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Article

Learning Styles and Vocational Guidance in Secondary Education

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Abstract

This research addresses the relationship between the learning style and the students' career choice close to finishing secondary education in Spain. The study was carried out with a sample of 590 participants from the province of Valencia in Spain. The learning style was determined using the *Honey-Alonso Learning Styles Questionnaire*. Career options were derived by adding a question about students career choice for the following academic year. The results indicated that the characteristic learning style of this student body is reflective, followed by the active, pragmatic, and theoretical styles. It was found that students with a preponderant reflective style preferred to continue their baccalaureate studies. However, students with an active or pragmatic learning style chose vocational training. It is concluded that awareness of a student's learning style is an efficient tool for guiding secondary education schools. Additionally, learning style's determination can help students achieve greater flexibility and autonomy in the way they learn.

Keywords

Learning styles • secondary education • school dropout • vocational guidance • Spain

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Teaching and learning practices in secondary education have recently undergone changes in response to an increased focus on the differing ways individual students learn (Di et al., 2019; Rodríguez et al., 2016). Such concerns involve both monitoring their learning problems (Veas et al., 2019) and attending to their emotional needs (Merino-Tejedor et al., 2018). Therefore, the student's learning style, defined as cognitive, affective, and physiological personality traits, represents a relatively permanent indicator of how the student perceives and copes with the environment and serves as a source of knowledge (Keefe, 1984). In this sense, one of the main characteristics of the learning style is that it affects how the students perceive information, build it in their mind and give meaning to their environment (Kanadli, 2016). As such, it is critical in school performance and in the cognitive and emotional development of students (Demirtas & Egilmez, 2018; Leasa et al., 2017). As Diago et al. (2018) pointed out, the idea behind learning style is that each person has a preferred style of learning and optimally learns if the information is presented according to that style.

Knowledge of students' learning style is essential because (i) it helps in the development of the teaching and learning process (Gómez & Gil, 2018), (ii) it is responsive to the need to find solutions to demands that originate in different educational contexts in terms of addressing individual learning differences of students (Haciomeroglu, 2016; Kulinna & Cothran, 2003), (iii) it enables improvements in school performance (Kim et al., 2016) and (iv) it becomes a useful tool for student guidance (Nixon et al., 2007).

Student guidance, in its personal, academic, and professional dimensions, can be understood as the processes that promote an integral and individualized education for that person. As such, it becomes a proper field where the theory and practice on learning styles acquires its broadest meaning: a synonym for individuality, reaching its own meaning with attention to the diversity of students in the classroom (McKenna et al., 2018). Adán (2008) analyzed the relationship between learning styles and vocational guidance. In this sense, the information provided by the determination of students learning style can provide them with greater self-knowledge - a capacity that has been highlighted as a critical indicator in vocational behavior.

In addition, academic guidance acquires particular importance in educational change processes, such as the transition of students to different educational levels (Meijers et al., 2013). These educational changes are intrinsically related to the bio-psychosocial changes that occur during adolescence. Choosing a specialty in high school or at the undergraduate stage is a crucial decision in the person's life, which has to do with, among other aspects, the processes of identity formation that begin and consolidate mainly in adolescence (e.g., educational commitment). Finding students' specialties as soon as possible can help them choose the right direction for their learning, occupational and educational goals. Therefore, it is essential to build a recommendation system that provides guidance to students. In this system of recommendations, knowledge of the student's learning style can help.

Therefore, this work has the general objective of exploring the relationship between the learning style of students in the 4th and final year of compulsory education in Spain, and their career choice. In this sense, the relationship between learning style and career choice, together with the style relationship, is a challenge for the literature on guidance and learning (Roberts et al., 2015). In this sense, the diagnosis of the learning style of secondary school students is a natural object of study. However, the relationship between styles and educational orientation is less addressed by the literature. Nevertheless, it is of particular importance in the last year of secondary education since it is a critical decision-making period.

The 4th year of secondary education in Spain has special significance in the development of students because it is the last course of compulsory education. Furthermore, during this time, the student must decide

whether to continue their studies or begin working. The students in the last course of secondary education in Spain are 15 to 16 years old. Adolescence is a crucial stage of development in which relevant changes occur at the brain (e.g., synaptic pruning, myelination, refinement of executive functions), psychological (e.g., emotional regulation, self-esteem, the formation of identity) and social (e.g., family relationships, peer group) levels. These changes are directly related to the teaching-learning processes, learning style, academic performance, and decision-making in both academic and work domains, and they have implications in later development stages.

