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García-Béjar, Ligia; Gaeta-González, Martha Leticia; Benítez-Ríos, Yuriko
Teresa; Reyes-Vergara, María de Lourdes; González, Mariela Lourdes
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Learning patterns of educational sciences students in private Mexican universities

Patrones de aprendizaje de estudiantes de carreras educativas en universidades privadas

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Ligia García-Béjar*
Martha Leticia Gaeta-González**
Yuriko Teresa Benítez-Ríos***
María de Lourdes Reyes-Vergara****
Mariela Lourdes González*****

Abstract

This study analyzed the learning patterns of Mexican students of educational sciences in relation to some academic variables – semester they were studying, degree program, perception as a student, academic achievement and performance – measured through the Inventory of Learning Styles (ILS; Vermunt, 1998). Participants were 175 students from two private universities. A significant positive correlation was observed between academic performance and the pattern oriented to meaning, and a significant negative correlation between the former and the undirected pattern. A multiple orientation pattern was predominant among students from both universities, followed by a pattern oriented to meaning.

Key words: learning patterns – learning conceptions – learning motivation – learning strategies – self-regulated learning.

Resumen

Este estudio analizó los patrones de aprendizaje de estudiantes universitarios mexicanos de ciencias de la educación, en relación con algunas variables académicas -semestre de estudios, programa, percepción como estudiante, esfuerzo y rendimiento académico-, medidos mediante el Inventario de Estilos de Aprendizaje (ILS; Vermunt, 1998). Participaron 175 estudiantes. A partir de un diseño transversal, se observó una correlación significativa positiva entre el rendimiento académico y el patrón orientado al significado y una

* Pedagogue and Ph.D. in Communication. Full time Professor, Universidad Panamericana Campus Guadalajara. Mexico. ligarcia@up.edu.mx

** Ph.D. in Psychology and Learning. SNI 1. Full time Professor, Universidad Popular Autónoma del Estado de Puebla. Mexico.

marthaleticia.gaeta@upaep.mx

*** Ph.D. in Ciencias Sociales y Humanidades. Research Professor and Head of Academic Quality at Universidad Panamericana Campus Aguascalientes. Mexico. ybenitez@up.edu.mx

**** Ph.D. in Educación. Director of Educational Innovation and Development at Universidad Popular Autónoma del Estado de Puebla. Mexico. mariadelourdes.reyes@upaep.mx

***** Ph.D. in Education Science. Professor, Universidad Nacional de Cuyo. Argentina. mlgonzalez@ffyl.uncu.edu.ar

correlación significativa negativa entre el primero y el patrón no orientado. En los estudiantes de ambas universidades predominó un patrón de orientación múltiple, seguido por un patrón orientado al significado.

Palabras clave: patrones de aprendizaje – concepciones de aprendizaje – motivación académica – estrategias de aprendizaje – aprendizaje autorregulado.

Introduction

The demands of life-long learning in a context of rapid changes make it necessary to develop new teaching and learning practices. Hence, teaching staff trained and qualified in educational processes is required for its beneficial impact on the learning process, the academic community, and the Educational System as a whole. In regard to the training of students in the areas of education in Mexico, two lines can traditionally be observed: “Escuelas Normales” (Teacher Colleges) and Undergraduate University Programs.

Escuelas Normales offer undergraduate programs to train professionals that can teach at the preschool, elementary, and secondary education levels. According to the National Institute for the Evaluation of Education (2016), enrollment in the 2015-2016 cycle was around 108,000 students in 460 institutions, 60% of which are public and the rest private. In contrast, universities offer undergraduate programs in various areas such as Education, Pedagogy, Educational Sciences, Psychopedagogy, and related areas, which aim to train professionals in the educational field inside and outside the classroom, from educational management to intervention and pedagogical inclusion.

In this research we have focused on students enrolled in educational sciences in the university context. Although the study of the educational processes in university has grown worldwide and Mexico is not an exception, this research work has been conducted primarily in public environments. This prompts us to delve into the teaching and learning processes that take place in the educational processes in private universities.

