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Examining gifted students preferred learning styles in Spain

Examinando los estilos de aprendizaje preferidos por alumnado superdotado en España

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Abstract

This study analyzed how intellectually gifted students learn by examining the different learning styles they use when facing academic tasks. For this purpose, a sample of 206 students with high intellectual abilities from Spanish schools responded to an adapted version of the Honey-Alonso Learning Styles Questionnaire. Results indicated a stronger inclination toward theoretical learning, though students did not exclusively identify with a single style. Additionally, statistically significant differences emerged when examining their fields of interest in relation to their learning styles: students interested in sports had lower mean scores in scientific-technical and sociolinguistic areas than those who preferred reflective learning. For other variables, mean differences were not statistically significant. These findings highlight the need to continue researching the specific educational needs of these students and how they navigate day-to-day teaching and learning processes, with the goal of promoting a balanced academic progression through the educational stages.

Keywords: gifted students; learning styles; school inclusion; educational response; modulating variables.

Resumen

Este estudio analizó cómo aprenden las alumnas y alumnos con altas capacidades intelectuales, examinando los diferentes estilos de aprendizaje que utilizan cuando se enfrentan a tareas académicas. Para ello, una muestra formada por 206 estudiantes con altas capacidades intelectuales de centros educativos españoles, respondió a una versión adaptada del Cuestionario Honey-Alonso de Estilos de Aprendizaje. Los resultados indicaron una mayor inclinación hacia el aprendizaje teórico, aunque no se identificaron exclusivamente con un único estilo. Además, surgieron diferencias estadísticamente significativas al examinar sus campos de interés en relación con sus estilos de aprendizaje: las alumnas y alumnos que se interesaban por los deportes mostraron puntuaciones medias más bajas en las áreas científico-técnica y sociolingüística, en comparación con quienes preferían el aprendizaje reflexivo. Para otras variables, las diferencias de medias no resultaron estadísticamente significativas. Estos hallazgos ponen de manifiesto la necesidad de seguir investigando las necesidades educativas específicas de este alumnado y cómo se desenvuelve en los procesos cotidianos de enseñanza y aprendizaje, con el objetivo de promover una transición académica equilibrada a lo largo de las etapas educativas.

Palabras clave: alumnado con altas capacidades intelectuales; estilos de aprendizaje; inclusión escolar; respuesta educativa; variables moduladoras.

Gifted students are unique protagonists in their educational journeys, and understanding how they process and assimilate information is essential for developing teaching approaches that meet their needs. Educational professionals must recognize and appreciate these differences to tailor instruction effectively, which makes the study of learning styles critical to enhancing educational quality and equity (Ezzani et al., 2021; Torrente et al., 2022). However, responses in education often lack tailored support for intellectually gifted students, resulting in educational inequalities. Reasons often cited for this include factors such as the low prevalence of giftedness (García-Barrera et al., 2021; García-Perales & Jiménez-Fernández, 2022; Ramos & Chiva, 2018), persistent myths and stereotypes about the nature of giftedness, and limited understanding of how to foster gifted students' potential (García-Barrera & De la Flor, 2016). Additionally, insufficient teacher training (Barrenetxea-Mínguez & Martínez-Izaguirre, 2020; Barrera-Algarín et al., 2021) and inadequate guidance for families (Pérez et al., 2017) contribute to these ongoing disparities.

Addressing these challenges requires in-depth research to uncover the distinct characteristics and needs of gifted students (García-Perales et al., 2017; Mahmood & Sayid, 2022; Papadopoulos, 2020). Responding to the question of whether we know how gifted students learn, this study focuses on learning styles among gifted students. Understanding how these students prefer to learn is a complex issue, as learning involves continuous changes shaped by both individual traits and environmental influences. Learning can be defined as the transformative process driven by knowledge and strategies acquired through experience or practice, where context and individual characteristics play essential roles.

