



The Relationship between Language Learning Strategies and Achievement Goal Orientations from Taiwanese Engineering Students in EFL Learning

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ABSTRACT

This study investigated the relationships between language learning strategies (LLSs) and achievement goal orientations (AGOs) in Taiwanese engineering students taking an EFL (English as a Foreign Language) class. Fifty freshmen from college of technology in university in central Taiwan participated in this study. All of the participants had studied English as a foreign language for more than six years. This study found that, among six categories of language learning strategies, students preferred using social strategies, such as asking for help from others while learning English. Students also frequently employed compensation strategies when presented with unfamiliar English words. Cognitive and affective strategies were the least used. In terms of achievement goal orientations, students employed the mastery-approach and the performance-approach more frequently than mastery-avoidance and performance-avoidance. Finally, a significant correlation was identified between language learning strategies and achievement goal orientations.

Keywords: language learning strategies, achievement goal orientations, EFL

INTRODUCTION

Language Learning Strategies (LLSs) play indispensable roles in the field of language learning. Strategic competence is an essential component of communicative competence, and refers to the ability to use strategies which allow the speaker to compensate for language knowledge limitations. Oxford (1990) described strategies as tools that involve active and self-directed development towards communicative competence. In an EFL classroom, LLSs are important for two reasons. First, by examining the LLSs used by EFL learners, learning processes that involve different strategy systems can be elucidated. Second, LLSs can be taught to less successful EFL learners in order to help them achieve better learning results (Chamot, 2005).

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Contribution of this paper to the literature

- This study aims to elucidate what language learning strategies are employed by engineering students in EFL learning.
- This study aims to elucidate which achievement goal orientations are used by engineering students in EFL learning.
- This study aims to characterize the relationship between LLSs use and AGOs among engineering students in EFL learning.

Different learners employ different LLSs. Researchers have therefore tended to focus on the relationship between LLSs and “individual differences”. Benson and Gao (2008) classified individual differences into two categories: first, supposedly innate attributes such as age, gender, aptitude and learning style; second, supposedly acquired attributes such as motivation and attitudes. Achievement goal orientation (AGO) which is described as an individual’s disposition or response to tasks is considered to be one of the variables affecting LLSs. In addition, both LLSs and AGOs in EFL learning are closely related to the contents of texts that play an important role in achieving effective learning. Short (2017) discussed the way to integrate content and language learning effectively for English language learners. Prediger and Zindel (2017) presented a design for fostering the conceptual understanding of language learners by the principles of relating registers and systematic variation of texts.

LLSs research has previously been conducted in Taiwanese EFL classrooms, primarily to investigate relationships between LLSs and grade level (Liu, 2005; Ong, 2005; Chuang, 2007), language proficiency (Chen, 2001), learning motivation (Liao, 2000; Peng, 2001), learning attitudes (Yang, 1992), and learning styles (Ko, 2001). However, few studies have focused on undergraduate students in investigating the relationship between LLSs and AGOs. Therefore, the current study sought to fill this research gap by examining the relationship between LLSs and AGOs in undergraduate EFL learners. The research questions were as follows:

Q1: What kinds of language learning strategies do engineering students use for EFL?

Q2: What are the achievement goal orientations of engineering students toward EFL?

Q3: What relationships exist between language learning strategies and achievement goal orientations?

LITERATURE REVIEW

Classification of Language Learning Strategies (LLSs)

LLSs have been one of the most popular research topics in the field of EFL (Griffiths & Oxford, 2014; Jeon & Yamashita, 2014). Rubin (1987) defined LLSs as strategies employed by a learner to regulate their learning. O’Malley & Chamot (1990) emphasized the use of thoughts or behaviors to achieve comprehension, learning, and retention of new information. Different LLS classifications have been proposed. Metacognitive strategies have been described as strategies by which the individual “learns about learning” through conscious effort. Cognitive strategies include steps that learners take to make material more manageable or easier to master. Social/affective strategies involve interactions with other individuals as well as the affective side of language learning. The aforementioned can be further broken down into direct and indirect strategies. Direct strategies directly involve targeted language and comprise memory strategies, cognitive strategies, and compensation strategies. Indirect strategies support language learning indirectly and include metacognitive strategies, affective strategies, and social strategies.