Private higher education in Mexico is a relatively new and complex issue because it has not been a natural object of study for those who research higher education; secondly, there are various perceptions about the role of private education in Mexico. These institutions, like public ones, are regulated by the Ministry of Public Education (SEP) and are currently numerous and diverse. According to the Federation of Private Mexican Institutions of Higher Education (FIMPES; 2018), private universities receive 18% of the country’s higher education students’ enrollment; this percentage corresponds to almost 650,000 young people nationwide.

Traditionally, private education in Mexico has also meant a solution for access to education for young people who do not have a guaranteed place in public universities. Private higher education can contribute positively to the general goals of higher education. Overall, atten-

tion has been paid to consolidating students' professionalization and quality measurement and seeking alternatives to expand access (Barret, Fernández & González, 2020), due to a growing demand for income and the inability of federal and state governments to provide broader coverage. However, the economy plays an important role: although there are affordable private institutions, the reality is that higher education private institutions imply an investment that, in a country where the current monthly income per household is 750 dollars, is difficult to absorb (ENIGH, 2016), added to the fact that almost 43% of the Mexican population lives in poverty and does not have access to private education or education in general (CONEVAL, 2016).

This research work seeks to contribute to the knowledge of how educational sciences students face the heavy academic demands of going to a university: a greater variety of tasks and forms of evaluation, solving problems and making decisions with less teacher supervision among them. Thus, we deem it necessary to delve into how students approach their studies in the context of a private university.

Learning Patterns of University Students

Interest in how university students approach learning has increased in the last decades, with the purpose of giving the students a central role and contribute to the achievement of meaningful learning and better academic performance. Learning at university should be conceived not only as professional training but also "as a place where epistemological and professional experiences are shared, experiences that provide students with training in various aspects of life" (Martínez-Fernández, Rávida, Adams, 2019: 567).

From this point different theoretical frameworks and lines of study have emerged in order to explain how students self-regulate their learning (Cash, 2016; Pintrich, 2000; Rosário *et al.*, 2014; Schunk, Usher, 2013; Zimmerman, 2008), develop their academic motivation (Ames, 1992; Boekaerts, 2009; González, 2015), personal epistemology (Hofer, Pintrich, 1997; Hofer, Benden, 2012; Muis, Chevrier, Singh, 2018), and learning styles (Gargallo-López, Pérez-Pérez, Verde-Peleato, García-Félix, 2018; Marton, Säljö, 1976; Sue, 2014; Tagg, 2003).

Learning patterns constitute an integrative construct to explain students' learning experiences, addressing cognitive, motivational-affective and regulative activities in an interrelated and dynamic way, as well as beliefs about learning in a certain context and period of time (Vermunt, Donche, 2017; Busato, Prins, Elshout & Hamaker, 1998); Vázquez, 2009). From this perspective, Vermunt (1998) proposed a model that has been considered one of the most complete in regard to the theoretical-conceptual aspects that it integrates and defines, as well as the different research work based on it (Vermunt, Donche, 2017).

Vermunt's proposal encompasses personal (self-regulation) and contextual (external regulation) processes, through which students show certain abilities and preferences "to access, process, regulate, produce and motivationally guide their learning actions" (Martínez-Fernández,

García-Ravidá, 2012: 168) which, even though they do not fully explain the complex process of learning, are considered key elements for the study and optimal development of the students' learning. These processes are integrated into the following dimensions (Vermunt, 1998; Vermunt, Donche, 2017):

Conceptions of learning, which refer to a student's cognitive construction of knowledge and ways of learning. That is the nature of knowledge and the roles that teachers, classmates, and students themselves should assume.

Motivations or academic guidelines, the set of student's intentions, purposes, attitudes, and concerns related to their studies.

Processing strategies, which refer to the combination of cognitive activities aimed at processing the contents of learning, understanding, and skill development. They are also known as learning approaches.

Regulation strategies, the number of metacognitive strategies that learners use to guide, monitor, and review, or not, their learning process and outcomes.

Based on the different combinations of sub-categories that integrate the dimensions above, four learning patterns have been identified (Vermunt, 1998): meaning-directed; application-directed; reproduction-directed and undirected.