Intelligence has a notable impact on learning, and different types of intelligence may influence how students approach and process information, thus affecting their learning style (Llanga & Villegas, 2019). As intelligence and learning capacity are closely connected, examining predominant learning styles in gifted students can provide insights into their distinct educational needs.

Learning styles refer to the cognitive, affective, and physiological traits that characterize how learners engage with, perceive, and respond to their learning environments (Keefe, 1988, in Alonso et al., 2007, p. 48). They determine how students focus on, retain, and process information within the learning environment. The model by Honey and Mumford (1986), based on Kolb's (1984) experiential learning theory, identifies four key learning styles: active, theoretical, reflective, and pragmatic. These learning styles describe distinct ways of interacting with information: learning through concrete experiences (active learning), abstract conceptualization (theoretical learning), reflective observation (reflective learning), or practical application (pragmatic learning). Honey and Mumford further developed these concepts by creating a questionnaire to help educators identify learning styles, enabling them to better support their students' educational processes.

Teachers play a crucial role in adapting their methods to match students' learning styles, which is a fundamental aspect of inclusive education (Flynn & Shelton, 2022). When students encounter new material, they naturally adopt certain strategies that align with their dominant learning style. Recognizing the predominant learning styles of gifted students is especially important to provide them with appropriately challenging tasks and activities. This approach not only enhances engagement but also supports students in processing information in ways that align with their cognitive preferences.

Gifted students exhibit several defining characteristics in their approach to learning. Academically, they often seek new knowledge enthusiastically and can easily concentrate on topics that interest them. They display strong abilities in redefinition, can automate mechanical processes such as reading and arithmetic, and frequently take on leadership roles. Their expanded vocabulary, effective communication, and critical thinking abilities are also distinctive (Fabio et al., 2023). Although they respect authority, they may challenge it, preferring to follow their own criteria. Gifted students often show intense interest in one or more academic fields and a level of autonomy in seeking information. They may sometimes feel isolated if their interests differ significantly from those of their peers (Secanilla, 2019). These traits can result in lower-than-expected academic performance if they find schoolwork repetitive or unchallenging (Aguilera & Aracama, 2022).

Neuroscience provides additional insights into the learning processes of gifted students. Their brain development differs markedly from that of their peers, with regions such as the cerebral cortex continuing to develop until around age 12—much later than the average, which peaks at around age 7 (Gómez, 2021). Enhanced myelination and synaptic connectivity in gifted students enable more efficient working memory and flexible information processing. Increased density of white matter correlates with faster information processing and more robust connections between ideas, which are essential for abstract reasoning and problem-solving (Romero-Castillo, 2022). The thicker corpus callosum in gifted students facilitates advanced logical reasoning, creativity, and hemisphere connectivity, further underscoring the need for differentiated instructional practices (Romero-Castillo, 2022; Rocha et al., 2020a).

A common misconception is that gifted students can thrive without external support, as if their abilities alone suffice. However, like all children, they benefit from adult guidance in organizing and processing information. Without such support, they may struggle with poor study habits, which can hinder academic progress (Secanilla, 2019). Studies by Reche (2019) and Çakır (2014) show that many gifted students perform below their potential due to a lack of intrinsic or extrinsic motivation, especially if their educational environment does not cater to their interests.

Various personal and contextual factors also influence gifted students' academic performance. These include sex—often leading to underdiagnosis in gifted women compared to men (Abdulla-Alabbasi et al., 2021; Dilekli, 2017; García-Perales & Jiménez-Fernández, 2022)—age, grade level, and the school environment (García-Perales & Palomares, 2020; Kaplan-Sayı & Yurtseven, 2022). Such factors are crucial considerations for future research, as they affect the identification, diagnosis, and educational response provided to gifted students (Zubaedi et al., 2021).

