

Study methods and learning styles of higher education students**Métodos de estudio y estilos de aprendizaje de los estudiantes de educación superior**

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Abstract

The main objective of this article was to explore the relationship between two study methods with the learning styles of higher education, the methodology used was quantitative, observational, transversal, descriptive and correlational. The compilation of the information was made through a standard instrument ILP-R (SCHECK), the sample was made of 800 subjects, the statistic techniques that were used were the descriptive, correlational and integrative from the factorial exploratory analysis. The contribution of the study lays in that it's concluded that the study method from practice of research increases in the collective the critic thinking through consulting, observation, analysis and questioning. Furthermore, that the aspects of deep thinking, encourage in the students to be a critical thinker, analytics, and assertive regarding to their study methods in order to acquire knowledge and give place to the auto-affirmation learning style through deductive actions

Resumen

El objetivo general del presente artículo fue explorar la relación que existe entre los métodos de estudio con los estilos de aprendizaje de los estudiantes de educación superior, la metodología que se utilizó fue cuantitativa, observacional, transversal, descriptiva y correlacional. La recopilación de la información se realizó a través de un instrumento estandarizado ILP-R (SCHECK), la muestra se conformó por 800 sujetos; las técnicas estadísticas que se utilizaron fueron la descriptiva, correlacional e integracional desde el análisis factorial exploratorio. La contribución del estudio radica en que se concluye que el método de estudio desde la práctica de la investigación aumenta en el colectivo el pensamiento crítico a través de la consulta, observación, el análisis y el cuestionamiento. Además, que, los aspectos de procesamiento profundo propician en el estudiante que sea un pensador crítico, analítico y asertivo en cuanto a sus métodos de estudio que lleva a cabo para obtener conocimientos y dar lugar al estilo de aprendizaje de auto-afirmación por medio de acciones deductivas.

Study method, Learning styles**Métodos estudio, Estilos aprendizaje**

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Introduction

There are different studies in which different aspects are seen that provide opportunities that impact in the success of the college studies; aspects that pay to the study methods in relation with the styles of learning, allow to understand teachers and students that people learn differently, in that sense, the education changes and transforms its learning techniques that answer the development of methods that impact in the seize of knowledge. This article has as a objective identify the relationship between the study methods with the university learning style, furthermore the specific objective of showing the variables that integrate so that the study method is deductive-analytic.

The main benefactors are the students of education in consideration that through the results of research could operate proposals of intervention for the phenomenon of study of the before mentioned.

The idea of learning style come from psychology and refers to the typically characteristic way of how people are oriented to a problem solution, but also to characteristic affective, cognitive and physiological behavior of one person, that serves as a stable indicator of how apprentices perceive, interact with and responds to the learning environment. (Esteban 1996).

According to Castillo (2021). Learning styles, group in three different representations visual, auditive and kinesthetic; where every student has a dominant or primary representation system, and in both cases combine two representations, that manifest in their behavior, the way of communication and mainly the learning style process. Hence the importance of each teacher, should make an analysis in the classroom to identify the learning styles of students, with this resource can be incorporated and implement strategies that motivate the interests, facilitate the process of teaching and even more in learning considering as monophasic activities that require of a style, biphasic, those that develop two styles, triphasic, with three styles and eclectic activities, that cover 4 styles. (Cacheiro, Colvin & Lago, 2008).

Otherwise Ospina et. Al, in the year 2014 made a compilation of the main models of learning styles found in literature. Those models are, in the first instance, ordered chronologically with the purpose of seeing the development of this study topic through time, on second instance, are the classified that through a series of categories that group to finally stablish which are the main relationships that exist between the two models. This work was developed with the purpose of building a theoretical update and an analytic approximation to the topic of learning styles.