Students with a *meaning-directed pattern* see learning as the construction of knowledge itself for which they are responsible. They are intrinsically motivated, adopt a deep processing approach, and learn in a self-regulated way.

Students who have an application-directed pattern tend to place greater value on the knowledge they can use and usually try to find a connection between what they learn and reality, and their vocational reasons are those which often underlie this pattern. They also use elaboration strategies in order to build deeper learning, and combine both self-regulation processes and external regulations.

In the reproduction-directed pattern, students conceive learning as a knowledge set to be "absorbed"; their main motivation is to pass and demonstrate their competence. They try to memorize contents and conduct a certain level of analysis, in addition to paying attention to external regulations.

Students with an *undirected pattern* usually conceive learning as something that should be encouraged by the teacher, they have an ambivalent motivational orientation, show poor processing, and they often experience a lack of regulation.

The term "style", employed initially by Jan Vermunt, the author of the model followed in this work, could give rise to what is understood as an invariant attribute, a personality trait. For that reason, he replaced it for pattern (Vermunt, 2005), which refers to a way of studying and

considering the learning activity as relatively stable but not immutable. In this way, a different understanding of what has been conceptualized as learning styles is established and presents different interrelated factors, with specific patterns of analysis according to the context in which they are developed.

The Vermunt model has been used in the context of European universities (Donche, Van Petegem, 2009; Martínez-Fernández, García-Ravidá, 2012), in the Asian context (Law, Meyer, 2011; Marambe, Vermunt, Boshuizen, 2012) and more recently in the Latin American context (Gaeta-González *et al.*, 2020; Martínez-Fernández, Vermunt, 2015; Vázquez, 2009), in order to research into the relationship between learning patterns and some personal and contextual factors. These studies have shown the links between the different learning patterns adopted by the students and their gender, age, field of studies and study term.

However, to date the results are not conclusive regarding the composition of the dimensions that integrate the learning patterns, and there are still questions about their behavior in different sociocultural contexts (Vermunt, Donche, 2017), particularly concerning the link between the learning patterns and other academic variables, including their self-perception as students, the effort made to study and their academic performance.

Based on the above, our research work has a dual objective: on the one hand, to analyze the way in which the dimensions of learning patterns are integrated into the Mexican private university context, specifically in the educational sciences, and on the other hand, to analyze the relationship between some academic variables (study term, self-perception as student, effort, and academic performance) and the learning patterns in students of two universities, based on the four dimensions proposed by Vermunt (1998): learning conceptions, academic motivation, processing strategies, and self-regulation strategies. The knowledge obtained from this research could be useful for the design and implementation of teaching and learning strategies, within a discipline and according to a particular university context.

Based on the objective proposed, we developed the following hypotheses: 1) We expect that the composition of the dimensions that make up the learning patterns will vary in the Mexican context, with respect to the original proposal stated by Vermunt (1998); 2) We expect to find significant correlations between academic variables (study term, perception as a student, effort and academic performance) and the dimensions of the learning patterns adopted by students.

Methodology

Participants

The training of education professionals in Mexico, in addition to having the variable of greater female participation (García, Ávila, Vargas and Hernández, 2015), does not represent a relevant enrollment compared to other areas. According to ANUIES (2017), in Mexico there are around 264,000 students of majors related to the field of education, about 200,000 of which are women

and the rest men. Within this universe is the sample of this study, which is limited to the states of Aguascalientes (N = 3,766), Mexico City (N = 24,813), Jalisco (N = 9,654) and Puebla (N = 13,075).

Participants were 175 university students enrolled in Pedagogy (44%) and Psychopedagogy (56%) programs of two Mexican private universities. The first, University A (n = 99), has campuses located in Mexico City, Aguascalientes, and Guadalajara, and the second, University B (n = 76), has a campus in the city of Puebla. Out of the total of participants, 167 (95%) were women, and 8 (5%) were male, aged between 17 and 28 years old (average 20; S.D. = 1.88). The academic variables of the sample are shown in Table 1. For the development of the research, participants were selected by convenience sampling, their participation was voluntary, and they did not receive any compensation or incentive in exchange.