In the following sections, current areas of study on learning styles are addressed, for example, the diagnosis in secondary school students, the application towards improved teaching and its relationship with some demographic variables; then, the study of the relationship between styles and academic orientation is justified.

Learning Styles in Secondary Education

The determination of learning style in secondary education students is a topic of the current study. The literature on learning styles has proposed numerous instruments or questionnaires to identify the style (García-Cué et al., 2009; Ventura et al., 2012). In Spain, the *Honey-Alonso Learning Styles Questionnaire* (CHAEA; Alonso, 1992) has a long history of research. Its reliability and validity have been verified in numerous empirical research works (Escurra Mayaute, 2011; Maureira, 2015). In particular, the CHAEA presented validity and reliability in a study of a sample of 1,371 students from 25 faculties in Spain (Alonso et al., 1994). This questionnaire distinguishes four learning styles: active, reflective, theoretical, and pragmatic. As suggested by Fleming et al. (2011) the active style is animator, improviser, discoverer, risky and spontaneous. People who have a preponderance of active style, fully and without prejudice, are involved in new experiences. They are open-minded, not skeptical, and enthusiastically undertake new tasks. The reflective style is weighted, conscientious, receptive, analytical, and exhaustive. Reflective people like to consider experiences and look at them from different perspectives. They collect data, analyzing them carefully before reaching any conclusion. The theoretical style is methodical, logical, objective, critical, and structured. Theoretical-style people adapt and integrate observations within their logical and complex theories. They tend to be perfectionists. They integrate the facts into coherent theories. The pragmatic style is experienced, practical, direct, effective, and realistic. The strong point of people with a predominance of pragmatic style is the practical application of ideas. They like to act quickly and safely with ideas and projects that appeal to them.

Research has analyzed learning styles in secondary school students through CHAEA. For instance, the study of Quintanal and Gallego (2011) analyzed the learning style of students in the 4th year of secondary education. The styles had the following average values: reflective style (13.61 on average), pragmatic style (13.40 on average), theoretical style (12.91 on average) and active style (12.76 on average). In the research by García Luna et al. (2015), it was found that the learning style averages of secondary education students from Baja California (Mexico) were the following: reflective style had an average of 12.97, theoretical style had a value of 12.83, active style had 12.45 and, finally, the pragmatic style had an average of 11.89. In the study by Tardecilla González et al. (2017), with 247 students from three Colombian Schools, the results found that active style had an average of 10.81, reflective style had an average of 14.34, theoretical style had an average of 12.95 and pragmatic style had an average of 12.22.

In the work of Vega Román and Hugo Ruiz (2018), it was found that secondary school students that had a higher arithmetic mean showed a reflective style, according to the following results, reflective style had an average of 12.39, active style had an average of 11.25, theoretical style had an average of 11.11, and pragmatic style had an average of 10.86.

Learning Styles and Teaching Improvement

One line of research on learning styles is related to academic performance (Di et al., 2019; Jabarullah & Iqbal Hussain, 2019). In general, it has been pointed out that teaching to individual learning styles is correlated with better academic performance and learning preferences. "When the learners are taught in accordance with their learning styles, and when they consider their own styles while studying, their academic achievements seem to improve" (Bosman & Schuelze, 2018, p. 1). In the study by Kamboj and Singh (2015), in which they used the instruments *VAK Learning Styles Self-Assessment Questionnaire* (Chislett & Chapman, 2005), and *Styles of Learning and Thinking* (Venkataraman, 1994), the preferred learning style of secondary students' is related to the use of "right-brain" modalities. Furthermore, secondary school students tend to learn from demonstrations, showing a preference to see and then to do and learn through exploration.

Regarding the types of learning styles that are analyzed through the CHAEA, in the work of Juárez et al. (2016), it was found that students classified as high-performing had a higher preference for reflective and theoretical styles. People with these learning styles like to plan, follow an order, interpret relevant information, and gather data before issuing a conclusion. In the study of Adán (2008), it was found that the students with a reflective style had a better academic performance than those with the other learning styles. This effect probably is because the student responds to the demands of the educational context, where listening and observation is enhanced by other behaviors such as spontaneity or creativity - characteristics more typical of theoretical, active, or pragmatic styles (Santibáñez et al., 2004).