It is useful to contextualize the reality of giftedness in Spain, looking at the 2022/23 academic year, the most recent non-university data available on the Ministerio de Educación, Formación Profesional y Deportes website (2024). The total number of gifted students was 51,396, or 0.62% of the students in non-university education. Almost two-thirds (33,307; 64.81%) were men, 18,089 (35.19%) were women, similar proportions to the present study. Finally, by educational stage, 325 (0.63%) were in Infant Education, 20,178 (39.26%) were in Primary Education, 22,387 (43.56%) were in Compulsory Secondary Education, 7,490 (14.57%) were in Baccalaureate, and 1,016 (1.98%) were in Vocational Training.

The aim of the present study was to assess how gifted students learn by analyzing their predominant learning styles. Additionally, the study examined the potential relation of personal and sociodemographic variables in the application of these learning styles, contributing to a more nuanced understanding of the educational approaches needed to support this unique group of learners.

Method

Participants

The sample of participants was selected through simple random probabilistic sampling to ensure representativeness within the intellectually gifted population. A total of 206 Spanish students participated from 11 of the 17 autonomous communities: Andalucía, Aragón, The Balearic Islands, Cantabria, Castilla-La Mancha, Castilla & León, Catalonia, Valencia, Madrid, Murcia, and the Basque Country. All participants had been formally identified and diagnosed as intellectually gifted within their school settings. The sample was predominantly male, with almost two-thirds (131; 63.59%) of the participants being boys, while girls comprised 36.41% (75) of the sample.

The participants ranged from 8 to 18 years old, covering a broad spectrum of developmental stages. The educational distribution included 111 students (53.88%) in Primary Education and 95 students (46.12%) in Secondary Education (82 students in Compulsory Secondary Education and 13 students in Baccalaureate).

In terms of special educational interventions, 33 students (16.02%) reported receiving flexible curricular measures, such as acceleration or an enriched curriculum, at some point during their schooling to better meet their specific needs. The remaining 173 students (83.98%) had not received extraordinary curricular interventions, reflecting the variability in educational responses to giftedness within the school system.

Most students resided in urban areas, with 170 students (82.52%) coming from urban settings and 36 students (17.48%) from rural areas. This distribution highlights an urban concentration of identified gifted students, which may reflect disparities in identification and available resources between rural and urban settings. Students were also asked to identify their primary academic or extracurricular areas of interest. A significant proportion, 133 students (64.56%), indicated a preference for Science and Technology subjects, including mathematics, biology, physics, chemistry, and technology. Another 43 students (20.87%) expressed interest in the Socio-Linguistic area, encompassing subjects such as geography, history, Spanish language, psychology, French, and English. Meanwhile, 20 students (9.71%) reported a preference for the Arts, covering areas such as music, visual arts, and fine arts, and 10 students (4.85%) indicated Sports, primarily focused on physical education. This distribution underscores a predominant interest in Science and Technology among gifted students in this sample, which aligns with literature findings on academic inclinations within gifted populations.

Instrument

The study used an adapted version of the Honey-Alonso Learning Styles Questionnaire (CHAEA), originally developed to assess different learning styles based on Kolb's experiential learning theory. The adapted questionnaire has 80 items that evaluate four distinct learning styles—active, reflective, theoretical, and pragmatic. Each style is covered by 20 items, randomly distributed throughout the questionnaire, allowing for a maximum score of 20 points per style. Respondents indicate their level of agreement or disagreement with each item, enabling comprehensive assessment of their predominant learning preferences and tendencies.

The adaptation was designed to suit the specific needs of the study's gifted student sample, ensuring both reliability and relevance (Alonso et al., 2007). The adapted format maintains the theoretical integrity of the original CHAEA while optimizing item clarity and applicability for a younger, academically diverse population. Furthermore, the adaptation allows determination of students' overall learning profiles, categorizing them into one or more dominant learning styles. This nuanced profile assessment supports a deeper understanding of individual differences in learning among gifted students, which is crucial for tailored educational strategies.

Table 1 outlines the conceptualization of each learning style.

