Article **Journal-Health Education and Welfare**
December 2021, Vol.5 No.9 9-14

Analytical learning and teaching strategies in the classroom

Estrategias analíticas de aprendizaje y enseñanza en el aula

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DOI: 10.35429/JHEW.2021.9.5.9.14 Received July 15, 2021; Accepted December 30, 2021

Abstract

The main objective of this work is learning styles and academic performance, the main objective is to know the factors that integrate them to make proposals for curricular design that guide the teacher regarding the best didactic strategy to use in the classroom. The ILP-R Questionnaire Spanish version of (Schmeck, 1991) was used, made up of 150 simple variables that make up 18 dimensions, with a Likkert-type scale the results where a cronbach alpha of .92 is obtained, in addition, the information was processed through of the statistical analysis: descriptive from frequencies and percentages, comparative with Student's t test for independent groups and Integrational with factor analysis. It is deduced that proactive students tend to learn in a pragmatic-solitary way leading to a better ability to memorize information and planning their studies, at the same time that they can carry out various activities which allow them to satisfactorily carry out their school activities. It is concluded that while the students carry out their activities separately, it helps them to gain independence, which is why they benefit from their responsibility in the academic field, an aspect to be considered by the teacher when choosing their didactic strategy.

Learning style, Academic performance, Teaching strategy

Resumen

El presente trabajo tiene como ejes los estilos de aprendizaje y el rendimiento académico, el objetivo principal es conocer los factores que los integran para realizar propuestas de diseño curricular que orienten al docente respecto a la mejor estrategia didáctica a utilizar en el aula. Se utilizó el Cuestionario ILP-R versión española de (Schmeck, 1991) conformado por 150 variables simples que conforman 18 dimensiones, con una escala tipo Likkert los resultados donde se obtiene un alfa de cronbach de .92 además, se procesó la información por medio de los análisis de la estadística: descriptiva desde frecuencias y porcentajes, comparativa con prueba t de Student para grupos independientes e Integracional con el análisis factorial. Se deduce que los alumnos proactivos suelen aprender de manera pragmática-solitaria llevando a tener mejor capacidad de memorizar información y planificación de sus estudios, a la vez que pueden realizar diversas actividades las cuales les permitan llevar satisfactoriamente el cumplimiento de sus actividades escolares. Se concluye que mientras los alumnos realicen sus actividades por separado estos les ayuda ir tomando independencia por lo que se ven beneficiados en su responsabilidad en ámbito académico aspecto a considerar por el docente al momento de elegir su estrategia didáctica.

Estilo de aprendizaje, Rendimiento académico, Estrategia didáctica

Citation: ESPERICUETA-MEDINA, Marta Nieves, SÁNCHEZ-RIVERA Lilia, VILLARREAL-SOTO, Blanca Margarita and SALDAÑA-SÁNCHEZ, Melissa. Analytical learning and teaching strategies in the classroom. Journal-Health Education and Welfare. 2021. 5-9:9-14.

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Introduction

The present work seeks to explain the relationship that exists between learning styles and academic performance, looking for the importance that both have in decision-making at the moment in which the teacher chooses the didactic strategy to use, as well as in the creation of plans and programs aimed at the surveyed population, which in this case are upper-level students.

With a methodological weight that helps to see what has already been studied previously on the subject of learning styles and academic performance that serve as the basis for the course of research using the ILP-R questionnaire, Spanish version of Schmeck in 1991.

Learning styles are important in education so that students can carry out their tasks and activities related to the subjects they study during their career, as well as identify the way in which they are facilitated either through summaries, comparative tables, case method or any other way you can learn and it is meaningful.

The foregoing is important because authors such as P. Primerano and MB Sánchez Arraba (2021) in a study conducted on online experiences in times of COVID-19 mention that ICTs in classrooms need to be implemented as democratically thought tools, so that virtual classrooms and networks do not become walls and that we become trapped in them as individuals, all of this taking into account the characteristics of the learner**.**

Gia Guerrero (2021) in her research work on didactic strategies mentions that the teacher is the protagonist and facilitator of the application of strategies. These should address the basic learning needs, their forms, styles and environments. In this way, students seek creative and alternative solutions for solving tasks and develop critical and analytical skills.

Likewise, Celi Celi D M., Salinas González JE (2021) in their research work on strategies for teaching literacy in basic education students suggests that the implementation of didactic strategies is a key point in the training process of the student body, because it allows them to develop different skills such as text comprehension, information analysis, data identification and prediction skills, so teachers have to know which didactic strategy is appropriate since children have different styles of learning, it is for this reason that teachers have to bear in mind that they cannot implement the same didactic strategies for all courses.

The theory of learning styles, from an epistemological point of view, deals with different perspectives and practices with their corresponding theoretical foundations, classifications and research instruments. Due to this, it is pertinent to raise the various currents that back up this theory, he mentions (Ventura, 2011).

