

# Learning Styles of students attending a 1<sup>st</sup> cycle leading to a degree in Education

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## Abstract

*Licenciatura* in Education is a first degree-leading programme that aims at preparing students to carry out education-related tasks in several institutions under the supervision of a senior professional. To qualify for independent work, a graduate in Education should complete a follow-up two-year professionalising Masters programme. To become autonomous professionals, students need to develop learning how to learn competences so that they can actively and continuously update their knowledge-base and develop their professional competences. The ways people use to learn depends on their learning style. Research indicates that undergraduates in Education tend to be reflexive or active with regard to Learning Styles. If *Licenciatura* in Education students follow this tendency, then they would be expected to become risk-takers and action-oriented as well as good entrepreneurs in their future professional lives. Hence, the objective of this paper is to identify the Learning Styles of the 2010/2011 University of Minho students attending a 1<sup>st</sup> cycle leading to a first degree in Education.

The Portuguese version of the Honey-Alonso questionnaire was applied to 115 students attending each of the three academic years of the *Licenciatura* in Education. Data were analysed with reference to the four Learning Styles categories developed by the questionnaire's authors. Students do not show a very high or a very low preference for any of the learning styles. Most of them show high preference for the reflexive learning style (85%) followed by the theoretical one (59%). Female students may be a bit more pragmatic and reflexive than their male counterparts. The order of choice of the study programme and the year that students are attending seem to be unrelated to the students' preferred learning styles. The preferences for the reflexive Learning Style may be a good indicator of success in developing learning how to learn competences. However, these students may lack both ability to use that knowledge and willingness to get involved into new experiences. Therefore, instead of just trying to match their teaching strategies to their students preferred learning styles, teachers at both the undergraduate and the post-graduate levels should try to adopt teaching styles able to develop their students' learning styles that are most relevant for students' professional lives.

**Keywords:** Learning Styles, Higher Education, Education Undergraduates, CHAEA Questionnaire

## 1. Introduction

*Licenciatura* in Education is a first degree-leading programme that aims at preparing students to carry out education-related tasks in several institutions under the supervision of a senior professional. To qualify for independent work, a graduate in Education should complete a follow-up two-year professionalising Masters programme that is supposed to foster the development of evaluation, planning and intervention competences. To become autonomous in their professional lives, Education students need to develop learning how to learn competences so that they can actively and continuously update their knowledge-base and develop their professional skills. It is commonly accepted among educators that the development of such competences can be either fostered or impaired by the teaching methodologies used by their teachers. However, Kolb (1984) raised the point that each individual tends to find ways of learning from both formal and informal settings in order to survive in an ever-changing knowledge society. This idea is associated with a conception of learning as “the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38). Therefore, responses to teaching contexts may depend not only on the characteristics of such contexts or on students' gender, race or motivation to learn but they may also depend on students' characteristics as learners (Felder & Brent, 2005). People can use several ways of learning, namely watching, listening, thinking, acting, visualizing, reasoning, memorizing, imagining and modelling (Felder & Silverman, 1988). However, people tend to use

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some more than others. The ways an individual chooses to learn (Kolb, 1984; Pashler, McDaniel, Rohrer & Bjork, 2008) and their relative efficacy (Pashler, McDaniel, Rohrer & Bjork, 2008) depend on his/her Learning Style (Kolb, 1984). Thus, “the term Learning Style refers to the concept that individuals differ in regard to what mode of instruction or study is more effective for them” (Pashler, McDaniel, Rohrer & Bjork, 2008).

## 2. Research question

Bearing in mind that an individual’s Learning Style may interfere with his/her ability to both cope with the need for lifelong learning and manage his/her own professional development as well with his/her initiative as an entrepreneur, the objective of this piece of research was to characterise the undergraduates that are attending a first degree in Education-leading programme at the University of Minho, in Portugal, with regard to their Learning Styles. The importance of this research lies in the fact that awareness of students’ Learning Styles helps to match teaching to students’ needs as learners and future professionals as well.