Table 1

Characterization of learning styles

Learning style	Characteristics	Learns best	Challenges
Active	General: learn by doing, involve themselves in activities and in new experiences, act first and then think about consequences, reject long term activities, like being the focus of activities, have open minds and enjoy group work. Principally: entertainers, risk-takers, discoverers, and spontaneous. Others: adventurers, protagonists, participants, competitive, willing, creative…	If there is a challenge to solve, if there is excitement and when activities are short term.	Adopting a passive role, dealing with details, analysing a lot of data, and working on their own.
Reflexive	General: cautious, enjoy watching others, analyse data to reach conclusions, study implications before taking action and try to remain in the background. Principally: analytical, thorough, conscientious. Others: observant, prudent, collectors, detail-oriented, patient…	If they can be an observer and when they can stop and think before taking action.	Being the centre of attention, explaining ideas off the cuff and without a lot of data to draw conclusions from.
Theoretical	General: enjoy analysing and summarizing information, seek rationality and reject the subjective, focus on problems sequentially (step by step) and incorporate observations into consistent theories. Principally: logical, structured, and methodical. Others: perfectionists, planners, systematic, disciplined, rationalists.	If they can investigate, examine, and ask questions, when they work on concepts from data and theories, and if they work in structured situations.	Participating in ambiguous activities, acting without a conceptual basis, and participating in situations where emotions are more important.
Pragmatic	General: enjoy putting ideas into practice, motivated by trying new ideas, enjoy acting quickly in projects that appeal, problems are a challenge, and they reject people who theorize. Principally: practical, effective, and experimenters. Others: planners, decisive, technical, objective, positive…	If they gain techniques to apply immediately to their work, if there is a connection between the subject they are working on and putting it into practice, if they see real problems, and if they are given many examples.	Learning things which are unrelated to their immediate needs, learning something not closely connected to reality, learning theoretical principles, and not having clear instructions.

Note: Adapted from Alonso et al. (2007, p. 70-74, pp. 158-167) .

The tool created for this study is a reduced version of the questionnaire. It is made up of 20 randomly distributed items with the students giving yes/no responses depending on whether they identify with the statement or not. Each learning style is covered by 5 items: active (items 4, 8, 9, 12, and 17), reflexive (items 1, 3, 10, 13, and 16), theoretical (items 2, 6, 11, 15, and 19), and pragmatic (items 5, 7, 14, 18, and 20). The entire instrument was administered to participants using a Microsoft Forms questionnaire. A final section was also included with space for participants to write what they considered appropriate to complete the research.

The weighting of the adapted instrument was based on the total positive answers. A student response of "yes" was given a score of 1 point, "no" was given 0 points. This gave a total of all positive responses for each learning style which were then compared. As noted above, each learning style had five statements, so the maximum score for each style was 5 points and the maximum total score was 20 points.

Procedure

The study was conducted nationwide in Spain between February and June 2023, involving giftedness associations in 11 of the 17 autonomous communities, specifically: Andalucía, Aragón, The Balearic Islands, Cantabria, Castilla-La Mancha, Castilla & León, Catalonia, Valencia, Madrid, Murcia, and the Basque Country. These associations were integral to facilitating participant recruitment and ensuring diverse regional representation. Initial contact was made by email to each association, with a detailed presentation of the study objectives, methodology, and ethical considerations, requesting their collaboration to disseminate information about the study to their member families.

The email included a link to the questionnaire hosted on Microsoft Forms, allowing students to participate remotely and securely, the questionnaires were completed, and the process was monitored in the association premises attended by the participants. Data collection adhered to strict ethical protocols, ensuring that responses were both anonymous and confidential, the participants were identified with the initials of their first and last names together with their date of birth. Each participant's family and association administrators received an informed consent form detailing the study's purpose, the voluntary nature of participation, and assurances of data privacy, in compliance with ethical standards and data protection laws and following the model of the Social Research Ethics Committee (CEIS) of the University of Castilla-La Mancha. Obtaining informed consent from both association administrators and families upheld the ethical obligation to respect participant autonomy and privacy throughout the study.