Following this last line of research, other works have analyzed, more specifically, the relationship between school failure and the characteristic learning style of students. The Antelm-Lanzat and Gil (2013) study showed that students at risk of school failure, students in the last year of secondary education with possible risk of school failure and students in the *Initial Professional Qualification Programme* - students with school dropout problems (González-Faraco et al., 2019) - had a characteristic style close to the pragmatic and active. In the same way, Gil and Sánchez (2012) showed that the learning style of Initial Professional Qualification Programme students was predominantly active. On the other hand, Aramendi et al. (2017) highlighted the enthusiasm and interest of Initial Professional Qualification Programme students as a critical element in addressing failure and dropping out of school. In the study of Becerra (2018) with Peruvian students in the 3rd grade, the authors observed a predominance of theoretical style, followed by the reflective, pragmatic and active, associations between high grades at high levels of the reflective and theoretical styles, and low grades at low levels of these styles. One aspect to consider was highlighted in a study of high school students in Kenya (Sellah et al., 2018), which shows that one of the variables to predict academic performance is the level of coincidence of student-teacher cognitive styles.

Learning Styles and Demographic Variables

Research has also been conducted on the relationship between learning styles and sociological or demographic variables. Of the demographic variables, two variables can be highlighted, the sex and age of students. Regarding the sex variable, the results of the relationship between style and sex are disparate. Studies by Blasco et al. (2011) and Villalba (2015) found that the reflective style was more dominant among females. In the study by Serra-Olivares et al. (2017), the active style was more dominant among females than males, and differences were observed in the rest of the styles. The inferential analysis showed a significant relationship between sex and learning style.

Regarding the age variable, in the research by Serra-Olivares et al. (2017), no significant differences were found between age groups in the majority of learning styles. Other studies, such as those of Villalba

(2015), found that participants under the age of 21 possess a reflective style, and in the research of Esguerra and Guerrero (2009), the results were disparate.

Learning Styles in Educational Guidance

For Kolb (1984), people feel more comfortable and, in the final analysis, are more satisfied in environments compatible or congruent with their particular learning style. As Stratton et al. (2005) point out, researchers have suggested that students with different learning orientations have different educational needs (Tan & Thanaraj, 1993). Furthermore, these varying needs are partly attributable to the characteristic learning style of students (Lindblom-Ylanne & Lonka, 1999).

As noted, individual differences in learning have been defined in terms of learning style (Murray-Harvey, 1994), which are generally conceived as relatively constant and in terms of orientation towards learning and study (Messick, 1994). In this sense, some authors (e.g., Entwistle, 1988), refer to styles as learning orientations, emphasizing the critical role of the student's perception of the learning situation (Schommer, 1993). The knowledge of the learning style facilitates knowledge of the characteristics of each student and their self-knowledge (Gravini Donado, 2010) - an aspect that is fundamentally crucial in stages of change, such as adolescence. Therefore, an essential line of research reflects the relationship between learning style and orientation, more specifically, educational guidance (Schenck & Cruickshank, 2015). For Adán (2008), the information provided by student learning styles can be used as a guideline for the most favorable strategies for optimal academic performance. In this sense, optimizing learning has been the classic focus of school guidance and tutoring.

The above findings point out the importance of the determination of students' learning styles, as it relates to academic performance and self-knowledge and, with it, educational guidance.

Objectives and Hypotheses

As noted, the general objective of this study was to explore the relationship between the learning style of students who complete compulsory secondary education and their career choice. To address this objective, first, the learning style is diagnosed through the CHAEA, and, second, the learning style is compared with the student's career choice. The present study also considers some demographic variables, such as sex and age, that have been analyzed in previous works on learning styles.

Based on the theoretical framework, three hypotheses were proposed. Studies that were carried out do not categorically showed the significant relationships between the learning style and the variables related to academic performance, or of a demographic type. Therefore, our hypotheses are written in the sense that there is no significant relationship. There will be no significant differences between boys and girls of secondary education on the learning style (hypothesis 1). There will be no significant differences in the learning style of secondary education students and the "age" variable (hypothesis 2). There will be no significant differences in the learning style of secondary education students and the "career choice" variable (hypothesis 3).

