

A Study of EFL College Students' Learning Styles and Learning Strategies

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Abstract: Research in the area of learning style and strategies in EFL contexts is mostly being conducted in primary schools, junior high schools, or senior high schools. Comparatively fewer studies concentrated on college students' learning styles and strategy use. In addition, most previous studies adopted Kolb's (1985) Learning Style Inventory or Reid's (1987) PLSPQ to measure learners' learning style preference. Few of them used Felder and Soloman's (1988) Index of Learning Styles (ILS), which is more concise and easy to be administered in written or computer formats. In order to fill in the void, the purpose of this study was to explore the relationship between tertiary level EFL college students' learning styles, and learning strategies. Participants were 109 freshmen, with 79 male and 30 female students. The instruments were Felder and Soloman's (1988) Index of Learning Styles (ILS) and Schmitt's (1997) taxonomy of vocabulary learning strategies. Descriptive statistics and one-way ANOVA were conducted and the results showed that most of the participants were balanced type of learners on all learning style dimensions. For their use of vocabulary learning strategies, most of the participants used determination and cognitive strategies more frequently than other strategies. Finally, for the effect of learning styles on learners' strategy choice, ANOVA analyses showed that only active, reflective and balanced types of learners affect their choice in social, memory, and metacognitive strategies. Results showed that students bring to the classroom a great diversity of learning styles, and the best practice for EFL teachers is to offer courses which employ many teaching styles, and to design tasks which help students in developing their learning styles they are weak, and plan their teaching using a balanced teaching approach.

Key words: learning styles, learning strategies, tertiary level

1. Introduction

Learning styles are learners' general approaches to language learning (Oxford, 2003), and theories related to learning style moved on a continuum ranging from the fixed trait approaches, in which one's learning styles are stable and fixed, to the opposite "fluid traits approaches", in which one's learning styles can change over time and vary based on different learning tasks (Litzinger, Lee, Wise, & Felder, 2007, pp. 309–310). The theory behind Felder and Soloman's (1988) Index of Learning Styles (ILS) used in this study was firmly rooted in the fluid trait approach (Litzinger, Lee, Wise, & Felder, 2007, pp. 309-310).

Learning strategies are specific ways learners employed to deal with language tasks in particular contexts (Oxford, 2003). Catalan (2003, p. 54) extended the concept and defined vocabulary learning strategy: as

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“knowledge about the mechanisms (processes, strategies) used in order to learn vocabulary as well as steps or actions taken by students (a) to find out the meaning of unknown words, (b) to retain them in long-term memory, (c) to recall them at will, and (d) to use them in oral or written mode.” It has been documented in studies that an individuals' strategy choices and strategy use was strongly related to learning styles, and learning styles and strategies had great impact on students' learning achievements (Reid, 1998; Schmitt, 1997).

Although many researchers contributed much information in style and strategy research and a review of these studies showed that the participants being investigated were ranging from learners in primary school (Hsu, 2007; Huang, 2011; Kung, 2004), junior high school (Lee, 2005; Liao, 2008), or senior high school (Tsao, 2002; Wang, 2004); comparatively fewer studies explored the relationship between tertiary level EFL college students' learning styles, and strategies. Secondly, most previous studies adopted Kolb's (1985) Learning Style Inventory or Reid's (1987) PLSPQ to measure learners' learning style preference. Few of them used Felder and Soloman's (1988) Index of Learning Styles (ILS), which is more concise and easy to administer one either in written or computer formats. In Kolb's version of learning styles, every participant just had only one mode of learning while Felder and Soloman's ILS has been used extensively used in engineering field, and resulted in more than one type of learning styles a person may have. It provides a rich profile of one's strengths and possible tendencies or habits (Williams et al., 2013). Therefore, this study aims to investigate the relationship between EFL freshmen's learning style, and learning strategies by using Felder and Soloman's (1988) Index of Learning Styles (ILS). The participants were 109 college freshmen from National Yunlin University of Science and Technology in Taiwan. Based on the research purpose, the research questions were as follows:

- (1) What are EFL college students' English learning styles?
- (2) What are EFL college students' English learning strategies?
- (3) What is the effect of EFL college students' English learning style on their learning strategies?

