

*Vocabulary Learning Strategies and Cognitive Styles among Junior High School
Students in Taiwan*

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Abstract

This study investigates the use of vocabulary learning strategies (VLSs) among EFL junior high school students in Taiwan, and explores the relationship between the use of VLSs and cognitive styles. We administered a VLS questionnaire and a Hidden Figures Test (HFT) to 277 Grade 9 junior high school students. The results show that students do not often use VLSs. Moreover, cognitive style is significantly correlated with the use of the following 3 VLS categories: social strategies, memory strategies, and metacognitive strategies—but not cognitive strategies. We suggest that teachers help students understand various VLSs and their cognitive styles to improve and facilitate their learning.

Keywords: vocabulary learning strategies, learning achievements.

INTRODUCTION

The differences between vocabulary learning strategies (VLSs) use and language learning achievement are often examined in the field of second or foreign language learning (Gu and Johnson 1996, Kojic-Sabo and Lightbown's 1999, Fan 2003). The results were similar; the high level students employed VLS more frequently than the low level students, and employed a wider range of VLSs.

Cognitive styles are the individual differences in how people perceive information and solve problems (Witkin and Goodenough 1981). Regarding the theory of cognitive styles, those who tend to rely on others more are regarded as field dependent, whereas those who depend on themselves more are considered field independent. The former students have the tendency to use more social strategies, such as practicing with peers, teachers, parents, or others, than the later. This is in agreement with Frank (1984) and Witkin and Goodenough (1981). Field-dependent learners need help from others. They like to collaborate with people and engage in social interactions to obtain information. Social input and external support can help them understand clues comfortably and easily in learning tasks, and the use of the appropriate VLSs.

The cognitive style type and the knowledge of the various matching VLS's are beneficial to the students learning English vocabulary. Therefore, we conducted the investigational study of the VLS's use and the type of cognitive style among the junior high students in Taiwan to explore the differences between the field-dependent and the field-independent students.

1.1 Background and motivation

Taiwan's educational system has increasingly emphasized the trend of learning English. However, researchers have discovered English learning problems among Taiwanese EFL students. Tseng indicated that English classes are constrained to 80 min per week, resulting in numerous students with insufficient time to immerse themselves in the foreign language to obtain successful learning results (as cited in Zhou 2009). Furthermore, EFL students have to learn a wide range of content, and thus, they are unaware of how to control their learning. Moreover, a large class of 30-35 students makes it difficult for teachers to care for every learner with limited class times, especially while managing students with varying levels of English proficiency (Jian 2005).

To study more efficiently, the students should understand the importance of the use of the appropriate VLS's. Language learning strategies are methods or techniques that can help improve and manage language comprehension, learning, and the retention of information, as well as performance (Weinstein and Mayer 1986). The appropriate use of learning strategies enables learners to take responsibility for their own learning, and thus, they can become autonomous learners (Cohen 1998, O'Malley and Chamot 1990).

Because of the significance of a vocabulary, the use of the appropriate VLSs should be able to generate benefits in second/foreign language learning. Nation (2001) claimed that the VLSs can help learners acquire the target language efficiently and effectively with the least difficulty. Gu and Johnson (1996) discovered that knowing how to use VLSs properly and correctly can lead to positive learning achievements. Sanaoui (1995) found that those who could employ organized approaches to vocabulary learning were successful in vocabulary acquisition. Thus, VLSs play a significant role in second language acquisition.

The different ways of learning can be attributed to individual differences (Witkin and Goodenough 1981). Cognitive styles (i.e., how a learner processes information) have been extensively discussed in the past (Riding and Cheema 1991). According to Frank (1984), individual cognition is able to influence individual learning preferences and further make learning effective. To benefit learning, it is necessary to provide appropriate materials and environments to meet students' cognitive styles (Witkin and Goodenough 1981).

The Ministry of Education (2009) proposed a vocabulary list of 1,200 high-frequency words that students should learn before they graduate from junior high school. Teachers are also required to match individual differences and develop their learning strategies while teaching. This study provides a more in-depth look into junior high school students' use of VLSs according to their cognitive styles. Based on the findings, we provide an effective way of learning vocabulary for all students.

The objective of this study is to help students learn how to effectively use the strategies of their learning preference. For teachers, the study promotes recognizing differences in student learning to enhance teaching.

LITERATURE REVIEW

2.1 Vocabulary learning strategies

Vocabulary is the core of any language learning process (Laufer 1997). Learning vocabulary requires VLSs, which are the strategies a learner uses to improve vocabulary acquisition (Schmitt 2000).

