

LEARNING STYLES IN DIDACTIC PLANNING OF HIGHER EDUCATION

**ESTILOS DE APRENDIZAGEM NO PLANEJAMENTO DIDÁTICO DA
EDUCAÇÃO SUPERIOR**

**ESTILOS DE APRENDIZAJE EN LA PLANEACIÓN DIDÁCTICA DE LA
EDUCACIÓN SUPERIOR**

 <https://doi.org/10.56238/sevened2025.036-151>

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ABSTRACT

Objective: To develop a methodological proposal to identify the characteristics of the students in a group (personality, academic level, context, cognitive structure and learning styles), to guide didactic planning towards comprehensive training, meaningful and personalized learning.

Theoretical Framework: Students with heterogeneous characteristics in their biography and academic history converge in the classroom. Its identification by means of various diagnostic models (Briggs-Myer; Honey-Mumford; Kolb; VARK; 4MAT-System) allows for the adaptation of didactic planning improving students' academic results.

Method: A qualitative, descriptive, literature review study was carried out, analyzing didactic planning and several models of learning styles, to develop a methodological proposal that identifies the characteristics of students in a school group (personality, academic level, context, cognitive structure, learning styles).

Results and Discussion: The characteristics and learning styles identified by the models reviewed are personality (Briggs-Myer), attitude and behavior (Honey-Mumford; Honey-Alonso), experiential learning (Kolb), preferential sensory modality for perceiving and processing information (VARK, Fleming-Mills model), laterality and specificity of the cerebral hemispheres (Bernice McCarthy's 4MAT-System), interaction between students and teachers (Grasha-Riechmann). It included also an initial diagnostic examination, individual and group interviews and team building.

Research implications: Didactic planning oriented towards the characteristics and learning styles of students is an innovative strategy to achieve meaningful and personalized learning.

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Originality/Value: The relevance of the study is to emphasize the need to identify the differences between the students of a group, in order to generate changes both in didactic planning and at the institutional level, benefiting the community.

Keywords: Learning Styles. Didactic Planning. Higher Education.

RESUMEN

Objetivo: Elaborar una propuesta metodológica para identificar estilos de aprendizaje y características del alumnado en un grupo (personalidad, nivel académico, contexto, estructura cognitiva), para orientar la planeación didáctica favoreciendo la formación integral, el aprendizaje significativo y personalizado.

Marco Teórico: En el aula confluyen estudiantes con características heterogéneas en su biografía e historia académica. Su identificación mediante diversos modelos diagnósticos (Briggs-Myer; Honey-Mumford; Kolb; VARK; 4MAT-System) permite adecuar la planeación didáctica para mejorar los resultados académicos.

Método: Se realizó un estudio cualitativo, descriptivo, tipo revisión bibliográfica, analizando la planeación didáctica y varios modelos de estilos de aprendizaje, para elaborar una propuesta metodológica que identifique las características del alumnado en un grupo escolar (personalidad, nivel académico, estructura cognitiva, estilos de aprendizaje y contexto).

Resultados y Discusión: Las características y estilos de aprendizaje que identifican los modelos analizados son: personalidad (Briggs-Myer), forma de actuar (Honey-Mumford; Honey-Alonso), aprendizaje experiencial (Kolb), modalidad sensorial preferente para percibir y procesar la información (modelo VARK, Fleming y Mills), lateralidad y especificidad de los hemisferios cerebrales (4MAT System de Bernice McCarthy), interacción alumnado-docentes (Grasha-Riechmann). Se incluyó: examen diagnóstico inicial, entrevistas e integración de equipos.

Implicaciones de la investigación: La planeación didáctica orientada hacia las características y estilos de aprendizaje del alumnado, es una estrategia innovadora para lograr el aprendizaje significativo y personalizado.

Originalidad/Valor: Este estudio destaca la necesidad de identificar las diferencias entre el alumnado de un grupo, para generar cambios en la planeación didáctica e institucionales, beneficiando a la comunidad.

Palabras clave: Estilos de Aprendizaje. Planeación Didáctica. Educación Superior.

RESUMO

Objetivo: Elaborar uma proposta metodológica para identificar estilos de aprendizagem e características do alunado em um grupo (personalidade, nível acadêmico, contexto e estrutura cognitiva), a fim de orientar o planejamento didático, favorecendo a formação integral e a aprendizagem significativa e personalizada.