Supporting previous studies, Ventura, Moscoloni and Gagliardi (2012) showed that, although students enter university with heterogeneous styles, these discrepancies are statistically accentuated according to the type of discipline. In Engineering, sensory and visual styles were preferred; and in Psychology, the intuitive and verbal styles predominated.

Reaffirming these differences, Villamizar Acevedo and Sanabria Martínez (2011) found that both Psychology and Engineering newcomers were characterized by preferring a reflective style. However, towards the end of academic training, Psychology students maintained their reflective predominance and Engineering students consolidated their preferences towards the pragmatic style.

The Schmeck model (Ramanaiah, Ribich and Schmeck (1977) for example focuses on learning strategies and considers that the student, in a conducive school setting, performs double learning; that related to pedagogical content and that related to the thought process, in order 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.

ISSN 2524-2075

Teachers tend to put learning styles aside and carry out non-functional activities in that students can use it in their working lives and sometimes students do not agree with the execution of the activity and do not usually learn or carry out the activity because this is not attractive to the student.

The hypothesis is: There is a relationship between learning styles and academic performance in higher-level students.

Know what attributes make up the learning styles and academic performance that promote teaching, and identify how they are integrated between them, so that there is an interrelation. Previously, various authors have delved into the study of both axes and they start from them and the methodological weight fell on them.

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, since it is not as specific as the latter, nor as general as the former". (Schemeck, 1982).

Llanos Mosqueda (2021) mentions that the methods and techniques have contributed to the preparation of students, the definition of strategies for learning programming, tools for detecting errors in the source code and intelligent tutoring systems. Improving student retention, study habits, and learning experiences.

Hernan Witkin and the discovery of cognitive styles, made contributions to the development of a theory of field-dependence, field-independence cognitive styles; was the first to conceptualize a cognitive differentiation related to performance in front of tasks that different people could solve with different strategies. (Yáñez, 2009)

For Hernández, Neuroanatomically, with early stimulation, lived experience and personal interests, each individual develops the processes and competencies to learn as learning styles, said author applied the Kolb test with which he evaluates the ways of learning of each person. (Hernández, 2018)

Learning styles, impulsivity and reflexivity by Quiroga and Rodríguez where they explain that impulsivity helps students to be faster to solve problems, unlike reflective students who spend a lot of time analyzing problems to give them a solution. (Rodriguez, 2005)

According to Díaz-Barriga Arceo (2002), the use of didactic strategies focused on activating previous knowledge, highlighting relevant information, organizing, recirculating and integrating information, promote the construction of meaningful learning, which is characterized by being interesting, useful, motivating and have meaning for the students, in addition to seeking that the subjects have a high-level cognitive activity so that they re-signify the knowledge. If its application is promoted, it would facilitate the generation of authentic learning, of a high level of appropriation in which the learners will handle the contents widely.

Greaney & Kellaghan mentions national assessment capacity development has enabled ministries of education as part of their lead role to describe national levels of learning outcome, especially in key subject areas, and to compare achievement levels of key subgroups (such as boys and girls, ethnic groups, urban and rural students, and public and private school students). (Kellaghan, 2008)

Methodology to be developed

In this research it is sought that students carry out activities during their university course which leaves them learning that they can use in their personal and work life, through the authors who have investigated the subject, the main proposal of the work is supported and it was carried out the development of objectives, research questions and hypotheses which guide the course of the investigation.

The ILP-R Questionnaire Spanish version of (Schmeck, 1991) was used, which is already standardized, which is why the pilot test was omitted. From the data obtained, they are organized in a concentration matrix and they are given statistical treatment to explore the results where a cronbach's alpha of .92 is obtained, in addition, the information is processed in the analysis of the statistics:

ISSN 2524-2075

Descriptive from frequencies and percentages, Comparison with Student's t test for independent groups and with the Integrational one with exploratory factor analysis; It is a quantitative, synchronous and transversal investigation of an exploratory and descriptive type which will be processed in the STATISTIC program The instrument was carried out on-line for reasons of the contingency of COVID-19 this consists of two sections, in the first section there are ten general data variables. The second section consists of one hundred and fifty variables with a scale from 1 to 6 (1 = Strongly disagree; 6 = Strongly agree) directed to the axis of learning styles. The sampling is non-probabilistic of a systematic type; This being a characteristic in research by students, where they depend on their willingness to answer the survey online.

Results

Descriptive Analysis

The participating students are from different universities, among them we find that 78 participants belong to the male gender and 166 to the female, giving a total of 244. The age of this is from 17 to 45 years, with 19 years of age being the most frequent (58).