The taxonomy of a VLS, as proposed by Schmitt (1997), includes five categories: determination strategies (DETs), social strategies (SOCs), memory strategies (MEMs), cognitive strategies (COGs), and metacognitive strategies (METs). Four of them were extracted from Oxford's (1990) taxonomy of learning strategies: SOCs, MEMs, COGs, and METs. The newly added category was DETs, which are used when a person needs to discover the meaning of a new word without help from others (Schmitt 2000). Schmitt listed 58 strategies and divided them into five categories. Numerous studies have adopted his comprehensive framework of VLSs (Chen 1998, Kudo 1999, Višnja 2008, Wang 2004), as have we for this research [(For a detailed description of the categories, see Chang, Weng, and Zakharova's vocabulary learning strategies use study (2013)].

2.3 Empirical research on vocabulary learning strategy use

This research is a follow-up study on VLS use among junior high school students in Taiwan. According to the results of our previous study (2013), high- and low-proficiency students differed significantly in three categories: MEMs, COGs, and METs. This suggests that high-proficiency learners use MEMs, COGs, and METs significantly more often compared to their low-proficiency counterparts. SOCs were employed with almost equal frequency. The results were consistent with the studies of Gu and Johnson (1996), Kojic-Sabo and Lightbown (1999), and Fan (2003). The studies indicated the relationship between learning success and the use of VLS (Gu and Johnson 1996, Fan 2003), resulting in the variety of the VLS's use among high proficiency students (Gu and Johnson 1996, Kojic-Sabo and Lightbown 1999, Fan 2003); low-level achievement students put less effort into vocabulary learning (Kojic-Sabo and Lightbown, 1999).

2.4 Cognitive styles

COGs represent the behaviors that a person perceives, thinks, and uses to solve problems, and they can affect the person's attitudes, values, and habits in learning, including the concepts of field independence and field dependence (Messick 1970). A

field-independent learner tends to be analytical in perceiving and processing information without being interrupted by irrelevant elements, whereas field-dependent learners rely more on the information and environment they experience (Witkin and Goodenough 1981).

Witkin (1952) found that subjects depended on visual cues to adjust the environment, which led to his establishing the Embedded Figures Test (EFT) to determine people's cognitive styles. In 1962, Messick revised Witkin's version and established a similar test called the Hidden Figures Test (HFT). This test uses a person's ability to identify a simple embedded figure from a complex visual field. At a perceptual level, a field-independent person is more able to distinguish figures as discrete from their backgrounds compared to a field-dependent person who experiences events in an undifferentiated manner.

A person who can easily separate an item from an organized perceptual field is referred to as being field independent (Witkin and Goodenough 1981). The skills of field-independent people are described as providing structure for interpreting a complex stimulus, for segmenting something into separate elements, and for providing an organization different from that suggested only with salient cues in the original information (Riding and Cheema 1991). They are more likely to learn more effectively under conditions of intrinsic motivation and are influenced less by social contexts (Messick 1976). They prefer using problem-solving techniques, organization, analysis, and structuring when participating in learning or work situations (Witkin and Goodenough 1981).

Field dependence describes socially oriented people who easily accept the dominating field or concept (Witkin and Goodenough 1981). Such people have a tendency to depend on external referents because of their degree of differentiation of the self from the non-self. They focus more on social cues and prefer to work and interact with others. In learning situations, field-dependent people appear to rely on the teacher and on peer support. They need more explicit and clear instructions when learning materials are disorganized (Frank 1984, Rickards, Fajen, Sullivan, and Gillespie 1997).

2.5 Research on cognitive styles and language learning

Certain studies have focused on the relationship between cognitive styles and language learning. Liu and Reed (1994) examined the correlation of language learning strategies and cognitive styles by using the Group Embedded Figures Test.

Participants were treated in a hypermedia language learning environment, and were investigated to see how they learned vocabulary. The findings showed that field-independent subjects liked to use detailed information (e.g., word definition, parts of speech, example sentences, and relationships) to study words because it provided the components of word knowledge. In contrast, dependent subjects preferred focusing on global information about the words from a video context. They used the courseware more frequently than did field-independent learners because it could provide a realistic context for language use to support their language learning. In addition, the study showed that the field-independent learners preferred a formal classroom setting including the analysis and mastery of activities, whereas the field-dependent learners preferred a communicative learning environment.

