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The Effects of Cognitive Style and Vocabulary Learning Strategies on Students' Achievements in Web-Based Learning†

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The purpose of this study is to investigate the effectiveness of English vocabulary learning strategies such as definition-oriented/context-oriented/situated context-oriented vocabulary learning strategy according to the cognitive styles of learners and interaction effect on the achievement test score between the learners' cognitive style and vocabulary learning strategies. The results show that there is no significant difference in the achievement test scores between field-dependent learner group and field-independent learner group. And there is significant difference in the English vocabulary achievement test scores among three experimental treatment groups, definition-oriented, context-oriented, situated context-oriented vocabulary learning strategy groups. Finally, there is an interaction effect on the achievement test score between the learners'

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cognitive style and vocabulary learning strategies.

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Ⅰ. INTRODUCTION

1. The Necessity and Purpose of Research

Acquiring vocabulary is indispensable for learning a foreign language. The lack of vocabulary is the greatest reason why a lot of people learning a foreign language have difficulty in understanding or speaking in that language. McKeown and Curtis (1987) maintained that the vocabulary and the ability to understand have a considerable correlation. The more vocabulary a person has, the more he/she can understand the target language. Learning vocabulary is one of the most difficult tasks in various aspects of language learning. In the same way as we learn the mother tongue, it is necessary to learn how to use the words, sentences and how to use them in proper context to learn foreign language. However, the activities to learn a language in classes provide only the language lesson which does not provide the context in most cases (Omagio, 1986). The judgment based on the common sense determines obviously the importance of the context in regard to the language learning. What is meant by the vocabulary often depends on the context in which the vocabulary is used, and people acquire most of the vocabulary from the context in a separate way from the evince instruction (Nagy, 1995).

Meanwhile, the difference between people, such as intelligence, aptitude, character of definition, etc should be taken into account for successful learning. In particular, it is necessary to compare the different characters of learners that affect what they can achieve in the hypermedia-based learning environment. For this, the following things should be considered. First, various strategies can be used to search for and handle the information. Second, those strategies might prove more effective to some or less effective to others. Third, individuals can be generalized to some degree by the general trend related to the adoption of

the information processing strategy called 'cognitive style' (Entwistle, 1981; Ford & Chen, 2000). Jonassen (1988) noted that the learners showed the distinction in the will and ability to use their own knowledge in the process of integrating the new information into the cognitive structure of the learner, depending on the individual difference. Namely, the learners have their own different ability, pattern and speed of learning, accepting and understanding in different ways though they learn in the same environment.

The learning strategy might be a factor contributing to the individual difference, and the successful use of the proper leaning strategy is one of the major keys to successful learning. The way of learning that uses clues to the context is one of the strategies that learners adopt very frequently to understand the meaning of the words. It has played a significant role in their learning of English vocabulary, along with various traditional way of learning individual words. A way that has helped people build up their vocabulary while learning foreign language. Yun (1997) proved that the didactics focusing on the context turned out to be more effective than the didactics focusing on the definition in terms of the ability to help learners retain memory for a long time and to learn vocabulary by comparing the context-oriented approach and the definition-oriented approach. In addition to that, he proved that higher English proficiency was also tantamount to a higher ability in using clue to the context.

Learning the vocabulary is an important factor in learning a foreign language, and the hypermedia technology in the Web-based environment presents another new possibility to provide a practical context of language, when we put together all the preceding research that we looked into so far. Moreover, practical research is required to be conducted in regard to the effect on learning from the vocabulary strategy that is different depending on the cognitive style of learners.

Therefore, this study aims to find out how individuals showed the distinction in their achievement, depending on their cognitive styles, after they learned English by applying various learning strategies in the web-based environment, and how the cognitive style and vocabulary learning strategies are correlated. In order to figure out an alternative for a effective vocabulary learning strategy that factors in the individual character.

2. Research Questions

The following is the concrete research issue to achieve the purpose of this study.

1) How does the cognitive style of learners affect the achievement of vocabulary learning in the Web-based learning?
2) How does the vocabulary learning strategy of learners affect the achievement of vocabulary learning in the web-based learning?
3) How do the cognitive style and the vocabulary learning strategy work together to affect the achievement of vocabulary learning in the web-based learning?

3. Limits of Research

First, the subject of this research is limited to 103 students of P technical high school in Anyang city.

Second, this research chose the vocabulary, determined by the National Education Curriculum for the high school English education and other education programs equivalent to that, in order to organize the web-based vocabulary learning based on such selected contents of learning. Third, a careful consideration is required to generalize the result from this study.

