The Relation of Gender, Major and Proficiency to Language Learning Strategy Preferences among Technological University Freshmen

科技大學新生英語學習策略與性別、科系及英語能力之相關研究

Mei-liang Lin

林美良

ABSTRACT

The purpose of this study is to identify the language learning strategy (LLS) preferences of technological university freshmen and to examine whether there are any significant differences in terms of gender, proficiency and college attended. The researcher surveyed 113 freshmen in a technological university using Oxford's (1990) Strategy Inventory for Language Learning, ESL/EFL Version 7.0. The results showed that the higher proficiency students used statistically significant more Affective Strategy and Overall strategy than the lower proficiency students. However, no statistical significant differences were found between gender and among different majors. It is recommended that LLS training or strategies-based instruction should be integrated into a more learner-centred curriculum so that the students can learn more effectively to become independent, active and autonomous life-long language learners.

Key words: EFL, ELT, language learning strategy, SILL, Strategy Inventory for Language Learning

摘要

本研究之目的為探討科技大學新生因性別、英文程度、就讀學院不同，在使用英語學習策略上是否有顯著差異。研究者使用 Oxford (1990)所編製的語言學習策略調查表來針對 113 位科技大學大一新生進行研究。結果顯示在情意策略及總學習策略方面，英文程度較高的學生比英文程度較低者所使用的頻率明顯高出許多。然而，不同性別或學院的學生所使用之學習策略，並沒有發現顯著差異。本研究建議應將策略教學融入以學習者為中心的課程設計，提升英語學習效率，如此學生方能成為獨立、積極而自主的終身學習者。

關鍵詞：英語外語學習、英語外語教學、語言學習策略、語言學習策略調查表。

1. INTRODUCTION

LLS have been examined and reported to successfully assist language learning (O'Malley & Chamot, 1990; Oxford, 1990; Green & Oxford, 1995). Also many researchers indicate that LLS instruction provides good results (Yang, 1998). Therefore it is important for teachers to find out and understand what LLS learners use to facilitate their own learning, and whether teachers support can contribute to learners' use of effective strategies.

Due to the over-expansion of the mass higher educational system, technological universities have become secondary universities in Taiwan. Most of the students who choose to attend technological university tend to be those who do not perform well academically, including at English. After the six-year mandatory formal education period in high school, English is still a core required subject in the technological university. However, these students often suffer low self-esteem and many have low motivation for learning the language. Many technological students may study English simply as

林美良 明志科技大學通識教育中心講師

a subject for passing exams rather than learning it for communication. It is clear that the problems faced by this group of students need attention. Despite the fact that there have been a lot of studies about technology university students with English majors, the non-English major students, however, have been inadequately examined in the past (Teng, 1999; Ho, 1999). In particular, there has been little investigation of freshmen's LLS in technological universities in Taiwan (Teng, 1999) because the LLS that the freshmen use are considered to rely heavily on raw memory, a necessary requirement in order to pass different kinds of college entrance examinations (Wang, 2005). However, this is essentially an assumption which only serves to make it more important to explore how language learning strategies are handled by this particular group of learners. The more teachers know about freshmen students' LLS, the more teachers can be well-equipped to apply the benefits of LLS awareness-raising in the first year of the English language curriculum. The aim is that the students can become autonomous language learners early in their lifelong learning, at the beginning of their university English course.

1.1 Rationale and Purpose

The purpose of this study is to identify the LLS preferences of technological university freshmen in Taiwan and to examine whether there are any significant differences in terms of gender, proficiency and College (faculty) attended.

Research Questions

The study was designed to examine the following questions:

1. Are there any significant differences between female and male students in relation to their use of LLS?
2. Are there any significant differences among students who study in different colleges regarding their use of LLS?
3. Are there any significant differences between students with higher (top quarter) and lower (bottom quarter) grades in the General English Proficiency Test (GEPT) in relation to their use of LLS?

2.0 LITERATURE REVIEW

During the past several decades, language learning strategies have attracted more attention and there has been an abundance of research regarding LLS (Brown, 2000). The following sections will review a brief historical background of LLS and studies on LLS in relation to gender, major and language proficiency.

2.1 Language Learning Strategies

According to Oxford (1990, p8), "learning strategies are specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferrable to new situations." Unlike learning style, learners can control and use LLS intentionally (Oxford, 2003), and research suggests that students can become good language learners through LLS training (Brown, 2001; Oxford, 1990, 2000). In addition, as Oxford (1990, p1) further points out, "Strategies are especially important for language learning because they are tools for active, self-directed involvement, which is essential for developing communicative competence".

2.1.1 Good Language Learner Studies

In the early 1970s, good language learner studies drew some generalizations to characterize good language learners. Through observing second language (L2) learners, Rubin (1975) provided a list of features of good language learners: being a willing and accurate guesser, having a strong drive

to communicate, or to learn from communication, being uninhibited most of the time, willing to make mistakes and live with vagueness, focusing on forms by paying attention to patterns, seeking out opportunities to use the language, monitoring their own speech and that of others; and paying attention to meaning.