Table 1. Description of academic variables (n = 175)

Academic variables	Frequency	%
Semester:		
1st - 4th semester	105	60
5th - 9th semester	70	40
Evaluation of the activity as a student:		
Successes	158	90.3
Failures	17	9.7
Performance variables:	Mean	S.D.
Average (range 7-9.9)	8.87	.65
Assessment of the effort or dedication to learning (range 3-10)	8.54	1.00

Instrument

In order to identify the learning patterns of university students, the study used the inventory of learning styles (ILS) designed by Vermunt (1998) for university student samples translated into Spanish by Martínez-Fernández *et al.* (2009).

The questionnaire consists of 120 items grouped into four dimensions: (1) learning conceptions (40 items), (2) motivational orientation for learning (25 items), (3) processing strategies (27 items), and (4) learning regulation strategies (28 items). For the dimensions of learning conceptions and motivational orientation for learning, the questionnaire was answered using a five-point Likert scale ranging from (1) "totally disagree" to (5) "totally agree". In the case of processing strategies and learning regulation strategies, the questionnaire was answered using a five-point Likert-type scale ranging from (1) "never" to (5) "almost always". The total reliability indexes (Cronbach's alphas) and the index from each factor that make up the original questionnaire are above .60 (Vermunt, 1998).

As an introductory part of the instrument, questions about the students' sociodemographic characteristics (sex, age) and academic variables (university, degree, study term, self-perception as students, effort devoted to learning, and academic performance) were included.

Procedure

Data were collected in groups, within the academic schedule, and with the authorization of the Council Board and the faculty professors at both universities. The questionnaires were applied in an electronic format, in the presence of the teacher, with an approximate duration of 20 minutes. Students were informed of the purpose of the study, their participation was voluntary, and the confidentiality of their information was guaranteed.

Data Analysis

The data analysis was carried out with the support of the statistical software package SPSS, version 22. Firstly, the psychometric properties of the ILS were analyzed through exploratory factor analysis (EFA). The principal components method was used, and a varimax rotation was applied to maximize the weights at the factor level. The reliability analyses of the total scale and the factors that comprise it were performed using Cronbach's alpha. Secondly, the normality assumptions of the data were estimated using the Kolmogorov-Smirnov test. Afterward, a comparative analysis of the learning patterns adopted by the students according to the academic variables (semester of studies, degree program, perception as a student, effort and academic performance) was carried out through the Mann-Whitney U test, as well as a correlation analysis of learning patterns and academic performance through Spearman's correlation. Finally, a comparative analysis between both university students' learning patterns was performed using the Mann-Whitney U test.

Results

Composition of the Learning Patterns Dimension

First, the internal consistency of the ILS was confirmed. As shown in Table 2, four different patterns (factors) in the way students learn were identified, which account for 61.06% of the cumulative variance. The instrument subscales in each factor and the designated name given to each one are described below.

In Factor 1, *Meaning*, the four subscales became saturated: deep-processing (relationship, structuring and critical thinking), step-by-step processing (analysis), concrete processing and self-regulation strategies (processes, results and learning contents) – which would correspond to a learning pattern directed towards meaning – as well as the external regulation (of results) typical of a reproduction-oriented pattern.

In Factor 2, *Multiple Orientation*, there is a distribution of the four patterns: construction of learning conceptions, increase and use of knowledge, cooperative learning and educational sti-

mulation, as well as motivational orientations of personal interest, and vocation and orientation to grades and evaluation, which are specific to the learning patterns directed towards understanding, application and reproduction, respectively.

Factor 3, *Reproduction*, consists of step-by-step processing subscales (memorization and essay) and external regulations, typical of a learning pattern directed towards reproduction.

Factor 4, *Undirected* pattern, involves an ambivalent motivational orientation and the absence of self-regulation strategies.