Methods

Participants

The incidental sample consists of 590 students in Grade 4 of compulsory secondary education in 17 schools in the province of Valencia in Spain. Specifically, the following regions and schools participated: Hota Nord (five schools), Valencia city (two schools), Poblats Maritims (three schools), Hota Sud (three

schools), Camp Turia (three schools) and Alto Palancia (one school). The set of schools is considered representative of the whole province as it includes a variety of schools located in different regions, with different socioeconomic conditions.

Regarding the characteristics of the students, the average age was 15.81 years (*SD* = 0.83). The range extended from 15 to 18 years of age, with the following distribution: 41.7% (247 students) were 15 years old, 39.1% (232 students) were 16 years old, 14% (83 students) were 17 years old and 4.4% (26 students) were 18 years old. Concerning *sex* variable, 48% (293 students) were male and 52% (307 students) were female.

Instruments

Not all individuals learn in the same way, but there are different styles (none is better than another). The CHAEA was used to diagnose learning style. Inscribed within cognitive approaches to learning, it is based on the vision of online learning by Gallego et al. (2011). The instrument consists of 80 statements divided into four sections of 20 items corresponding to the four learning styles: active, reflective, theoretical, and pragmatic (Alonso et al., 1994). The test is self-administered with dichotomous punctuation, agreement (+ sign) or disagreement (- sign). The absolute score the student obtained in each section indicated the degree of preference. This means that the questionnaire shows preferential learning styles. In this sense, there are people with a dominant learning style and with different preferences in styles.

In the questionnaire, a question was added regarding the student's career option for the next academic year. Students were asked if at the end of secondary education, they would take the following career options: 1 = study baccalaureate, 2 = study vocational education, 3 = find a job, 4 = start working, 5 = study a special education program, and 6 = stay home. This question option allowed us to analyze the relationship between learning styles and career preferences.

Procedure

To carry out the study, the research team obtained the authorization of the Department of Education of Generalitat Valenciana. Once authorization has been obtained, facilitation and collection of the questionnaires was carried out with the students of 17 secondary education schools in the province of Valencia. The delivery and collection of the questionnaires were carried out by the research team itself, which supervised the procedure for completing the questionnaires and checking the suitability of the searches at all times. The selection of centers was carried out by random sampling based on the location of the schools in Valencia.

Data Analysis

Two types of analysis were carried out. First, a descriptive study of the learning styles and career options. Second, a *t*-Student analysis to determine differences between learning styles and three variables that have been dichotomized, sex (*male* and *female*), age (*fifteen-year-old students* and *over fifteen-year-old students*), and career option (*baccalaureate* and *vocational education*). The SPSS was used for both types of analysis.

Results

Table 1 presents the descriptive statistics of the learning style of the whole sample of students in the 4th year of secondary education.

Table 1. *Descriptive statistics of the learning styles of students in Grade 4 of compulsory secondary education*

	Active	*Reflexive*	*Theoretical*	*Pragmatic*
Average	12.27	12.97	11.86	12.55
Standard deviation	3.40	3.49	3.38	3.12
Minimum	1	2	1	4
Maximum	20	20	20	20

As can be seen in Table 1, the predominant learning style of students as a whole was *Reflective* (average 12.97), followed by *Pragmatic* (average 12.55), *Active* (average 12.27) and, finally, *Theoretical* (average 11.86).

Figure 1 indicates students preponderant learning style. In some cases, there was no characteristic style, which we have called "non-predominant style".

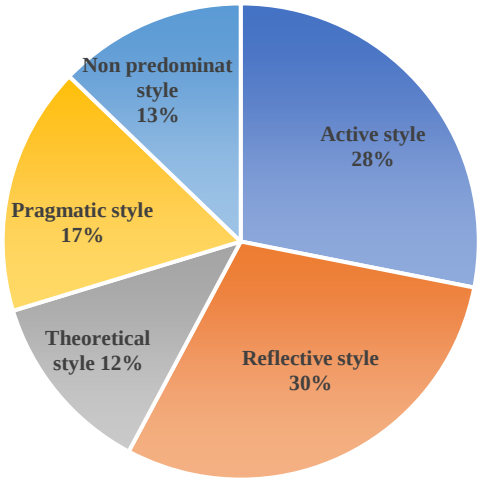

Figure 1. *Percentages of students predominant learning style*

As Figure 1 shows, the most prevalent learning style of the students was *Reflective* (29.7% of students sample as a whole), followed by the *Active* style (28.1%), the *Pragmatic* style (16.9%) and the *Theoretical* style (12.5%). The rest of the sample (12.8%) did not manifest a predominant learning style.