Research on LLSs in Taiwan

In Taiwan, high-proficiency learners have tended to report significantly more frequent use of LLSs than medium and low proficiency learners (Chen, 2001). Motivation has been identified as one of the factors that underlies individual differences, and Liao (2000) and Peng (2001) investigated the relationship between motivation and LLSs. Attitude (Yang, 1992) and learning style (Ko, 2001) have also been correlated with LLSs use.

Achievement Goal Orientations (AGOs) Theory

AGO is described as individual's disposition when responding to tasks and explains how individuals orient themselves when pursuing goals (Vandewalle, 1997; Musa et al., 2016; Allahdadi et al., 2016). Ames's (1992) study provided a dichotomous framework of AGOs in which goals were classified as being oriented towards mastery (mastery goals) or oriented towards performance (performance goals). Elliot (1999) considered the dichotomous framework insufficient to account for all types of goal orientation and therefore proposed the trichotomous framework. This framework retained the original concept of mastery goals, but sub-divided performance goals into two categories: performance-approach goals and performance-avoidance goals. Performance-approach goals are indicative of an individual's desire to outperform others and demonstrate his or her superiority. In contrast, performance-avoidance goals focus on the avoidance of demonstrating incompetence and gaining unfavorable judgments (Vandewalle, 1997).

Elliot and McGregor (2001) stated that neither the dichotomous framework nor the trichotomous framework took mastery avoidance goals into consideration; therefore, they proposed the 2x2 achievement goal framework, which constructed goal orientation in two dimensions by considering the definition of competence (performance versus mastery) and the valence of competence (approach and avoidance).

Research on AGOs in Taiwan

Research pertaining to AGOs theory has gradually increased in Taiwan, and researchers (He, 2004; Lin, 2011; Chen, 2012) have generally been interested in the relationship between AGOs and three variables. The first variable is self-efficacy, which represents the student's belief that he or she can successfully perform a task; self-efficacy influences the AGOs students adopt. The choice of whether to adopt mastery-approach or mastery-avoidance goals has been attributed to the self-efficacy of participants. The second variable is learning goal orientations, and students that adopted these demonstrated better academic achievement (Lin & Hsieh, 2001). The third variable is self-regulated learning (Li, 2012; Wu, 2016). In investigating self-regulated learning, Lin (2011) concluded that, under the cues of approach-performance classroom goals, cognitive processing strategies tended to become less effective for the mastery goal group, whereas cognitive processing strategies improved for the approach-performance goal group.

The Relationship between LLSs and AGOs

Although researchers have classified AGOs differently, most research that has focused on the relationship between LLSs and AGOs has tended to employ the dichotomous framework, which divides AGOs into mastery goals and performance goals. A study by Ames & Archer (1988) found that a student's AGO was related to different patterns of LLS use, wherein students who adopted mastery goals were more likely to report the use effective learning strategies. Tickle (2001) further concluded that students motivated by mastery goals were more likely to employ deep learning strategies. Other researchers (Fenollar et al., 2007; Liem et al., 2008) reported that mastery goals were usually related to greater use of deep-processing learning strategies, such as elaboration or organization strategies. A study by Dupeyrat and Mariné's (2005) also showed that mastery goal orientation was positively correlated with deep-processing strategies, while performance goals were positively correlated with both shallow and deep strategies.

Findings pertaining to the relationship between performance goals and LLSs have been inconsistent; some studies have reported that performance goals were related to both shallow and deep learning strategies while others revealed a close correlation between performance goals and shallow-processing strategies, such as rote learning or memorization (Nolen, 1988; Miller et al., 1996). According to Harackiewicz et al. (2002) and Pintrich et al. (2003), performance-approach goals may benefit students' cognitive learning. Indeed, performance-approach goals have been correlated with the use of cognitive strategies, while performance-avoidance goals have been correlated to surface processing activities, such as rehearsal (Pintrich, 2000).

METHODOLOGY

Participants

The present study employed a cluster sampling design, and participants included fifty freshmen enrolled in a college of technology at a university in central Taiwan. All participants were male students who were attending the same class and were aged 19 or 20 years old. All participants had studied English as foreign language for more than six years.