## 3. Theoretical framework

Learning Styles are a sort of personal variables that lie somewhere between intelligence and personality (Camarero Suárez, Martín del Buey, & Herrero Diez, 2000) and explain the individual different ways of approaching, planning, and answering to the learning challenges. Over the last decades, educators, parents as well as layman have recognised Learning Styles as an individual characteristic that is worthwhile knowing and appropriately dealing with (Pashler, McDaniel, Rohrer & Bjork, 2008) because: knowing the learners’ Learning Styles enables the educators to adapt teaching and to explore students’ potential as learners (Pashler, McDaniel, Rohrer & Bjork, 2008); the diversity of students’ social-demographic characteristics leads to different Learning Styles that requires a diversity of teaching resources and strategies in order to improve success (Montgomery & Groat, 1998); dealing with the diversity of students’ Learning Styles fosters students attitudes towards the school subject (Montgomery & Groat, 1998), having a positive effect on education and the school subject itself.

The important role that Learning Styles may play in the teaching and learning process may be the reason why since the first decades of the twentieth century (Coffield, Moseley, Hall & Ecclestone, 2004) an ever growing number of research studies have concentrated on identifying individual Learning Styles and their effect on people’s performance in educational and work experience settings (Cagiltay, 2008). Those studies resulted in the development of more than 70 instruments (Coffield, Moseley, Hall & Ecclestone, 2004; García Cué, Santizo Rincón & Alonso García, 2009) although most of them are varieties of a rather smaller number of different instruments. The majority of such instruments are Likert-type questionnaires with dozens of items. According to García Cué, Santizo Rincón & Alonso García (2009), most of them are written in English and have been used in research studies carried out in countries like USA, Canada, and Great-Britain. This group of Learning Styles Instruments includes the well-known Kolb’s Learning Style Inventory. In Ibero-American countries, the most used Learning Styles questionnaire is the *Cuestionário Honey-Alonso de Estilos de Aprendizaje* (CHAEA), which is also a Likert-Type questionnaire that was originally written in Spanish (Alonso, Gallego & Honey, 1997) and later on was translated to Portuguese and validated to Portuguese higher education population by Miranda (2005).

Learning Styles questionnaires draw heavily on the phases of the learning process. Kolb’s Learning Style Inventory acknowledges the four phases of the learning process (Cassidy, 2004) that go from concrete to abstract reasoning, as follows: concrete experience; reflexive observation; abstract conceptualisation; and active experimentation. Hence, Kolb (1984) classifies people according to their Learning Styles, as follows: converger, a person whose greatest strength lies in the practical application of ideas; diverger, a person whose greatest strength lies in creativity and imaginative ability; assimilator, a person whose greatest strength lies in the ability to understand and create theories; accommodator, a person whose greatest strength lies in carrying out plans and experiments and involving themselves in new experiences. Munford (quoted by Alonso, Gallego & Honey, 1997) assumes a different rationale to the learning process, based on the things one does when embedded in a learning situation. They are as follows: live an experience; transmit the experience; draw conclusions from the experience; and plan a follow-up experience. Alonso, Gallego & Honey (1997) argue that individuals tend to concentrate on certain phases rather than others, depending on their dominant Learning Styles. Thus, those that tend to value the living of an experience have an active Learning Style; those that prefer to concentrate on reflecting upon the experience have a reflexive Learning Style; those that concentrate on generalising and formulating hypothesis are theoretical; those that value knowledge application are pragmatic. The CHAEA

questionnaire integrates Kolb's and Munford's ways of conceptualising learning in such a way that it enables the relationship between the Learning Styles classification based on CHAEA and the one based on the Kolb's inventory, as follows: convergers are pragmatic; assimilators are theoretical; divergers are reflexive; and accommodators are active (Alonso, Gallego & Honey, 1997).

Research on Learning Styles has concentrated on teachers as well as on students. Although it may seem a bit unexpected, a few research studies have investigated teachers' Learning Styles. Alonso, Gallego & Honey (1997) argue for the relevance of these studies on the basis that teachers tend to teach, as they would like to be taught, that is they tend to teach in agreement with their own Learning Styles. Therefore, knowing teachers' Learning Styles gives information on teachers' preferred ways of teaching. This information may be useful for teachers themselves as well as for teacher educators, as teachers' Teaching Style (Martínez Geijo, 2009) should match students Learning Style. Teachers that are aware of their own Learning Style may make an effort to avoid following it but rather to use a diversity of teaching resources and strategies in order to reach all the students, whatever their preferred Teaching Styles.

