

An Analytic Hierarchy Process for English Learning Strategies of College Students in Taiwan

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Abstract

The purpose of this study was to investigate the importance weights of English learning strategies that Taiwanese college students possess as well as to clarify the differences of their weight order between genders and among three proficiency groups. This study adopted an Analytic Hierarchy Process (AHP) to design the research framework, and English learning strategies were divided into 2 criteria, 6 sub-criteria and 18 indicators as the AHP structure for the research instrument. An AHP questionnaire was administered to 405 university students in Taipei, Taiwan. The results showed that, except Attitudes in the sub-competence of the intercultural competence, they held a very different view on the importance of almost all of the criteria and sub-criteria.

Key Words: English Learning Strategies, Analytic Hierarchy Process

1. Introduction

It has been widely believed that learning a second or foreign language (SL/FL) is a complex process, during which the role of the teacher is to facilitate that process by providing essential knowledge and skills and learners participate or practice actively (Hedge, 2000). Cohen (2000) suggests that proficient and effective learning requires not only sufficient knowledge of the language, the text, and the world, but also capable use of learning strategies. This indicates that without access to acquire a variety of learning strategies, learners probably have little opportunity to develop their language proficiency. The assumption behind this is that the use of learning strategies is seen as both learner-directed and learner-centered (Chamot, 2004).

For the former, it is always the learners themselves who consider and decide what strategies they utilize while learning or in any other situation, and also the learners who monitor and evaluate their learning process so as to continue to adopt certain strategies or to change into new ones. This is very important because it can help learners realize what they can or what they should do in a certain setting, without which their learning might encounter problems or difficulties, and consequently, hamper their language development. For the latter, since learners have to decide what strategies to adopt in or even to change them if necessary, this hands the control or responsibility over to the learners. The use of learning strategies is not forced by their teachers or anyone else, but the learners themselves are the centre, and the motives, thoughts and actions are derived from them. Thus, language learning strategies play an imperative role in learning a SL or FL, as they assist learners in mastering the forms, meanings and functions required for input and output in the language (Brown, 2000), and enable students to become more competent, independent, autonomous, and lifelong learners (Hedge, 2000).

In this regard, it is extremely important for SL or FL teachers to identify their students' language learning strategies. An understanding and awareness of such use can provide valuable insights into the process of language learning and teaching. Then, teachers can accordingly provide strategy instruction as well as guided practice to students who lack knowledge or skills in the use of certain language learning strategies (Griffiths, 2003). However, after reviewing some related studies, we still do not know what students' decisions of strategy use are and how such preferences differ. In order to fill this gap, the present study tapped into the questions on how EFL students chose strategies for their learning. In other words, it aimed to investigate the decision on learning strategies the university students made in learning English.

Since such decisions may be affected by other individual differences and personal preferences, this study particularly intended to find the differences between both genders and among three language proficiency levels (i.e. elementary, intermediate, and upper intermediate).

2. Literature Review

Research has attempted to define and classify learning strategies and several comprehensive classification schemes of learner strategies have been developed (Liu, 2010). Earlier studies used either observations to describe language learning strategies (Dansereau, 1985), or categories derived from research in first language contexts (Rubin, 1987), or a list of learning strategies derived from learners' self-reported strategies (Oxford, 1990). More recently, strategy identification and classification have been data-driven through think-aloud protocol analysis (Cohen, 2000; Chamot, 2004). On the basis of their reviews, Ellis (1994) and Liu (2010) advocates that Oxford's taxonomy (1990) is possibly the most comprehensive currently available, and her Strategy Inventory for Language Learning (SILL) has been used extensively by researchers and instructors in many language learning settings around the world. SILL is a type of self-report questionnaire and its reliability has been examined in multiple ways and has been reported as high in validity, reliability and utility (Oxford, 1996). In addition, the factor analysis of SILL has been confirmed by many studies (Hsiao & Oxford, 2002; Oxford & Burry-Stock, 1995). Oxford and Ehrman (1995) has also found moderate inter correlations between the items of six categories in SILL. Taking these issues into account, this study adopted Oxford's Strategy Inventory for Language Learning (SILL) as its main instrument and as a basis for its research framework.

Oxford (1990) divides language learning strategies into two major categories in which *memory, cognitive* and *compensation strategies* are under the *direct strategies*, and *met cognitive, affective*, and *social strategies* are under the *indirect strategies*.