Frank (1984) investigated the differences between field dependence and field independence, and discovered that field-dependent people performed better when they were provided with the instructor's support. Rickards, Fajen, Sullivan, and Gillespie (1997) examined the effects of signaling and note-taking on field-dependent and field-independent learners. They found that recall was maximized when note-taking with signals, whereas it was minimized without signaled texts. Field-dependent learners relied more on note-taking and obtained more benefits from taking notes on signaled texts. Moreover, the field-independent learners performed better when using the discovery learning approach and worse on the rule learning approach compared to field-dependent learners. This shows that the field-independent learners preferred using contextual concepts and meaning to understand sentences, applying the learning materials, and maintaining learning by themselves. In contrast, the field-dependent learners relied on external and systematic rules that the teacher had provided so that they could form sentences.

Based on the results of these studies, we hypothesize that people's cognitive styles are related to their choices of using different VLSs. Therefore, we expect field-dependent learners to prefer SOCs, whereas field-independent learners would favor METs, as well as strategies that require deeper mental operation.

METHODOLOGY

3.1 Participants

In total, 277 ninth grade students (146 girls and 131 boys) participated in the experiment. The participants were from eight classes taught by different teachers in a junior high school in Yilan. All participants had learned English for 4-5 years.

3.2 Instruments

We used a VLS questionnaire and an HFT in the study.

To identify the participants' approaches to vocabulary learning, we adopted Kudo's version of the VLS questionnaire (1999). The questionnaire included two parts: background information and VLS use. It measured the frequency of VLS use on a 4-point Likert scale, ranging from 1 (*never*) to 4 (*often*). The questionnaire is valid and reliable ($\alpha=.77$). It consisted of 44 items, including 8 social strategies, 15 memory strategies, 10 cognitive strategies, and 11 metacognitive strategies).

To identify the participants' cognitive styles, we used the HFT, as proposed by Messick (1962). The test consisted of two parts with 16 questions each. Each part included five simple figures, followed by 16 complex figures. In each part, the participants were asked to find the embedded simple figures from 16 complex patterns in 10 min. The total test time was 20 min. Those who obtained higher scores were identified as field-independent learners, whereas those who scored lower were defined as field-dependent learners. The reported reliability was $\alpha=.86$.

3.3 Procedure

3.3.1 Piloting

The questionnaire was translated into Chinese and paraphrased for easier understanding. The validity of the questionnaire was found to be acceptable by three English teachers with a master's degree in TESOL.

In total, 107 third-year students from three classes, the same sample as that of the study, took the pilot test. The reliability of the questionnaire was $\alpha=.89$ ($\alpha=.80$ for social strategies, $\alpha=.82$ for memory strategies, $\alpha=.77$ for cognitive strategies, and $\alpha=.78$ for metacognitive strategies).

3.3.2 Distribution and data collection

The VLS questionnaire was sent to the class teachers of the EFL participants, and was distributed in class. The completed questionnaires were collected and placed in a sealed envelope. Of 282 collected questionnaires, 5 were eliminated because of too many missing answers, yielding 277 valid questionnaires.

The HFT was completed. In total, 282 students took the test.

3.4 Data analysis procedures

Pearson's correlation coefficients were calculated for this study to measure the relationship of VLS use and cognitive styles.

RESULTS

4.3.1 Frequency of use

According to the study results, the most frequently used strategy was COGs, whereas the least frequently used was SOCs ($M = 2.31$ and $M = 1.94$, respectively). The mean score for MEMs was $M = 2.23$, and for METs it was $M = 2.11$.

4.3.2 Correlation between strategy category use and cognitive style

The results of the correlation between overall strategy use and cognitive style are listed in Table 1. The table shows a positive significant correlation between overall strategy use and cognitive style ($r = 0.33, p < .01$). Because the correlation is between 0.10 and 0.39, it shows that the variables have low correlation. The results suggest that learners with more field independence use more overall VLSs.

Table 1 Correlation between strategy category use and cognitive style

	Overall strategy use	SOC	MEM	COG	MET
Cognitive style	.33 (**)	-.62 (**)	.29 (**)	.13	.73 (**)

** $p < .01$

Table 1 shows the results of the correlation between each strategy category use and cognitive style. In SOCs, a significant negative correlation exists between SOC use and cognitive style ($r = -.62, p < .01$). Because the correlation is between 0.40 and 0.69, the variables are moderately correlated. In MEMs, a significant positive correlation exists between MEM use and cognitive style ($r = .29, p < .01$). The variables are slightly correlated, with overall $r = .33$. For COGs, no significant correlation exists between COG use and cognitive style ($r = .13, p < .01$). For METs, a significant positive correlation exists between MET use and cognitive style ($r = .73, p < .01$). Because the correlation is between 0.70 and 0.99, the variables are highly

correlated.

