Predominant learning styles in basic general education students

Estilos de aprendizaje predominantes en estudiantes de educación general básica

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Abstract

The main objective of this research is to identify the predominant learning styles among seventh-grade students of basic general education in the Durán canton, Ecuador. To do so, the VARK model was used, which classifies learning preferences into four categories: visual, auditory, literacy, and kinesthetic. The study was conducted using a non-experimental methodology with a quantitative, correlational, and cross-sectional approach, with a descriptive design. The sample consisted of 38 students from an educational institution in the Durán canton, representing all seventh-grade students, who responded to the VARK version 8.0 questionnaire. The results revealed that the most prevalent learning style is kinesthetic, with 36.8% of students preferring it. This is followed by visual (23.5%), auditory (21.1%), and literacy (18.6%). Furthermore, the independent samples t-test showed a P value greater than 0.05, indicating no significant differences in learning styles based on gender. These findings are relevant for teachers to design educational methodologies tailored to their students' specific learning needs.

Keywords: learning, basic education, teaching.

Resumen

La presente investigación tiene como objetivo principal identificar los estilos de aprendizaje predominantes entre los estudiantes de séptimo año de educación general básica en el cantón Durán, Ecuador. Para ello, se utilizó el modelo VARK, que clasifica las preferencias de aprendizaje en cuatro categorías: visual, auditivo, lectoescritura y kinestésico. El estudio se llevó a cabo mediante una metodología no experimental con un enfoque cuantitativo, de tipo correlacional y de corte transversal, con un diseño descriptivo. La muestra estuvo compuesta por 38 estudiantes de una institución educativa del cantón Durán, representando la totalidad de los alumnos de séptimo año, quienes respondieron al cuestionario VARK versión 8.0. Los resultados revelaron que el estilo de aprendizaje más prevalente es el kinestésico, con un 36,8% de los estudiantes prefiriéndolo. Este es seguido por el estilo visual (23,5%), auditivo (21,1%) y lectoescritura (18,6%). Además, la aplicación de la prueba t para muestras independientes mostró un valor P mayor a 0,05, indicando que no existen diferencias significativas en los estilos de aprendizaje en función del género. Estos hallazgos son relevantes para que los docentes puedan diseñar metodologías educativas que se ajusten a las necesidades específicas de aprendizaje de sus estudiantes.

Palabras clave: aprendizaje, educación básica, enseñanza.

Introduction

Learning styles (LS) refer to the preferred ways in which individuals acquire and process information, which can vary significantly from one person to another. The study of LS within the educational context is essential, as identifying each student's predominant learning style allows educators to select the most appropriate teaching techniques to facilitate effective learning and, consequently, optimal academic performance (Costa et al., 2020). According to Alanya et al. (2021), some students can grasp certain content more quickly, while others may face challenges that, if persistent, can hinder their progress in various levels of formal education, potentially leading to failing courses or dropping out of the educational system. Therefore, it is crucial for teachers to identify the LS of their students to adapt their pedagogical strategies, thereby promoting more meaningful and successful learning. This is especially relevant today, given the significantly low levels of learning observed.

According to the United Nations (ONU, 2022), globally, many children from different countries exhibit low learning levels, reaching the age of ten without being able to read adequately and lacking basic knowledge in key areas, which jeopardizes their future and limits their opportunities for a better quality of life. In Ecuador, for instance, the situation is similar; the National Institute for Educational Evaluation (INEVAL, 2024) reports that students in basic education do not meet the minimum learning standards required, scoring below 700 points, which highlights limitations in their knowledge, skills, and abilities to navigate their educational level effectively. This reality reflects an educational crisis that requires urgent attention to ensure the comprehensive development and future opportunities of students.

This situation of low academic performance is evident in an educational center in the canton of Durán, Ecuador, where seventh-grade general education students face difficulties in assimilating the content taught, due to a predominant teaching methodology that does not consider the different LS of the students. Previous studies in other educational institutions in the country have reflected a similar problem. For example, Cevallos (2023) found that teachers employ methodologies that do not always account for the diversity of LS among their students, while Calderón & Montero (2022) concluded that many teachers are unaware of the learning styles with which their students identify, complicating the planning of inclusive classes that address the diversity and heterogeneity of the classroom. According to Loor & Alarcón (2021), students tend to discover how they learn best as they progress through formal education; thus, timely intervention from teachers is critical to accelerate this process, fostering interest in learning and making previously unappealing subjects or content perceived as interesting and motivating.