2.1 Direct Strategies

Direct strategies has been defined as involving the target language directly and are like a learner working with language itself in a variety of learning tasks or situation. Such strategies can be divided into three sets as below (Oxford, 1990):

- *Memory strategies* have been seen as having a specific function that enable students to store and retrieve new information. Four strategies are categorized in this set: *creating mental linkages, applying images and sounds, reviewing well*, and *employing action*.
- *Cognitive strategies* are the ways adopted by learners to construct a model in their mind based on analysis and comparison, create general rules, and revise those rules when new information is available. This set contains four strategies: *practicing, receiving, and sending messages, analyzing and reasoning*, and *creating structure for input and output*.
- *Compensation strategies* means that in order to compensate their insufficient knowledge about the new language, learners often use a wide variety of linguistic or non-linguistic means to either comprehend or produce the new language. There are two strategies in this set: *guessing intelligently in listening and reading*, and *overcoming limitations in speaking and writing*.

2.2 Indirect Strategies

Indirect strategies are used to support and manage language learning in most instances without directly involving the target language, and are useful and applicable to all language learning skills (i.e. speaking, listening, reading and writing) and situations. All these strategies can be clustered into three sets as follows (Oxford, 1990):

- *Metacognitive strategies* enable learners to employ their own cognition in the learning process by using functional measures and provide a way for learners to control their own learning. Three strategies are included in this set: *centering your learning, arranging and planning your learning*, and *evaluating your learning*.
- *Affective strategies* help learners modify or regulate their emotions, motivations, and attitudes for language learning so as to relax or ease negative feelings, and learn more effectively. Three strategies in this are *lowering your anxiety, encouraging yourself*, and *taking your emotional temperature*.
- *Social strategies* help students utilize appropriate social skills to communicate with other people effectively and learn through such interaction. Three strategies are included: There are two strategies in this set: *asking questions, cooperating with others*, and *empathizing with others*.

In sum, having reviewed Oxford's (1990) classification, the major merit of learning strategies lies in the fact that they play an imperative role in language teaching and learning, and they are learners' intended actions or reactions to make their learning process more successful, self-directed, and enjoyable. As can be seen, the key issue in the choice and success of language strategy use is centered on students' personal factors (Brown, 2000; Felder & Brent, 2005; Hedge, 2000), that is, motivation (Crookes & Schmidt, 1991; Dörnyei, 2001), gender (Chen & Tsai, 2007; Kim, 1995), cultural background (Bedell & Oxford, 1996; Peacock & Ho, 2003), attitude (Oh, 1997), language proficiency (Gharbavi & Mousavi, 2012; Wong, 2005), age (Hatch, 1983), learning styles (Carson & Longhini, 2002; Jones, 1998; Oxford, 2003) and personalities (Ford & Chen, 2000; Oxford & Nyikos, 1989).

It can be found that these factor "may play an important role in the receptiveness of students to learning strategy training and in their ability to acquire new learning strategies" (O'malley & Chamot, 1990, p. 160). It can also be seen that some factors play a more dominated role than others (Ford & Chen, 2000). For example, those who have high motivation or a positive attitude are more likely to take opportunities to learn or to use learning strategies, and consequently, their language proficiency appears to develop more. The same point seems to apply to the relationship between learning style and language proficiency (Felder, 1996). In addition, since this study aims at investigating university students' perspectives of strategy priority in English learning in Taiwan, the issue of cultural background is less significant. Taking these issues into consideration, this study intends to detect the learning strategies used among university students, and in particular to elicit the differences of their learning strategy priority in terms of gender and language proficiency. The research questions are listed below:

1. Are there any differences of the importance weights of language learning strategies between genders?
2. Are there any differences of the importance weights of language learning strategies among three English language proficiency levels?