Comparative analysis

T Student's t for independent samples

In order to compare samples through their arithmetic means and find significant differences depending on the behavior, the following shows the comparative analysis with the student's t test for independent samples with a probable value of error less than 0.05 ($p < 0.05$), the statistical values that appear in this analysis are the sample values of each analysis group (Mean (X) of the groups), the t-test value (t-value), the degrees of freedom (df) and the probability of the error level.

For the first comparison, gender is taken as the grouping variable and the contrast variables that make up the section of the complex variable of the analytical “agentic” procedure. the men. It is inferred that men learn more actively and pragmatically as they tend not to be as theoretical and reflective as women.

For the second comparison, City is taken as the grouping variable and those that make up the section of the complex variable of the analytical “agentic” procedure as contrast variables. From the analysis it is observed that the Saltillo students believe that it is important to look at the problems rationally and logically, without drawing intuitive conclusions. Therefore, it is inferred that they learn in a reflective, theoretical and logical way, unlike the Potosinos.

For the second comparison, the grouping variable University career is taken and as contrast variables those that make up the section of the complex variable of Analytical “agentic” procedure. From the analysis it is observed that the students of the Law Degree prefer to work the problems in parts solving them part by part and they need to do things step by step, in an orderly way. It is inferred that the students of the Law Degree carry out their activities in an active, reflective, theoretical and logical manner.

Integrational Analysis

Exploratory factorial

In order to establish the structure that underlies the subjects studied, we work with a normalized varimax factor rotation, with a probable level of error $p \leq 0.01$ and an $r \geq 0.16$ and a confidence level of 99.99%; with the procedure multiple communities of r^2.

Next, the factors that support the educational innovation proposal are exposed.

The first factor is called Independent study, it explains 8.37% and is made up of the complex variables of thought, self-efficacy, data retention, motivation: academic interest, motivation: self-affirmation effort, study method, deep procedure: abstract / semantic, deep procedure: criterion thinking, elaborative procedure: self-realization, elaborative processing: concrete / episodic, "agentic" processing: serial / sequential, manual of impressions, the results show that students are interested in learning new content analytically, rote , verbal and visual. It follows that students are capable of creating their own knowledge without needing the teacher to teach topics and the role of this becomes only a guide that helps the young person.

In the second factor called counseling, it explains 7.59% of the total variance, it is made up of self-efficient organization, self-efficient thinking, self-efficient data retention, motivation: academic interest, motivation: personal responsibility, motivation: effort, self-esteem, self-affirmation, processing deep: abstract / semantic, elaborative processing: self-actualization, analytic "agentic" processing, literal repetition. The results show that students have difficulties in memorizing, feel confused, not easily bored, need guidance, and are not able to do things on their own. It is deduced that the students of striking activities in order to focus their attention on the classes and work as a team so as not to feel distressed, these students learn in a social and kinesthetic way what refers to the fact that the teachers of the universities of Mexico need to carry out their planning in based on these learning styles.

In the third factor called content retention, it explains 4.54% of the total variance, it is made up of self-efficiency organization, self-efficiency data retention, motivation: personal responsibility, motivation: effort, self-affirmation, study method, deep processing: abstract / semantic, deep processing: critical thinking, elaborative processing: self-realization, literal repetition, conventional attitudes, manual of impressions and random response scale. The results show that the students memorize what they have to learn and all the material, however they do not analyze what they are reading or think that it can be useful when reading and prefer that the teachers only limit themselves to giving the contents without giving their own contributions. I know deduces that students learn in a pragmatic-solitary way, which refers to teachers adapting their activities to help young people to be more outgoing and reflective so that they not only retain information, but can use it in their daily lives.

The fourth factor called logical effort explains 4.24% of the total variance and is made up of motivation: effort, deep processing: critical thinking, elaborative processing: self-realization, elaborative processing: concrete / episodic, "agentic" processing: serial / sequential, analytical "agentic" processing, and literal repetition. The results show that the students are analytical and need to have everything in order, they never leave anything unfinished, they solve problems logically and strive to obtain all the details of the content.

Conclusions

According to the results obtained from the statistical analyzes, this section presents the conclusions that show the perspective of learning styles; To answer the main question, objectives and hypotheses, it is concluded that students of striking activities in order to focus their attention on the classes and work as a team so as not to feel distressed, these students learn in a social and kinesthetic way what refers to the teachers from universities in Mexico need to plan based on these learning styles.

It is denoted that students are capable of creating their own knowledge without needing the teacher to teach topics and the role of this becomes only a guide that helps the young person.

It is denoted that students learn in a pragmatic-solitary way, which refers to teachers adapting their activities to help young people to be more outgoing and reflective so that they not only retain information but can use it in their daily lives.

It is concluded that university students learn logically and are inclined to the area of mathematics, so teachers must be more proactive at the time of teaching, that is, they need to give detailed content and precise instructions for carrying out activities.

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ISSN 2524-2075