning assessment, thereby also helping in the process of agency accreditation.

In order to broaden this study, we recommend its replication in other nursing schools and applying different statistical analyses in the factors of each strategy and on academic performance. Furthermore, we recommend offering learning strategy seminars in the first introductory courses of the curriculum, and including activities that promote student use of learning strategies.

Curricula focused on meta-cognitive strategies should be developed, since these help students establish clear goals in order to attain the degree in the shortest possible time.

Our research focus in the future will be to analyze learning strategies in other schools, relating them to learning styles as well as studying new admissions and those students about to finish their degree.

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