Research on students' Learning Styles has focused either on just characterising students' Learning Styles or on analysing the relationship between students' Learning Styles and other educational or personal variables. Despite the considerable amount of studies carried out on this issue, research results are often contradictory. On one hand, while some studies (Svinicki & Dixon, 1987; Mola Garay, 2008; Zapata Esteves & Flores Correa, 2008) show that most students may have a preferred Learning Style, others (Gravini Donado, Cabrera Pérez, Avila Molina & Vargas González, 2009) indicate that the majority of the students may adopt the four styles altogether. On the other hand, while some studies (Cerqueira, 2008) indicate that students' Learning Style does not depend on the programme they are attending, others (Svinicki & Dixon, 1987; Mola Garay, 2008, Zapata Esteves & Flores Correa, 2008) indicate that students attending different programmes may have different preferred Learning Styles. In the latter case, Education (Svinicki & Dixon, 1987; Zapata Esteves & Flores Correa, 2008) or primary teacher education (Mola Garay, 2008) students in other countries than Portugal were found to be reflexive or active, rather than theoretical or pragmatic. Although Learning Styles may be conceptualized as personal characteristics, Cerqueira (2008) and Reinicke Seiffert, Chiang Salgado, Montecinos Palma, Solar Rodriguez, Madrid Valderbenito & Acevedo Pierart (2008) noticed that students' Learning Styles change from the beginning of the undergraduate programmes towards the end of them. In fact, participants in Cerqueira's study started by being predominantly assimilators and tended to adopt more than one Learning Style by the end of the programme. Santizo Rincón, García Cué & Gallego (2008) also found that Learning Style may change with schooling, as in their study involving 21 countries they concluded that the more degrees people have the more reflexive they are; the less degrees they have the more active they are. Consistent with this empirical rule is the fact that students in the same study tended to prefer the active Learning Style while the teachers tended to prefer the reflexive or the theoretical Learning Styles. With regard to gender, Cerqueira (2008) and Hervás Avilés (2008) found that there is no statistically significant difference between students' gender and their Learning Styles but Madrid Valdebenito, Acevedo Pierart, Chiang Salgado, Montecinos Palma & Reinicke Seiffert (2009) found just the opposite. In their study focusing on undergraduates from Chile they noticed that male students are more pragmatic or active and female students have no preferred Learning Style.

Understanding the students' Learning Style is a relevant issue as a relationship may exist between students' Learning Styles and their learning strategies (López Aguado & Silva Falchetti, 2009). If it is so, then a relationship should be expected between students' dominant Learning Style and the level of academic success (Mola Garay, 2008). As students that prefer the reflexive (diverger) or the theoretical (assimilator) Learning Styles tend to adopt superficial and realisation-oriented learning strategies, and Education students from other countries may be reflexive (Svinicki & Dixon, 1987; Zapata Esteves & Flores Correa, 2008), then it is worthwhile investigating whether or not *Licenciatura* in Education students follow this tendency, as they would be expected to become risk-takers and action-oriented as well as good entrepreneurs in their future professional lives.

#### 4. Methodology

This study focused on all the undergraduates that were attending the three years of the 1<sup>st</sup> cycle in Education run by the University of Minho that is a total of 162 students. However, only 115 students, 15 (13.0%) male and 100 (87.0%) female, participated in the study as the others have missed classes the days in which data were collected. This undergraduate programme was the first choice for the majority (64.3%) of the participants in the study, the

second choice for 14.8% of them and the possible choice for the remaining 20.9% of the participants. Their ages range from 18 to 50 years old; 74.8% are under 25 years old and 86.1% are 30 or fewer years old.

Instruments available were analysed in order to find out whether one of them was suitable for our data collection purposes. It was noticed that there are quite a few instruments on Learning Styles (DGB/DC, 2004; Pashler, McDaniel, Rohrer & Bjork, 2008) although some of them have to be bought and/or require special permission and/or analysis of research context and purposes before permission is obtained. In addition, as most of these questionnaires are Likert-type questionnaires, they require quite complex validity and reliability analysis in order to find out whether or not they fulfil the minimal quality requirements when applied to the target population.