3. Research Methods

3.1 Participants

A total number of 405 college students at three universities in Taipei, Taiwan, participated in this research. They are all native Chinese speakers, ranging in age from 19 to 22 years old. They have had at least 8 years of English language learning since elementary school. English is one of the required subjects they all have to take, usually in the first year of college. They attended two one-hour lessons per week for two consecutive semesters (September-January and March-June) and English is seldom used as an instructional medium in other subjects. The number of Females (54.3%) was higher than males (45.7%), which parallel the normal gender ratio of undergraduate students in universities in Taiwan. With regard to their English proficiency, 32.3% of the respondents were A2 (Elementary) level in the Common European Framework of Reference for Languages (CEFR), 38% B1 (Intermediate), and 29.7% B2 (Upper intermediate). A total of 500 questionnaires were sent to students via email and 405 respondents were replied, with a reply rate of 81%.

3.2 Research Instrument

An AHP questionnaire of English learning strategy was used and included three parts: personal information including gender and English proficiency test score, instructions for answering questions and learning strategies. The last section was adapted from Oxford's (1990) Strategy Inventory for Language Learning (SILL). The original inventory is divided into six groups including 19 sub-groups, but there is only one strategy (i.e. structured reviewing) in the sub-group of reviewing well. As Saaty (1990) states, at least two elements are included in a pair wise comparison in the AHP analysis. Thus, in this study, the structured reviewing strategy was integrated into the sub-group (i.e. employing action), and the original sub-group (i.e. reviewing well) was deleted. The final version of learning strategies section includes six sub-criteria (6 items) and 18 indicators which was belonged to the six sub-criteria of memory strategies (3 items), cognitive strategies (4 items), compensation strategies (2 items), metacognitive strategies (3 items), affective strategies (3 items), and social strategies (3 items).

In response to the question items, the participants were asked to compare the importance of the left and right sub-criteria, or indicators. Based on the intensity of each pair-item they selected, they decided which side (either left or right) is stronger than the other, and then selected one appropriate intensity scale ranging from 1 to 9 representing equal importance to extreme importance to indicate one's importance degree than the other importance degree (see Table 1 for example).

Table 1: The AHP questionnaire sample

	Left < Right									Left < Right									
	Extreme		Very strong		Strong		Moderate		Equal	Moderate		Strong		Very strong		Extreme			
	9:1	8:1	7:1	6:1	5:1	4:1	3:1	2:1	1:1	1:2	1:3	1:4	1:5	1:6	1:7	1/8	1/9		
A			✓*															B	
													✓**					C	

Note. * represents that the importance intensity of the left-criterion A is much stronger than the right-criterion B; ** means that the importance intensity of the right-criterion C is stronger than the left-criterion A.

3.3 Data Analysis

This study aimed to investigate the important weights of English competences possessed by international trade workers with two different personal variables and to compare the differences among them. To do this, the Analytic Hierarchy Process (AHP), a structured technique for helping decision makers find one that best suits their goal or solution of the problem (Saaty, 2005; Saaty & Vargas, 2000), was employed. It provides a comprehensive and rational framework from which the participants is able to assess the relative weight of multiple factors, to clarify and quantify its elements, to relate those elements to overall goals, and to evaluate alternative solutions (Saaty, 1990). The procedure of the AHP can be divided into the following steps:

3.3.1 Structuring a decision problem and selecting criteria

Arranging all the constituent parts in a hierarchy provides an overall view of the complex relationships and helps the participants to decide whether the elements in each level are of the same prominence so that they can be compared accurately (Saaty, 1990). The AHP design was adopted in this study and its hierarchical structures (see Figure 1) were divided into three levels including 2 criteria, 6 sub-criteria, and 18 indicators as described below:

1. Criteria: direct strategies (B1), indirect strategies (B2).
2. Sub-criteria: memory strategies (C1), cognitive strategies (C2), compensation strategies (C3), met cognitive strategies (C4), affective strategies (C5), social strategies (C6).
3. Indicators: creating mental linkages (D1), applying images and sounds (D2), reviewing well and employing action (D3), receiving and sending messages (D4), creating structure for input and output (D5), analyzing and reasoning (D6), practicing (D7), guessing intelligently (D8), overcoming limitations in speaking and writing (D9), cantering your learning (D10), arranging and planning your learning (D11), evaluating your learning (D12), lowering your anxiety (D13), encouraging yourself (D14), taking your emotional temperature (D15), asking questions (D16), cooperating with others (D17), empathizing with others (D18).