Afterwards, to find out effective learning strategies employed by successful learners to accomplish specific tasks, numerous researchers attempted to discover and classify all possible learning strategies used by L2 learners and methods for developing learners' LLS. Although no single set of LLS was found always used by good language learners (Oxford, 2003), many studies found that successful learners tend to use more appropriate and effective strategies to complete language tasks than the poor learners do (Green & Oxford, 1995; Griffiths, 2003,2007; Ho, 1999; Liu, 2004; Oxford & Nyikos, 1989; Su, 2005; Sy, 1996; Teng, 1999; Yang, 1996). Vann and Abraham (1990) found that although unsuccessful learners also used language strategies actively, they often applied strategies inappropriately that led to language task incompletion. Oxford (2003, P8) suggests that LLS are useful when "(a) the strategy relates well to the L2 task at hand, (b) the strategy fits the particular students' learning style preferences to one degree or another, and (c) the student employs the strategy effectively and links it with other relevant strategies."

2.1.2 Identifying and Classifying LLS

After examining and classifying all possible learning strategies used by second language learners, two well-known taxonomies based on cognitive theory were proposed by O'Malley and Chamot (1990) and Oxford (1990). O'Malley and Chamot (1990) classified learning strategies into three categories: cognitive learning strategies, metacognitive learning strategies and social-affective learning strategies. On the other hand, on the basis of cognitive theory and her own research, Oxford (1990) proposes her well-known, comprehensive and detailed taxonomy, the Strategy Inventory for Language Learning (SILL). There are many studies employing SILL to measure the frequency of strategy use by foreign language learners (Ehrman and Oxford, 1988; Oxford and Nyikos, 1989) and by English as second language (ESL) or English as foreign language (EFL) learners (Ho, 1999; Liu, 2004; Su, 2005; Sy, 1996; Teng, 1999; Yang, 1992, 1996). In this study SILL was used to investigate the LLS preference among EFL students in Taiwan so this system is further elucidated.

In SILL, LLS is divided into two groups: direct strategies and indirect strategies. Direct strategies involve direct language learning, while indirect strategies help the general management of language learning. Direct strategies include memory strategies, cognitive strategies and compensation strategies; while indirect strategies include metacognitive strategies, affective strategies and social strategies. The six subcategories of LLS are:

(a) Memory Strategies to store new information and retrieve it later more effectively, such as grouping or using imagery,

(b) Cognitive Strategies to use all the mental processes, such as summarizing or reasoning deductively,

(c) Compensation Strategies to compensate for missing knowledge, like guessing or using synonyms,

(d) Metacognitive Strategies to organize and evaluate leaning, allowing learners to control over their learning process,

(e) Affective Strategies to manage learners' emotions, helping to regulate emotions, motivations and attitudes related to language learning,

(f) Social Strategies to help students learn through interaction with others, such as questioning,

cooperating with peers and developing empathy.

2.2 Factors That Influence Strategy Choice and Use

There are many variables which affect the learners' choice of language learning strategies, such as motivation, proficiency, years of study, sex and major which were examined by Oxford and Nyikos (1989) and Ehrman and Oxford (1988). Besides, ethnicity, national origin, general learning style and other variables have been discussed in other researches (Alta, 2004; LoCastro, 1994; Nyikos & Oxford, 1993; Oxford & Ehrman, 1995; Politzer & McGroarty, 1985). In Taiwan, studies have identified gender, major and L2 proficiency as significant factors in various contexts (Ho, 1999; Liu, 2004; Su, 2005; Sy, 1996; Teng, 1999; Yang, 1996). The following sections will discuss the studies on LLS in relation to gender, major and language proficiency.

2.2.1 Gender and LLS Use

There have been an increasing number of SILL-based studies worldwide tackling the gender differences in the use of LLS. Several studies have found significant differences in relation to gender (Ehraman & Oxford, 1988; Oxford & Ehraman, 1995; Oxford & Nyikos, 1989), while some have also showed that there were no significant differences between males and females (Liu 2004; Young & Oxford, 1997). The findings of Ehraman and Oxford's (1988) study on 78 foreign language learners showed that female learners use more strategies than males, especially in relation to general strategies, authentic language use, searching for and communicating meaning and self-management strategies. Oxford and Nyikos' (1989) study on 1200 foreign language learners echoed Ehraman and Oxford's findings. They discovered that female learners significantly use more language strategy in conversational input elicitation strategies, reflecting social interaction and they also used two additional types of strategies – general study strategies and formal rule-related practice strategies. These differences might have been associated with psychological type as well as "women's greater social orientation, stronger verbal skills (including proper rule usage), and greater conformity to norms, both linguistic and academic" (Oxford, 1989, p238). Oxford and Ehrman (1995) explored 520 foreign language learners and obtained similar results that females scored higher on overall strategy use and females used more compensation strategies. In addition, Green and Oxford (1995) used the SILL to study 374 EFL or ESL university students and the results also accorded with the previous study that females used significantly greater overall language learning strategies than males; however, they clarified that this male-female difference did not necessarily be interpreted as females were more successful at language learning than males. This could be explained by the fact that females and males used different approaches to language learning. On the other hand, Young and Oxford (1997) examined 49 foreign language learners' use of global and local strategies by gender, but there were no significant differences were found although females tended to use global strategies slightly more than males.