The Honey-Alonso's questionnaire (Alonso, Gallego, & Honey, 1997) is one of the Learning Styles questionnaires available in the literature that has no use restrictions so far. In addition, it was previously translated to Portuguese and validated by Miranda (2005) for the Portuguese Higher Education population with good results. In fact, internal consistency coefficients obtained were higher than 0.6. This questionnaire includes 80 items, being each group of 20 items representative of each one of the four Learning Styles. Each item is supposed to be answered by means of a four points Likert-type scale, ranging from Totally Disagree (1 point) to Totally Agree (4 points). There are not positive and negative items (as it is usual in a Likert-type questionnaire), but rather items that are consistent with one Learning Style and others that fit better another Learning Style. Thus, in order to attain the objective of this research, the Portuguese version of the Honey-Alonso questionnaire was applied by one of the authors under examination conditions to each one of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year students group of the *Licenciatura* in Education, during the 2<sup>nd</sup> semester of the 2009/2010 academic year. There was no time limit for students to fill in the questionnaire. It took them 20 to 30 minutes to do it.

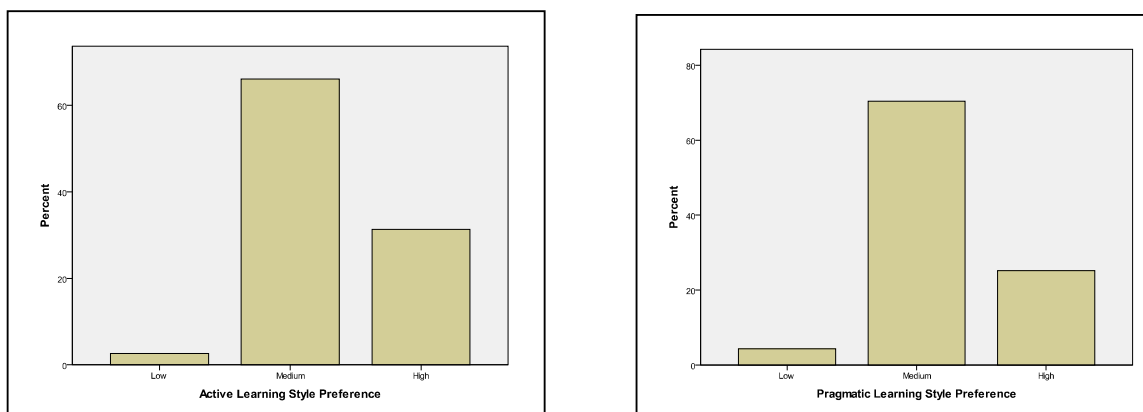
For data analysis purposes, items were clustered by Learning Style and students' scores in each Learning Style were computed. Afterwards, to obtain students' preference for each Learning Style, a recode of students' scores in each Learning Style was done based on the following criteria: very high preference: 80-71 points; high preference: 70-56 points; moderate preference: 55-45 points; low preference: 44-30 points; very low preference 29-20 points. Along with global analysis of students' Learning Styles preferences, comparisons between groups were done, based on year of the programme, gender, and order of choice of the study programme.

## 5. Results

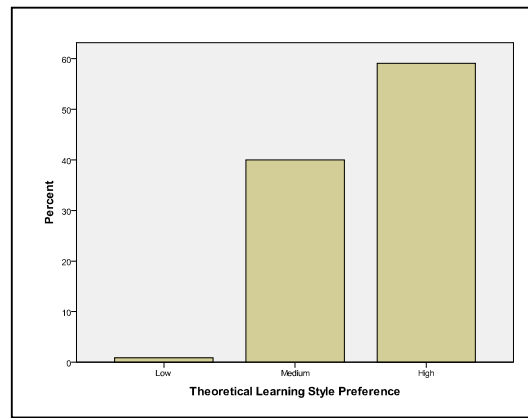
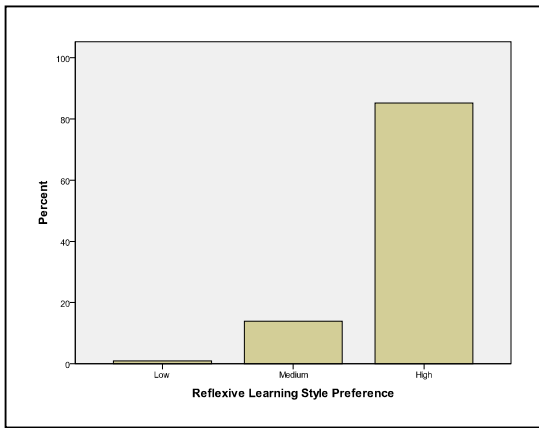
Figure 1 shows the students' preferences for the four Learning Styles. Students did not show very high or very low preferences for any of the Learning Styles, as no student got scores higher than 70 or lower than 30 in any of the Learning Styles. The majority tend to show: medium preferences for active (66.1%) and pragmatic (70.4%) Learning Styles; high preference for the theoretical (59.1%) and the reflexive (85.2%) Learning Styles. Results regarding the high preference for the reflexive Learning Style are consistent with those due to research studies (e.g., Svinicki & Dixon, 1987; Zapata Esteves & Flores Correa, 2008) showing that Education students of other countries tend to be reflexive.