The college of technology was chosen because all of the freshmen in this college had attended a vocational high school, which typically require fewer English credits than normal senior high schools. Unlike students from other high schools, vocational high school students choose whether to study English as a primary subject. Therefore, to investigate language learning strategies and achievement goal orientations in the context of English learning, freshmen enrolled in the college of Technology were selected as study participants.

Instrumentation

Since the objective of the present study is to elucidate the correlation between the language learning strategies and achievement goal orientations adopted by undergraduate students, a quantitative research method was employed. Participants were given two questionnaires: the Strategy Inventory for Language Learning (SILL) and the Achievement Goal Orientation Scale (AGOS).

The Strategy Inventory for Language Learning (SILL)

The Strategy Inventory for Language Learning (Oxford, 1989) is the language learning strategy questionnaire which is most commonly employed world-wide. The SILL includes six categories of language learning strategies: memory strategies (items 1-9), cognitive strategies (items 10-23), compensation strategies (items 24-29), metacognitive strategies (items 30-38), affective strategies (items 39-44), and social strategies (items 45-50).

Participants were asked to rate each strategy statement on a five-point Likert scale. The choices were as follows: 1) Never or almost never true of me, 2) Generally not true of me, 3) Somewhat true of me, 4) Generally true of me, and 5) Always or almost always true of me. To obtain an overall SILL score, a point value was assigned to each response, and the points were totaled. A higher score indicated that the participant tends to use multiple strategies when learning English. The reliability and validity of Oxford's Strategy Inventory for Language Learning were .96 and .95, respectively. To account for the different English abilities of participants, this study adopted the Chinese version of the SILL, which was translated by Yang (1992). Yang reported a Cronbach alpha coefficient of .94 based on a sample of 590 Taiwanese university students, confirming that the Chinese version of the scale also has high reliability.

Achievement Goal Orientation Scale (AGOS)

This study employed a version of the achievement goal orientation scale that is suitable for Taiwanese students. Specifically, this scale was developed by Liu (2005), who adapted the original achievement goal orientation scale proposed by Pintrich (2000) and Hsieh (2003). The AGOS consists of four types of goals: mastery-approach goals (items 1-8), performance-approach goals (items 9-16), mastery-avoidance goals (items 17-23) and performance-avoidance goals (items 24-30).

The AGOS uses a five-point Likert scale. Participants were asked to choose an answer from among the following: 1) Never or almost never true of me, 2) Generally not true of me, 3) Somewhat true of me, 4) Generally true of me, and 5) Always or almost always true of me. Since the scale by Liu (2005) was developed to investigate participant goal orientation while learning psychology, this study further modified the scale to measure participant goal orientation while learning English. The Cronbach's Alpha of the modified version of the scale was .944.

Table 1. The highest and lowest mean scores in each of the six SILL categories

Categories	Highest mean item (M)	Lowest mean item (M)
Memory	Item 1: I think of relationships between what I already know and new things I learn in English. (3.45)	Item 6: I use flashcards to remember new English words. (2.76)
Cognitive	Item 10: I say or write new English words several times. (3.57)	Item 17: I write notes, messages, letters, or reports in English" got the lowest mean score. (2.64)
Compensation	Item 24: To understand unfamiliar English words, I make guesses. (3.40)	Item 26: I make up new words if I do not know the right ones in English. (2.86)
Metacognitive	Item 33: I pay attention when someone is speaking English. (3.24)	Item 34: I plan my schedule so I will have enough time to study English. (2.69)
Affective	Item 40: I encourage myself to speak English even when I am afraid of making a mistake. (3.29)	Item 43: I write down my feelings in a language learning diary. (2.69)
Social	Item 45: If I do not understand something in English, I ask the other person to slow down or say it again. (3.57)	Item 47: I practice English with other students. (2.81)

Data Collection

This study selected a class of freshmen enrolled in a college of technology at a university in central Taiwan. On the day of questionnaire administration, the researcher briefly explained the purpose of the questionnaires and provided participants with instructions pertaining to how the questionnaires should be answered. Every participant was given two questionnaires: SILL and AGOS, which took about 50 minutes to complete. After participants completed the questionnaires, answer sheets were collected.