Table 2 presents students' choices for the next academic year when their secondary education ends.

Table 2. *Career options chosen by the compulsory secondary education students*

Career option	*Frequency*	*Percentage (%)*
Study baccalaureate	404	68.40
Study vocational education	171	29.00
Look for a job	1	0.00
Start to work	3	0.01
Initial professional qualification programs	1	0.00
Stay at home	2	0.00
Others	8	0.01
N	590	100

As Table 2 shows, the highest percentage of study options for students in the last year of secondary education is baccalaureate with 68.4%, followed by studying training cycles with 29.0%. These two options

accounts for 97.4%, practically all the participants in the study. The students barely considered the rest of the career options.

Table 3 shows the career options in each of the learning styles.

Table 3. *Career option for students of compulsory secondary education by each of learning styles*

Learning styles	*High school*	*Vocational education*	*Other options*
	% (n)	*% (n)*	*% (n)*
Active	60.2% (100)	36.7% (61)	3.1% (4)
Reflexive	74.9% (131)	23.4% (41)	1.7% (3)
Theoretical	73.0% (54)	23.0% (17)	4.0% (3)
Pragmatic	62.0% (62)	34.0% (34)	4.0% (4)
Active & Reflexive	81.3% (13)	18.7% (3)	0.0% (0)
Active & Pragmatic	62.5% (10)	37.5% (6)	0.0% (0)
Reflexive & Theoretical	83.3% (20)	17.7% (4)	0.0% (0)
Other learning style	79.5% (14)	24.5% (5)	0.0% (0)

As observed in Table 3, most students want to continue their *Baccalaureate studies*, especially those students with a *Reflective* (74.9%) or *Theoretical* (73.0%) style. The student body in which a higher percentage of *Vocational education studies* is observed have an *Active* style (36.7%), followed by students with a *Pragmatic* style (34.0%). Concerning students who do not have a predominant learning style, since two styles can receive the same maximum score, in Table 3 it can be seen that the highest percentage of students (37.5%) who indicated their intention to undergo vocational training after completing secondary education are those with *Active* and *Pragmatic* learning styles.

Table 4 shows the *t*-Student analysis for dependent variable *Learning styles* and independent variables *sex* (hypothesis 1) and *age* (hypothesis 2), students of 15-year-old and over 15 years of age. Also, Table 4 presents the descriptive analysis of *sex* and *age* variables according to the *Learning styles*.

Table 4. *t-Student for variable Learning styles and independent variables sex and age, and descriptive analysis of Learning styles according to sex and age*

Learning styles		*Sex*					*Age*			
		N	*M*	*SD*	*t*		*N*	*M*	*SD*	*t*
Active	Boys	283	12.08	3.59	-1.323	15 years	255	11.99	3.14	-1.781
	Girls	307	12.45	3.22		+15 years	335	12.49	3.58	
	Total	590	12.27	3.40		Total	590	17.27	3.40	
Reflexive	Boys	283	12.78	3.45	-1.303	15 years	255	13.35	3.29	2.289*
	Girls	307	13.15	5.53		+15 years	335	12.68	3.62	
	Total	590	12.97	3.49		Total	590	12.97	3.49	
Theoretical	Boys	283	11.93	3.43	0.347	15 years	255	12.34	3.27	2.976**
	Girls	307	11.81	3.33		+15 years	335	11.51	3.41	
	Total	590	11.86	3.38		Total	590	11.86	3.38	
Pragmatic	Boys	283	12.75	3.25	1.498	15 years	255	12.55	3.01	-0.043
	Girls	307	12.37	2.98		+15 years	335	12.56	3.21	
	Total	590	12.55	3.12		Total	590	12.55	3.12	

Note. M: Mean; SD: Standard Deviation; $^{*}p < .05$; $^{**}p < .01$.

As can be seen in Table 4, there are no significant differences between *sex* and *Learning styles*, which confirms hypothesis 1. Regarding the *age* variable, significant differences are observed between this variable and the *Theoretical* style, so hypothesis 2 is rejected.

In addition, Table 4 presents the descriptive statistics of *sex* and *age* variables according to the learning style. For *age* variable, two age groups have been considered. The first group of students was 15 years old, and the second group was made up of students over 15 years old. Significant differences were found regarding the *age* variable in relation to *Reflective* and *Theoretical* styles. In the case of reflective students, there was a higher value for students aged 15 (average of 13.35) than in those over 15 years of age (average 12.68). The *Theoretical* style had a higher value in students under 15 (average 12.34) than for students over 15 years old (average 11.51).