The different approaches for the study of learning styles facilitate the deepening in the knowledge of this phenomenon and conduct to reaffirm that it does not exist just one and only way to learn. Because learning is a process that is given in the life of a person and learning styles can change through age, results convenient to keep in mind that the scholar field it is not the only stage where attention should be focused when understanding the learning of a person rather the growing interest that has reached the study of the styles of learning that has allowed to propose the ideas that were had about intelligence and the way of learning, because is now possible to understand them as processes that vary from one person to another and that are influenced by multiple factors, in between them the styles of learning. (Ospina, Salazar & Meneses, 2013) Valencia, L. (2014), explains that:

The learning styles play a fundamental role in the academic processes, depending on the present trend in students, the learning will be facilitated or obstructed, that's why the importance of center the attention in the process of teaching-learning, and in the relevance of creating a direct accompaniment in freshman students that as a promotion and prevention strategy of the students academic low-performance.

In that same year (2014) Mejia in his research work through his results mentions that:

The style with the highest average is the reflexive style, this due to that teachers enjoy when they have the time to prepare their work and make it consciously, because they try to interpret it well any information before manifesting any conclusion, they rather have the greatest number of sources of information and gather data to reflex, and because working consciously fills them with satisfaction and pride.

On the other hand, the active style has the lowest average, that is given because only eight of their items are located in the scale of “almost always” and has two items with an average under the scale “almost never”. From these last two it can be said that teachers don’t considerate that it is precise to break the rules more than comply with them and results uncomfortable to have to plan and prevent things.

In (2016), Bobadilla et al., in its research that has a sample of 311 students, mention that, “the learning styles according to the circumstances can vary because they are not absolutes. There are not styles completely pure, a learning style can be used with higher frequency than other, nonetheless, when existing diverse experiences will be used different styles of learning”.

The next are investigations that looked the styles of learning in different populations:

Subsequently in (2017) González *et al.*, in his research “styles of learning for the development of competences in student’s undergraduate nursery students”, which is a descriptive transversal study in which 271 students, and that was posted in the Iberoamerican magazine for research and educative development, explain us that:

The accomplishment of greater reaches and better results in the academic formation would be given fundamentally for the possibility of diversifying the methods and the techniques that are applied in the classroom. This resource would allow to reduce possible imbalances between the learning styles and styles of teaching.

It is considered that to the extent that teachers can work from individual preferences, the capacities and performance of the students will be enhanced.

During 2018 Zambrano et al., In their research article named "learning styles, learning strategies and their relationship with the use of ICT in secondary school students", which used a qualitative-descriptive methodology and a sample of 62 study subjects, in the article they mention that:

Even though learning styles and teaching strategies are variable elements, recognizing the styles in a certain moment can help determine the strategies to get better results in the academic development of students.

One year later, Perez et al., (2019) in the article of research “The styles of learning as a strategy for teaching in higher education” in which has a mixed (qualitative and quantitative) and one sample of 33 people, posted on the magazine of learning styles, in which we found that:

Exploring learning styles will allow us to know how a student learns, which can serve as a starting point towards contextualized planning of activities ... so as not to design didactic activities focused solely on the interest and style of the teacher. Not all teaching-learning techniques can be used as a generalization for all learning styles. Also, the types of curricular content to be learned must be considered.

Finally, for Schmeck, a learning style, “is simply the cognitive style that an individual manifests when faced with a learning task, and reflects the preferred, habitual and natural strategies of the student to learn, hence it can be located somewhere between personality and learning strategies, because it is not as specific as the latter, nor as general as the former”. (Martin Pantoja, 2013).

The Schmeck model focuses on learning strategies and considers that the student, in a conducive school setting, performs double learning; the one related to the pedagogical contents and the one related to the thought process, to develop understanding, synthesis and analysis, elements on which thought processes are based. Three learning styles are proposed, each one involves the use of a particular learning strategy by the individual in which there can be deep, superficial, and achievement-based learning (Boyle, Duffy, & Dunleavy, 2003).

According to Schmeck and his collaborators in carrying out the questionnaire, learning styles not only consist of the preferential appeal of certain strategies or cognitive skills, but also incorporate motivational factors (academic self-esteem, self-efficacy, etc.), the type of information processing, as well as study methods used (Ruiz, 1996).