Data analysis

The quantitative data were analyzed using IBM SPSS v. 28.0, with a confidence level set at 95%. Descriptive analyses were conducted for each learning style and for the questionnaire overall, including frequency (f), percentage (%), mean (M), and standard deviation (SD). To explore potential relationships between learning styles and participants' demographic variables—specifically sex, age, flexible schooling, geographic location, and areas of interest—both descriptive statistics and non-parametric tests were used.

The choice of non-parametric tests was guided by preliminary tests for normality (Kolmogorov-Smirnov) and homoscedasticity (Levene's test), which indicated that the data

did not meet the assumptions required for parametric testing. As a result, the Mann-Whitney U test and the Kruskal-Wallis test were applied to compare groups across these categorical variables.

To further examine the influence of multiple variables, Quade's non-parametric ANCOVA was used to control for potential covariates, allowing a more robust analysis of differences between learning styles and participant characteristics. This combination of tests ensured that the analysis remained rigorous and statistically appropriate for the data distribution characteristics, supporting reliable conclusions.

Results

This section gives the results for the learning styles and the results for the personal and sociodemographic variables considered in the study. Prior to that, the following Cronbach's alpha reliability indices were obtained for each learning style: Activist .70, Reflector .68, Theorist .72 and Pragmatist .67. The frequencies and percentages for each learning style based on the number of affirmative response ("yes") from each student were as follows (Table 2):

Table 2

Frequencies and percentages for each learning style

Learning styles	Items with affirmative response					
	0*f* (%)	1*f* (%)	2*f* (%)	3*f* (%)	4*f* (%)	5*f* (%)
Activist	3 (1.46)	16 (7.77)	52 (25.24)	57 (27.67)	49 (23.79)	29 (14.08)
Reflector	1 (0.49)	16 (7.77)	28 (13.59)	44 (21.36)	77 (37.38)	40 (19.42)
Theorist	1 (0.49)	5 (2.43)	10 (4.85)	35 (16.99)	63 (30.58)	92 (44.66)
Pragmatist	3 (1.46)	17 (8.25)	28 (13.59)	78 (37.86)	48 (23.30)	32 (15.53)

For example, 92 students (44.66%) indicated 5 items from the theoretical learning style, showing a preference for the logical and methodical and a preference to leave ambiguous or subjective activities to one side. Only a single participant (0.49%) selected none of the items from the theoretical or reflexive styles. The reflexive style was also selected by a large number of participants, as 77 students (37.38%) identified with 4 of the 5 items in this style and 40 (19.42%) identified with all 5. In contrast, in the pragmatic and active styles, most students selected 3 of the 5 items (57 students (27.67%) in active, and 78 (37.86%) in pragmatic). Lastly, the activist style had the fewest students identifying with all 5 items (29; 14.08%). The means and standard deviations for each learning style were as follows: Activist M = 3.07 (SD = 1.22), Reflector M = 3.46 (SD = 1.20), Theorist M = 4.09 (SD = 1.05) and Pragmatist M = 3.20 (SD = 1.19). The means for the four styles were above 3 on a

5-point scale. The theoretical learning style had the highest mean of 4.09 (*SD* = 1.05), while the active learning style had the lowest, at 3.07 (*SD* = 1.22).

The personal and sociodemographic variables considered were: participants' sex, educational stage, flexible schooling, location, and areas of interest. For the first four dichotomous variables, the results were as follows (Table 3):

Table 3

Descriptive (M and SD) and inferential statistics (Mann-Whitney U) for the dichotomous variables