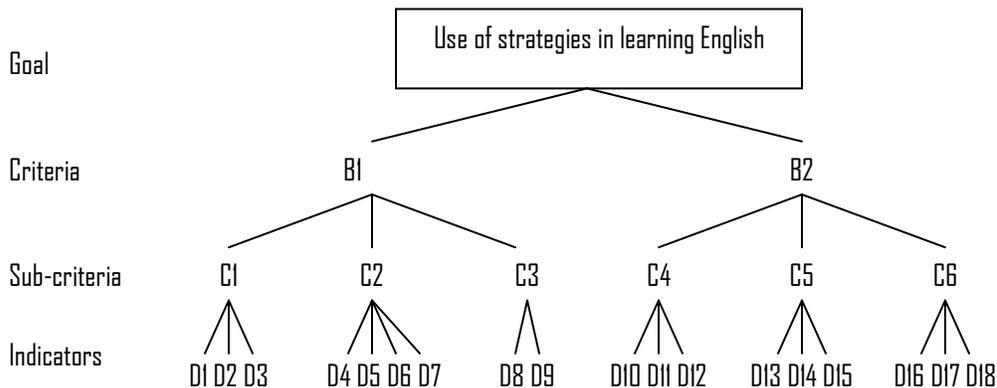


Figure 1: A Hierarchy Structure

3.3.2 Setting the priority of the criteria by pair wise comparison (weighing)

For each pair of criteria, the participants are required to decide the relative importance of two elements based on a pair wise comparison (Saaty, 1990), which is a scale with the values 1 denoted equally important (i.e. two elements contribute equally to the objective), 3 represented slightly more important (i.e. experience and judgment slightly favor one element over another), 5 equaled strongly more important (i.e. experience and judgment strongly favor one element over another), 7 denoted demonstrably more important (i.e. one element is favored very strongly over another; its dominance is demonstrated in practice) and 9 referred to absolutely more important (i.e. the evidence favoring one element over another is of the highest possible order of affirmation). By doing so, personal judgments about the elements' relative meaning and importance can be employed in performing the evaluations. The weighing is then normalized and averaged to obtain an average weight for each criterion.

3.3.3 Pair wise comparison of alternatives on each criterion (scoring)

Based on the evaluation of the elements, a pair-wise comparison matrix A can be established. If there are n elements, then we can carry out n (n-1) elements pair-wise comparisons. If C_1, C_2, \dots, C_n represent the set of elements, a_{ij} refers to a quantified judgment on a pair of elements C_i, C_j . The relative importance of the two elements is rated by a scale using the values 1, 3, 5, 7, and 9. This yields an n-by-n matrix A as follows (Saaty, 1990):

$$A = [a_{ij}] = \begin{matrix} & \begin{matrix} C_1 & C_2 & \dots & C_n \end{matrix} \\ \begin{matrix} C_1 \\ C_2 \\ \vdots \\ C_n \end{matrix} & \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ 1/a_{12} & 1 & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{bmatrix} \end{matrix}, \tag{1}$$

In matrix A, where $a_{ij} = 1$ and $a_{ij} = 1/a_{ji}$, $i, j = 1, 2, \dots, n$, the problem turns into assigning the n elements C_1, C_2, \dots, C_n , a set of numerical weights W_1, W_2, \dots, W_n that reflects the recorded judgments. Supposing A is a consistency matrix, the relations between weights W_i and judgments a_{ij} are simply given by $W_i / W_j = a_{ij}$ (for $i, j = 1, 2, \dots, n$.) and matrix A is formed as follows (Saaty, 1990):

$$A = \begin{matrix} & \begin{matrix} C_1 & C_2 & \dots & C_n \end{matrix} \\ \begin{matrix} C_1 \\ C_2 \\ \vdots \\ C_n \end{matrix} & \begin{bmatrix} w_1/w_1 & w_1/w_2 & \dots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \dots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \dots & w_n/w_n \end{bmatrix} \end{matrix}, \tag{2}$$