Data Analysis

SPSS software was used to analyze the collected data. Means (M) were calculated for each category of the SILL and AGOS questionnaires. The Pearson product-moment correlation was employed to investigate the relationship between learning strategy and goal orientation.

RESULTS

The present study examined the LLSs and AGOs of undergraduate students and the relationship between them. The results of the study are divided into two sections. Section one reported the descriptive statistics from questionnaire items. Section two reported the correlations between the LLS and AGO.

Descriptive Statistics of SILL

Items that received the highest and lowest mean scores in each category of the SILL are shown in **Table 1**. In the memory strategies category, item 1 received the highest mean score (M=3.45), and item 6 received the lowest mean score (M=2.76). In the cognitive strategies category, item 10 received the highest mean score (M=3.57), and item 17 received the lowest mean score (M=2.64). In the compensation strategies category, item 24 received the highest mean score (M=3.40), and item 26 received the lowest mean score (M=2.86). In the metacognitive strategies category, item 33 received the highest mean score (M=3.24), and item 34 received the lowest mean score (M=2.69). In the affective strategies category, item 40 was the most frequently used (M=3.29), and item 43 was the least frequently used (M=2.69). In the social strategies category, item 45 received the highest mean score (M=3.57), and item 47 received the lowest mean score (M=2.81).

Table 2. The six items with the highest mean SILL scores

Highest item	Learning strategies	M	Category	n
10	I say or write new English words several times.	3.57	Cognitive	
45	If I do not understand something in English, I ask the other person to slow down or say it again.	3.57	Social	
1	I think of relationships between what I already know and new things I learn in English.	3.45	Memory	
24	To understand unfamiliar English words, I make guesses	3.4	Compensation	
29	If I can't think of an English word, I use a word or phrase that means the same thing.	3.38	Compensation	
46	I ask English speakers to correct me when I talk	3.36	Social	
			Compensation	2
			Social	2
Total			Memory	1
			Cognitive	1

Table 3. The six items with the lowest mean SILL scores

Lowest item	Learning strategies	M	Category	n
17	I write notes, messages, letters, or reports in English.	2.64	Cognitive	
18	I first skim an English passage (read over the passage quickly) then go back and read carefully.	2.69	Cognitive	
34	I plan my schedule so I will have enough time to study English.	2.69	Metacognitive	
43	I write down my feelings in a language learning diary.	2.69	Affective	
16	I read for pleasure in English	2.74	Cognitive	
6	I use flashcards to remember new English words	2.76	Memory	
			Cognitive	3
			Metacognitive	1
Total			Memory	1
			Affective	1

In order to better elucidate participants' language learning strategies, the six items with the highest overall mean and the six items with the lowest overall mean were investigated further. The six items with the highest mean scores are listed in **Table 2**. As shown in **Table 2**, the items with the highest overall means were item 10 (in the cognitive strategies category), item 45 (in the social strategies category), item 1 (in the memory strategies category), items 24 and 29 (in the compensation strategy category), and item 46 (in social strategies category).

The six items with the lowest overall mean scores are listed in **Table 3**. Three of these items (16, 17, and 18) belonged to the cognitive strategies category. The other three items belonged to the metacognitive strategy category, the memory strategy category, and the affective strategy category, respectively.

Table 4 shows that, of the six categories of learning strategies, the EFL learners in this study most preferred social (M=3.19), compensation (M=3.14) and memory (M=3.07) strategies, while cognitive (M=2.99), affective (M=3.02), and metacognitive (M=3.03) strategies were the least preferred.