Referencial teórico: Na sala de aula coexistem estudantes com características heterogêneas em suas trajetórias pessoais e histórias acadêmicas. A identificação dessas características por meio de diferentes modelos diagnósticos (Briggs-Myers; Honey-Mumford;

Kolb; VARK; sistema 4MAT) permite adequar o planejamento didático, contribuindo para a melhoria dos resultados acadêmicos.

Método: Foi realizado um estudo qualitativo, descritivo, do tipo revisão bibliográfica, analisando o planejamento didático e diversos modelos de estilos de aprendizagem, com o objetivo de elaborar uma proposta metodológica capaz de identificar as características do alunado em um grupo escolar (personalidade, nível acadêmico, estrutura cognitiva, estilos de aprendizagem e contexto).

Resultados e discussão: As características e estilos de aprendizagem identificados pelos modelos analisados incluem: personalidade (Briggs-Myers), forma de agir (Honey-Mumford; Honey-Alonso), aprendizagem experiencial (Kolb), modalidade sensorial preferencial para perceber e processar informações (modelo VARK, de Fleming e Mills), lateralidade e especificidade dos hemisférios cerebrais (sistema 4MAT, de Bernice McCarthy) e interação entre estudantes e docentes (Grasha-Riechmann). Foram incluídos, ainda, exame diagnóstico inicial, entrevistas e integração de equipes.

Implicações da pesquisa: O planejamento didático orientado pelas características e estilos de aprendizagem do alunado constitui uma estratégia inovadora para promover a aprendizagem significativa e personalizada.

Originalidade/valor: Este estudo destaca a necessidade de identificar as diferenças entre os estudantes de um grupo, a fim de promover mudanças no planejamento didático e institucional, beneficiando a comunidade acadêmica.

Palavras-chave: Estilos de Aprendizagem. Planejamento Didático. Educação Superior.



1 INTRODUCTION

"... The most important factor influencing learning, it is what the student already knows. Find this out and teach yourself accordingly."
D. Ausubel (1983).

For most of the last century, in the field of education, traditionalist pedagogy privileged teaching over learning, thus highlighting the leading role of teachers over that of students. Also notable in educational programs was the supremacy of thematic content, over the application, construction and reconstruction of knowledge, as well as teaching work where strategies, teaching techniques and learning assessment focused on the cognitive functions of the left cerebral hemisphere (memorization and reproduction of content or information); likewise, the context of the educational process was significantly ignored.

However, it was from the emergence of the constructivist approach in educational models in the seventies and eighties of the twentieth century, essentially based on (Carretero M, 1993; Lozano A, 2001):

1. The theory of cognitive development (1936-1950) by Jean Piaget (1896-1980), which relates the first stages of human development, from birth, to the improvement of cognitive functions (cognitive constructivism, 1971).
2. The theory of significant learning (1960-1970) by David Ausubel (1918-2008), which is developed by relating new information with previous knowledge in a non-linear way.
3. The theory of socio-cultural learning (1978) by Lev Vygotsky (1896-1934), which emphasizes the importance of social, cultural, and linguistic interaction between people and their environment for the development of learning (social constructivism, 1978).

When the panorama of teaching work began to change, tending to prioritise learning over teaching, so that the main protagonist of the teaching-learning process began to be the students and not the teachers (Guerra GJ, 2020).

Current pedagogical trends promote comprehensive training, meaningful, student-centered learning, and personalized learning (Ausubel D, 1983; Delors J, 1996; UNESCO-OIE 2017). How to develop an appropriate environment in the classroom to achieve this objective? It is difficult to answer this question, but achieving it means for teachers to accept the challenge and responsibility, truly understanding what their role should be as teachers of the 21st century: to assume the position of guide, facilitator, mediator and example throughout the educational process, but above all, to be a promoter of learning and a researcher of the

characteristics and learning styles of the students. of their own teaching practice and educational context (Valarezzo JW, 2019; UNESCO, 1996, 2017).

On the other hand, it is a reality that in a classroom, students with very diverse characteristics and needs converge, related to their personal biography, academic level, personality, cognitive structure and learning styles, as well as their interests and abilities (Alonso CM, 1997, 2007).