3.3.4 Calculating Eigen value and eigenvector

When matrix A multiplies the elements weight vector (x), it equals to nx . That is $(A - nI)x = 0$, and the x is the Eigen value (n) of Eigenvector. Because a_{ij} is the decision makers' subjective judgment comparison and appraisal, the true value (W_i/W_j) may be a little different, so $Ax = nx$ may not be set up. Saaty (1990) suggested that the largest Eigen value λ_{max} be:

$$\lambda_{max} = \sum_{j=1}^n a_{ij} \frac{W_j}{W_i}, \tag{3}$$

If A is a consistency matrix, eigenvector X can be obtained by

$$(A - \lambda_{max} I)X = 0, \tag{4}$$

3.3.5 Checking the consistency of the judgments

A primary idea of AHP is that a matrix A of rank n is only consistent when it has one positive Eigen value $n = \lambda_{max}$ while all other Eigen values are zero. In addition, the consistency index (CI) is developed and calculate the deviation from a consistent matrix (Saaty, 1990):

$$CI = (\lambda_{\max} - n) / (n - 1), \tag{5}$$

The consistency ratio (CR) is applied to aid the decision of whether or not to revise the matrix. It is defined as the ratio of the CI to the so-called random index (RI), a CI of randomly generated matrices (Saaty, 1990):

$$CR = CI / RI . \tag{6}$$

Saaty (1999) suggests that the required consistency ratio (CR^{Goal}) should be less than the average consistencies (RI values) of randomly generated matrices (as shown in Table 2) in order to get a sufficiently consistent matrix; otherwise, the matrix needs to be revised.

Table 2: The average consistencies of random matrices (RI value)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49	1.52	1.54	1.56	1.58	1.59

3.3.6 Obtaining an overall relative score for each option and making a final decision

Once the priorities’ weights of each main criterion are established, numerical priorities can be calculated on each main criterion to decide the best alternative. The scores here represent the relative ability of the alternatives in achieving the goal. Finally, after all the impacts of all the elements and priorities have been computed for the hierarchy as a whole and the judgments have been made, the less important elements can be eliminated from further consideration. The priorities can again be computed thoroughly to help revise the judgments (Saaty, 1990).

4. Results

With regard to the weight of the two criteria in Table 3, both genders agreed that direct strategies (DS) were more important than indirect strategies (IS). It should be pointed out that, regarding to sub-criteria, they ranked them in different ways. Both groups gave compensation strategies (CPS) and metacognitive strategies (MCS) the last important strategies. However, it appears that the weight of two other competences was just the opposite. That is, cognitive strategies (CS) were seen as the most important strategies by male group, but it was placed in the second position by female group. Social strategies (SS) was laid on the most important one by female, and yet it came in second place by male.

Table 3: Eigenvectors for criteria and sub-criteria between genders

Criteria	Weight	Sub-criteria	Male		Weight	Female	
			Weight	Rank		Weight	Rank
DS	.609	MS	.278	2	.587	.406	1
		CS	.523	1		.372	2
		CPS	.199	3		.222	3
						CR=0.01(<0.1)	
IS	.391	MCS	.242	3	.413	.228	3
		AS	.440	1		.354	2
		SS	.318	2		.418	1
						CR=0.01(<0.1)	

Taking criteria into account in Table 4, the three proficiency groups held the same view on the weight order in which direct strategies (DS) were the first priority, and indirect strategies (IS) came in second. For sub-criteria, they rated compensation strategies (CPS) and metacognitive strategies (MCS) at last place. However, they held the other two strategies in reverse order. As to direct strategies, A2 and B2 groups tended to see cognitive strategies (CS) as the most important one, but it was placed the second by B1 group. Concerning indirect strategies, while social strategies (SS) takes first place in the B1 and B2 groups, A2 group placed it in the second place.

Table 4: Eigenvectors for criteria and sub-criteria among three proficiency groups

Criteria	Weight	Sub-criteria	A2		Weight	B1		Weight	B2	
			Weight	Rank		Weight	Rank		Weight	Rank
DS	.613	MS	.278	2	.583	.406	1	.558	.353	2
		CS	.523	1		.372	2		.448	1
		CPS	.199	3		.222	3		.199	3
			CR=0.01(<0.1)		CR=0.01(<0.1)		CR=0.01(<0.1)			
IS	.387	MCS	.242	3	.417	.228	3	.442	.286	3
		AS	.440	1		.354	2		.306	2
		SS	.318	2		.418	1		.408	1
			CR=0.01(<0.1)		CR=0.01(<0.1)		CR=0.01(<0.1)			

As can be seen in Table 7, there was an agreement on the weight order of the three most and the least important strategies between male and female groups. That is, they placed guessing intelligently in listening and reading (GILR), overcoming limitation in speaking and writing (OLSW), creating mental linkages (CML) and practicing (P) in the first, the second, the third and the last positions respectively. Interestingly, the ranking of three strategies in one group was just one place behind those in the other group. For example, analyzing and reasoning (AR) was in the fourth place in the male group, and yet it was in the fifth place in the female group. Females considered creating structure for input/output (CSIO) as the sixth important strategy, which was the 7th in the male group. In regard to the rest of the two strategies, while applying images and sounds (AIS) was seen as the 8th important strategy by males, employing action was put at the same place in the female group.