Table 5 displays the *t*-Student analysis for dependent variable *Learning styles* and independent variables *Career choice* (hypothesis 3). Only two career options are considered as they are the majority in students (baccalaureate and vocational education). Besides, Table 5 shows the descriptive statistics of the different *Learning styles* and *Career options* of fourth year secondary students.

Table 5. *t-Student for dependent variables Learning style and independent variables Career choice, and descriptive statistics of Learning styles according Career choice*

Leaning styles	*Career choice*	*N*	*M*	*SD*	*t*
Active	Baccalaureate	404	12.12	3.38	-1.834
	Vocational Education	171	12.69	4.46	
	Total	575	12.29	3.41	
Reflexive	Baccalaureate	404	13.39	3.42	4.268***
	Vocational Education	171	12.05	3.46	
	Total	575	12.99	3.48	
Theoretical	Baccalaureate	404	12.24	3.35	4.073***
	Vocational Education	171	10.99	3.33	
	Total	575	11.86	3.39	
Pragmatic	Baccalaureate	404	12.44	3.14	-1.132
	Vocational Education	171	12.76	3.00	
	Total	575	12.54	3.10	

Note. M: Mean; SD: Standard Deviation, *** $p < .001$

Table 5 shows the third hypothesis that refers to the relationship between *Learning styles* and the student's career option. As can be seen in Table 5, there are statistically significant differences between the variable *Career choice* and the *Reflexive* and *Theoretical* styles, so the hypothesis 3 is rejected.

If we consider the *Reflective* and *Theoretical* styles in which significant differences have been found, it is observed that the students who decide to continue their *Baccalaureate studies* have a greater preponderance towards the *Reflective* style (mean 13.39) than the students who opt for a *Vocational education* (mean 12.05). In the case of *Theoretical* style, higher values are found in students who decide to study for their *Baccalaureate* (mean 12.24) compared to those who propose to have *Vocational training* (mean 10.99).

Discussion

Studying learning styles in secondary students is a subject of interest in literature (Quintanal & Gallego, 2011). This work has highlighted the importance of learning style diagnosis for, among other reasons, its relationship with student performance (Adán, 2008; Zambrano Acosta et al., 2018) and its link with school dropout problems (Antelm-Lanzat & Gil, 2013). Other aspects, such as the relationship between

learning styles and school guidance in secondary education, have been less addressed. Thus, this work's objective was to examine the relationship between the learning style and the students' career choice close to completing their compulsory secondary education degree. For this reason, decision-making is considered of particular importance at this time. In this sense, the maximum amount of information should be available from academic guidance so that the decision is made in the interests and expectations of the students.

To address the research objective, first, a diagnosis of the learning style was carried out with the CHAEA. The results of this analysis revealed that the most characteristic style, with a higher average, of the students close to finishing secondary education, is reflective, followed by active and pragmatic. These results are indicative of the educational system that requires characteristics such as observation and prudence in students. Other works have also found the reflective style as characteristic of secondary education students (García Luna et al., 2015; Quintanal & Gallego, 2011; Tardecilla González et al., 2017; Vega Román & Hugo Ruiz, 2018), which would confirm the idea of adapting students to the needs and demands of the educational system itself. Moreover, this style is also characteristic of other educational levels such as baccalaureate (Adán, 2002) and those of university (Camarero Suárez et al., 2000). These results could indicate a demand for the educational system towards a learning style close to the reflective style. However, this statement should not be taken definitively, as other research have shown a higher preference of students for other styles, for example, the theoretical style in accounting students (Garzuzi & Mafauad, 2014) and the theoretical and pragmatic style in civil engineering students (Acevedo & Rocha, 2011).

Second, after diagnosing the style of secondary students, the relationship between learning style and career choice was examined. In this sense, it was found that students with a reflective style opt for baccalaureate studies, where the learning requirements are similar to those of secondary education, while students with active and pragmatic styles more often opted to continue with vocational training in which there is a higher demand for practical experiences (in line with the learning demands of students with the active or pragmatic style). Therefore, it is understood that the learning style diagnosis is a tool that can help provide supportive career guidance.

