Spanish EFL undergraduate students' perceptions of learning styles

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Abstract

This paper presents the findings of research on learning styles carried out in a Spanish EFL higher education context. The specific objectives of the study were to investigate students' perceptions of their learning styles and to determine students' responses to the identification of their learning styles using the Kolb Learning Style Inventory (LSI) adapted by McCarthy (1980). Participants included 53 students from an English Philology degree program. The results showed that most of the students had a Diverging style and an Accommodating style. The findings also suggested that students had a positive reaction to the identification of their learning styles, despite its novelty in the Spanish EFL university context. Most of the students' perceptions of their own learning styles concurred with the results obtained from the Kolb LSI. More research on educational practices and university instruction that have to do with learning style concepts is needed.

Keywords: learning styles, Kolb Learning Styles Inventory (LSI) adapted by McCarthy (1980), English as a Foreign Language (EFL), students' perceptions

Introduction

Since 1980 the concept of learning styles has received a lot of attention in research, principally in the field of psychology and education (Cano-Garcia & Hughes, 2000; Coffield, Mosely, Hall, & Ecclestone, 2004). Moreover, learning styles research has also been applied to the field of Second Language Acquisition (SLA) (Reid, 1995; Ehrman, 1996; Ehrman & Oxford, 1990; Oxford, 1990; Oxford & Ehrman, 1993; Oxford, Ehrman, & Lavine, 1991; Chapelle, 1992; Chapelle & Roberts, 1986). Learning styles and diversity in the foreign language classroom have been considered crucial factors mainly due to their close relationship to learning strategies. As Reid (1995) points out, "my own classroom research in learning styles began when I recognized the diversity of learning styles in my ESL classes…[T]here are substantial individual differences among students' preferred styles and their selected use of strategies" (p. 300).

Within the scope of SLA, many learning style classifications have been developed, such as field dependence/independence, tolerance, perception, reflection or impulsivity, and multiple intelligences (Ehrman, 1996; Griffiths & Sheen, 1992; Reid, 1995; Skehan, 1998). A plethora of definitions also exist for the concept of learning styles (Dunn & Griggs, 2000; Lemire & Gray, 2003; Center on Disability Studies, n.d.; Sims & Sims, 1994). For instance, Keefe and Ferrell (1990) define style as "a complexus of related characteristics in which the whole is greater than its parts. Learning style is a gestalt combining internal and external operations derived from the individual's neurobiology, personality, and development and reflected in learner behavior" (p. 59).

Essentially, learning styles refer to the way information is processed, and each individual processes information in a unique way. The existence of different learning styles shows not only that there are various ways of processing information, but also that each learning style may have strengths and weaknesses. This view is supported by Dörnyei and Skehan (2003) who claim that "different styles may be equally valid and advantageous. It is possible to envision all styles as making contributions, even if in different domains" (p. 602).

Studies by researchers such as Marton or Carroll are crucial to the literature of learning styles, as they conclude that the knowledge of learning styles may predict "academic achievement" and may also influence the "improvement of teaching-learning processes" (Zywno, 2003, p. 12). Carroll was the first researcher to clearly show the influence of individual learning styles on academic achievement (Carroll, 1963; Henson & Borthwick, 1984; Claxton & Murrell, 1987; Bedford, 2006). Up to that point, the preeminent belief was that Intelligence Quotient (IQ) was the only predictor of academic achievement. More recently, Gardner (2005) reported how focusing on individual differences in second language acquisition is most appropriate when analyzing the degree of association between motivation and achievement. This conclusion was supported by Horwitz (1995) who posited that student affective variables represent the willingness to engage in the activities necessary to enhance second language attainment.

Van Zwanenberg, Wilkinson, and Anderson (2000) and Zywno (2003) considered the existence of other variables, such as the variety of learning and teaching styles or academic performance expectations, which could also influence student output. This notion was shared by

Ellis (1989) who reported on a study of two adult learners of L2 German and how their learning styles vary to cope with the instruction method provided.

In SLA higher education contexts, instruments to assess learning styles have not been sufficiently developed with a high degree of validity and reliability. An exception to this was Oxford and Burry-Stock (1995) who described applications of the Strategy Inventory for Language Learning, an instrument found to have high reliability with many different cultural groups learning a foreign language. More promising work was done by Wintergerst, DeCapua, and Verna (2003) who published the positive results of the testing conducted on a learning styles instrument to assess foreign language students. DeCapua and Wintergerst (2005) have contended that a triangulated approach using a questionnaire, semi-structured oral interviews, and participant observations to measure learning styles in EFL contexts would present a fuller picture of instrument validation. It is clear that more extended use of these assessment tools is needed.

As a consequence of the need for further instrument development, planning for all students' learning styles in the EFL context becomes a complex task for foreign language instructors. Indeed, Ellis (1992) points out that "matching is best achieved by the teacher catering for individual needs during the moment-by-moment process of teaching" (p. 188). Moran (as cited in Bedford, 2006) asserts that it is important that teachers' own learning styles be appropriate for their students' learning style, arguing for the "desirability of achieving a match between the learning styles of instructors and those of their students" (p. 28). Therefore, matching students' learning styles to instructional techniques may influence learning significantly. However, identification of learning styles is not a common educational practice yet. In some educational contexts, the use of learning style inventories to detect different students' learning styles has only been done in the interest of matching the diverse cultures in the classroom (Hickcox, 2006) or examining the role culture plays in the way individuals learn (Joy & Kolb, 2009).