Wrenn 1976 cited by Velez 2009, comments that various studies have indicated that the learning of certain subjects is more durable if that achievement is achieved through methods, that is, if the student uses certain procedures and techniques to acquire knowledge. On the contrary, it is less durable and more superficial when they are obtained by the circumstantial obligation to acquire it with a view to responding to the student's academic commitments. Derived from these results, emphasis has been placed on the analysis of study methods, and many investigations have been oriented towards determining techniques that lead to their acquisition. That is, each student uses study methods that support the understanding of the topics addressed in the subjects, which impacts their learning and academic life, all the above according to each learning style.

Methodology to be developed

The focus of the study was quantitative in nature; data collection was carried out using an instrument that measures significant aspects regarding the learning styles of university students through the standardized ILP-R questionnaire (SCHMECK); its application was carried out using a Google forms to 800 subjects. The work was identified as being cross-sectional in nature because it is an investigation that collects information and has its purpose and incidence in a single moment.

Finally, the statistical processes that were carried out were the descriptive analysis to characterize the subjects, comparative to examine the contrasts between independent groups and integrative from the analysis of factors where it was observed how the study variables and their relationships are integrated

Results

Descriptive Analysis. Frequencies and Percentages

To analyze the values of the significant variables that represent the study sample, an analysis of frequencies and percentages applied to the subjects under study is carried out, the total of which corresponds to a value n of 800 individuals.

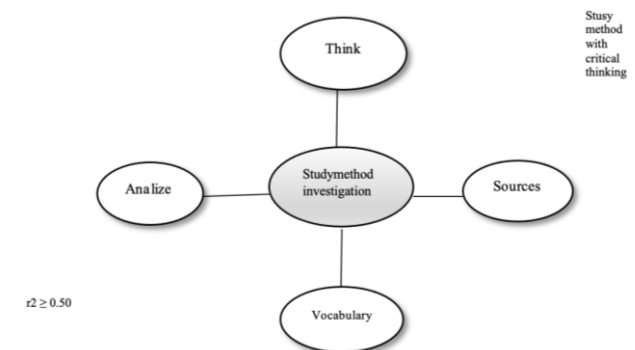
It is observed that 523 are female and 274 belong to male, with ages ranging from 16 to 52 years, most are from the City of Saltillo, followed by Monclova and then Monterrey. Of the total sample, 50.12% do not currently work and 49.87% do.

Correlation analysis

This analysis works with Pearson product-moment correlations, with pairwise criteria, considering significant correlations with probable error and a correlational coefficient of $r^2 \geq 0.50$, with a sample of $n = 800$ higher education students.

-Study methods in relation to critical thinking

The variable with positive correlation of study methods with critical thinking indicates that when students investigate various sources to understand a concept, they start to think about what they read and they try to find answers to the questions that come to their mind. It is conducive to questioning things you hear in lectures or read in books, therefore increasing your vocabulary by building lists of new terms.



Graphic 1 Correlation analysis of the study method with critical thinking

Exploratory factor analysis

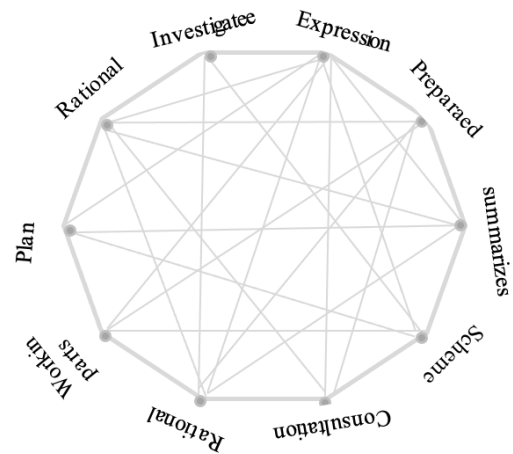
In order to establish the underlying structure of the factors that describe the strategies to obtain knowledge and the learning styles presented by higher education students ($n = 800$), an exploratory factor analysis is carried out, where we work with rotation of normalized varimax factors and an $r \geq 0.31$ and with the *Principal axis method procedure*.