Although the reduced number of male participants prevents a concluding analysis of students' preference with regard to gender, data given in Table 1 seems to indicate that female students as a group may be more pragmatic and reflexive than their male counterparts. This result may contradict that of Cerqueira (2008) and Hervás Avilés (2008), as these authors found that there is difference between students' gender with regard to their preferred Learning Styles.

**Figure 1: Students' Learning Styles preferences**







On the other hand, Table 1 shows that male students may be more theoretical than their female colleagues. This result differs from that of Madrid Valdebenito, Acevedo Pierart, Chiang Salgado, Montecinos Palma & Reinicke Seiffert (2009), as these authors found that male students are more pragmatic or active and female students have no preferred Learning Style.

**Table 1 – Students’ Learning Styles preferences with regard to gender f(%)**

Gender	Learning Style	Very low	Low	Medium	High	Very High
Female (n=100)	Active	0	2(2.0)	67(67.0)	31(31.0)	0
	Pragmatic	0	5(5.0)	69(69.0)	26(26.0)	0
	Reflexive	0	1(1.0)	13(13.0)	86(86.0)	0
	Theoretical	0	1(1.0)	41(41.0)	58(58.0)	0
Male (n=15)	Active	0	1(6.7)	9(60.0)	5(33.3)	0
	Pragmatic	0	0(0,0)	12 (80.0)	3 (20.0)	0
	Reflexive	0	0(0,0)	3(20.0)	12(80.0)	0
	Theoretical	0	0(0,0)	5(33.3)	10(66.7)	0

Table 2 shows the results of the analysis of students’ Learning Styles preference with regards to their study programme choice order. Although caution should be taken due to the different sizes of the groups, it seems that there is no relationship between the order of students’ choice of the Mastera programme and their Learning Style. In fact, whatever the choice order number, students tend to prefer the reflexive and the theoretical Learning Styles. The preference for the first mentioned Learning Style is consistent with the result obtained by Svinicki & Dixon (1987) and by Zapata Esteves & Flores Correa (2008). The independence of students’ Learning Styles preferences with regard to programme choice may be consistent with research results (Madrid Valdebenito, Acevedo Pierart, Chiang Salgado, Montecinos Palma & Reinicke Seiffert, 2009) indicating that there is no difference between preferred Learning Styles of students attending study programmes in different areas (e.g., Science, Technology, Education). It may also be one of the factors that help to understand how these students decided to stay in the programme of studies even when it was not their first choice. Maybe students for whom this programme of studies was not the first choice stayed in it because their learning style makes them feel comfortable with its contents and required learning strategies.

**Table 2 – Students’ Learning Styles preferences with regard to the study programme choice order f(%)**

Programme Choice	Learning Style	Very low	Low	Medium	High	Very High
1st (n=74)	Active	0	2(2.7)	53(71.6)	19(25.7)	0
	Pragmatic	0	3(4.0)	50(66.6)	21(28.4)	0
	Reflexive	0	1(1.3)	9(12.2)	64(86.5)	0
	Theoretical	0	1(1.3)	29(39.2)	44(59.5)	0
2nd (n=17)	Active	0	1(5.9)	9(52.9)	7(41.2)	0
	Pragmatic	0	1(5.9)	14(82.3)	2(11.8)	0
	Reflexive	0	0(0.0)	3(17.7)	14(82.3)	0
	Theoretical	0	0(0.0)	7(41.2)	10(58.8)	0
Other (n=23)	Active	0	0(0.0)	13(56.5)	10(43.5)	0
	Pragmatic	0	0(0.0)	17(74.0)	6(16.0)	0
	Reflexive	0	0(0.0)	3(13.9)	20(87.0)	0
	Theoretical	0	0(0.0)	9(39.0)	14(60.1)	0