As reviewed so far, the topic of individual learning styles in language learning is complex and has provided little conclusive knowledge (Ehrman, Leaver, & Oxford, 2003; Peterson, Rayner, & Armstrong, 2009). Even if learning style identification and matching theories have helped to focus learning style research in recent years

(Sims & Sims, 2006), the practice of learning style identification among Spanish EFL practitioners is still rare. This may be due to a certain reticence among instructors in using teaching methods that consider affective variables, like learning styles, or it may be due to a lack of familiarity with learning style inventories. The Kolb (1985) Learning Style Inventory (LSI) adapted by McCarthy (1980) is an instrument that has traditionally been widely used in psychological educational contexts; however, it has not been utilized in EFL higher education contexts. Therefore, this study uses the Kolb LSI in a Spanish EFL university classroom to observe undergraduate students' perceptions of their identified learning styles. The research questions were as follows:

1. What are the Spanish EFL undergraduate students' learning styles according to the Kolb Learning Style Inventory?
2. What are the Spanish EFL undergraduate students' reactions to using the Kolb Learning Style Inventory in the EFL classroom?

To answer these questions, a study was conducted at the University of the Balearic Islands (UIB) in Palma de Mallorca, Spain.

Method

Participants
The participants in this study were all first-year students (N=53) enrolled in the English Philology degree program at the UIB. There were 42 female and 11 male students. The average age of the students was 19 years.

The English Philology program takes a traditional approach to teaching and assessment. Instruction includes a primary emphasis on traditional pedagogy (Kauchak & Eggen, 2008), although a segment of the curriculum does include the theories and principles of communicative methodologies in the teaching of a foreign language (Cook, 2000). In addition to guided lectures and explicit instruction, activities such as oral presentations, research panels, and interdisciplinary study are also included in each course.

Students are evaluated by means of diverse performance tasks; in most courses, there are three to four traditional objective examinations, a comprehensive final essay examination, and a written project.

Instruments

All students completed two research instruments. The first was the Kolb LSI, an instrument selected because it gathers data on the way individuals receive and process information. Moreover, it has been found to be suitable in tertiary education settings (Hickcox, 2006). During administration of the Kolb LSI, the researcher checked whether the test items were understood by the students and taught students how to calculate their scores.

Four learning styles are distinguished in this inventory: Diverging, Assimilating, Converging and Accommodating. Divergers tend to be creative, and they like to learn in settings that favor affective variables and group work. Individuals with a predominantly Assimilating style learn by organizing ideas in a logical way, and they like to learn abstract concepts. Students with a Converging style are good at practical applications of concepts and ideas. Individuals with an Accommodating style are good at learning with others. Their dominant learning modalities are active experimentation and concrete experience.

The second instrument was a follow-up questionnaire (See Appendix 1) administered to the students to determine their perceptions of the value of identifying their learning styles. The questionnaire was specifically developed for this study and was used to observe student reaction to having worked on learning styles in the EFL classroom. The questionnaire consisted of eight questions. Each of the first six questions included two different parts. The first part was a Yes/No question, which mainly aimed at gathering feedback on the students' reactions to the Kolb LSI. The second part was an open-ended question where students had to state the reason for having chosen yes or no in the first part. Question 1 asked whether or not the students liked having to identify their own learning style using the Kolb LSI. Questions two and three requested that respondents indicate if they had taken the Kolb LSI before, or if they had taken another learning styles inventory. Questions four and five solicited the students' opinion on the usefulness of the Kolb LSI for students and teachers. Question six asked the informants about

the extent of their agreement or disagreement with their Inventory scores. Finally, the questionnaire included two additional open-ended questions (i.e., 7 and 8) in which respondents listed the characteristics they believed most represented themselves as learners, as well as commented on their experience and perceptions in using the Kolb LSI.

The responses to all the open-ended questions were analyzed for patterns and categorized. The categories that emerged include all the various answers the informants provided. Open-ended questions were used in this study since the purpose was to investigate the students' overall reactions to having used the Kolb LSI without directing their responses through previous wording. As the respondents' answers were not limited, open-ended questions allowed informants to include more information related to their attitudes and feelings towards the use of the Inventory in the EFL classroom.

The Kolb LSI and the questionnaire were administered during the second semester of the academic year 2007. Students in the present study worked in four one-hour sessions on the identification of their own learning styles and on the awareness of the importance of identifying learning styles. After test and questionnaire administration, general group discussions on learning styles ensued.