Likewise, UNESCO's International Bureau of Education (IBE) has emphasized the importance of recognizing the diversity of learning styles and addressing the needs of each student, paying attention to the relevance of what is taught and stimulating the capacity for inquiry (UNESCO-IBE, 2017).

Hence, the organization of the educational institution and the planning of the teaching work ("*Didactic Planning*") must contemplate this perspective, especially to help students achieve their maximum potential for human and professional development.

OBJECTIVE: To develop a methodological strategy that allows the identification of the individual characteristics of the students of a group, in relation to their personality, academic level, context, cognitive structure and learning styles, to guide didactic planning favoring the development of comprehensive training, meaningful and personalized learning of students.

2 METHODOLOGY

2.1 RESEARCH DESIGN: QUALITATIVE, DESCRIPTIVE, BIBLIOGRAPHIC REVIEW.

2.2.1 Materials and method

The models related to different learning styles of various authors (available in academic Internet search engines such as Google Scholar, Redalyc, SciElo, Dialnet) designed to identify the characteristics, preferences and learning styles of the students were analyzed. Based on the different methodological approaches analyzed, a strategy proposal was developed to identify the personal characteristics of the students who make up a class group, in relation to their personal history, personality type, cognitive structure and learning styles. Likewise, strategies were added to assess the academic level and personal context, in order to improve the student's academic result, through the adaptation of didactic planning.

3 RESULTS

The different models designed to assess learning styles, which were reviewed and analyzed, are: the Kolb model, Honey-Mumford, 4MAT System, Briggs and Myers, VARK (N.



Fleming, and C. Mills) and the Grasha-Riechmann model. Among its main characteristics and the aspects they investigate are:

3.1 KOLB MODEL

Developed by David A. Kolb, at the beginning of the 70's. Identify two fundamental dimensions of the learning process: perception and processing, finding that in each of them there are 2 opposite types:

- a) In perception: concrete experience and abstract conceptualization.
- b) In processing: active experimentation and reflective observation.

With the above, Kolb built a 4-quadrant model where he explains and describes four learning styles: convergent, divergent, assimilator and accommodating. Each person shows a style that is predominant, but not exclusive.

To locate each learning style, he developed an instrument called the Learning Style Inventory (LSI); this "inventory" is obtained through a 12-question questionnaire, which he formulated based on his *"theory of experiential learning"* (Kolb, 1984).

3.2 HONEY-MUMFORD MODEL

Produced by Peter Honey and Allan Mumford in 1986. It consists of a questionnaire of 20 questions, which locate the learning style according to 4 categories: active, reflective, theoretical and pragmatic. From the first results they obtained, they elaborated a detailed description of each style, based mainly on the *"way people act"*.

Based on this proposal, Alonso, Gallego and Honey (1992) prepared a list of the characteristics and skills of each style (Honey-Alonso questionnaire), concluding that: *"the four learning styles can present combinations between them, in a logical order and of cultural significance"*

3.3 MODEL 4MAT SYSTEM

It was developed by Bernice McCarthy in 1987, based on proposals by Kolb and Briggs-Myers. It consists of applying a questionnaire devised by Kolb (2008), which contains 18 questions, which are based on *"the laterality and specialization of the two cerebral hemispheres"*. This author proposes 4 learning styles: imaginative, analytical, common sense and dynamic. He even considers that these styles integrate a *"natural learning cycle"*, so that this proposal states that optimal learning is only achieved when the person goes through the

four styles.

The 4MAT System integrates the levels of:

1. Comprehension (experimenting with information and integrating it into oneself).
2. Conceptualization (internalizing concepts).
3. Operationalization (applying knowledge through practice and customization).
4. Evaluation (creating knowledge and integrating it into personal life).

3.4 BRIGGS AND MYERS MODEL

These authors based their proposal on the model of "*personality types*" of Carl G. Jung (1921), which allows correlating learning styles with interpersonal relationships. They identified two perceptual processes (sensitive and intuitive) and two for decision-making (rational and emotional), which people use daily in any activity. The difference is in the process used predominantly, which according to Jung, characterizes the personality type (Almaguer TE, 1998).