Table 5: Eigenvectors for indicators of direct strategies between genders

Sub-criteria	Indicator	Male			Female		
		Weight		Rank	Weight		Rank
		Raw	Overall		Raw	Overall	
MS	CML	.434	.127	3	.406	.127	3
	AIS	.218	.083	8	.339	.122	4
	EA	.348	.119	5	.256	.091	8
CS	P	.081	.056	9	.107	.065	9
	RSM	.284	.107	6	.253	.094	7
	AR	.378	.123	4	.336	.118	5
	CSIO	.257	.101	7	.304	.112	6
CPS	GILR	.525	.145	1	.507	.139	1
	OLSW	.475	.135	2	.493	.132	2
			CR=0.01(<0.1)		CR=0.05 (<0.1)		

For indicators of indirect strategies shown in table 6, both genders held the same view on the three strategies' weight order, including arranging and planning your learning (APYL) in the second place, cooperating with others (CWO) in the fifth position, and encouraging yourself (EY) in the seventh one. With regard to other strategies, Table 6 displays entirely different judgments on the weight orders between both genders. For male students, the weight of asking questions (AQ) was the highest, but it was in the sixth place in the female group. When the strategy of taking your emotional temperature (TYET) takes first place by female students, male students placed it in the third place. While female students placed centering your learning (CYL) in the fourth place, the male group left it in next to last place. It is interesting to see that for female students, empathizing with others (EWO) was the third priority and centering your learning (CYL) come in fourth, but both strategies were the least two important ones in the male group.

Table 6: Eigenvectors for indicators of indirect strategies between genders

Sub-criteria	Indicator	Male			Female		
		Weight		Rank	Weight		Rank
		Raw	Overall		Raw	Overall	
MCS	CYL	.303	.096	8	.338	.113	4
	APYL	.375	.127	2	.380	.127	2
	EYL	.332	.105	6	.282	.094	8
AS	LYA	.344	.110	4	.249	.083	9
	EY	.315	.101	7	.305	.102	7
	TYET	.342	.121	3	.446	.148	1
SS	AQ	.386	.141	1	.318	.108	6
	CWO	.332	.109	5	.326	.110	5
	EWO	.282	.090	9	.346	.115	3
		CR=0.01(<0.1)			CR=0.05 (<0.1)		

It is obvious in Table 7 that there was an agreement on the weight of order of four indicators among the three proficiency groups. All groups gave analyzing and reasoning (AR), guessing intelligently in listening/reading (GILR), applying images and sounds (AIS), and overcoming limitation in speaking/writing (OLSW) the second, sixth, seventh and eighth positions respectively. Regarding to other indicators, the three proficiency groups ranked them in very different ways. When the A2 group ranked creating structure for input/output (CSIO) as the most important strategy, the B1 and B2 groups were inclined to consider it as third position. On the other hand, when the B1 group thought that the first position was creating mental linkages (CML), the A2 group preferred it as the fifth, and the B2 group gave it the fourth. It should be noted that the B1 group considered employing action (EA) as the fifth important strategy, but this was last in the A2 and B2 groups' point of view.

Table 7: Eigenvectors for indicators of direct strategies among three proficiency groups

Sub-criteria	Indicator	A2			B1			B2		
		Weight		Rank	Weight		Rank	Weight		Rank
		Raw	Overall		Raw	Overall		Raw	Overall	
Ms	CML	.484	.099	5	.435	.153	1	.565	.148	4
	AIS	.328	.067	7	.226	.080	7	.283	.074	7
	EA	.188	.039	9	.339	.120	5	.152	.040	9
CS	P	.181	.119	4	.157	.071	9	.161	.097	5
	RSM	.257	.169	3	.275	.135	4	.313	.188	1
	AR	.278	.182	2	.286	.141	2	.269	.161	2
CPS	CSIO	.284	.187	1	.283	.139	3	.257	.154	3
	GILR	.516	.074	6	.540	.084	6	.609	.083	6
	OLSW	.484	.064	8	.460	.077	8	.391	.054	8
		CR=0.01(<0.1)			CR=0.03(<0.1)			CR=0.02(<0.1)		