Results

In this section, both the quantitative and qualitative results are presented. The results from the Kolb LSI show that 33% of the sample population appear to have a predominantly Diverging learning style, 25% have an Accommodating learning style, and 23% show a predominantly Converging learning style (see Figure 1 below). About 20% appear to have an Assimilating learning style. Thus, a tendency is observed favoring the Diverging, Accommodating and Converging learning styles, with the Diverging learning style showing a slightly stronger tendency among these three styles. Individuals with a Diverging learning style have Concrete Experience (CE) and Reflective Observation (RO) as their dominant learning skills and are generally interested in people and culture. The Assimilating learning style appears to have the poorest presence.
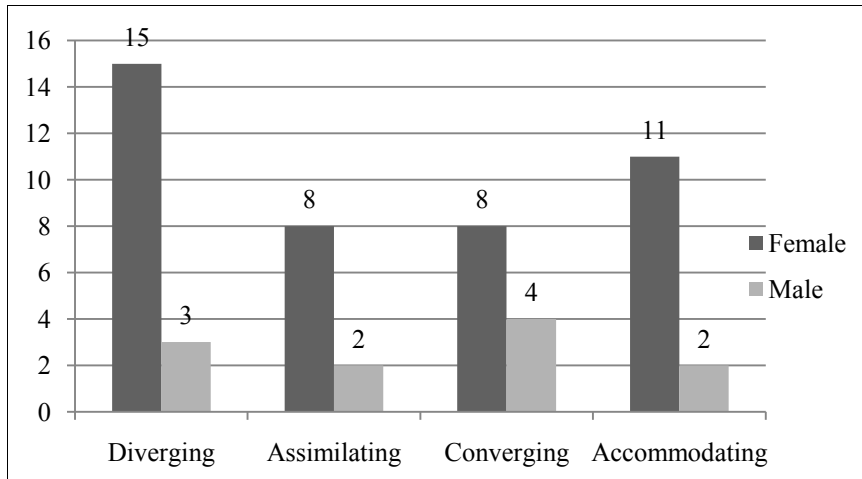
Figure 1. EFL Spanish Undergraduate Students' Results on the Kolb LSI

Table 1 below shows the proportion observed for each one of the four samples: Diverging, Assimilating, Converging and Accommodating. In this case, there are no significant differences among the samples using a confidence level of 95%.

Table 1. ANOM Report

95% Decision Limits

UDL = 0.52
Central line = 0.26
LDL = 0.00

Number of samples outside the limits = 0

* = Outside the limits

Sample	Size	Proportion
1	18	0.339623
2	10	0.188679
3	12	0.226415
4	13	0.245283

Table 2 below includes the StatAdvisor, a procedure that tests the hypothesis that all the mean proportions in the four samples are identical. It also generates a graphic analysis of means to determine which samples are significantly different from the global mean. Given a p-value equal to or higher than 0.10, there are no significant differences between the samples using a confidence level of 90% or higher.

Table 2. The StatAdvisor

Analysis of Means—Binomial proportions

Data/Variables: Col_2

Number of samples = 4
Mean sample size = 13.25
Mean proportion = 0.262371

Chi-square comparison

Chi-square	GL	P-Value
0.94	3	0.8169

A chi-square test was run to test the hypothesis that the row and the column selected are independent. Since the p-value is equal to or higher than 0.10 (see Table 3 below), we cannot reject the hypothesis that the rows and columns are independent. As a result, the row observed in a particular case may not be related to its column.

Table 3. Chi-square comparison

Chi-square	GL	P-Value
1.57	3	0.6665

Note: The frequency of some cells is less than 5

Figure 2 below shows that there are no significant differences between male and female respondents in relation to the four learning styles.
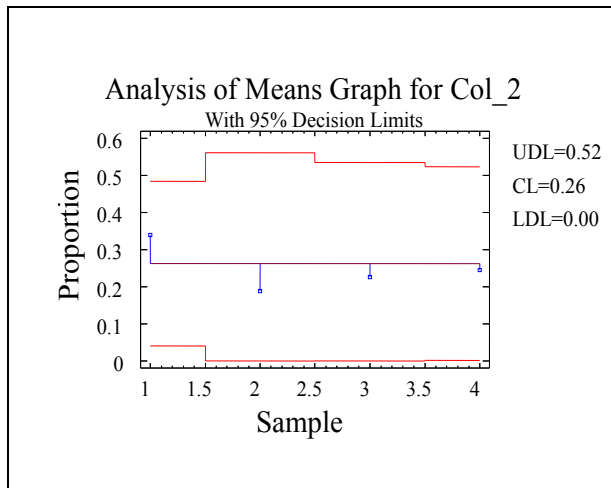

Figure 2. Analysis of Means

Students provided a wide range of responses to the questionnaire used to determine their perceptions about the identification of individual learning styles (Figure 3 below). Questionnaire results include the responses to both close-ended as well as open-ended questions. The open-ended responses were categorized and frequencies were displayed with graphs. The categories are not exclusive as respondents may have provided answers that could be included in more than one category. Representative quotes of the qualitative data are included in this section.
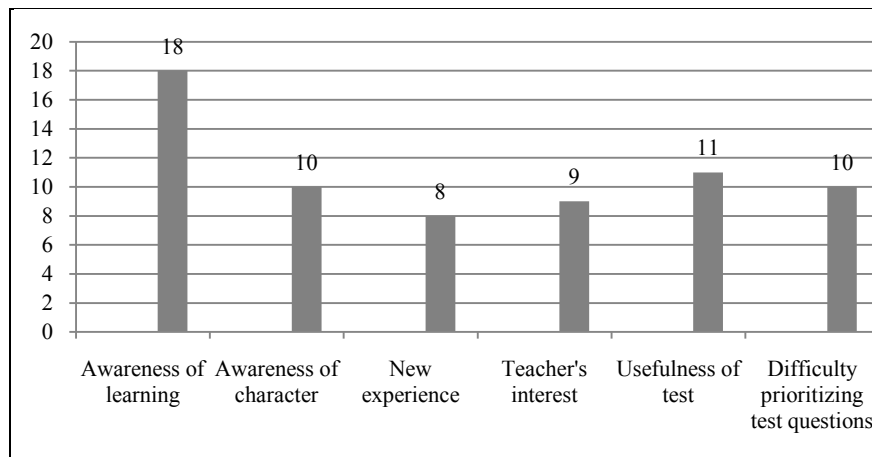
Figure 3. Students' Perceptions of the Use of the Kolb LSI