Dichotomous variables		Activist	Reflector	Theorist	Pragmatist
Sex	Boy (*n* = 131)	3.07 ± 1.22	3.38 ± 1.27	4.06 ± 1.04	3.15 ± 1.17
	Girl (*n* = 75)	3.07 ± 1.23	3.59 ± 1.07	4.13 ± 1.08	3.28 ± 1.22
	U (*p*)	4973.50 (.88)	4587.00 (.41)	4624.00 (.45)	4551.50 (.36)
Educational stage	Primary Education (*n* = 111)	3.11 ± 1.22	3.43 ± 1.17	4.14 ± 1.05	3.29 ± 1.13
	Secondary Education (*n* = 95)	3.02 ± 1.24	3.48 ± 1.24	4.03 ± 1.06	3.09 ± 1.26
	U (*p*)	5071.00 (.63)	5438.00 (.69)	4948.50 (.42)	4992.00 (.49)
Flexible schooling	Yes (*n* = 33)	3.06 ± 1.41	3.27 ± 1.28	4.09 ± .98	3.48 ± 1.00
	No (*n* = 173)	3.07 ± 1.19	3.49 ± 1.18	4.09 ± 1.07	3.14 ± 1.22
	U (*p*)	2869.00 (.96)	2584.00 (.37)	2805.50 (.87)	3223.50 (.22)
Location	Rural (*n* = 36)	3.31 ± 1.45	3.36 ± 1.25	3.86 ± 1.22	3.44 ± 1.11
	Urban (*n* = 170)	3.02 ± 1.17	3.48 ± 1.19	4.14 ± 1.01	3.15 ± 1.20
	U (*p*)	3500.50 (.16)	2897.00 (.60)	2698.00 (.23)	3385.50 (.30)

The results indicate that there were no statistically significant differences in each style of learning for the dichotomous variables. The mean scores were similar for boys and girls, except in the reflexive and pragmatist styles, where girls scored higher, although the difference was not statistically significant (p = .41 and p = .36, respectively). In the educational stage variable, there were higher mean scores in primary education in three of the four styles: activist, theorist and pragmatist; in secondary education, there were higher scores in the reflector style. In the flexible schooling variable, it is worth noting the higher scores for reflexive learning in students who had not had flexible schooling, M = 3.49 (SD = 1.18), and the higher scores for pragmatic learning in students who had, M = 3.48 (SD = 1.00), with the latter approaching statistical significance p = .22. Finally, students in rural environments scored higher in active and pragmatic learning, with the former approaching statistical significance at p = .16; in contrast, reflexive and theoretical learning had higher scores in urban students.

In addition to these dichotomous variables, the last variable analyzed was the students' areas of interest, the results were as follows (Table 4):

Table 4

Questionnaire results by participants' areas of interest

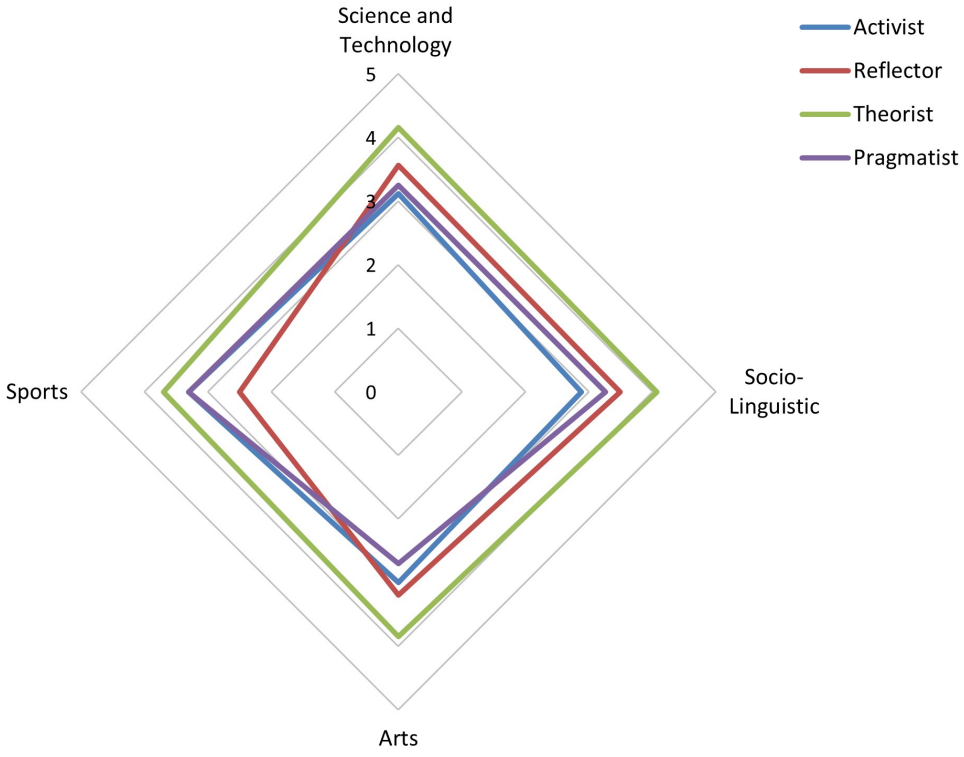
Learning styles	Science and Technology (*n* = 133)		Socio-Linguistic (*n* = 43)		Arts (*n* = 20)		Sports (n = 10)		H (*df* = 3)
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Activist	3.12	1.23	2.88	1.20	3.00	1.38	3.30	.95	1.69
Reflector	3.56	1.16	3.49	1.30	3.20	1.06	2.50	1.27	8.31*
Theorist	4.16	1.02	4.07	1.03	3.85	1.09	3.70	1.42	2.69
Pragmatist	3.25	1.14	3.26	1.33	2.70	1.17	3.30	1.25	3.88