In Taiwan, there has been growing evidence of gender differences. Sy (1996) examined 411 college students and discovered that college students in Taiwan had significant gender differences on the SILL. In this study females not only used language learning strategies more frequently than males, but also significantly surpassed males in the use of cognitive, compensation, metacognitive and social strategies. In the same year, Yang (1996) reported on a study of 505 Taiwanese university students and it was found that female students on the average reported using social strategies more often than male students. Correspondingly, after investigating 156 freshmen from a university of science and technology in Taiwan, Teng (1999) found that

female students used more language learning strategies than male students and females tended to use more memory strategies. These results reinforce the idea that the females are better language learners than males because the frequency of strategies used implies that females take more steps to enhance their language achievements (Sy, 1996; Teng, 1999). What is more, Liu (2004) reported that among 379 English-majored students from a technological institute, female students were found to be significantly more frequent in overall strategy use, memory strategies and affective strategies, compared to male students. Despite several previous studies indicating that significant differences exist in gender, Ho (1999) surveyed 372 two-year program juniors in a university of technology with SILL and found, however, that there were no significant differences between female students and male students.

2.2.2 Major Subject and LLS Use

In terms of the relationships between students' major and their strategy use, Politzer and McGroarty (1985) explored 37 ESL students and the results showed that university students of social science/ humanities adopted functional practice strategies more often than those of engineering/ physical science majors. Similarly, Oxford and Nyikos (1989) found that university major subjects made a highly significant difference in LLS choices and this suggests that students with different career interests tend to use different LLS. Students of humanities/social science/ education used functional practice strategies and resourceful, independent strategies significantly more often than did students with other majors.

In Taiwan, Yang (1992) examined college students and also discovered that students' major subjects made a significant difference in their use of language learning strategies. Foreign language majors used more social strategies than those of business majors; while business majors used more metacognitive strategies. Moreover, technical majors used more social strategies than those of business and management majors. Again, Yang (1996) explored university students and found that foreign language majors tended to use functional practice strategies more often than other majors; language and business majors used metacognitive strategies more often than science and engineering majors; and science and engineering majors used social strategies less frequently than all other majors.

Teng's (1999) investigation on Taiwanese students at university of science and technology showed that the students of information management use strategies most frequently, followed by students of business administration. The students with electrical engineering backgrounds used the least number of learning strategies. However, no significant differences were found among different majors and Teng explained that the limited major subjects in a university of science and technology might be the reason why major subject differences could not be found.

2.2.3 L2 Proficiency and LLS Use

Language proficiency is often implied by exam scores, student's self-ratings, course level and the number of years of language study. Research has shown that second/foreign language proficiency is related to language learning strategies and students with higher language proficiency tend to use different strategies from the less advanced students (Green & Oxford, 1995; Oxford & Nyikos, 1989; Griffiths, 2003,2007) For example, Oxford and Nyikos (1989) reported that foreign language adult learners' self-ratings of proficiency were highly related to their language strategy use in reading, listening and speaking. The higher the learners' self-perceived proficiency, the more frequently they used learning strategies. Green and Oxford (1995) investigated 374 students at three course levels at the University of Puerto Rico and the results agreed with Oxford and Nyikos' study

that the more successful learners used language learning strategies of all kinds more frequently than less successful learners. Presumably, these findings indicated that more is better. However, according to Chen's (1990) qualitative study on English major students by comparing six higher proficiency students with six lower-proficiency ones at the Guangzhou Foreign Language Institute, it was found that higher-proficiency learners used fewer communication strategies but in more effective ways to express concrete and abstract concepts when interviewed by a native speaker. Cohen (1988) suggested that this result showed that higher-proficiency learners may be able to use fewer but more effective strategies to handle the communicative tasks successfully in this study. On the other hand, lower-proficiency learners may keep trying different strategies so they end up using more strategies in total. Thus, Cohen (1998, p8-9) proposed that:

> '…the total number or variety of strategies employed and the frequency with which any given strategy is used are not necessarily indicators of how successful they will be on a language task. Whereas the successful completion of some tasks may require the use of a variety of strategies used repeatedly, the successful completion of others may depend on the use of just a few strategies, each used only once but successfully.' Cohen (1998, p8-9)

In Taiwan, most studies found that the more successful learners used overall learning strategies more frequently than less successful learners (Chiang & Liao, 2006; Ho, 1999; Liu, 2004; Su, 2005; Teng, 1999; Yang, 1996). Yang's (1996) study on college EFL students also showed that higher-proficiency learners tended to use more learning strategies. Teng's (1999) study on freshmen students at university of science and technology also showed that higher-proficiency students used more developed Cognitive strategies. Ho (1999) divided junior technological university students into two groups according to their test scores and found that the higher-proficiency group tended to employ significantly more learning strategies than the lower-proficiency group. In addition, the higher English proficiency level the students had the more frequently they tended to use memory, cognitive and compensation strategies.