More than one quarter of the students (i.e., 27%) responded that having identified their learning style through the Kolb LSI helped them become aware of their own way of learning. In fact, many pupils commented that the Kolb LSI was a self-awareness learning tool. A student remarked, "I think it has helped me to understand a little bit more what my way of learning is."[1]

Other respondents referred to the test's potential for developing awareness of how to improve learning. As one student pointed out, "I can say that this activity has helped me to better see how I study and how I could continue to improve studying." A second student said, "I think that it is a good way of knowing how we can make the most of our studying time," while another said, "I think that doing this activity on the questionnaire helps people who need to create a good study plan for themselves."

Some students referred to the utility of the Kolb LSI as a way to become more aware of the importance of a learning style in the learning context. In particular, a student mentioned, "It is a good way to create a method of how to study in relation to both who we are and our way of studying, or even better to be able to face our studies." Another affirmed, "I think that it was an interesting way to analyze myself and to analyze

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[1] Students' comments, which were written in English, the students' target language, have been included in their original version.

my way of working." Similarly, one student said, "Having to answer those questions has helped me to reflect on how I study and learn, and it has made me think that maybe I don't do it in a way that would be better."

Some students added that the Kolb LSI had not only been useful for the knowledge gained about their own way of learning, but also for the awareness of other ways of learning. For example, one student commented, "I think that this questionnaire is very complete because it makes you rethink what your learning system is. Because the truth is that we all follow one system in particular without stopping to think about other possibilities we have and that we miss." Another student commented, "I have learned other learning techniques, which I didn't know."

Some students also pointed to the usefulness of the Inventory in determining one's learning behavior (17%) (see Figure 3 above). This idea is illustrated with the following student statement: "I like this type of test because it is useful in determining learning styles and behavior." Yet another explained, "I think that the questionnaire is quite useful because it makes us see how we act in certain situations."

As Figure 3 shows, various students believed that having completed the Kolb LSI in class demonstrated that the teacher was interested in them as students (14%). One respondent reflected, "I think that these questionnaires are a good idea as they make us realize how we study and how we can learn in a better way. Moreover, this shows that the teacher is interested in the pupils' needs."

Many students also thought that the information included in the LSI was useful for the teacher. The information compiled from the results may be able to inform teaching methodology and help improve actual teaching practice. In this respect, one student concluded, "The experiences I have in participating actively in class are good, and I think that the "Learning Styles questionnaire" is very interesting and positive for the students as well as for the teachers because students become aware of and realize how they have to study and how they should do it, and teachers can see what strategies are more effective when teaching their subject, and how they have to do it to improve their classes day by day."

Some students also revealed that knowing about their learning styles through the Kolb LSI had not only been useful for them as students, but

had also helped them to know more about themselves, mainly about their character and personality (14%) (see Figure 3 above). In this regard, one student noted, "I think these types of activities should be done in order to better know ourselves." Another stated, "It is like a test which reflects certain aspects of your personality and your way of being." Still another student added, "I have learned many useful things that not only apply to other participants, but I can also apply them to other things. For instance, I now dare to watch TV series in their original version. I have also found out what things I am more interested in." One respondent not only referred to the usefulness of knowing about oneself, but also to the fact that the students had enjoyed themselves by engaging in the LSI activity. In that respect, a student said, "The truth is that I think it is a great idea. It has a very good purpose and a fun way of learning about ourselves."

For many students, completing the Kolb LSI helped them to become self-aware of certain areas that they had previously not reflected on. For example, one student said, "I noticed after reading some of the answers from the questionnaire that I should try to get to know myself even better, because that is clearly going to affect the way I learn."

In spite of all these positive comments about the Kolb LSI, students also pointed out some drawbacks. As Figure 3 shows, some students responded that it was somewhat difficult for them to establish a priority among all the questions included in the questionnaire (15%). One pupil made the following statement, "Some questions were a bit difficult but I like it."

Besides some difficulties that they had found in answering the Kolb LSI, students acknowledged that completing a learning styles inventory was something new to them (12%) (see Figure 3 above). A large number of students made statements such as the following: "I had never questioned myself on many of the things included in the questionnaire" and "I have thought about things I don't usually think about." Others said, "It was something new and nothing similar to what I had ever done before" and "I had never done a questionnaire of this type. I think it is a good idea to determine what style is better than another one when studying." Lastly, one student added, "When I did the styles questionnaire I had to pay attention to the way I used to learn. It was something that I hadn't paid attention to before because I suppose that it is an accepted fact that everyone does it."

Students in general complained about the limited number of activities on learning styles in the course. In particular, one student opined, "I think that it is a very good idea to complete the questionnaire, and I think that we should do more throughout the course to know our ways of doing things and to know how to improve."

Furthermore, many students complained about the fact that tasks on learning styles could have been done earlier so as to achieve better academic results. Among the students, one respondent posited, "If I had used the techniques of the questionnaire I would have passed this subject; so I think that it is somehow useful."

By using the Kolb LSI in class, most students perceived that a completely new teaching approach was being used. One student remarked, "I think that these new trends in teaching have to be welcomed, and a change in the field of teaching and education will always be productive and beneficial."