Katharine Cook Briggs (1875-1968) and Isabel Briggs Myer (1897-1980), mother and daughter respectively, designed a questionnaire in the 40's called Myers-Briggs Type Indicator (MBTI), which allows people to know their own personality type; It was first published in 1962. It consists of questions whose answers are a pair of opposites, which describe their preferences in relation to the following aspects, where the respondent chooses the one that is closest to their reality:

1. Flow of interest (directing or receiving energy): focusing on the outside world (E = extroversion), or on the inner world (I = introversion).
2. Attention (assimilating information): focused on facts (S = sensory), or on the big picture (I = intuition).
3. Decision-making (deciding and reaching conclusions): with an objective (T = thinking) approach, or empathetic (F = feeling).
4. How one wishes to live life: seeking closure (J = judgment), or being open to new information (P = perception).

From them, 16 possible combinations are generated (four-letter code) which describe the "*different types of personality, normal, healthy and the differences that exist between people*", which are not static but dynamic, being able to move from one to another during the course of a day and throughout life. Finally, he emphasizes that understanding, appreciating,



and valuing personality differences can lead people to collaborate with others more constructively (Myers & Briggs Foundation, 1975).

3.5 VARK MODEL

Developed in 1992, by Neil Fleming and Collen Mills. Their model takes the name VARK from the sensory modalities that are identified: V = visual, A = auditory, R = reading/writing, and K = kinesthetic or kinesic.

To this end, they developed a questionnaire that initially consisted of 13 multiple-choice questions, but in 2006 3 more were added, in which the sensory preferences of the students are investigated, which allows them to identify the dominant sensory modality to receive and select the information according to their personal interests (Fleming, ND & Mills C, 2006).

It is also possible to identify students who are multimodal, that is, who use various sensory perceptions to process information. These students have greater ease of learning in relation to unimodal students.

3.6 GRASHA-RIECHMANN MODEL

Designed in 1974 by Anthony Grasha and Cerril H. Riechmann, it is based on the preferences of the student body with respect to "*interaction with their peers and faculty*". The teaching style assessment instrument is called the Teaching Styles Inventory (TSI) and has 5 categories: expert, authority, model, facilitator and delegator, which are usually combined. The learning styles they propose are contrasted and are located in 6 categories: participatory-elusive, competitive-collaborative and dependent-independent (Grasha A, 2001).

Based on the approaches formulated above, we present the following Table, with a proposal as a possible strategy to contextualize and improve the design, planning, execution and academic results of the teaching work, by identifying the characteristics and differences in the various learning styles of the students who coincide in a school group. Finally, an attempt was made to balance the three basic aspects in this regard, such as: academic level, learning styles and the personal context of the students.



Table 1

Strategies for identifying students' characteristics and learning styles

STRATEGY SUGGESTED	JUSTIFICATION OF CHOICE STRATEGY	ADJUSTMENTS IN DIDACTIC PLANNING
<p>1. Initial diagnostic exam (knowledge)</p> <p>(Brief oral or written exam applied at the beginning of the course or unit; evaluates the level of prior knowledge necessary for the optimal development of the study program).</p>	<p>It allows the ACADEMIC LEVEL to be assessed, in relation to:</p> <ul style="list-style-type: none"> ✓ Oral and written language management. ✓ Mastery of technical language. ✓ Mastery of support disciplines. ✓ Theoretical-practical knowledge of the curricular discipline. ✓ To guide the development of the study program. 	<ul style="list-style-type: none"> 1. Adequacy of objectives and contents of the syllabus. 2. Implement leveling. 3. Rethink the Activities of learning. 4. Redesign the evaluation.
<p>2. Survey to detect LEARNING STYLES and PERSONALITY TYPE of the students.</p> <p>(Written instrument that is applied to each student at the beginning of the course, based on some methodological model).</p>	<p>It allows you to identify the LEARNING STYLE(s) and characteristics of your PERSONALITY to:</p> <ul style="list-style-type: none"> ✓ Identify individual learning style(s). ✓ Determine the predominant learning style(s) in the group. ✓ Observe the personality type ✓ Detect individual learning needs. ✓ To guide teaching and learning techniques and activities in didactic planning. 	<p>Design and elaboration of the survey, based on the models of:</p> <ul style="list-style-type: none"> 1. Kolb. 2. Honey-Mumford. 3. 4MAT System. 4. Briggs and Myers. 5. VARK. 6. Grasha-Riechmann. 7. Others. <p>Adapt the didactic planning, according to the results.</p>
<p>3. Personal presentation to the group and interviews (Institutional Tutoring Program).</p> <p>(Brief presentation of each student and the teacher in the first class. Periodic, individual or group interviews of students with the teacher</p>	<p>It allows us to know the personal CONTEXT:</p> <ul style="list-style-type: none"> ✓ Knowledge of the student as a human person and his/her family and social context. ✓ Management of oral communication. ✓ Promote satisfactory intra- and interpersonal relationships. ✓ Identify the needs for comprehensive training and meaningful learning. 	<p>Institutionalize and systematize the strategy.</p>
<p>4. Integration of collaborative work groups.</p>	<p>It allows us to improve the RESULTS of meaningful learning:</p>	<p>Institutionalize and systematize the strategy</p>