* $p = .05$

There was a statistically significant difference in the scores for the reflexive learning style, at $p = .04$. This was due to differences in scores for this style from students who were interested in scientific-technological and socio-linguistic areas —means of 3.56 (*SD* = 1.16) and 3.49 (*SD* = 1.30)— and students who were interested in sport, who had lower mean scores in this learning style of 2.50 (*SD* = 1.27). These results are shown graphically in Figure 1.

Figure 1

Results by participants' areas of interest



To examine the significance more thoroughly, ANCOVA tests between variables were performed, specifically, the reflexive learning style according to areas of interest with the covariable sex [$F(3,202)=2.90$; $p = .04$], environment [$F(3,202)=2.95$; $p = .03$], flexible schooling [$F(3,202)=3.13$; $p = .03$], and educational stage [$F(3,202)=2.84$; $p = .04$].

Finally, some of the comments made by the participants are worth highlighting, such as "At school I sometimes get bored. They go over the same things again," and "When I'm learning, I don't like it that they repeat everything a hundred times," indicating a perception of school as repetitive and insufficiently stimulating.

Discussion

Knowing how students learn is one element to keep in mind in order to develop quality inclusive educational processes (Flynn & Shelton, 2022). The personalization of teaching and learning processes requires identifying the styles that students use to learn. This could result in better adjustment and individualization of education, with the consequent improvement of academic performance, increased motivation, engagement and participation, and increased self-esteem and self-confidence. Better understanding and retention of information allows for more effective learning, so knowledge and application of learning styles in the classroom is a key strategy for ensuring that all students have the same opportunities for success, thus promoting inclusive and equitable education (Gallego et al., 2022).

Understanding how intellectually gifted students learn is essential for tailoring educational approaches to support their unique needs effectively. These students display a range of specific characteristics that challenge efforts to outline clear profiles (Rocha et al., 2020b). Our findings underscore this complexity: no single learning style was universally adopted among participants. Nevertheless, 44.66% of participants identified with all items in the theoretical learning style, which aligns with a preference for logical analysis, step-by-step problem-solving, and well-structured theories. Students with this style tend to excel when given opportunities to investigate questions in structured environments. They may, however, struggle with ambiguous tasks or settings that emphasize emotional rather than conceptual engagement. The active style was the least selected, with only 14.08% of participants choosing all five items, suggesting that hands-on or spontaneous activities may appeal less to this population.