On the second question of the perceptions questionnaire, students were asked which characteristics they thought most corresponded to them as learners. They provided a wide range of responses (see Figure 4 below). Fourteen percent of the students mentioned that they preferred learning by observing; thus, these are individuals who perceive information concretely, a finding which concurs with the one third (33%) of the population interviewed who reported a Diverging learning style (see Figure 1). Ten percent of the students indicated a preference for learning by getting involved in activities, a characteristic also portrayed in people with the Diverging learning style who generally need to be personally involved in tasks. Seven percent of the informants considered themselves to be responsible, and seven percent also asserted that they take their time before acting. This would also seem to correspond to the characteristics of seeking commitment and of valuing insightful thinking, both of which are common traits in Divergers. Three percent of the students affirmed that they accept people or situations as they are, which is a characteristic of Divergers. Some students said they liked learning things through feelings, and many students also added that they usually had lots of questions (6%).
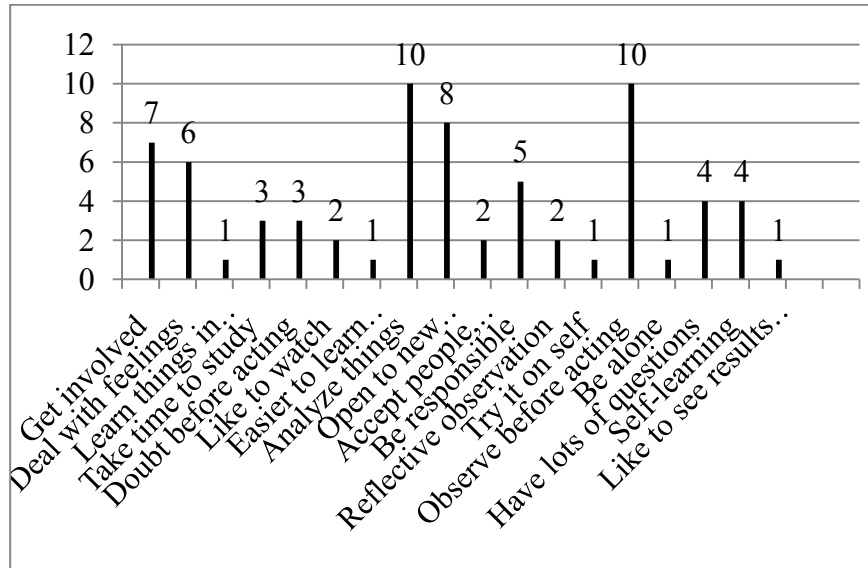
Figure 4. Students' Characteristics that Correspond Most to Them as Learners

Twelve percent of the students considered themselves open to new experiences, which would correspond to the 25% of students who showed an Accommodating learning style (see Figure 1) and who therefore like to "involve themselves in new and challenging experiences" (Kolb & Kolb, 2006, p. 50). Some students indicated that they prefer to work by trying things out for themselves, which also points to a trait of Accommodators who prefer to learn by trial and error.

Fourteen percent of the students said that they preferred learning by analyzing things. This would correspond to the 23% of students who showed a Converging learning style.

Some students (3%) thought of themselves as users of the skill of Reflective Observation (RO), which would correspond to either Divergers or Assimilators. In addition, others commented on being energetic and enthusiastic, or seeing results as a consequence of their own efforts.

By answering the questionnaire, some students realized that they showed more than one pattern of learning behavior and therefore could be included in more than one learning style category. As one student pointed out, "I think that liking to break things down into pieces and

always evaluating the possibilities makes me more of an AC person, although the other type, RO, has some characteristics that are most like me too."

All in all, the results in Figure 4 confirm the presence of three main learning styles (viz., Diverging, Accommodating and Converging) among the students and correspond in general to the results presented in Figure 1.

Finally, as to student reaction to the results of the Kolb LSI (see Figure 5 below), most of the students (91%) agreed with their scores, which reveals that the information obtained from the Kolb inventory coincided with the students' previous perceptions of their own learning style. In this regard, one student pointed out, "I think that the Learning Styles questionnaire is quite interesting and in my case it is quite accurate and right with my learning style, which is concrete and reflective."
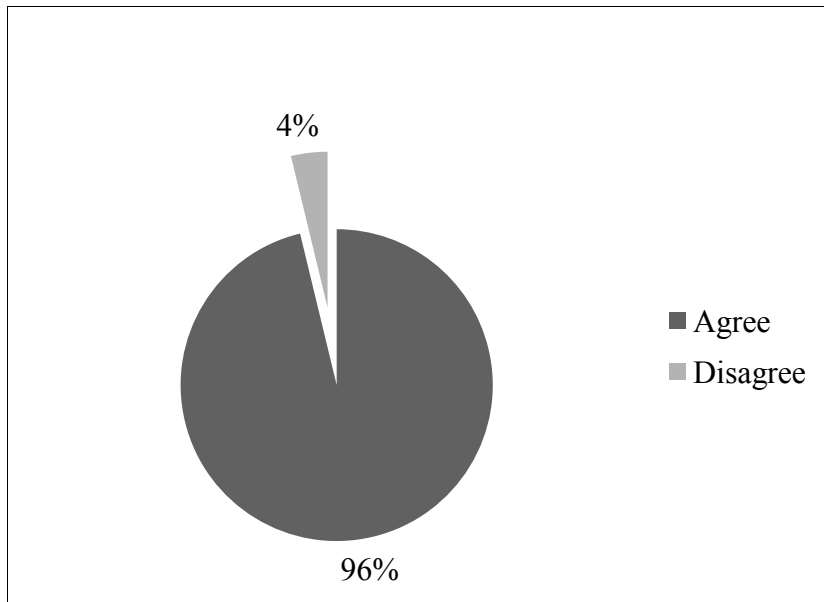

Figure 5. Students' Agreement with the Kolb LSI Results

1. Student comments, which were written in English, the students' target language, have been included in their original version.