In this sense, recognizing the predominant LS among seventh-grade students in an educational center in the canton of Durán is fundamental, as it provides valuable information that guides teachers in designing teaching methodologies tailored to these preferences. This allows each student, who is about to transition into secondary education, to achieve learning that enhances their future academic performance. Almeida & Cunha (2020), along with Darko et al. (2024), agree that identifying LS facilitates teachers' implementation of more effective techniques and strategies that enrich the teaching-learning process and improve student performance. Moreover, Sholihah & Wijayanti (2023) relate the understanding of LS to academic success, as it enables students to select resources that accelerate their learning, resulting in better academic development. In this regard, Cobeña et al. (2024) indicate that an educational methodology aligned with LS makes the teaching-learning process more interactive, participative, collaborative, and engaging, contributing to improved academic performance. Therefore, the study

of learning styles in educational institutions is a necessary and beneficial practice, as it allows both students and teachers to focus their efforts on achieving more effective and meaningful learning.

Over the years, various theories have been proposed to explain learning styles, including the one formulated by Fleming (2001), who defines these styles as preferred sensory modalities for receiving and processing information. From this idea arises the VARK model, which classifies LS into four categories: visual (V), auditory (A), reading/writing (R), and kinesthetic (K), whose initials form its name:

- **V:** the visual style refers to those who learn best through observation, utilizing graphical and symbolic information such as diagrams, colors, graphs, and spatial schemes.
- **A:** the auditory style corresponds to those who prefer learning by listening, through debates, conversations, discussions, auditory resources, and seminars.
- **R:** the reading/writing style is linked to those who learn through written texts, such as books, notes, essays, and written feedback.
- **K:** finally, the kinesthetic style is associated with those who learn by physically interacting, through activities such as role-playing, demonstrations, practical examples, and movement.

The main advantage of the VARK model is its clear and concrete categorization, which instills confidence in educators and is widely used in research related to learning styles (Idris & Jamil, 2024). Therefore, this study aims to identify the predominant learning styles among seventh-grade general education students in the canton of Durán, Ecuador, also considering potential differences by gender, using the VARK model as a reference.

Methodology

To achieve the objective of identifying the predominant learning styles (LS) in seventh-grade general education students based on gender, a non-experimental design was employed, utilizing a quantitative, correlational approach with a cross-sectional and descriptive nature. This approach does not involve the deliberate manipulation of variables but rather the collection of data that describes the reality of students in relation to their LS within the specific context of an educational center in the canton of Durán, Ecuador.

Regarding the sample, it was a census sample consisting of all students enrolled in seventh grade during the 2024-2025 academic year at the selected educational institution, totaling 38 participants. These were evenly distributed by gender, with 19 males and 19 females, allowing for comparisons of results to determine if significant differences exist in predominant LS based on gender.

To identify the predominant LS, the VARK questionnaire version 8.0, developed by Fleming & Bonwell (2019), was utilized. This instrument consists of 16 items that reflect an updated context, including the use of digital technologies. Each item presents four brief, polynomial response options, each associated with a specific LS: (1) visual, (2) auditory, (3) reading/writing, and (4) kinesthetic. Based on the students' responses, the predominant LS in each group were determined, and comparisons were made to analyze potential differences by gender.

Results

The results obtained from the application of the VARK questionnaire to the 38 students, identifying the predominant learning styles—visual, auditory, reading/writing, and kinesthetic—are presented below. The data analysis, reflected in Table 1, considers responses to the 16 items of the instrument, totaling 618 responses, with 309 corresponding to females and 309 to males.