Table 2. ILS factorial structure (n = 175)

ILS subscales	Factor 1	Factor 2	Factor 3	Factor 4
<i>Learning conceptions</i>				
Construction of knowledge	.351	.679		
Increase of knowledge		.676	.493	
Use of knowledge		.574		-.505
The teacher as encouragement		.611		
Cooperative learning		.561		
<i>Motivational Orientation</i>				
Personal interest		.639		
Orientation towards grades		.522	.341	
Orientation towards evaluation		.653		
Orientation towards vocation		.470		-.630
Ambivalent				.769
<i>Processing strategies</i>				
Deep thought				
Relationship and structuring	.868			
Critical thinking	.849			
Step-by-step processing				
Memory testing				.860
Analysis	.742			.388
Concrete processing	.783			-.302
<i>Regulation strategies</i>				
Self-regulation of processes and outcomes	.808			
contained in learning	.559		.318	
External regulation				

of processes			.782	
of results	.529		.402	
Absence of regulation				.615
Self-worth	5.76	2.99	2.04	1.43
Explained variance %	28.78	14.95	10.2	7.12
Cumulative variance %	28.78	43.73	53.94	61.06

The instrument showed a reliability index of .93, which is considered excellent, as well as each one of the factors above .70, which is considered acceptable, except for factor 4, considered weak (Table 3).

Table 3. Reliability indexes of the instrument

Factor	Sub-scales	α
Factor 1 <i>Meaning-oriented learning pattern</i>	Deep thought: Relationship and structuring Deep thought: Critical thinking Step-by-step processing: Analysis Concrete processing Self-regulation of processes and outcomes Self-regulation contained in learning External regulation of results	.88
Factor 2 <i>Multiple orientation pattern</i>	Construction of knowledge Increasing knowledge Use of knowledge The teacher as encouragement Cooperative learning Personal interest Orientation towards grades Orientation towards evaluation Orientation towards vocation	.79
Factor 3 <i>Reproduction-oriented pattern</i>	Step-by-step processing: Memory testing External regulation of processes	.73
Factor 4 <i>Undirected learning pattern</i>	Ambivalent Absence of regulation	.64
Total questionnaire	20 sub-scales	.93

Academic Variables and Learning Patterns Adopted by Students

Contrast of Assumptions

Data normality analysis indicated the existence of a non-normal distribution for the ILS subscales ($p < .05$). Also, although the levels of asymmetry and kurtosis were close to below two in most of the dimensions, the multiple orientation patterns showed a greater than two kurtosis (Table 4). Based on that, a non-parametric analysis of data was performed.

Table 4. Data normality analysis

Learning pattern	Kolmogorov-Smirnov		Asymmetry		Kurtosis	
	Statistical	Sig.	Statistical	Standard error	Statistical	Standard error
Meaning	.046	.200*	-.166	.184	.039	.365
Multiple	.071	.032	-.663	.184	2.333	.365
Reproduction	.072	.026	.079	.184	-.270	.365
Undirected	.071	.030	.566	.184	.658	.365

*Greater limit than the true significance

Semester of Studies, Degree Program and Learning Patterns

When comparing students' semester of studies (1st-4th; 5th-9th), statistically significant differences were found in the reproduction pattern ($z = 2.83$; $p = .005$) and multiple orientation ($z = 2.86$; $p = .004$). That is, more students from the 1st to 4th semester (average range = 96.85), compared to the 5th to 9th semester (average range = 74.72), showed a reproduction pattern. Also, more students from the 1st-4th semester (average range = 96.85), compared to the 5th-9th semester (average range = 74.72), showed a multiple-orientation pattern. This implies that more students from the first semesters on try to memorize learning materials without analyzing them thoroughly. Even when they sometimes try to direct their learning and prepare for their profession, they rely more on external regulation and the prescribed materials than on their resources.

No significant differences were found regarding the degree program (Pedagogy, Psychopedagogy).

Perception as a Student, Effort and Learning Patterns

When analyzing the perception as a student, most of the participants considered that in the previous levels they had had more successes (90.3%) than failures (9.7%). Further, most of them valued positively the effort they dedicated to learn (mean = 8.54; S.D. 1.00), and had an average grade of 8.87 (S.D. = 1.17 = .65), which shows that students' learning processes and results are related to their previous outcomes attained.