Recently more studies have focused on English major students' proficiency related to their LLS. Liu (2004) investigated 379 English major students in Nanyang institute of technology and based on students' scores the students were separated into high and low proficiency learners. The higher-proficiency learners were found to employ more metacognitive strategies. Su (2005) studied the LLS of 419 technological and vocational college students majoring in Applied Foreign Languages and their self-perceived English proficiency. The higher self-perceived English proficiency students used significantly more LLS not only in the overall strategy use but also in all six categories of strategies. Chiang and Liao (2006) investigated 134 college English major students in relation to their exam scores and found that higher-proficiency students used significantly more LLS in the categories of memory strategy, cognitive strategy, compensation strategy, metacognitive strategy and affective strategy.

3.0 METHODOLOGY

The participants' background, pilot study, the procedure of data collection and the instrument used in this study will be introduced in this section.

3.1 Participants

The participants were 113 freshmen from Ming Chi University of Technology with three colleges: the College of Engineering, the College of Environment and Resources and the College of Management and Design. Forty-two (37.2%) females and seventy-one (63.8%) males were randomly selected from three colleges according to

the proportion of each college to the university. All students were about 18-20 years old and had studied English formally for six years in junior and senior high schools. Table 3.1-1 shows the detailed numbers of participants in each college in terms of different gender.

Table 3.1-1 Different Gender in Each College

College	Female	Male	Total	%
Engineering	6	40	46	40.7
Environment & Resources	13	19	32	28.3
Management & Design	23	13	35	31
Total	42	71	113	100

In this study, participants of higher-proficiency were defined as the top 25% in their GEPT scores (full mark 240) gained a week after the survey conducted, while lower-proficiency group came from the bottom 25% (Gronlund, 1985). Thus, the sample size for the GEPT proficiency investigation was smaller, as students of middle-range were removed, leaving 29 students at top level and 29 students at bottom level. The mean scores, standard deviation, score range and the numbers of the whole group, the higher/ lower-proficiency groups were shown in Table 3.1-2 (see next page).

Table 3.1-2 Higher/ Lower-proficiency groups and GEPT scores

	Mean	S.D.	Range	N	%
All students	98.8	29.9	198 - 48	113	100.0
High Group	140.5	20.9	198 - 116	29	25.7
Low Group	67.3	7.9	76 - 48	29	25.7

Freshmen students were chosen because it was not only the first time there were female students enrolling in this male-student only university for the past forty years, but also it was very important to clarify the LLS preferences of freshmen students so that the teachers could provide appropriate LLS instruction to facilitate their learning in their compulsory Freshman English Course.

3.2 Pilot Study

The researcher conducted a pilot study for research questions 2 and 3 one year before the formal study with a sample size of 110 at the same technological university. Three freshman classes were randomly chosen from each of the three colleges. After the pilot study, minor changes were made to the background questionnaire, the test procedures and instructions, and the time that the students needed to finish the questionnaire was noted. Since the reliability of the instrument had been tested worldwide (Oxford & Burry-stock, 1995) and the reliability of the Chinese version has been tested, it was assumed that the instrument was reliable.

3.3 Data Collection

All questionnaires were administered in Chinese. The questionnaires were distributed by language teachers and teaching assistants at the beginning of the first semester of the first year during the new student orientation day, and were returned on the same day. First, the purpose of the survey and the procedure were explained and then the participants were reminded to answer in terms of how their own learning conditions and there were no right or wrong answers to the questionnaire items.

3.4 Instrument

The instrument used in this study is the Strategy Inventory for Language Learning, ESL/EFL Version 7.0. This questionnaire, deemed highly

reliable across many cultural groups (Oxford & Burry-stock, 1995), has been widely employed to investigate LLS for more than a decade and has been modified and translated into Chinese by Yang (1992). Internal consistency (reliability) using Cronbach's alpha is .96 based on 590-person sample of college students. In addition to the SILL, a background questionnaire covering students' personal details, gender and major was administered. The student ID numbers were used to track students' performances in GEPT.

The Chinese translation version of the SILL questionnaire consists of forty-nine multiple-choice items. One item- item 43- is removed from the original 50-item SILL, due to culture differences (Yang, 1992). The multiple-choice items use a five point Likert-scale ranging from 5 to 1 in response to each strategy item: 5 - always or almost always true of me, 4 - usually true of me, 3 - somewhat true of me, 2 - usually not true of me, 1 - never or almost never true of me. The criteria of LLS use frequency is based on: low frequency use (1.0-2.49), moderate frequency use (2.5-3.49), and high frequency use (3.5-5.0) (Oxford, 1990). The forty-nine items are characterized into six subcategories of LLS: (a) Memory strategies: Items 1-9, (b) Cognitive strategies: Items 10-23, (c) Compensation strategies: Items 24-29, (d) Metacognitive strategies: Items 30-38, (e) Affective strategies: Items 39-43, (f)Social strategies: Items 44-49. These individual items were converted into aggregate scores for each of these six scales by dividing the sum of each subcategory by the number of the items in each subcategory.