Table 1

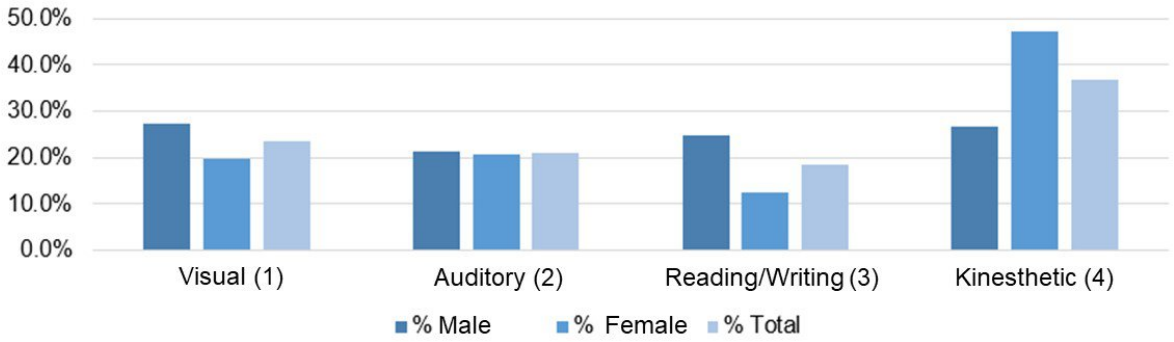
Predominant LS by gender for seventh-grade students

Sample	Visual (1)	Auditory (2)	Reading/Writing (3)	Kinesthetic (4)	Total
Males	83	65	75	81	304
	27.3%	21.4%	24.7%	26.6%	100.0%
Females	60	63	38	143	304
	19.7%	20.7%	12.5%	47.0%	100.0%
Total	143	128	113	224	608
	23.5%	**21.1%**	**18.6%**	**36.8%**	**100.0%**

Source: Authors' own elaboration

Figure 1 displays the predominant learning styles distributed according to the gender of the surveyed students:

Figure 1
Predominant LS by gender for seventh-grade students



Source: Authors' own elaboration

The data reveals that the predominant learning style among participating students is kinesthetic, accounting for 36.8% of responses. This indicates that most students learn best through interaction with their environment, sensory touch, and movement. Therefore, it is essential for educators to adopt methodologies that keep students active and engaged in the teaching-learning process, utilizing activities such as games, real-life examples, demonstrations, crafts, and physical exercise.

The second most frequent LS is visual, at 23.5%, corresponding to students who learn best through observation and the use of graphical or symbolic information. In this case, educators should implement strategies that leverage visual resources such as colors, diagrams, charts, videos, and spatial arrangements to capture interest in the content being taught.

Third, the auditory LS accounts for 21.1%, grouping those who learn better by listening. For these students, it is advisable for educators to use methodologies based on discussions, conversations, seminars, and auditory resources that facilitate content assimilation.

Finally, the reading/writing LS represents 18.6%. In this group, educators should promote learning through basic skills such as reading and writing, utilizing notes, books, essays, readings, and written feedback.

Regarding gender, differences in LS preferences are observed. Among males, the predominant style is visual, at 27.3%, followed by kinesthetic (26.6%), reading/writing (24.7%), and auditory (21.4%). In contrast, females show a greater inclination towards the kinesthetic LS, at 47.0%, followed by auditory (20.7%), visual (19.7%), and reading/writing (12.5%). This suggests that females tend to learn better through practice and interaction, demonstrating greater sociability compared to males, who prefer a visual style while maintaining kinesthetic as a secondary preference.

As part of the inferential analysis, an independent samples t-test was applied to determine if significant differences exist in LS preferences between males and females. The results of this test are presented in Table 2.

Table 2
Analysis of differences in LS by gender

		T-test for equality of means					
		t	df	Sig. (two-tailed)	Mean difference	Std. error difference	95% confidence interval for the difference
							Lower
Visual	Male	0.890	36	0.379	1.21053	1.36041	-1.54852
	Female	0.890	33.419	0.380	1.21053	1.36041	-1.55594
Auditory	Male	0.085	36	0.932	0.10526	1.23157	-2.39248

	Female	0.085	34.747	0.932	0.10526	1.23157	-2.39562
Reading/Writing	Male	1.307	36	0.199	1.94737	1.48968	-1.07384
	Female	1.307	26.484	0.202	1.94737	1.48968	-1.11199
Kinesthetic	Male	-1.761	36	0.087	-3.26316	1.85310	-7.02142
	Female	-1.761	35.502	0.087	-3.26316	1.85310	-7.02325

Source: Authors' own elaboration

Discussion

The analysis using the independent samples t-test reveals that there are no statistically significant differences in the learning styles of seventh-grade students based on gender (p-value or sig. > 0.05). This indicates that being male or female does not determine a preference for a specific style, reinforcing the need for educators to conduct prior assessments to adapt teaching methodologies to the characteristics of their students. This conclusion aligns with the findings of Bueno & Font (2021), who emphasize the importance of identifying learning styles to optimize the educational process.