Academic Performance and Learning Patterns

There was a significant positive correlation between academic performance and meaning-oriented learning pattern ($r_s = .256$; $p < .01$), which implies the adoption of a deeper approach and motivation to learning, as well as the self-regulation of learning. On the other hand, there was a significant negative correlation between academic performance and the undirected pattern ($r_s = -.222$; $p < .01$), which implies an ambivalent motivational orientation and the absence of self-regulation (Table 5).

When comparing students' learning patterns according to their academic performance (7-8; 9-10), more students with an average grade seven-eight (on a scale of ten) showed an undirected pattern ($z = 2.57$; $p = .010$), which means that they do not know well how to approach their learning and experience a lack of self-regulation. In contrast, students with an average grade of nine to ten presented a meaning-oriented pattern ($z = 2.57$, $p = .010$), which involves the use of self-regulated and deep processing strategies.

Table 5. Correlation between learning patterns (n = 175)

	1	2	3	4
Meaning				
Multiple	.279**			
Reproduction	.377**	.341**		
Undirected	-.047	.135	.122	
Academic performance	.256**	-.122.	.053	-.222**

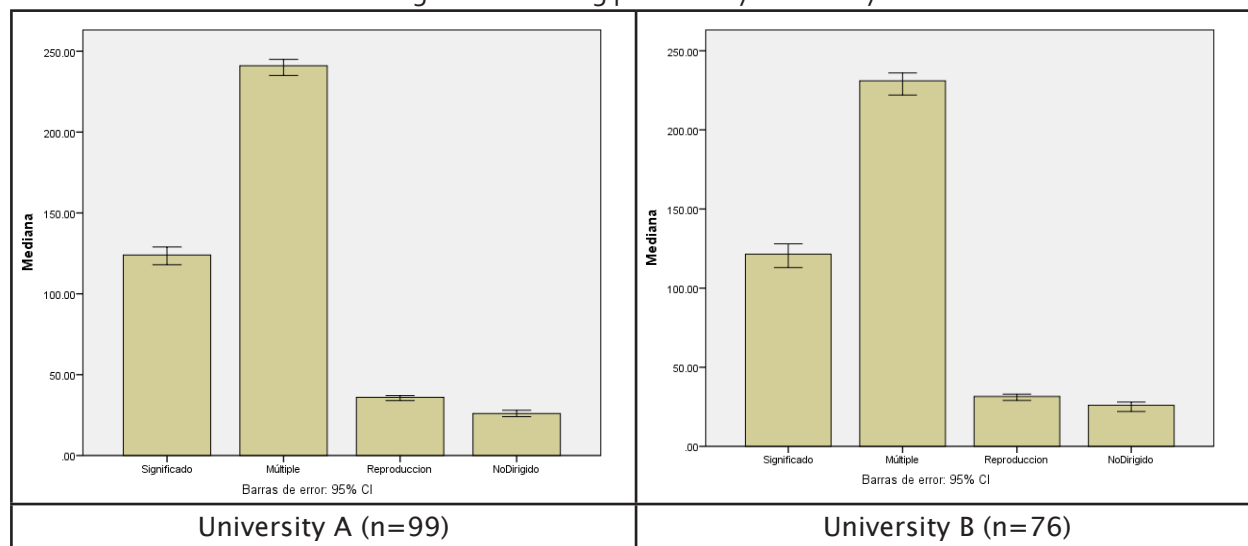
** $p < .01$

University of Origin and Learning Patterns

Regarding the learning patterns of students from University A (n = 99), as shown in Figure 1, most of them showed a multiple orientation pattern (median = 241; S.D. 16.72), followed by students with the meaning-oriented pattern (median = 124.00; S.D. 22: 30) and, to a lesser degree, students with a reproduction-oriented pattern (median = 36.00; S.D. 6.95) and with an undirected pattern (median = 26.00; S.D. 6.64).

As for the learning patterns of students from University B (n = 76), as shown in Figure 2, most of them showed a multiple orientation pattern (median = 231; S.D. 29.86), followed by students with a meaning-oriented pattern (median = 121.50; S.D. 24: 03) and, to a lesser degree, students with a reproduction-oriented pattern (median = 31.50; S.D. 8.18) and with an undirected pattern (median = 26.00; S.D. 9.09).