4.0 ANALYSIS

4.1 Data Analysis

An Independent-Sample T Test was used to explore the relation between gender and LLS uses and as well as L2 proficiency and LLS uses. One-way ANOVA was used to find out the relation among different colleges and LLS use. The standard for significance in this study was $p < .05$. All these statistical analyses were operated by means of the Statistical Package for the Social Science (SPSS), Version 15.0.

4.2 Research Question 1

Comparing female and male students in relation to their LLS use by using Independent-Samples T Test, it was found that there was no statistical significance in the differences between the two gender groups (see Table 4.2). The mean of the overall strategies for females is 3.03 with SD 0.58, whereas for males is 3.05 with SD 0.68.

4.3 Research Question 2

Comparing students in three colleges in relation to their LLS use, there was no statistically significant differences by using a one-way ANOVA (see Table 4.3-1). This may be explained by the relatively small size of the subgroups. The detailed descriptions of the statistical data among three colleges are presented in Table 4.3-2(see next page).

Table 4.2 T-Test on LLS use by Gender

	Female		Male		t-test for Equality of Means		
Strategy	M	SD	M	SD	t	df	Sig. 2-tailed
Memory	3.15	0.60	3.15	0.76	0.05	111	0.96
Cognitive	2.83	0.65	2.94	0.70	-0.87	111	0.39
Compensation	3.00	0.73	3.05	0.78	-0.29	111	0.77
Metacognitive	2.97	0.70	3.10	0.79	-0.88	111	0.38
Affective	3.11	0.69	3.10	0.74	0.08	111	0.94
Social	3.14	0.72	2.96	0.89	1.17	111	0.25
Overall	3.03	0.58	3.05	0.68	-0.11	111	0.91

Table 4.3-1 ANOVA on LLS use by Colleges

		df	F	Sig.
Memory Strategy	Between Group	2	1.89	0.16
	Within Group	110		
	Total	112		
Cognitive Strategy	Between Group	2	0.85	0.43
	Within Group	110		
	Total	112		
Compensation Strategy	Between Group	2	1.85	0.16
	Within Group	110		
	Total	112		
Metacoginitive Strategy	Between Group	2	1.07	0.35
	Within Group	110		
	Total	112		
Affective Strategy	Between Group	2	1.9	0.16
	Within Group	110		
	Total	112		
Social Strategy	Between Group	2	0.05	0.95
	Within Group	110		
	Total	112		
Overall Strategy	Between Group	2	1.31	0.28
	Within Group	110		
	Total	112		

Table 4.3-2 Descriptive on LLS use by Colleges

College	Engineering		Environment & Resources		Management & Design	
Strategy	M	SD	M	SD	M	SD
Memory	3.30	0.73	3.07	0.75	3.03	0.60
Cognitive	2.98	0.61	2.89	0.85	2.79	0.58
Compensation	3.14	0.72	3.10	0.90	2.83	0.65
Metacognitive	3.17	0.72	3.02	0.94	2.92	0.60
Affective	3.25	0.73	3.07	0.74	2.94	0.68
Social	3.04	0.83	3.05	0.93	2.99	0.76
Overall	3.15	0.61	3.03	0.75	2.92	0.55

4.4 Research Question 3

Independent Sample T-Test showed that statistically higher proficient learners more frequently used Affective strategy and Overall strategy than lower proficient learners did. The findings were illustrated using boxplots (see Figure 4.4-1 and Figure 4.4-2). The difference between the mean Affective Strategy in this two proficiency group was found to be statistically significant (p=0.004, t=2.885, df=0.006) and as well as the difference between the mean Overall Strategy (p=0.044, t=3.138, df=0.003). Each of the means in the higher-proficiency group was higher than those in the lower–proficiency group among the six subcategories. The detailed means, S.D. and T-Test results are presented in Table 4.4.