2. Literature

2.1 Overview of Learning Styles and Learning Strategies

Language learning is one of the most challenging and fairly complicated activities one has to cope with. Many factors existed affecting the success of language learning, such as learners' learning process, which involves the professional and educational guidance as well as personal learning tendencies in receiving, absorbing, organizing and applying information they acquire. Therefore, understanding one's own innate strengths could help learners perform better in different fields, and learners' awareness about their own learning styles, strategies and their ability to use the most appropriate strategies for themselves are important (Cabi & Yalcinalp, 2012). Learning styles and learning strategies were key to their language learning achievements (Ehrman & Oxford, 1990), and learning preferences, strategies choices and academic achievement were interrelated (Ehrman, Leaver & Oxford, 2003). For example, Li and Qin (2006) examined the relationship between students' learning styles and strategies by using questionnaires and interview and confirmed that different learning styles had a significant influence on learners' learning strategy choices, and suggested that providing learners' training and helping them identify their strengths and weaknesses could have positive influence on learning outcomes.

2.2 Relationship between Learning Styles and Learning Strategies

Oxford (1989) believed that factors like learner' target language, length of language learning, age, gender, attitude, and motivation impacted learners' selections of learning strategies. Among them, learning style is one of

the major factors affecting one's learning. Later, Oxford and Anderson (1995) further pointed out learners with different learning styles tended to use the strategies mirroring their habitual learning modes, and learners' learning strategies were always related to their learning styles (Reid, 1998). If learners were aware of their learning strengths and able to apply effective learning strategies, the negative emotion from learning frustration could be diminished (Rubin, 1975). Previous studies showed that students chose certain strategies more or less according to their own learning styles (Ehrman, Leaver & Oxford, 2003; Ehrman & Oxford, 1990; Rossi-Le, 1989). For instance, in Ehrman and Oxford's study (1995), individuals' learning styles and strategy use were explored in the strategy training instruction and the results showed that learners' learning styles had a moderate correlation with their learning strategies. In Carson and Longhini's (2002) diary study, they found that the participants' learning styles (visual, introverted, intuitive/random) often impacted their use of strategies. Similarly, Huang (2011) investigated the correlation of the six graders' vocabulary learning strategies and learning styles, and students' learning styles (visual, auditory, tactile, kinesthetic, and group style) were all moderately and positively correlated to their overall vocabulary learning strategy use. Also, Lin and Qin (2006) investigated the relationship between learning styles and strategies in tertiary-level English learners in China. Utilizing both qualitative and quantitative data collection methods, the researchers demonstrated that learning styles have a significant influence on learners' learning strategy choices.

So far, many researchers have proved the connections between learning preferences and learning strategies. Nevertheless, some results of the researchers did not support this point of view. For instance, Kılıç and Karadeniz (2004) investigated the effect of navigation strategies, gender and learning styles to success. The results of their study indicated that students' success did not change with gender, learning style and navigation strategies. Also, it had been indicated that navigation strategies did not differ significantly according to learning style and gender. In the same year, another study conducted by Myers and Dyer (2004) identifying the influence of student learning styles on critical thinking skills. The target population for this study was 135 students enrolled in a college of agriculture and life sciences leadership development course. Results showed no differences in critical thinking ability existed between students' learning styles. They attributed the results to teachers' instructional methods and techniques that would enhance the critical thinking skills of the learners. Cabi and Yalcinnalp's research (2012) had the same outcome. Their study aimed to find the effect of learning strategies, gender and departmental differences on learning styles of prospective teachers in higher education. The results showed that there was no significant effect of learning strategies (rehearsal, elaboration, organization, critical thinking, metacognition, managing time and study environment, effort management, peer learning, and help-seeking strategies) on learning style of students. They further suggested to conduct such studies in design of instructional applications that will be developed based on students' characteristics and requirements. Taken as a whole, the relationship between learning styles and learning strategies is not as simple and definite as the majorities think. A review of these studies showed that learning styles were not the only factor affecting one's learning. Instead, many factors influenced learners' selection of learning strategies, and all the possible factors need to be taken into consideration. Therefore, this study aims to investigate the relationship between EFL freshmen's learning style, and learning strategies by using Felder and Soloman's (1988) Index of Learning Styles (ILS).