As shown in Table 8, an agreement on the three least important strategies among the three groups can be found, and they gave arranging and planning your learning (APYL), empathizing with others (EWO), and evaluating your planning (EYL) the seventh, eighth and ninth positions respectively. Noticeably, the agreement and disagreement on the weight order of four strategies were intersected among groups. The A2 and B1 groups took lowering your anxiety (LYA) the first priority, but this was the third by the B2 group. In the same way, if the A2 and B1 groups thought that fourth position was asking questions (AQ), the B2 group preferred it as the most important one. On the other hand, when the B1 and B2 groups ranked cooperating with others (CWO) as the second important strategy, the A2 group was inclined to consider it as 6th position. Encouraging yourself (EY) was considered as the third important strategy by the A2 group, but the B1 and B2 groups gave it fifth position.

Table 8: Eigenvectors for indicators of indirect strategies among three proficiency groups

Sub-criteria	Indicator	A2			B1			B2		
		Weight		Rank	Weight		Rank	Weight		Rank
		Raw	Overall		Raw	Overall		Raw	Overall	
MCS	CYL	.444	.096	5	.387	.090	6	.485	.124	4
	APYL	.331	.071	7	.333	.077	7	.317	.081	7
	EYL	.225	.048	9	.280	.065	9	.198	.051	9
AS	LYA	.354	.173	1	.446	.164	1	.371	.133	3
	EY	.315	.159	3	.249	.095	5	.319	.114	5
	TYET	.332	.163	2	.305	.139	3	.310	.111	6
SS	AQ	.498	.125	4	.290	.133	4	.461	.178	1
	CWO	.331	.093	6	.351	.160	2	.347	.134	2
	EWO	.221	.062	8	.359	.071	8	.191	.074	8
		CR=0.01(<0.1)			CR=0.03(<0.1)			CR=0.02(<0.1)		

5. Discussion and Conclusions

One objective of this study was to understand what university students' perceptions of the importance of strategy use were, and the results have added to the growing body of research of learning strategies in terms of gender and language proficiency. An important finding is that learning strategies would hold a prominent role in English learning and teaching. That is, English instructors should consider the inclusion of appropriate learning strategies in course and material design, based on learners' backgrounds and language levels. At a minimum, they should adopt some universal strategies to make their students more effective and proficient in English learning. Otherwise, if teachers select strategies to be taught without considering the different preferences of their students, students will find the strategy instruction inappropriate and less attractive, and then lose interest in learning.

An imperative implication is that teachers have to carefully consider gender and language proficiency when selecting strategies, since students' strategy use was shown to be affected by these two factors. Therefore, teachers should be aware of the importance of strategy instruction in students' learning, acquaint themselves with sufficient knowledge and effective skills, be sensitive to make their instruction more flexible and make changes if necessary, and provide students with adequate information about the concepts and approaches of practising the strategies in their learning. Being aware of these factors can help reduce the negative effects of selecting strategies that do not fit students' needs.

A related implication is that strategy instruction is a key to help learners become competent learners. But, when we consider the implementations of strategy instruction, a further discussion of the current English education emerges. In Taiwan, university students usually take English courses in the first year, attending two one-hour lessons per week for two consecutive semesters. Moreover, English is seldom used as an instructional medium in other subjects, and students have to pass language proficiency tests, which are equivalent to a B1 level of English proficiency in the CEFR before graduation. Rather than being limited to such a test-oriented setting, an English program should create an authentic situation where learners can experience strategy use as they might do in their daily life. In addition, a self-controlled and pressure-free learning environment should be established so as to enhance learners' desire to learn, and in particular, to practice strategies.

In conclusion, there is a need for including learning strategies in the school syllabus at all levels, which can serve as a reinforcement for improving the current teaching and learning situation. For this reason, this study calls for teachers and educational authorities to include learning strategy training and practice. The strategy instruction will not be as effective if the issues mentioned above have not been taken into account.

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