Discussion

The objective of the present study was twofold. First, it aimed at investigating the learning styles of Spanish undergraduate students by means of the Kolb LSI, and, second, it aimed at determining students' perceptions of their own learning style identification by means of an opinion questionnaire.

As for the first research question, the results on the Kolb LSI indicated that most undergraduate students studying for an English Philology degree at the University of the Balearic Islands, Spain, had either a Diverging, Accommodating or Converging learning style. Among these, the Diverging style had the highest percentage. Among the sample of undergraduate learners, female informants were a decided majority, comprising about 79% of the total sample population, while the male presence in the study did not reach the one-quarter mark (21%). Yet, the results also revealed that most female students had a Diverging learning style while most male students had a Converging learning style. It could be that the males in this group were skill-oriented and learned by problem-solving and decision-making. Our results differ from two other studies (Contessa, Ciardiello & Perlman, 2005; Mammen et al., 2007) with participants who were surgical students. Those results revealed Converging as the most commonly occurring style and suggested that individual learning styles may be constant throughout residency training.

In the present study the learning style which registered the lowest percentage among students was the Assimilating learning style, which could be due to the fact that Assimilating type of learners are "less focused on people and more interested in ideas and abstract concepts" (Kolb & Kolb, 2006, p. 49). Assimilators, therefore, tend to specialize in the natural sciences, maths, or research. These are subjects that do not pertain to this study's participants. This would be corroborated by the findings of Terrell (2002) whose results indicated that most doctoral students majoring in Computing Technology in Education fell into Kolb's Converger and Assimilator categories. Similarly, Demirkan and Demirbaş (2007) observed that the distribution of freshman design students was concentrated in the assimilating group.

As for the second research question, the results showed that the Spanish EFL undergraduate students generally had a positive reaction to using the Kolb LSI in the EFL classroom. More specifically, the qualitative findings obtained through the questionnaire showed that the

Kolb LSI was an appropriate tool to promote self-awareness of learning, identification of learning style, and the importance of its use in the classroom. This agrees with the contention that the Kolb LSI is "the most widely used adult-oriented inventory emphasizing information processing and cognitive personality style models" (Hickcox, 2006, p. 5). The findings further support those by Lashley and Barron (2006) who strongly suggest using the Kolb's experiential cycle as a way of approaching the learning needs of students, as well as encouraging the development of balanced learning strategies that lead to reflective practice.

The qualitative findings also show that the results obtained from the Inventory were in accordance with the students' previous perceptions of their own learning style. The application of the Kolb LSI in an EFL context also made for an increase in the knowledge of learning styles among the students. Some of the learning styles may have differed from a student's own particular learning style and thus favored an awareness of how to improve learning.

Additionally, the qualitative findings from the undergraduate students' perceptions also suggest that the application of the Kolb LSI in an EFL context may positively influence the praxis of the teacher and allow for teaching method selection based on the student learning style landscape. The findings of Thomas and McKay (2010) provide evidence of the improvement of learning outcomes when instructional material is matched to students' cognitive styles.

The qualitative results suggest just how novel it is to use the Kolb LSI in the foreign language classroom. Unfortunately, traditional teaching methodologies still dominate in the Spanish EFL university context in which little attention is given to learning styles. Terrell (2002) advised that educational institutions should be prepared to address learning style issues when developing and offering formative programs. That has not happened yet.

Undergraduate students encountered some difficulties in categorizing their styles when completing the Kolb LSI. This may be due to the students' lack of familiarity with these types of tools in particular, and the rarity of tackling issues related to the learning process in the EFL classroom in general. Similar challenges were described by Arthurs (2007) among nurse educators in a nursing program. Still, the results of

the present study show a generally positive reaction to the use of the Kolb Inventory in the EFL classroom.

Conclusions and Recommendations

The results obtained in this study are generally supportive of using tools, such as the Kolb LSI, to assist in identifying student learning styles in the second language classroom and to help especially in enhancing student awareness of various learning styles. More qualitative research should be conducted to provide a more accurate picture of EFL educational practices that address various learning style approaches (or the lack thereof) in the curricula. It would also be useful to control for the possible effect of teacher acknowledgment of the student learning style diversity, as well as for the effect of various differentiated instructional methods (Elhe, 2007). The information which may be gathered from student learning styles may "enable educators to be more constructively responsive to individual differences amongst students, and to design instruction that accords with the instructor's purposes in deliberately striving to achieve either a match or a mis-match of the instruction with individual students' learning styles" (Claxton and Murrell 1987, p. iii). Cavanagh and Coffin (2009) also believe that matching students' learning styles preferences with teaching styles is important for maximizing learning.