In terms of personal and sociodemographic variables, no statistically significant differences emerged by sex, educational stage, flexible schooling, or geographic location. This aligns with findings from other studies (Dilekli, 2017; Kaplan-Sayı & Yurtseven, 2022) that also reported a lack of significant impact of sex or environment on learning styles.

However, some research indicates that sex and educational stage can influence cognitive attitudes and learning behaviors, such as perfectionism and cognitive mindset (Tsai, 2023), or even intelligence domains (Şahin & Küçük, 2023), suggesting these areas may merit further investigation.

One significant finding in the study pertains to students' areas of interest, with statistically significant differences (p = .04) in the reflective learning style. Students interested in sports had lower scores in the reflective style (M = 2.50, SD = 1.27) than those inclined toward scientific-technological (M = 3.56, SD = 1.16) and socio-linguistic fields (M = 3.49, SD = 1.30). ANCOVA analyses, examining reflexive learning style according to areas of interest with sex, environment, flexible schooling, and educational stage, confirmed these relationships, suggesting that students' areas of interest may significantly shape their learning style preferences. This insight is critical, as it suggests that individualized approaches based on students' interests could enhance engagement and learning outcomes.

Feedback from students in the final section of the questionnaire highlights an important disparity between learning styles and their needs and their educational experiences. These reflections align with findings from Ivarsson (2023) and Mendonça et al. (2020) that gifted students often feel misunderstood in educational settings. Their expressed lack of motivation and desire for learning outside the classroom suggest that educators must consider more flexible and stimulating curricula to match these students' intellectual curiosity and pace of learning. These statements serve as a reminder that we must ensure educators are equipped with the necessary training and resources to support an inclusive and quality education for gifted students.

Despite the study's contributions, it does have limitations. Although we have had a sample of interest considering the existing under-diagnosis of these students in Spain (Ministerio de Educación, Formación Profesional y Deportes, 2024), it could have benefited from broader representation in the educational stages included in the study, especially *Baccalaureate* students, to achieve greater balance in relation to the participating students in Compulsory Secondary Education (the two educational stages make up Secondary Education). Future research should aim to replicate these findings with larger and more diverse samples. Further studies might also consider additional variables, such as academic performance, self-concept, self-esteem, academic engagement, physical activity, motivation for learning, perfectionism, critical thinking, and study habits, to build a more comprehensive understanding of gifted students' learning styles and needs.

Education professionals must improve their understanding of the characteristics of intellectually gifted students to provide appropriate, tailored educational experiences that foster their potential (García-Martínez et al., 2021; Piske et al., 2022). Recognizing that each gifted individual is unique, educational systems should prioritize inclusivity and quality,

ensuring that all students receive support that respects their distinct needs (Rocha et al., 2022; Tirri & Laine, 2017). The diversity within this group is especially pronounced, characterized by a wide range of traits and learning preferences that make generalized interventions challenging (Kaplan-Sayı & Yurtseven, 2022; Renzulli & Reis, 2021). Therefore, identification and intervention processes for gifted students must be multidimensional to capture the complexity of traits that shape their personalities, cognitive styles, and academic engagement (Barrenetxea-Mínguez & Martínez-Izaguirre, 2020; Papadopoulos, 2016).

This study highlights learning style as one key aspect of gifted students' academic needs, especially as they transition between educational stages. The findings underscore the importance of recognizing individual learning preferences—such as theoretical, reflective, or pragmatic styles—as these can influence how gifted students engage with content, retain information, and perceive their educational environment. Personalized approaches in teaching, tailored to these learning styles, can significantly enhance academic experiences and outcomes for gifted students, facilitating smoother transitions between levels and fostering sustained engagement.

In summary, personalized teaching and learning processes are fundamental to achieving an inclusive educational system. By understanding and addressing the unique ways in which gifted students learn, educators and institutions can progress toward a more responsive and adaptive educational environment—one that not only values but actively supports each student's learning journey. This commitment to personalized education underscores the broader objective of fostering an educational landscape where all students can realize their full potential in a supportive, inclusive setting.

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