Figure 1. Learning patterns by University



When comparing the university of origin, analysis showed significant differences in the multiple-orientation ($z = 2.32$; $p = .020$) and reproduction ($z = 4.08$; $p = .000$) patterns. A greater number of students from University A showed a multiple-orientation pattern (mean average = 95.80), in contrast to the students of University B (mean average = 77.84). Also, more students from University A (average range = 101.67) than University B (average range = 70.20) showed a reproduction-oriented pattern. However, there were no significant differences between the meaning-oriented and the undirected learning patterns, and no significant differences in the academic performance of students from both universities.

Discussion

Based on the aims outlined in this study, namely to analyze how the dimensions of learning patterns are integrated into the Mexican private context, specifically in the educational area, and to examine the relationship between some academic variables (semester of studies, degree program, perception as a student, effort, and academic performance) and the learning patterns of students from the two private universities, our research findings are discussed below.

First, the presence of four dimensions that make up the learning patterns was confirmed, although the composition of each dimension varies with respect to the original proposal stated by Vermunt (1998). This result is similar to more recent works, which indicates its multi-dimensionality (Donche, *et. al.*, 2010; Vermunt, Donche, 2017), as well as the presence of combinations of processes features in the different learning patterns (Martínez-Fernández, García-Ravidá, 2012, Yu, 2019). Also, in this study, the ILS showed adequate psychometric indexes to continue using it for research purposes.

Specifically, in this study Factor 1 showed a *meaning-oriented learning pattern*, with characteristic elements of deep-processing, step-by-step processing and concrete processing, as well as self-regulation strategies. It also incorporated external regulation elements of the reproduction-oriented pattern.

In Factor 2, the *multiple orientation pattern*, a distribution of the four patterns proposed by Vermunt (1998) is observed: learning conceptions directed towards knowledge, strategies of cooperative learning and external regulation, of motivational orientation of learning and towards the performance and the search of obtaining good grades. This second factor corresponds to a new and different combination of the components of the model, which confirms that it does not conform analogously to the Vermunt proposal, but if the meaning-oriented and the reproduction-oriented pattern are maintained, they are the poles of the model. Factor 3 contains elements characteristic of a *reproduction-oriented pattern* – step-by-step processing and external regulation – while factor 4 constitutes an *undirected learning pattern*, characterized by ambivalent motivational orientation and the absence of regulation.

These findings corroborate those of previous studies (Donche, Van Petegem, 2009; Vermunt, Donche, 2017) regarding the dynamic nature of the learning patterns and their construction from the students' experiences in different learning environments, which define their structure. Therefore, the resulting learning patterns can be seen only as prototypical dimensions.

Regarding the relationship between the academic variables and the learning patterns adopted by students, significant differences were observed depending on the semester studied: students from the initial semesters (1st-4th) showed multiple orientation patterns, as well as content reproduction and more characteristics of lack of self-regulation, compared to students in more advanced semesters (5th-9th). These findings are opposite to those obtained by Martínez-Fernández and García-Ravidá (2012), who found a positive relationship between age and higher scores in the reproductive pattern, and orientation towards grades and certificates in students of education. However, generally speaking, our findings agree with the findings of Vázquez (2009), in the engineering area, and of Donche and Van Petegem (2009), in the education area, who found that older students and those in more advanced semesters (associated to educational experience), respectively, show a meaning-oriented pattern.

There is a significant positive correlation between academic performance and the meaning pattern, and a significant negative relationship between the former and the undirected pattern. Thus, students with an average grade between seven and eight showed an undirected pattern, while students with an average grade between nine and ten had a meaning-oriented pattern. This result provides further evidence that the adoption of a deeper approach to learning and learning in a self-regulated way are linked to several indicators of a better academic performance (Vermunt, Donche, 2017).

Moreover, most of the students considered that in previous levels they had achieved more successes than failures, and valued positively the effort they dedicate to learn. In this sense, other previous studies (Diseth, Pallesen, Brunborg, Lersen, 2010; Martínez-Fernández, García-Ravidá, 2012) claim that the effort that students make to study and learn has an impact on their academic performance. However, apparently, in this study the estimation of the effort is not enough for the achievement of a good academic performance if it is not accompanied by a meaning-oriented pattern.