Figure 4.4-1 Affective Strategy by L2 Proficiency

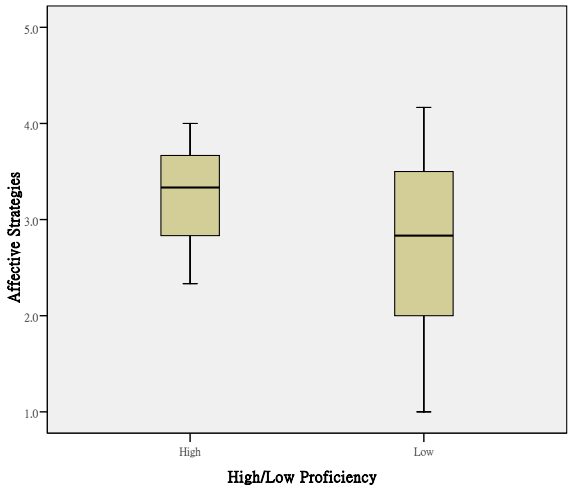

Figure 4.4-2 Overall Strategy by L2 Proficiency

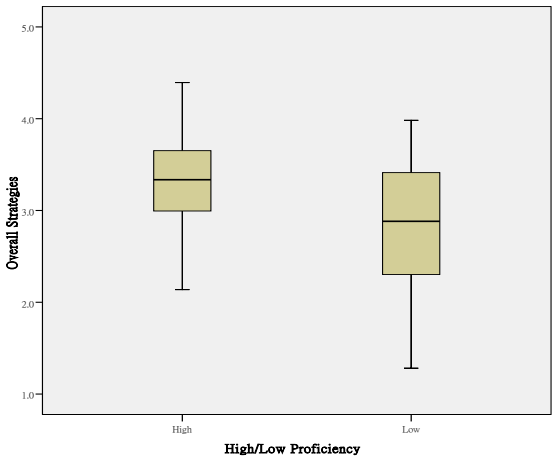

Table 4.4 T-Test on LLS by L2 Proficiency

	Higher-p		Lower-p		t-test for Equality of Means		
Strategy	M	SD	M	SD	t	df	Sig. 2-tailed
Memory	3.30	0.57	2.92	0.88	1.93	48.07	0.06
Cognitive	3.23	0.63	2.64	0.70	3.39	56.00	0.00
Compensation	3.32	0.77	2.70	0.78	3.04	56.00	0.00
Metacognitive	3.41	0.78	2.79	0.83	2.93	56.00	0.01
Affective	3.33	0.50	2.79	0.87	2.89	44.71	0.006*
Social	3.30	0.73	2.75	0.93	2.48	56.00	0.02
Overall	3.31	0.54	2.77	0.77	3.14	49.96	0.003*

5.0 DISCUSSION OF FINDINGS

5.1 Findings

5.1.1 Gender and LLS use

Unlike most of the previous studies but similar to Ho's (1999) studies in technological university level students, the results of the present study show that gender was not a statistically significant factor in LLS preference. Moreover, it was found that male students had slightly higher Overall Strategy use than female students and this contradicts the results of the studies in the literature review that females have higher Overall Strategy use than males. Only Affective and Social strategies were used more by female than male students. Despite statistical insignificance, Social Strategy, the second most frequently used strategy by female students, was ranked as the second least used strategy by male students. According to Oxford, Nyikos, and Ehrman (1988), social strategies are the best-known strategies employed more by female than male language learners and Sy's (1996) study supports such a finding in a Taiwanese context. Since females are superior in verbal aptitude and social orientation, it is not surprising to find that female students applied more Social Strategies in this study. On the other hand, male students did not use Social Strategies frequently might be because most males in this sample were engineering students who tended to be good at manipulating machines or mathematical formulas rather than learning through interaction with others socially. However, Wharton (2000) examined LLS of university students in Singapore and obtained a high mean and ranking in Social Strategies. The researcher surmised that the development of the Internet and World Wide Web might be the reason for this kind of tendency to appear.

The most commonly used type of strategy by both male and female students was Memory Strategy, while the least used was Cognitive Strategy. The high frequency of using Memory Strategy agrees with the prediction that these newly senior high school graduates had been encouraged and equipped to employ a great deal of Memory Strategy to pass the College Entrance Examination. In addition, according to Oxford (1990) and Politzer (1989), Asian students preferred rote memorization and other forms of memorization. Sy (1996) proposed a possible reason: learning Chinese demands a lot of memory work to memorize verbatim each Chinese character's meaning, brush strokes and pronunciation, so the Chinese language learners tent to use their most familiar ways to learn a new word or language.

5.1.2 Major Subject and LLS use

Regarding students with different major subjects, no statistically significant differences were found and this echoes Teng's (1999) study in technology-university level students but contrasts with most other findings in the literature review. How can this be explained? Teng (1999) suggested that one explanation might be the limited range of major subjects in a university of technology might be the reason why the differences among majors can't be found. Another possibility might be due to the variety of major subjects in each college. For instance, in present study the College of Management and Design is composed of the departments of design and the departments of

management and this apparently arbitrary housing together of major subjects might affect the results. Besides, as mentioned previously, this group of participants, predominantly males, is different from those in the literature review.

It is also found that the College of Engineering had the highest use of LLS, followed by the College of Environment and Resources, while the College of Management and Design used LLS the least. Overall, the College of Engineering and the College of Management and Design used Memory Strategy most, while the College of Environment and Resources used Compensation Strategy most. Interestingly, Compensation Strategy, the most frequent used by the College of Environment and Resources, is the third least used by the College of Engineering and the second least used by the college of Management and Design. Uniformly, Cognitive Strategy was the least used by all three colleges.