In the first factor named Deductive-critical study method, it is seen that this type of student has as learning strategies the expression and reaffirmation of the knowledge they share, they are not afraid to tell an important person that they disagree with their opinion ; usually protests openly when something bothers them; In addition, they repeatedly study a topic even if are already prepared for the exam; Also, they summarize a text perfectly before starting to write, which allows them to make diagrams and graphics that help them remember the subject they are carrying out at the time.

Before the exam, the student prepares a summary of all the material studied; only when finding an unknown word always look it up in the dictionary and write down the definition. During the school period, normally reviews the material and prepares a notebook integrating all the informational sources of the course, to plan a topic for the student itself and to realize how its ideas fit together. Therefore, these activities increase the vocabulary of the students and the construction of lists with new terms, consider different points of view within their mind when putting into practice the study of a new subject and when reading a problem try to think of different alternatives to solve it; As for the investigations they carry out, they find different ways of interpreting the conclusions, they like to compare different theories, to obtain the adequate details. Since it states that the best approach to the key to a problem is logical and systematic thinking.

In general, these types of students work on one thing and then on another, they need to do things step by step, in an orderly way; begins something and continues until finishing it, this is achieved by working a problem piece by piece and giving solution piece by piece, these students express how important it is to look at problems rationally and logically, without drawing intuitive conclusions.

The second factor *Method of study by retention*, shows aspects where students refer to the fact that the teacher's job is to provide them with all the answers, since being successful in life is more a matter of good luck than of their own aptitudes, which allude that his life is determined mainly by other people.



Graphic 2 First factor deductive critical study method

On the other hand, they stat they keep a daily schedule of time to study and memorize everything they have to learn word by word, however they contend that they learn more when teachers limit themselves to facts and do not give their own ideas; This helps them never forget the data they have learned previously, they never get bored when they have to present a class, since their work is always perfect, thanks to the perfect memory that characterizes them; they never fail in anything they try to do, much less when it comes to taking an exam, this is due to continuous preparation in terms of reading all their textbooks from top to bottom, in order to never make a problem wrong mathematician when it comes to this subject.

And the third factor *Strategic-administrative study method*, mentions that students study for the tests but, before examine themselves to prepare a list of questions and answers that they hope could be in the test; After this, they repeatedly study a topic, although they are already prepared for the exam, they always summarize a text perfectly before starting to write. By means of diagrams and graphs they help themselves to remember the subject, they also write a summary of the material they read. Normally they investigate several sources to understand a concept and summarize all the work material before the exam, when they find an unknown word, they always look it up in the dictionary and write down the definition.

They usually keep a daily schedule of study time and during the school period they normally review the school material periodically preparing a notebook integrating all the informative sources of the course.

These students also always find it useful to plan a topic for myself, seeing how their ideas fit together, giving way to increasing their vocabulary and therefore building lists of new terms.

Conclusions

It is concluded that the study method from research increases critical thinking in the collective through consultation, observation, analysis, and questioning.

In addition, it is noted that the study method impacts the motivation-effort of the students through the preparation of an exam through their own planning, which strengthens the knowledge of how to reach the educational goals that have been proposed. In addition, that, the aspects of deep processing, encourage the student to be a critical, analytical, and assertive thinker regarding the student's study methods that students carries out to obtain knowledge and give place to the learning style of self-affirmation through deductive actions.

It should be noted that in the students are present characteristics of strategic planning and administration in the various study methods they use to obtain knowledge according to their learning style.

Therefore, it is pertinent to develop school environments that encourage students to clarify their study methods, which allows them to promote the most solid habits, more specific according to the learning style of each one to promote self-knowledge with critical foundations of analysis and questioning.

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