3. Method

In order to answer the research questions, the researchers used quantitative study approach to collect and

analyze data from the participants. Using questionnaire as a tool for data collection is a flexible and efficient approach to investigate a wide range of topics, and can be used to generate findings which can be used as a basis to draw conclusions about the target population. Two questionnaires on Felder and Soloman's (1988) Index of Learning Styles (ILS) and Schmitt's (1997) taxonomy of vocabulary learning strategies were given to all the participants in this study.

The participants were 109 freshmen from one technological university, including 79 males and 30 females in Taiwan. Their native language is Mandarin, and they were about 18 or 19 years. In terms of their English learning experiences, all of the students have received at least six years of English education since junior high schools and the length of their English education were about the same.

3.1 Instrument

Two questionnaires, including Index of Learning Styles (ILS) survey and English Vocabulary Learning Strategies (VLS) survey were used in this study. The index of learning style (Felder & Soloman, 1991) contains 44 two-alternative forced choice questions designed to break the learning styles approximately into four dimensions of a learning style model: active/balanced/reflective, sensing/balanced/intuitive, visual/balanced/verbal, and sequential/balanced/global.

The second instrument, adopted from Schmitt's (1997) taxonomy of vocabulary learning strategies, grouped strategies into five categories. There were 58 items in total. Nine items for Determination Strategies (DET), 8 items for Social Strategies (SOC), 24 items for Memory Strategies (MEM), 9 Items for Cognitive Strategies (COG), and 8 items for Metacognitive Strategies (MET). DET and part of items of SOC were strategies for the discovery of a new word's meaning while MEM, COG, MET and part of items of SOC are strategies for consolidating a word once it has been encountered.

3.2 Procedure and Data Collection

The learning styles and learning strategies questionnaires were administered to the 109 freshmen in one university. Before the test, the researchers gained the permission of all the participants and the instructor by signing the consent forms to conduct the investigation during the class time. The test lasted 100 minutes since the large number of items. Before the test, the researcher gave the participants a brief introduction about the purpose and the procedure of investigation to make sure the participants understood what they needed to do. Also, any question that the participants asked was welcomed. The participants were informed that the data collected from the two questionnaires were for academic purposes, and they could answer according to their experience. All of the participants' personal information was confidential and their responses were not be revealed to anyone else. After data collection, the researchers entered the data by creating an electronic spreadsheet in Microsoft Excel, and then transfer data from Excel to SPSS for statistical analysis.

3.3 Data Analysis

To answer the research questions in the present study, the quantitative data was analyzed by using Statistical Package for Social Science (SPSS) version 20.0. Firstly, descriptive statistic and One-way ANOVA was used to examine whether there were any significant differences among learning style and the vocabulary learning strategies the participants.

4. Findings of the Study

4.1 Results of Research Question 1

Research Question 1: What are EFL college students' English learning styles?

As Table 1 displayed, except for the dimension of visual/verbal, most of the participants belong to the balanced type in other three dimensions (active/reflective, 61.47%; sensing/intuitive, 61.47%; sequential/global, 64.22%). In the dimension of visual and verbal, the majority of participants were visual learners (75.23%) while verbal learners were with very low proportion (0.92%). The findings were similar to previous studies (Oxford & Anderson, 1995; Reid, 1987) in which Asian students relied highly on pictures, charts, demonstration and other visual ways to study. Also, the results were consistent with the study done by Mulalic, Mohd Shah and Ahmad (2009), who reported that visual learning style was the preferred way of learning. Moreover, the findings corresponded with the research that Chinese college students demonstrated strong inclinations for visual learning style (Wintergerst, DeCapua & Verna, 2003). In all, the results of the learning style distributions were in accord with the investigation done by Yeow et al. (2010), which also showed the students predominantly balanced in the dimension of active/reflective, sensing/intuitive, and sequential/global. However, most of them had visual learning styles in the visual/verbal dimension.