5.1.3 Proficiency and LLS use

As with previous studies, statistically significant greater overall use of LLS among successful learners was found. Additionally, the higher-proficiency students used significantly more Affective Strategy than the lower-proficiency students. This shows that successful language learners not only use more LLS but also control their feelings and motivation, and know how to reduce their language learning anxiety better than unsuccessful learners.

The most frequently used strategy by the higher-proficiency students was Metacognitive Strategy; while the lower-proficiency students used Memory Strategy most. In Liu's (2004) study on Chinese technological institute students, it was also found that there was a strong correlation between proficiency and Metacognitive Strategy use. This may indicate that higher-proficiency learners direct their own learning process and learn actively.

Cognitive Strategy was found the least used by both higher-proficiency and lower-proficiency learners. This result not only accords with the findings in the gender and major subject factors in this study but also agrees with Ho's (1999) study that technological university students tended to use Cognitive Strategy least. This implies that these language learners seldom use their mental processing for summarizing or reasoning for language learning and this might be caused by their attitudes towards English as a subject for examination instead of a real language for communication. In addition to teaching summary making and reasoning skills, more out-of-class communicative language activities can be included in syllabi to enable students to use the target language in informal settings and to make language learning more lively and meaningful.

According to the GEPT scores, in the higher-proficiency group, only 2 out of 29 students passed the intermediate GEPT which is equivalent to the required English level of Taiwan senior high school graduates. Thus, the higher-proficiency group was really at intermediate proficiency level rather than at advanced level. The mean score of Overall Strategy use (mean 3.04 with SD 0.64) shows that the students only use LLS to a moderate extent, so there is room for improvement and further development. Students need to be taught the LLS necessary for successful language acquisition and EFL teachers should focus more on helping students to become self-directed language learners.

5.2 Limitations of the Study

This research study carries the following limitations: firstly, this study was based on a sample population of technological university students so its results may not be generalized well to other population with different educational settings.

Secondly, the subjects involved in this study were randomly selected according to the proportion

of each college to the technological university and because of the unbalanced numbers of students in different gender, the results might not be generalized to a larger population.

Thirdly, the context of this study is surely relevant to its findings. Unusually, this technological university was in a transition period between its long history as an all-male institution and the recent arrival of female students.

Finally, it may also be relevant that this type of technological university may tend to attract certain type of learners with certain approaches to language learning.

5.3 Recommendations

This present research study can provide EFL teachers with a better understanding of the ways Taiwanese technological university freshmen approach their English language learning. Besides, this study revealed some LLS difference between higher-proficiency and lower-proficiency learners, between different gender and among different major subjects and served as base-line data about the technological university freshmen; however, more investigation is needed to be done in this particular group of learners.

Also, this study obtained enough evidence to say that Taiwanese technological university students should use more strategies that aim to promote their English language learning. Especially Cognitive Strategy was shown the least used strategy. Therefore, LLS training should be taught in class and strategies based instruction should be integrated into a more learner-centred curriculum so that the students can learn better and more effectively to become independent, active and autonomous language learners.

The SILL can be used in class for developing awareness of strategy use. Yang (1996, 1998) suggested that language teachers should encourage students to discuss their definition, beliefs and expectations about language learning to raise their strategy-related awareness or it can be done by conducting survey, interviews and keeping a language learning diary. English teachers can also integrate learning strategy training into regular classroom activities and provide ample opportunities for students to practise.

Moreover, with the rapid development of the Internet, the impact of the new information and communication technologies on language learning cannot be neglected. With few studies thus far, the role of LLS in the web-based learning environment should be explored further.

6. ACKNOWLEDGMENTS

I am grateful to the students, teachers and assistants who participated in or helped to conduct this survey. Moreover, I would like to thank two anonymous reviewers who provided very thoughtful comments.

7. REFERENCES

1. Altan, M. Z. (2004). Nationality & language learning strategies of ELT-major university students. *Asian EFL Journal, 6*(2) Retrieved 10th March, 2008 from http://www.asian-efl-journal.com/Article_3_June_mza_nlls.2004.pdf

2. Brown, H. D. (2000). *Principles of language learning and teaching* (4th ed.). New York: Pearson Education.

3. Brown, H. D. (2001). *Teaching by principles: An interactive approach to language pedagogy* (2nd ed). NY: Pearson Education.

4. Chamot, A. U., & Kupper, L. (1989). Learning strategies in foreign language instruction. *Foreign Language Annals, 22*, 13-24.

5. Chen, S. Q. (1990). A study of communication strategies in interlanguage production by Chinese EFL learners. *Language Learning, 40*(2), 155-187.

6. Chiang, M., & Liao, P. (2006). Language learning strategy use among vocational college English majors. *Electronic Journal of English Education,* (22) Retrieved 10th March, 2008 from http://ejee.ncu.edu.tw/showarticles.asp?CO_no=425

7. Cohen, A. D. (1998). In Candlin C. N. (Ed.), *Strategies in learning and using a second language*. New York: Addison Wesley Longman Limited.

8. Ehrman, M., & Oxford, R. (1989). Effects of sex differences, career choice, and psychological type on adult language learning strategies. *The Modern Language Journal, 73*(1), 1-13.