This study has shown that the majority of the informants responded positively to the use of the Kolb LSI, which would warrant further use of such inventories in EFL tertiary education settings. Efforts to generalize a common practice of identification of learning style should be made to promote improvement in the educational quality of EFL contexts. As Hickcox posits (2006) "It is highly recommended that educators are offered opportunities to connect learning styles to a variety of teaching approaches" (p. 14). Finally, teacher education programs should also address both theoretical and practical aspects of learning styles.

There are certain limitations of this study, such as the small number of participants, as well as the fact that they were all drawn from one group of students in a particular setting at a single educational level. Further research should consider the diversity of learning styles not only in the field of instruction, but also in educational assessment, to avoid

systematically favoring students with one particular learning style in higher education academic contexts.

References

Arthurs, J. B. 2007. "A juggling act in the classroom: Managing different learning styles." *Teaching and Learning in Nursing, 2*(1), 2-7.

Bedford, T. 2006. "Learning styles: A review of English-language literature." In R. R. Sims & S. J. Sims (Eds.), *Learning styles and learning*. New York, NY: Nova Science Publishers. 19-42.

Cano-Garcia, F., & Hughes, E. H. 2000. "Learning and thinking styles: An analysis of their interrelationship and influence on academic achievement." *Educational Psychology, 20*(4), 413-430.

Carroll, J. B. 1963. "A model of school learning." *Teachers College Record, 64*, 723-733.

Cavanagh, S. J., & Coffin, D. A. 2009. "Matching instructional preference and teaching styles: A review of the literature." *Nurse Education Today, 14*(2), 106-110.

Center on Disability Studies. (n.d.). *Effective practices brief: Social and emotional learning*. Retrieved from University of Hawaii, Center on Disability Studies website: http://www.sig.hawaii.edu/products/briefs/sel_brief.pdf.

Chapelle, C. A. 1992. "Disembedding 'Disembedded figures in the landscape…': An appraisal of Griffiths and Sheen's 'Reappraisal of L2 research on field dependence/independence'." *Applied Linguistics, 13*(4), 375-384.

Chapelle, C. A., & Roberts, C. 1986. "Ambiguity tolerance and field independence as predictors of proficiency in English as a second language." *Language Learning, 36*, 27-45.

Claxton, C. S., & Murrell, P. H. 1987. *Learning styles: Implications for improving educational practices* (Report No. 4). Washington, DC: Association for the Study of Higher Education.

Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. 2004. *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. Retrieved from Learning and Skills Research Centre website: http://www.hull.ac.uk/php/edskas/learning%20styles.pdf

Contessa, J., Ciardiello, K. A., & Perlman, S. 2005. "Surgery resident learning styles and academic achievement." *Journal of Surgical Education, 62*(3), 344-347.

Cook, G. 2000. *Language play, language learning*. Oxford, England: Oxford University Press.

DeCapua, A., & Wintergerst, A. C. 2005. "Assessing and validating a learning styles instrument." *System, 33*(1), 1-16.

Demirkan, H., & Demirbaş, Ö. O. 2007. "Focus on the learning styles of freshman design students." *Learning and Instruction, 17*(3), 345-359.

Dörnyei, Z., & Skehan, P. 2003. "Individual differences in second language learning." In C. J. Doughty & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 589-639). Oxford, England: Blackwell.

Dunn, R., & Griggs, S. 2000. *Practical approaches to using learning styles in higher education.* Westport, Connecticut: Bergin and Garvey.

Ehle, M. J. 2007. "Enhancing equity and diversity in teacher education through assessment and accommodation of pre-service teachers' learning and teaching styles." Paper presented at the ATEE 32nd Annual Conference, University of Wolverhampton, Telford Campus.

Ehrman, M. E. 1996. *Understanding second language difficulties.* Thousand Oaks, CA: Sage.

Ehrman, M., & Leaver, B. L. 2003. "Cognitive styles in the service of language learning." *System, 31*(3), 393-415.

Ehrman, M. E, Leaver, B. L., & Oxford, R. L. 2003. "A brief overview of individual differences in second language learning." *System, 31*(3), 313-330.

Ehrman, M. E., & Oxford, R. 1990. "Adult language learning styles and strategies in an intensive training setting." *Modern Language Journal, 74*(3), 311-327.

Ellis, R. 1989. "Classroom learning styles and their effect on second language acquisition: A study of two learners." *System, 17*(2), 249-262.

Ellis, R. 1992. *Second language acquisition and language pedagogy.* Clevedon, Philadelphia: Multilingual Matters.

Gardner, R. C. 2005. "Motivation and Attitudes in Second Language Learning." In Brown, K. (Ed.), *Encyclopedia of language and linguistics* (2nd ed., Vol. 8, pp. 348-355). Oxford, England: Elsevier.

Griffiths, R., & Sheen, R. 1992. "Disembedded figures in the landscape: A reappraisal of L2 research on field dependence/independence." *Applied Linguistics, 13*, 133-148.

Henson, K. T., & Borthwick, P. 1984. "Matching styles: A historical look." *Theory into Practice, 23*, 3-9.

Hickcox, L. K. 2006. "Learning styles: A review of the inventories—1960s-2000s and the question of their actual uses inside and outside of the classroom." In R. R. Sims & S. J. Sims (Eds.), *Learning styles and learning* (pp. 1-17). New York, NY: Nova Science Publishers.

Horwitz, E. K. 1995. "Student affective reactions and the teaching and learning of foreign languages." *International Journal of Educational Research, 23*(7), 573-579.