Table 1 The Distribution of Learning Styles

	n	Percent
Active/reflective		
Active	16	14.68
reflective	26	23.85
balanced	67	61.47
Sensing/Intuitive		
sensing	26	23.85
intuitive	16	14.68
balanced	67	61.47
Visual/Verbal		
visual	82	75.23
verbal	1	.92
balanced	26	23.85
Sequential/Global		
Sequential	12	11.01
Global	27	24.77
balanced	70	64.22
Total	109	

4.2 Results of Research Question 2

Research Question 2: What are EFL college students' English learning strategies?

Among the five learning strategy categories, the highest one was determination (mean = 3.36, *SD* = .50), followed by cognitive (mean = 3.22, *SD* = .65), metacognitive (mean = 2.90, *SD* = .77), memory (mean = 2.82, *SD* = .66), and social (mean = 2.79, *SD* = .72). Determination strategies were the most frequently employed by the

participants while social strategies were the least frequently used. The finding that social strategies had the lowest mean accorded with previous studies (Sung, 2006; Wang, 2004; Wu, 2010). However, the findings of that determination strategies was the most frequently used strategies were similar to previous studies (Hsiung, 2011; Huang, 2011; Liao, 2008; Wu, 2005)

4.3 Results of Research Question 3

Research Question 3: What is the effect of EFL college students' English learning style on their learning strategies?

In order to explore the relationship between the participants' English learning styles and their leaning strategies, one-way ANOVA analyses were conducted to examine the role of learners' different learning styles on their learning strategies. The findings were presented accordingly.

Firstly, for the effect of active/reflective and balanced styles on learners' learning strategies , results showed that active/reflective and balanced styles had significant effect in social strategies ($F = 8.235, p < .000$), memory strategies ($F = 5.994, p < .003$), and metacognitive strategies ($F = 10.246, p < .000$). However, no significant differences were found in determination strategies ($F = 2.364, p < .099$) and cognitive strategies ($F = 2.680, p = .073$). It means that different learning styles (active, reflective, and balanced) can lead to different strategy choices in social, memory, and metacognitive categories. The post hoc Scheffe tests showed that active and balanced types of learners used significantly more in social strategies than those of reflective type of learners. Secondly, in terms of memory strategies, the active learners employed more strategies than reflective learners. Thirdly, in metacognitive strategies, active learners used significantly higher strategies than those of the reflective and balanced learners. Also, balanced learners employed more metacognitive strategies higher consciousness than reflective learners.

Table 2 Mean Score, Standard Deviation, and Post Hoc Scheffe of Active/Reflective on Learning Strategies

categories	Types of learning	.437	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	Post hoc Scheffe
Determination	(1) Active	16	3.576	.437	2.364	.09	NA
	(2) Reflective	26	3.235	.478			
	(3) Balanced	67	3.352	.513			
Social	(1) Active	16	3.203	.609	8.235	.000***	(1) > (2) (3) > (2)
	(2) Reflective	26	2.375	.678			
	(3) Balanced	67	2.849	.683			
Memory	(1) Active	16	3.232	.609	5.994	.003***	(1) > (2)
	(2) Reflective	26	2.535	.549			
	(3) Balanced	67	2.825	.669			
Cognitive	(1) Active	16	3.556	.435	2.680	.073	N A
	(2) Reflective	26	3.115	.562			
	(3) Balanced	67	3.182	.701			
Metacognitive	(1) Active	16	3.523	.697	10.246	.000***	(1) > (2)(3) (3) > (2)
	(2) Reflective	26	2.495	.665			
	(3) Balanced	67	2.907	.737			