Overall, cognitive style is significantly correlated with the use of the three VLS categories: SOCs, MEMs, and METs, but not COGs. The use of SOCs is negatively correlated with cognitive style. Both MEM use and MET use are positively correlated with cognitive style. The findings suggest that a person with greater field independence is more likely to use MEMs and METs. Conversely, a person with greater field dependence is more likely to use SOCs.

DISCUSSION AND CONCLUSION

5.1 The frequency of VLS use among EFL junior high students

The results showed that junior high students in Taiwan do not often use vocabulary strategies (close to *seldom*, $M = 2.17$). Kudo (1999) obtained similar results. This could have occurred because students lack the knowledge of various VLSs.

5.2 Vocabulary learning strategy use and cognitive style

The findings show a significant correlation between overall VLS use and cognitive style. This supports our hypothesis, and is similar to the view by Witkin and Goodenough (1981); that is, cognitive styles are related to ways of learning. Each category of a VLS shows that cognitive styles are positively and significantly correlated with MEMs and METs, but negatively and significantly correlated with SOCs. No significant correlation exists between COGs and cognitive style. The results suggest that field-independent learners tend to use more MEMs and METs, whereas field-dependent learners seem to employ more SOCs

In this study, we also show that field-independent learners tend to adopt more METs. This is in accordance with Messick (1976), who showed that field-independent learners exhibit a tendency to manage and direct their learning. They prefer to organize information by themselves rather than accepting knowledge reprocessed by others. They can apply learning materials (e.g., English-language Internet sites, TV programs, books, and songs) and monitor their learning (e.g., self-testing, learning from mistakes, spaced review, and systematic approaches) when left on their own. In addition, we found that field-independent learners appear to employ more MEMs. In MEMs, people need to focus on the detailed information of a word (e.g., the spelling, pronunciation, word part, and association), much akin to the analytical characteristics of field-independent learners. They are attentive to component parts. They tend to break the whole into segments and generate rules from prior experience (Riding and

Cheema 1991). They are able to analyze information and associate the new item with their preexisting knowledge.

However, we found that cognitive styles are not significantly correlated with COGs, possibly because COGs involve approaches that both field-independent and field-dependent students tend to use. This type of strategy is common for learners. Hence, particular differences are non-existent between field-independent and field-dependent students.

5.2 Pedagogical implications

Based on the findings of the study, we suggest the following:

First, teachers should teach VLSs to enhance student knowledge of strategies and help them improve their vocabulary learning. As the findings show, students do not use VLSs often. Even when they do use them, they prefer COGs, that don't require complex cognitive operations, and with which they might already be familiar. According to Schmitt (2000), it is important to teach various VLSs for learners to select and use, for successful learning.

Second, as a teacher, it is important to understand students' learning behaviors, so that they can provide appropriate teaching for different people (Liu and Reed 1994). This study showed significant correlations between VLS use and cognitive style among junior high school students. The use of a VLS is negatively correlated with SOCs, but positively correlated with MEMs and METs. This finding suggests that field-dependent learners tend to rely more on SOCs, whereas field-independent learners appear to use more MEMs and METs, with fewer SOCs. Because field-dependent learners need more social support, teachers can incorporate interactive activities while introducing different types of VLSs to provide a proper learning environment, such as the one they are already used to. For field-independent learners, teachers do not necessarily have to ask them to learn vocabulary in social-oriented ways. Hence, when cultivating students' VLSs, teacher should use suitable ways to match the styles of different learners to enhance their learning and develop their potential.

Finally, teachers can also help students understand their cognitive style to help their learning. They can indicate the different characteristics and information between field dependence and field independence to assist them in understanding their own learning

process. If they are aware of the category of style they belong to, they can work on their style development and use comfortable and appropriate ways to adjust their learning process and further enhance the effectiveness of their learning.

5.3 Limitations of the study

This study provides valuable findings in the education field, but it has limitations. First, we used a VLS questionnaire, which required junior high school students to rate their frequency of VLS use on a 4-point Likert-scale. Because the questionnaire is a self-reported research method, it may not completely reflect the participants' actual learning behaviors. The subjects might have been confused with the instructions or how they should answer the questions on the questionnaire. Second, the questions were close-ended, which might limit the information the participants wanted to express. Third, the study focused only on third-year junior high school students in one school in Northern Taiwan. Generalization should be applied with caution because the results may not represent other populations in Taiwan. Hence, a future study may employ more research instruments, such as interviews, and consider more populations in different schools and areas of Taiwan.

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