Joy, S., & Kolb, D. A. 2009. "Are there cultural differences in learning style?" *International Journal of Intercultural Relations, 33*(1), 69-85.

Kauchak, D., & Eggen, P. 2008. *Introduction to teaching: Becoming a professional* (3rd ed.). Boston, MA: Pearson Education.

Keefe, J. W., & Ferrell, B. G. 1990. "Developing a defensible learning style paradigm." *Educational Leadership, 48*(2), 57-61.

Kolb, D. A. 1985. *Learning style inventory.* Retrieved from http://www.haygroup.com.

Kolb, A. Y., & Kolb, D. A. 2006. "Learning styles and learning spaces: A review of the multidisciplinary application of experiential learning theory in higher education." In R. R. Sims & S. J. Sims (Eds.), *Learning styles and learning*. New York, NY: Nova Science Publishers, 45-91.

Lashley, C., & Barron P. E. 2006. "The learning style preferences of hospitality management students: Observations from an international and cross cultural study." *International Journal of Hospitality Management, 25*(4), 552-569.

Lemire, D., & Gray, J. 2003. "An introduction to learning styles for developmental educators." *Journal of College Reading and Learning, 33*(2), 231-239.

Mammen, J. M., Fischer, D. R., Anderson, A., James, L. E., Nussbaum, M. S., Bower, R. H., & Pritts, T. A. 2007. "Learning styles vary

among general surgery residents: Analysis of 12 years of data." *Journal of Surgery Education, 64*(6), 386-389.

McCarthy, B. 1980. *The 4MAT system: Teaching to learning styles with right/left mode techniques*. Barrington, IL: Excel.

Moran, A. 1991. "What can learning styles research learn from cognitive psychology? *Educational Psychology, 11*(3/4), 239-246.

Oxford, R. L. 1990. *Language learning strategies: What every teacher should know*. Boston, MA: Heinle and Heinle.

Oxford, R. L., & Burry-Stock, J. A. 1995. "Assessing the use of language learning strategies worldwide with the ESL/EFL version of the Strategy Inventory for Language Learning (SILL)." *System, 23*(1), 1-23.

Oxford, R., & Ehrman, M. 1993. "Second language research on individual differences." *Annual Review of Applied Linguistics, 13*, 118-205.

Oxford, R., Ehrman, M., & Lavine, R. 1991. "Style wars: Teacher-student style conflicts in the language classroom." In S. S. Magnan (Ed.), *Challenges in the 1990s for college foreign language programs*. Boston, MA: Heinle and Heinle, 1-25.

Peterson, E. R., Rayner, S. G., & Armstrong, S. J. 2009. "Researching the psychology of cognitive style and learning style: Is there really a future?" *Learning and Individual Differences, 19*(4), 518-523.

Reid, J. M. (Ed.). 1995. *Learning styles in the ESL/EFL classroom*. Boston, MA: Heinle and Heinle.

Sims, R. R., & Sims, S. J. (Eds.). 1994. *The importance of learning styles: Understanding the implications for learning, course design, and education*. Westport, CT: Greenwood Press.

Sims R. R., & Sims, S. J. (Eds.). 2006. *Learning styles and learning*. New York, NY: Nova Science Publishers.

Skehan, P. 1998. *A cognitive approach to language learning*. Oxford, England: Oxford University Press.

Terrell, S. 2002. "The effect of learning style on doctoral course completion in a web-based learning environment." *Internet and Higher Education*, 5(4), 345-352.

Thomas, P. R., & McKay, J. B. 2010. "Cognitive styles and instructional design in university learning." *Learning and Individual Differences, 20*(3), 197-202.

Van Zwanenberg, N., Wilkinson, L. J., & Anderson, A. 2000. "Felder and Silverman's Index of Learning Styles and Honey and Mumford's Learning Styles Questionnaire: How do they compare and do they predict academic performance?" *Educational Psychology, 20*(3), 365-380.

Wintergerst, A. C., DeCapua, A., & Verna, M. A. 2003. Conceptualizing learning style modalities for ESL/EFL students. *System, 31*(1), 85-106.

Zywno, M. S. 2003. *A contribution to validation of score meaning for Felder-Soloman's Index of Learning Styles*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Nashville, TN.

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Appendix 1

Questionnaire to determine the perceptions on identifying one's learning style through the Kolb (1985) Learning Style Inventory

(Students)

MALE/FEMALE:
AGE:
DEGREE:
COURSE:

1. Did you like to identify your learning style through the Kolb LSI?

YES	NO

Why_____
_____
_____
_____

2. Was it the first time that you identified your learning style in class with the Kolb LSI?

YES	NO

3. Had you identified your learning style before with another type of test?

YES	NO

If you gave a positive answer, which test did you use?
_____
_____

4. Do you think that it is useful for you to know what learning style you have?

YES	NO

Why_____
_____
_____
_____

5. Do you think that it is useful for your teacher to know what
    learning style you have?

YES	NO

Why_____
_____
_____
_____

6. Did you agree on the learning styles results obtained through the
    Kolb LSI?

YES	NO

Why_____
_____
_____
_____

7. From the Kolb LSI, which characteristics seemed to be the most
    connected to who you believe you are as a learner?

_____
_____
_____
_____
_____
_____

8. Write about your experience and perceptions using the Kolb LSI?

_____
_____
_____
_____
_____
_____