9. Green, J. M., & Oxford, R. (1995). A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly, 29*(2), 261-297.

10. Griffiths, C. (2003). Patterns of language learning strategy use. *System, 31*, 367-383.

11. Griffiths, C. (2007). Language learning strategies: Students' and teachers' perceptions. *ELT Journal, 61*(2), 91-99.

12. Gronlund, N. E. (1985). *Measurement and evaluation in teaching* (5th ed.). New York: Macmillan.

13. Ho, I. (1999). Relationships between motivation/attitude, effort, and English proficiency and Taiwanese technological university students' English learning strategy use. *Journal of National Taipei University of Technology, 32*, 611-674.

14. Liu, D. (2004). EFL proficiency, gender and language learning strategy use among a group of Chinese technological institute English majors. *Annual Review of Education, Communication & Language Sciences E-Journal, A5* Retrieved 10th March, 2008 from http://www.ecls.ncl.ac.uk/publish/Volume1/Dongyue/Dongyue.htm

15. Locastro, V. (1994). Learning strategies and learning environments. *TESOL Quarterly, 28*(2), 409-414.

16. Nyikos, M., & Oxford, R. (1993). A factor analytic study of language-learning strategy use: Interpretations from information-processing theory and social psychology. *The Modern Language Journal, 77*(1), 11-22.

17. O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. New York: Cambridge University Press.

18. Oxford, R. L. (1989). Use of language learning strategies: A synthesis of studies with implications for strategy training. *System,* (17), 235-247.

19. Oxford, R. L. (1990). *Language learning strategies: What every teacher should know.* Boston, Massachusetts: Heinle & Heinle Publishers.

20. Oxford, R. L. (2003). Language learning styles and strategies: An overview. Paper presented at the *GALA 2003*, 1-25. Retrieved 1st March, 2008 from http://web.ntpu.edu.tw/~language/workshop/read2.pdf

21. 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.

22. Oxford, R. L., & Ehrman, M. E. (1995). Adults' language learning strategies in an intensive foreign language program in the United States. *System, 23*(3), 359-386.

23. Oxford, R., & Nyikos, M. (1989). Variables affecting choice of language learning strategies by university students. *The Modern Language Journal, 73*(3), 291-300.

24. Oxford, R. L., Nyikos M., & Ehrman, M. E. (1988). Vive la difference? Reflections on sex differences in use of language learning strategies. *Foreign Language Annals*, *21*(4), 321-328.

25. Plitzer, R. L. (1983). An exploratory study of self-reported language learning behavior and their relationship to achievement. *Studies in Second Language Acquisition, 6*, 54-67.

26. Plitzer, R. L., & McGroarty, M. (1985). An exploratory study of learning behavior and their relationship to gains in linguistic and communicative competence. *TESOL Quarterly, 19*(1), 103-123.

27. Rubin, J. (1975). What the "good language learner" can teach us. *TESOL Quarterly, 9*(1), 41-51.

28. Su, M. H. (2005). A study of EFL technological and vocational college students' language learning strategies and their self-perceived English proficiency. *Electronic Journal of Foreign Language Teaching, 2*(1), 44-56. Retrieved 1st March, 2008 from http://e-flt.nus.edu.sg/v2n12005/su.htm

29. Sy, B. M. (1996). Sex differences and language learning strategies. *Selected Papers from the Eleventh Conference on English Teaching and Learning in the Republic of China* (pp.19-52). Taipei, Taiwan: Crane Publishing Co.

30. Teng, H. (1999). An investigation of EFL learning strategies used by students in a college of technology. *Proceedings of the Eighth International Symposium on English Teaching* (pp.639-644). Taipei, Taiwan: Crane Publishing Co.

31. Vann, R. J., & Abraham, R. G. (1990). Strategies of unsuccessful language learners. *TESOL Quarterly, 24*, 177-198.

32. Warton, G. (2000). Language learning strategy use of bilingual foreign language learners in Singapore, *Language Learning, 50(2)*, 203-243.

33. Yang, N. D. (1992). *Second language learners' beliefs about language learning and their use of learning strategies: A study of college students of English in Taiwan.* Unpublished doctoral dissertation, University of Texas at Austin, U.S.A.

34. Yang, N. D. (2006). A review of research on language learning strategies in Taiwan. *English Teaching & Learning, special issue*(2), 71-110.

35. Yang, N. D. (1998). Exploring a new role for teachers: Promoting learner autonomy. *System, 26*, 127-135.

36. Yang, N. D. (1996). A study of factors affecting college EFL students' use of learning strategies: An investigation of Taiwanese college students. *Papers from the Eleventh Conference on English Teaching and Learning in the Republic of China* (pp.53-82). Taipei, Taiwan: Crane Publishing Co.

37. Young, D. J., & Oxford, R. (1997). A gender-related analysis of strategies used to process written input in the native language and a foreign language. *Applied Language Learning, 8*(1), 43-73.