(Formation of heterogeneous work teams made up of 3 – 4 students, during the first week of the course)	<ul style="list-style-type: none">✓ Promote collaborative, independent and participatory learning.✓ Teamwork with research projects and PBL.✓ Provide feedback on the teaching and learning process.✓ Ensure the fulfillment of the objectives.✓ Establish timely remedial measures.	
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4 DISCUSSION

According to the evolutionary psychology of J. Piaget (1896-1980), the student should be considered as an individual, unique and unrepeatable being, with characteristics common to his or her age group. On the other hand, their personal development is influenced both by their genetic inheritance and by their interaction with the environment, and especially with other people (family, friends, classmates, teachers, authorities, etc.), which will determine significant differences related to their gender, age, character, personality, previous experiences, interests, motivations, abilities, skills and needs, as well as their cognitive structure and learning styles or traits intellectuals (Ferreiro E, 1999; Delors J, 1996 UNESCO).

This supports the assertion that individual differences among students in a classroom have always been present and constitute a reality at any educational level or environment, as well as in all areas of human knowledge (Bahamón M, 2012).

Basically, teachers must take these differences into account as key elements for the design and planning of teaching work, in order to provide opportunities for access to comprehensive training, meaningful learning and personalized learning to all students (UNESCO-IBE, 2017), which can be translated into: *"providing different paths to acquire content, process information and generate a result"* (Tomlinson, 1995).

It is therefore necessary to identify the different personal histories, the different learning styles and personality styles that converge in the classroom. To this end, there is the possibility of using various diagnostic models, some focused on personality types (Briggs & Myer, 1940), others on the way people act (Honey-Mumford, 1986; Honey-Alonso, 1992), or based on the *"theory of experience-based learning"* (Kolb, 1971, 1984). Similarly, the VARK model, which allows identifying the preferred sensory modality for perceiving and processing information (Neil Fleming & Collen Mills, 1992), the 4MAT System model (Bernice

McCarthy, 1987) which proposes a natural learning cycle taking into account the laterality and specificity of the two cerebral hemispheres, and the Grasha-Riechmann model (1974) which focuses on the type of student-student and student-teacher interaction.

Current pedagogical models promote meaningful learning (Ausubel D, 1980; Moreira M, 2017), and personalized learning (Pérez Guerrero J, Ahedo Ruiz J, 2020) where the student becomes the main protagonist of the educational act as a being capable of creating, innovating, thinking and reflecting, actively participating in the construction, reconstruction and application of knowledge focused on problem solving, research, collaborative work and project design.

To achieve this, it has been proposed that teaching practice should be oriented towards being personalized to facilitate the learning process in a more natural and scientific way, thus supporting each student to reach their full potential, both in their human and professional development (UNESCO-IBE, 2017).

5 CONCLUSIONS

Among the many current challenges of higher education (in all its areas), as well as at other educational levels, is to achieve the quality of the various academic programs, which guarantees comprehensive training, meaningful and personalized learning, together with the development of professionalism and ethics of the students.

Didactic planning oriented towards the characteristics and learning styles of students ("*personalized learning*") is undoubtedly the most suitable and innovative strategy to achieve these objectives in higher education, and even in other educational levels.

In the contemporary world, the student is projected as a responsible, supportive, creative, innovative and participative person, with the ability to work in a team, maintain satisfactory intrapersonal and interpersonal relationships, solve problems, self-learning, continuous and collaborative learning, if the conditions and opportunities for access are provided.

A proposal is presented as a possible strategy to contextualize and improve the didactic planning and the academic results of the teaching work, by identifying the characteristics and learning styles of the students in a group of classes. It was also a matter of balancing the basic aspects in this regard: academic level, learning styles, personality type and personal context.

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