However, it is noteworthy that in the educational unit studied, 36.8% of students prefer a kinesthetic learning style, followed by 23.5% who lean towards the visual style. In contrast, the study by Martínez et al. (2023), conducted with 30 primary education students in Ambato, Ecuador, found that the visual style predominated at 50%, while kinesthetic represented 33%. Meanwhile, Coronel & Cevallos (2024) reported that 36% of students in a primary school in the canton of San Miguel, Ecuador, showed a preference for auditory learning, followed by 29% with a visual style and 25% kinesthetic.

Similarly, the study by Coque et al. (2024), conducted across various Ecuadorian schools, revealed that most students preferred the visual style (40%), followed by auditory (25%), kinesthetic (20%), and reading/writing (15%). These findings suggest that in primary education, the preference for a particular learning style varies by geographic context and even among different educational institutions, although, as previously mentioned, gender does not appear to have a significant influence on these preferences.

Consequently, Coque et al. (2024) recommend that educators adopt more flexible and adaptive educational methodologies that can respond to the individual learning needs of students, thereby creating an inclusive and effective educational environment that significantly enhances academic performance. In a similar vein, Espinar & Vigueras (2020) highlight the importance of implementing innovative methodologies that consider different learning styles, thus promoting a more inclusive education. Bueno & Font (2021) further state that since learning styles vary across different groups, educators should avoid focusing on a single style and instead adopt flexible and adaptive approaches that respond to the diversity of the student body.

Conclusions

The study aimed to identify the predominant learning styles in seventh-grade general education students in the canton of Durán, Ecuador, according to gender, using the VARK model, which evaluates four categories: visual, auditory, reading/writing, and kinesthetic. The sample consisted of 38 students enrolled at this educational level in the reference institution, with 19 males and 19 females.

After applying the VARK version 8.0 questionnaire, it was found that 36.8% of students prefer the kinesthetic style, followed by visual at 23.5%, auditory at 21.1%, and reading/writing at 18.6%. This indicates that the majority learn best through action and observation. Additionally, the inferential analysis using the independent samples t-test, when comparing learning styles between males and females, yielded a p-value > 0.05, allowing us to conclude that gender is not a determining factor in the preference for a specific learning style.

Furthermore, it was demonstrated that preferred learning styles vary by context, as the results obtained in this educational unit in Durán differ from findings in other studies, even at the national level. Therefore, it is essential for educators to assess the predominant learning styles in their classrooms to adapt their teaching methodologies, which must be flexible and responsive to the learning needs of their students, thereby creating an inclusive and effective environment for the educational process.

To achieve this, it is recommended to:

- Train educators to identify the different learning styles in the classroom and adapt their methodologies based on individual needs, applying appropriate techniques and strategies that promote an inclusive and quality educational environment.

- Incorporate digital pedagogical resources and teaching strategies that respond to the various learning styles, making the educational process more engaging, interactive, participative, and collaborative, which will favor better academic performance.
- Guide students in identifying their predominant learning style, helping them select techniques and resources that facilitate meaningful learning and increase their interest in subjects or content that were previously unappealing, thus contributing to their academic success.
- Ensure, from the central government and the Ministry of Education, that educational institutions are equipped with the necessary resources for quality education, along with adequate infrastructure and a student-to-teacher ratio that aligns with teaching capacity. It is important to note that the ideal number of students per classroom is 15, with a maximum recommended number of 25, whereas the educational unit in Durán recorded 38 students in the seventh-grade classroom.

Ultimately, these actions will contribute to improving the quality of education and the academic performance of students by adapting teaching to their individual styles and needs.

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