In this work, three hypotheses were proposed. The first and second hypotheses referred to the relationship of the learning style of the students and demographic variables, such as sex and age, which was the object of study by the literature of learning styles (Serra-Olivares et al., 2017), and the third hypothesis related learning style and the choice of career variable, which is identified with our research objective.

Regarding hypothesis 1, it has been verified that there were no significant differences between learning style and sex variables. Cano García (2000) found significant differences between learning styles and this variable. In Gallego and Nevot's (2008) research, correlations were found only between sex and the pragmatic style. In general, research has not identified the effect of sex variable on learning style as significant (Jones et al., 2003; Kayes, 2005).

Hypothesis 2 evaluated the relationship between learning styles and age. The sample was divided into two groups, students of 15 years and students of more than 15 years. With this division, it was intended to know the existence of a critical age in the evolution of the learning style of adolescents. The analyses carried out have verified significant differences in the reflective and theoretical styles. Furthermore, in these differences it is verified that the 15-year-old students have a higher preference towards these two styles. Other works, such as Villalba (2015), found that students over 21 years old had a higher preference for the reflective style, while other investigations did not find this type of difference (Serra-Olivares et al., 2017).

Hypothesis 3 studied the relationship between learning style and the career choice variable. Significant differences were found in the reflective and theoretical styles. It is verified that students with these two styles have a greater tendency to choose baccalaureate compared to vocational education. This is

probably because the demands of high school learning, focused on observation and receptivity to new knowledge, are similar to those of secondary education, and fit more with the characteristics of the reflective style. However, vocational education may have demands for action and the search for new alternatives that are more identified with the active style.

For all these reasons, in the determination of learning styles, tutors and counsellors have a tool to ensure students to reach maximum flexibility and autonomy in their way of learning (Griggs, 1985), deepening the role of development and prevention, and highlighting the contribution of guidance and tutoring in secondary education (De la Oliva et al., 2005). Moreover, it enables teachers, tutors, and counsellors to work continuously to improve the learning of all students (Kruk & Zawodniak, 2019). Thus, it relates to developing skills related to the tutoring activity (Al-Balhan & Soliman, 2019). In this sense, counsellors must attend to the different profiles and motivational goals and not be exclusive but rather promote self-concept (Brannan et al., 2016), self-efficacy and interests in choosing career planning interventions, taking into account the Realistic, Researcher, Artistic, Social, Entrepreneurial, and Conventional (RIASEC) typology (Cupani et al., 2018). Along the same lines are the results of a study with Colombian students (Casas & Blanco-Blanco, 2017), in which the model of interests and vocational choices defined by the Social Cognitive Theory of Career Development (SCCT) was found to predict the interests and occupational aspirations of students in the scientific-mathematical domain. It seems necessary for the tutor to diagnose the learning styles of the student body as well as determining their own style. This would enable a second step (individually or in a small group) of reviewing in an informed way the most needed aspects of optimizing academic performance (with a view to broadening a student's flexibility and possibilities for learning). In this manner, they can transcend the purely academic field, with the purpose of deepening aspects related to learning social skills and conflict management (Hassinger-Das et al., 2017; Pineda-Alfonso, 2017).

When interpreting the results obtained in this work, it is necessary to mention some limitations. First, the conclusions are somewhat attenuated by the self-report measuring instruments used, with the corresponding limitations of this type of tool (e.g., response bias). Second, the sample came from a single Spanish province (Valencia), an aspect that, although conducted through a random sampling stratified by clusters, partially limits the generalization of the results throughout the Spanish territory (or beyond). Third, the study was cross-sectional. Thus, cause-effect relationships cannot be established. Fourth, adolescence is a stage of development in which various changes occur at a biological, psychological, and social level. These aspects must be taken into account in the interpretation and generalization of the results found in this work. Fifth, the studies carried out are correlational since our research objective was to make a first approach to the phenomenon of the relationship between learning styles and career choice at a critical stage of development (i.e., adolescence). In other investigations, it is possible to continue exploring this relationship, focusing on the suitability of individual styles for a particular career choice or the development of specific competencies.

Moreover, the evolution of current events will require students to adapt to a changing labor market, where self-training and continuous training will be one of the most essential values (Adán, 2008), thus promoting professional maturity (Janeiro & Marques, 2010). Together with the importance of the decision-making processes (Pérez Navío, 2015). In this sense, it is about identifying the current and future needs of students, with a view to an ecological approach to education (Zych et al., 2019).

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