Table 3 indicates that 1<sup>st</sup> year students' Learning Styles preferences compare to their 2<sup>nd</sup> and 3<sup>rd</sup> year counterparts preferences. As a matter of fact, whatever the programme year, the Reflexive Learning Style got the highest percentages of students in the High preference category. On the other hand, the active and pragmatic Learning Styles got the highest percentages in the Medium category in every programme year based group. Although evolution cannot be properly assessed with different groups of students, these results may be consistent with the idea that an individual's preferred Learning Styles are a quite well fixed characteristic (Riding & Sadler-Smith, 1997) but they may contradict the results obtained by Cerqueira (2008) and Reinicke Seiffert, Chiang Salgado, Montecinos Palma, Solar Rodriguez, Madrid Valderbenito & Acevedo Pierart (2008) that suggest that Learning Style may change during the study programme.

**Table 3 – Students' Learning Styles preferences with regard to the study programme choice order f(%)**

<i>Programme year</i>	<i>Learning Style</i>	<i>Very low</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Very High</i>
1st (n=39)	Active	0	1(2.5)	23(60.0)	15(38.5)	0
	Pragmatic	0	1(2.5)	27(69.2)	11(28.2)	0
	Reflexive	0	1(2.5)	6(15.4)	32(82.1)	0
	Theoretical	0	1(2.5)	12(30.8)	26(66.7)	0
2nd (n=37)	Active	0	2(5.4)	27(73.0)	8(21.6)	0
	Pragmatic	0	1(2.7)	27(73.0)	9(24.3)	0
	Reflexive	0	0(0.0)	3(8.1)	34(91.8)	0
	Theoretical	0	0(0.0)	15(40.5)	22(59.5)	0
3rd (n=39)	Active	0	0(0.0)	26(66.7)	13(33.3)	0
	Pragmatic	0	3(7.7)	27(69.2)	9(23.1)	0
	Reflexive	0	0(0.0)	7(17.9)	32(82.1)	0
	Theoretical	0	0(0.0)	19(48.7)	20(52.3)	0

## 6. Conclusions

The results of this study suggest that this group of Education students do not show a very high or very low preference for any of the Learning Styles. Most of them show a high preference for the reflexive Learning Style (85%) followed by the theoretical one (59%). Female students may be a bit more pragmatic and reflexive than their male counterparts. The order of choice of the study programme and the year that students are attending seem to be unrelated to the students' preferred Learning Styles. Bearing in mind that reflexive or diverger people's greatest strength lies in creativity and imaginative ability, and that theoretical people or assimilators greatest strength lies in the ability to understand and create theories, then education students may be expected to become good in imagining ways to deal with challenges but they will hardly deal with such challenges, as they are not strong in terms of practical application of ideas (as pragmatic people or convergers would be) or in involving themselves in new experiences (as active people or accommodators would be).

The results of this study may have implications for teaching as well as for research. To become autonomous professionals, students need to develop learning how to learn competences so that they can actively and continuously update their knowledge-base and develop their professional competences. The preferences for the Reflexive Learning Style may be a good indicator of success in with this respect. However, ability to use that knowledge and willingness to get involved into new experiences would be useful competences for professionals that have to do independent work and need to become entrepreneurs. Therefore, instead of just trying to match their teaching strategies to their Education students preferred Learning Styles (Camarero Suárez, Martín del Buey & Herrero Diez, 2000), teachers at both the undergraduate and the post-graduate levels should try to adopt Teaching Styles (Martínez Geijo, 2009) able to develop their students' Learning Styles that are thought to be relevant for their future professional lives.

As there are some differences between results from diverse research studies, more research is needed in order to get more information on these issues. It could be interesting to use diverse data collection instruments with the same samples in order to find out whether or not those differences can be due to the nature of the instruments used for data collection purposes. Learning Styles questionnaires or inventories include too many items and this can reduce their reliability especially if respondents are not motivated enough to answer them. In addition, longitudinal studies should be done in order to find out whether or not Learning Styles change with schooling or

are related to number and type of degrees hold. Comparisons between different groups (e.g., novice and sophomore, students and teachers) can give some insight on this issue but they cannot shed enough light to fully understand how it works. As a matter of fact, the short review of literature done for the purpose of this paper reveals too many divergences for methodological threats to be ignored. Therefore, this may be a promising area of research.

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