Table 4. Mean scores of the six learning strategy categories

Direct strategies	M	Indirect strategies	M
Memory	3.07	Metacognitive	3.03
Cognitive	2.99	Affective	3.02
Compensation	3.14	Social	3.19

Table 5. Items that received the highest and lowest mean scores in each AGOs category

Categories	Highest mean item (M)	Lowest mean item (M)
Mastery-approach	Item 7: The reason I learn English is to improve my English proficiency rather than show off my ability. (3.62)	Item 5: I want the teacher to teach something challenging so that I can learn more knowledge" got the lowest mean score. (3.14)
Performance-approach	Item 9: When I get better score on English than others, I think I am successful. (3.62)	Item 15: It doesn't matter whether I acquire knowledge or not because what's more important is to get good grades. (2.90)
Mastery-avoidance	Item 21: When learning English, I am confused and wonder if I learn English in wrong ways. (3.43)	Item 18: I am worried about making no progress in English, so I supervise myself with high standard. (2.88)
Performance-avoidance	Item 26: My main goal in English class is to avoid bad performance. (3.21)	Item 28: It is important to not be considered silly in English class. (2.69)

Descriptive Statistics of AGOS

Table 5 shows that, of mastery-approach goals, item 7 received the highest mean score ($M=3.62$), and item 5 received the lowest mean score ($M=3.14$). Of performance-approach goals, item 9 received the highest mean score ($M=3.62$), and item 15 received the lowest mean score ($M=2.90$). Nonetheless, the lowest mean score received by a performance-approach goals item was far below the lowest mean score received by a mastery-approach goals item.

Regarding mastery-avoidance goals, the highest and lowest mean scores were received by item 21 ($M=3.43$) and item 18 ($M=2.88$), respectively. In general, the mean scores of performance-avoidance goals were not high. Specifically, in this category, the highest mean score was achieved by item 26 ($M=3.21$), and the lowest mean score was received by item 28 ($M=2.69$).

As shown in **Table 6**, three out of six items that received the highest overall mean scores on the AGOS questionnaire belonged to the mastery-approach goals category; another two belonged to the performance-approach goals category; and the final item belonged to the category of mastery-avoidance.

Table 6. The six items with the highest mean AGOs scores

Highest item	Achievement goal orientation	M	Category	n
7	The reason I learn English is to improve my English proficiency rather than show off my ability.	3.62	Mastery-approach	
9	When I get better score on English than others, I think I am successful.	3.62	Performance-approach	
10	When my performance on English is better than others, it sufficiently proves my English ability.	3.55	Performance-approach	
3	I hope that I can comprehend and much more familiar with what I learn in English.	3.45	Mastery-approach	
8	It is important that I can comprehend what is taught in English class and have sense of achievement in learning English.	3.45	Mastery-approach	
21	When learning English, I am confused and wonder if I learn English in wrong ways.	3.43	Mastery-avoidance	
			Mastery-approach	3
Total			Performance-approach	2
			Mastery-avoidance	1

Table 7. The six items with the lowest mean AGOs scores

Lowest item	Achievement goal orientation	Mean	Category	n
28	It is important to not be considered silly in English class.	2.69	Performance-avoidance	
18	I am worried about making no progress in English, so I supervise myself with high standard.	2.88	Mastery-avoidance	
29	The reason I study English is to avoid getting the worst score in English class.	2.88	Performance-avoidance	
15	It doesn't matter whether I acquire knowledge or not because what's more important is to get good grades.	2.9	Performance-approach	
14	In English class, I am encouraged because I want to be better than others.	2.93	Performance-approach	
25	I am afraid of asking my teacher silly questions because I don't want to be considered silly.	2.93	Performance-avoidance	
			Performance-avoidance	3
Total			Performance-approach	2
			Mastery-avoidance	1

Table 7 reveals that most of the items with the lowest mean scores were related to performance goals. Specifically, three of these items belonged to the performance-avoidance category and two of these items belonged to the performance-approach category. Only one item was related to mastery-avoidance.

Table 8. Mean scores of AGOs categories

Mastery Goals	M	Performance Goals	M
Mastery-approach	3.38	Performance-approach	3.22
Mastery-avoidance	3.11	Performance-avoidance	2.98

Table 9. Correlations between LLSs and AGOs categories

LLSs	AGOs			
	Mastery-approach	Performance-approach	Mastery-avoidance	Performance-avoidance
Memory strategies	.418**	.589**	.652**	.230
Cognitive strategies	.418**	.589**	.652**	.230
Compensation strategies	.539**	.566**	.627**	.400**
Metacognitive strategies	.697**	.631**	.684**	.480**
Affective strategies	.543**	.457**	.571**	.379*
Social strategies	.651**	.707**	.751**	.408**

* $p < .05$, ** $p < .01$

Table 8 reveals that students were most likely to adopt a mastery-approach ($M=3.38$), followed by performance-approach ($M=3.22$) and mastery-avoidance ($M=3.11$). Performance-avoidance ($M=2.98$) was the least preferred approach to goal orientation.