Note *** $p < .001$; NA: no significant differences in post hoc analyses

Secondly, in terms of the effect of sensing/balanced/intuitive learning styles on students' learning strategies, ANOVA analyses reported that different learning styles did not have any significant effect on determination strategies ($F = 1.610, p = .205$), social strategies ($F = 1.559, p = .215$), memory strategies ($F = 1.120, p = .330$), cognitive strategies ($F = .282, p = .755$), and metacognitive strategies ($F = .269, p = .764$). For the effect of sequential/global/balanced learning styles on learning strategies, the result of one-way ANOVA indicated that there were no significant differences between sequential/global/balanced styles on any types of four strategies. To sum up the findings of research question 3, only active/balanced/reflective styles had great impact on learners' choice in social, memory, and metacognitive strategies. The other three dimensions of learning styles did not show any significant differences in learning strategies. Although the results were contradictory with many studies (Huang, 2011, Liao, 2008; Wang, 2004), still there were some researches supported this findings (Cabi & Yalcinalp, 2012; Kılıç & Karadeniz, 2004). For instance, Cabi and Yalcinalp (2012) found that there was no significant effect of learning strategies on learning style of students. Another research done by Kılıç and Karadeniz (2004) also found navigation strategies did not vary significantly according to learning styles.

5. Conclusion

5.1 Pedagogical Implication

Most learning styles did not influence learners' selection of learning strategies, only the dimension of active, reflective, and balanced type significantly influenced learners' strategy choice in social, memory, and metacognitive strategies. Even so, teachers should not neglect students' learning ways in their learning process, and they need to find out what other factors like anxiety, motivation, personality, language aptitude may be related to students' learning achievement. There was some useful information in the study for teachers' reference. Among the four dimensions of learning styles, most participants belonged to balanced type in three out of four learning style dimensions. These balanced type learners were capable of using the two distinct learning ways. Thus, teachers can design more different curriculum, plan various activities or tasks in class and make adjustments to let students use their different learning preferences to enjoy learning. For instance, activities like team work or group learning is effective in this context by having a balance of style within the group learning so that each may learn from others with different learning styles. Felder and Silverman (1988, p. 680) also proposed thirteen teaching techniques to address all learning styles. Some of them are as follows: "Assign some drill exercises to provide practice in the basic methods being taught (sensing/active/sequential) but do not overdo them (intuitive/reflective/global)... Provide some open-ended problems and exercises that call for analysis and synthesis (intuitive/reflective/global). ..Explain to struggling sensors or active or global learners how they learn most efficiently may be an important step in helping them reshape their learning experiences so that they can be successful (all types)."

To summarize, learning style is just one of the many factors which influence the learning process and the learning results (Castro & Peck, 2005). The aim of exploring the connection between learning style and learning success is not to discover which learning style is better or worse. Instead, the information is valuable in offering educators a way to check their teaching approaches and to facilitate learners to be aware of their own advantages and drawbacks in learning. Undoubtedly, in the real EFL learning situation or EFL classroom teaching, it is better to take all of the students' learning preferences into account and it is better for teachers to constantly try to remember how each learner learns best.

5.2 Limitations of the Study

There were some limitations in this study. First of all, the target participants in the current study were confined to the freshmen at a particular university. Also, the number of participants may not be sufficient to generalize the results to illustrate all the EFL college students. Next, due to the fact that ILS and VLS questionnaires were the only instruments used to investigate the participants' learning styles and learning strategies, the data was restricted to the self-report questionnaire. The responses from the participants may not truly reflect their real leaning behaviors because of other types of learning styles and learning strategies may not be included in the questionnaires used in the study. Therefore, for future studies, other comparative studies about students with larger sample size, different geographical regions, or age groups, and different cultures and countries are strongly encouraged to determine if these findings are applicable to other target population.

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