On the other hand, we found that students from both universities mostly have multiple orientation patterns, followed by students with a meaning-oriented pattern and, to a lesser degree, students with a reproduction-oriented pattern and an undirected pattern. Thus, it can be inferred that, in general, students in this study conceive learning as the construction, development, and use of knowledge, and use strategies for self-regulated learning, but at the same time they seek their teachers' encouragement. In addition, they show a motivational orientation in which there is a personal interest but also seek to obtain a higher academic performance, obtaining good grades and the positive assessment of others.

These findings are consistent with those depicted by Vermunt and Donche (2017) in that students may show characteristics belonging to different patterns, and these dimensions are not mutually exclusive. Besides, as stated by Donche and Van Petegem (2009), some learning patterns are more susceptible to undergo changes than others, but once a particular learning pattern is adopted there is a tendency to maintain it through time. In this regard, keeping a multiple-orientated pattern or a reproduction pattern seems to be more adaptive for the students in this study.

The above can be nuanced by another finding of the study, concerning the comparison between universities, in which a greater number of students of University A, unlike the students of University B, show a multiple orientation-learning pattern and a reproduction-orientation pattern. However, there were no significant differences between the meaning-oriented patterns and the undirected learning pattern. These results provide further evidence on the complexity of the different learning patterns that students adopt and their variation according to environmental factors (Vermunt, Donche, 2017; Law, Meyer, 2011). Thus, it can be assumed that in addition to personal attributes, there are various contextual factors that may influence students' learning patterns: teaching and evaluation methods, collaboration and participation opportunities, among others. This is a good reason to do further research into learning environments and teaching strategies that prevail in different Mexican universities, and that fosters certain types of patterns in the students.

Some limitations of this study should be pointed out, such as the size of the sample and the fact that, given the nature of the educational disciplines, most participants were women, which could have affected the results. In addition, it is a cross-sectional study, so in further studies we

suggest expanding the sample to include different disciplines and to evaluate learning patterns for students in a longitudinal way (Donche, Van Petegem, 2009), and even work with cohorts of students so their learning experiences can be captured more comprehensively.

Notwithstanding, we believe that this research constitutes a step forward in the knowledge of learning patterns in the context of Mexican private university studies, specifically in the educational area. It showed that although a number of students are oriented to the meaning, in which deep learning is sought, and there is a predominance of self-regulation strategies, a multiple-orientation pattern still prevails in which in addition to the search for understanding of contents and application of knowledge, there coexist reproductive elements, content memorization, as well as an ambivalent and externally regulated motivational orientation. Based on the above results, we advocate the need to make the cultural dimension of learning patterns a key topic in the research agenda on learning processes, as well as the study of learning patterns in different areas of knowledge to find variations among them.

On the other hand, it is important for teachers to understand their role in identifying learning patterns and all those elements that impact the learning processes of university students. This underscores the need to include enriching educational practices that may promote to a greater extent the active and committed participation of students in the construction of their learning, especially in the initial semesters of university education since, as it was shown in this paper, the perception of past successes or the assessment of effort does not necessarily affect academic performance if they are not linked by a meaning-oriented pattern, which in turn has an impact on a higher academic performance.

In this regard, we put a special emphasis on the dynamic nature of learning patterns, as well as the evolution towards meaningful patterns as the students' progress through the curriculum, which could be linked to the learning environment and patterns that are promoted within such an environment, inviting further research on the subject in the future. It would be desirable to extend this research by delving deeper into the impact of learning environments on learning in order to provide students with the most appropriate spaces to learn.

In addition, there are distinctive features of pedagogical training, such as the interest in meaningful learning, which can be applied in solving educational problems. For this reason, universities will have to become more strategic, creating value propositions for students (Pucciarelli, Kaplan, 2016) so they can deal successfully with the challenges of a complex and increasingly competitive society, that demands competent professionals capable of responding to the social needs and the common benefit.

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