Correlation between LLSs and AGOs

As indicated in **Table 9**, both memory strategies and cognitive strategies had highly significant correlations with mastery-approach goals, performance-approach goals, and mastery-avoidance goals; but no significant correlation existed between these strategies and performance-avoidance goals.

Compensation strategies, metacognitive strategies, and social strategies were all correlated with four AGO items, and these correlations were highly significant. Affective strategies showed highly significant correlations with mastery-approach goals, performance-approach goals, and mastery-avoidance goals.

DISCUSSION

In this section, the results are discussed in the context of the following research questions: Q1) What kinds of language learning strategies do engineering students use for EFL? Q2) What are the achievement goal orientations of engineering students toward EFL? Q3) What relationships exist between language learning strategies and achievement goal orientations?

Q1: LLSs of EFL Learners

Results from the SILL indicate that, among the six learning strategy categories, EFL learners most preferred social, compensation, and memory strategies, while cognitive, affective, and metacognitive strategies were the least preferred. These results are similar to those obtained by Chen (2001) and Chen (2012), who found that technology college students with both high and low English proficiency used compensatory learning strategies most frequently. Furthermore, Ong (2005) found that sophomores also use compensatory strategies most frequently, while cognitive strategies were used least frequently. However, research by Lin (2011) that investigated the LLSs of college English majors suggested that students employed cognitive strategies the most and affective strategies the least. Ong (2005) found that students enrolled in different majors/schools showed significantly different use of English learning strategies. Therefore, the inconsistent results between Lin's research and the present study may be due to the different academic disciplines of participants. Lin's research focused on English majors, while the present research focused on engineering majors.

In addition, although one of the highest scoring learning strategies fell under the cognitive strategies category, cognitive strategies ranked as the least preferred strategies overall. Indeed, half of the least preferred items belonged to the cognitive strategies category, implying that English learners are less likely to employ cognitive strategies. Conversely, the results suggest that EFL learners prefer using social strategies. For example they might “ask others to slow down or say it again when they don’t understand,” or “ask English speakers to correct their speech.” This finding is in line with a study by Wharton (2000). Specifically, Wharton (2000) examined the language learning strategy use of university students in Singapore and reported that social learning strategies received a high mean and rank. Regarding compensation strategies, this study found that EFL learners tended to guess and seek for similar meaning when they encounter unfamiliar English words. This finding is supported by Wu’s (2016) research, which reported that “guessing the approximate meaning” was ranked first among all LLSs that had been considered.

Q2: AGOs of EFL Learners

Results pertaining to AGOs indicate that EFL students tended to prefer the mastery-approach and performance-approach orientations more than the than mastery-avoidance and performance-avoidance orientations. The main reasons that students wished to learn English were to improve their English proficiency and to demonstrate their English ability. Students also noted that they believed a sense of achievement was important and that they considered themselves to be successful learners. Most previous AGOs studies in Taiwan have focused on elementary and junior high school students. Results of those earlier works support the current study; specifically, they suggested that mastery-approach orientations were most common, followed by performance-approach orientations, mastery-avoidance orientations, and performance-avoidance orientations (Hsieh, 2003). In other words, when the mean scores of goal categories were ranked, students were more inclined towards mastery goals than performance goals. However, five of the six items with the lowest overall mean scores were related to performance goals, implying that students are more likely to pursue mastery-oriented goals than performance-oriented goals.

Q3: Relationships between LLSs and AGOs

In general, this study found a highly significant correlation between LLSs and AGOs. The six learning strategy categories showed especially strong correlations with the mastery-approach orientation, the performance-approach orientation, and the mastery-avoidance orientation. The correlation between LLSs and performance-avoidance was less significant, implying that students’ desire to avoid demonstrating incompetence and receiving unfavorable judgments did not impact their learning strategy use to the same degree.

Study Limitations

The participants of the study were EFL freshmen that were majoring in engineering. Therefore, the results of this study do not necessarily reflect the relationships between LLSs and AGOs for all undergraduate EFL learners. In addition, this study did not account for different levels of English proficiency. Future studies that include English proficiency as a variable may be able to provide a more comprehensive elucidation of LLSs, AGOs, and the correlations that exist between them.

Pedagogical Implications

The results of this study can help teachers better understand their students’ LLSs and AGOs. By understanding LLSs that are commonly employed by students, teachers can tailor their classes to better meet student strengths and learning needs. By understanding common AGOs, teachers can design curriculum goals which cater to students’ goal orientations. The significant correlations that we identified between certain LLSs and AGOs can also help teachers better design their teaching to correspond to curriculum goals.

CONCLUSION

This study investigated the relationship between learning strategies and achievement goal orientations in 50 Taiwanese engineering students involved in EFL learning. All participants had studied English as foreign language for more than six years. Of the six LLSs categories considered, students reported using social strategies most frequently. In terms of AGOs, students were more likely to be mastery-approach and performance-approach oriented than mastery-avoidance and performance-avoidance oriented. Finally, this study finds a significant correlation between the LLSs and AGOs employed by students.

REFERENCES

- Allahdadi, S., Jahedizadeh, S., Ghanizadeh, A. & Hosseini, A. (2016). On the Impact of Achievement Goal-orientations on EFL University Students' Demotivation. *International Journal of Educational Investigations*, 3(1), 103-114.
- Ames, C. (1992). *Achievement goals, motivational climate, and motivational processes*. In G. Roberts (Ed.), *Motivation in sports and exercise*, Champaign, IL: Human Kinetics Books, 161-176.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80(3), 260-267.
- Benson, P., & Gao, X. (2008). *Individual variation and language learning strategies*. In S. Hurd & T. Lewis (Eds.), *Language learning strategies in independent settings*, Bristol, England: Multilingual Matters, 25-40.
- Chamot, A. U. (2005). *Language learning strategy instruction: Current issues and research*. *Annual Review of Applied Linguistics*.
- Chen, I. (2001). *Language learning strategies used by high and low English proficiency students in a technology college* (Unpublished thesis). National Changhua University of Education, Changhua, Taiwan.
- Chen, W. Y. (2012). *Moderated effects of classroom goal structure on the relationships between students' goal orientation, self-efficacy, and approach/avoidance behavior* (Unpublished master's thesis). National Cheng Kung University, Tainan.
- Chuang, H.Y. (2007). *The study of foreign language anxiety, English learning motivation and strategies in the elementary school* (Unpublished master's thesis). National Chayi University, Chayi, Taiwan.
- Dupeyrat, C., & Mariné, C. (2005). Implicit theories of intelligence, goal orientation, cognitive engagement, and achievement: A test of Dweck's model with returning to school adults. *Contemporary Educational Psychology*, 30, 43-59.
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34(3), 169-189.
- Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology*, 80(3), 501-519.
- Fenollar, P., Román, S., & Cuestas, P. J. (2007). University students' academic performance: An integrative conceptual framework and empirical analysis. *British Journal of Educational Psychology*, 77, 873-891.
- Griffiths, C. & Oxford, R. L. (2014). The twenty-first century landscape of language learning strategies: Introduction to this special issue. *System*, 43, 1-10.
- Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology*, 94, 638-645.
- He, T. H. (2004). The relations among trichotomous achievement goals, self-efficacy, and self-regulation in EFL sixth-grade classes in Taiwan. *Journal of National Taipei Teachers College*, 17(1), 111-133.
- Hsieh, D. L. (2003). *The analysis of mediating effect of 4-Dimensional Goal Orientation of Junior High School Students* (Unpublished master's thesis). National Chenkung University, Tainan, Taiwan.
- Jeon, E. H. & Yamashita, J. (2014). L2 Reading Comprehension and Its Correlates: A Meta-Analysis. *Language Learning*, 64(1), 160-212.

- Ko, Y. W. (2001). *Perceptual style preferences and their relationship to English achievement and learning strategies of junior high EFL learners in Taiwan*. (Unpublished master's thesis). National Gau-Shung University of Education, Taiwan.
- Lan, L. R. & Oxford, R. L. (2003). Language learning strategy profiles of elementary school students in Taiwan. *International Review of Applied Linguistics in Language Teaching*, 41(4), 339-379.
- Li, C. W. (2012). *The mediating effect of individual goal orientation on the relation between effort belief and self-regulated learning strategies, and the moderating effect of ability belief* (Unpublished master's thesis). National Cheng Kung University, Tainan.
- Liao, Y. F. (2000). *A study of Taiwanese junior high school students' EFL learning motivation and learning strategies*. Unpublished master's thesis, National Changhua University of Education, Taiwan.
- Liem, A. D., Lau, S., & Nie, Y. (2008). The role of self-efficacy, task value, and achievement goals in predicting learning strategies, task disengagement, peer relationship, and achievement outcome. *Contemporary Educational Psychology*, 33, 486-512.
- Lin, C. C., & Hsieh, C. L. (2001). Effects' of vocation high school students' goal orientation on learning strategies and academic achievement. *Journal of Educational Measurement and Statistics*, 9, 131-168.
- Lin, Y. H. (2011). *The effect of cues of classroom goal and personal goal orientation on solving mathematics problems and self-regulated learning* (Unpublished master's thesis). National Cheng Kung University, Tainan.
- Liu, M. L. (2005). *A study of beliefs about language learning and learning strategies of senior high school students* (Unpublished master's thesis). National Kaohsiung Normal University, Kaohsiung, Taiwan.
- Miller, R. B., Greene, B. A., Montalvo, G. P., Ravindran, B., & Nichols, J. D. (1996). The role of learning goals, future consequences, pleasing others, and perceived ability. *Contemporary Educational Psychology*, 21, 388-422.
- Musa, K. J., Dauda, B., & Umar, A. (2016). Gender differences in achievement goals and performances in English language and mathematics of senior secondary schools students in Borno State. *Journal of Education and Practice*, 7(27), 165-175.
- Nolen, S. B. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognition and Instruction*, 5, 269-287.
- O'Malley, J. & Chamot, A. (1990). *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.
- Ong, S. Y. (2005). *English language learning strategies used by the sophomore students of a technology university* (Unpublished master's thesis). Nantai University of Science and Technology, Tainan, Taiwan.
- Oxford, R. L. (1989). *Strategy inventory for language learning (SILL)*, EFL/ ESL 7.0 version.
- Oxford, R. L. (1990). *Language Learning Strategies: What Every Teacher Should Know*. Boston: Heinle & Heinle.
- Peng, I. N. (2001). *EFL motivation and strategy use among Taiwanese senior high school learners*. Unpublished master's thesis, National Taiwan Normal University, Taiwan.
- Pintrich, P. R. (2000). Multiple-goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92, 544-555.
- Pintrich, P. R., Conley, A. M., & Kempler, T. M. (2003). Current issues in achievement goal theory and research. *International Journal of Educational Research*, 39, 319-337.
- Prediger, S. & Zindel, C. (2017). School academic language demands for understanding functional relationships: A design research project on the role of language in reading and learning. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(7b), 4157-4188.
- Rubin, Joan (1987). Learner strategies: theoretical assumptions, research history and typology. In A. Wenden & Joan Rubin (eds), 15-19.
- Short, D. J. (2017). How to integrate content and language learning effectively for English language learners. *EURASIA Journal of Mathematics Science and Technology Education*, 13(7b), 4237-4260.
- Tickle, S. (2001). What have we learnt about student learning? A review of the research on study approach and style. *Kybernetes*, 30(7/8), 955-969.
- Vandewalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement*, 57(6), 995-1015.

- Wharton, G. (2000). Language learning strategy use of bilingual foreign language learners in Singapore. *Language Learning*, 50(2), 203-243.
- Wu, W. C. (2016). *The relationship among individual goal orientations, self-regulated learning strategies and on-task/off-task motivation interference of junior high school students* (Unpublished master's thesis). National Cheng Kung University, Tainan.
- Yang, N. (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, Austin.

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