Therefore, the results may differ, depending on other field of language learning or the contents.

II. THEORETICAL BACKGROUND

1. Web-based Learning

Lately, there are many studies about language-learning by using computer (Choi, 1995) or using internet (Park, 2004; Park, 2004). Web-based learning is a new type of learning that keeps intact a variety of interactions in the cyber space or virtual reality. These are realized by the high tech information and telecommunication technology. Designed to perform various activities of teaching and learning and the interactive activities that actually occur in the classroom.

The Web is based on the principle of hyperlink, and Hyper means the non-lineal distribution of information in the virtual reality created by the computer. Link means connecting the node that exists in the virtual reality.

Node is the unit of information that encompasses text, photo, animation, sound, voice and movie clips. The Web provides diversity in presenting the material, and the learner organizes the meaning by using the presented material. Moreover, the Web is organized in the form of hypertext, thus looking similar to the way that humans organize the information, and is capable of providing an experience very close to the reality of the learner because it delivers a virtual learning environment very similar to the reality (Ban, 2002).

Hypertext is composed of character information and picture information, and hypermedia is made up various types of multimedia information such as text, graphic, animation, video clips and so forth. In light of that, both have little difference in principle despite their different pattern of information. The material on the internet, composed of the hypertext, can embrace various styles and ability of learning and the demand for the information by individual learners, and allows the individual learning. Learners can create their own individual route of learning to achieve their goal of learning, while acquiring the additional information depending on their speed of learning.

They can promote the effect of learning by delivering the information via various visual, audible, lingual, and physical senses and providing the information preferred by each individual learner. In addition to that, the configuration of the database by the hypertext provides an access the information at various levels and ways, enabling the individual learning which depend on the individual's level and way of learning (Choi, 2000).

Teachers have to develop various assignments that are suitable for the learning style of each individual learner because the style of learning varies depending on the individual. Teachers have to design their class in a way that fits the way of individual's learning, not that of the group. The Web sets up an environment that is instrumental to achieving the learner-oriented goal by letting each student research in-depth on one subject and discuss from various viewpoints according to their own style of learning. Meanwhile, the most effective environment of learning a foreign language is to let people exposed to the target language and the culture from the younger age, but there are a lot of

constraints to organizing such an environment.

One way to promote the understanding of language for the beginners is to present the vocabulary in various contexts because they are lacking in the understanding of the language that they are learning and the cultural background of that language. It might be a desirable way of learning to let the learners use the hypermedia function of the internet and make use of the multimedia information useful to their learning of language while integrating meaningful contexts to the language learning.

It can be said that lavishing the contexts on the learners plays an important role in the language learning, and the hypermedia technology that provides meaningful material in the real environment has the potential to reinforce the language learning.

2. Research on the Cognitive Style and Learning of Language

In relation to the character of learners, the cognitive style is cited as one of the most powerful hypothetical factors that explain the individual difference. The cognitive style means the consistent and characteristic pattern of individual learners when they perceive the objects, organize and process the information. Each individual can show different pattern and the pattern of individuals to perceive the environment appears differently depending on their cognitive style (Jeong, 1999). The unique cognitive style in the process of perception plays a significant role in determining the behavior of individuals. Therefore, the individual difference depending on the cognitive style can be assumed to bring a certain distinction in the pattern or achievement of learning. The cognitive style means the consistent individual difference in how they organize and handle the information, and we can find that it indicates the behavior, preference, habitual strategy and the like that an individual uses to work out the problem related to the perception and thinking (Kim, 1998).

The cognitive style has many forms, and what characterizes them the best is field-dependence and field independence. According to Witkin et al. (1977), the filed independent learner perceives some of the field as separate from the surrounding field and easily separates the organized perception. In other words, the person who tends to easily separate one article from the perceptional

situation where it belong is a field- independent person. By contrast, a field-independent person tends to embrace the field of perception or its whole contents by including some of the field in the surrounding field for the perception, and they tend to have difficulty in separating a specific article from that perceptional situation (Yun, 1991). In other words, having the overall experience of events and objects subject to the context or situation, tend to display the field-dependent inclination. By contrast, distinguishing the object from the hidden context easily points to the field-independent inclination.

Field-dependence and field-independence show themselves differently even in the social arena. Those with field-dependence respond more sensitively to social factors. But those with field-independence do not display a sensitive reaction to them, and tend to be individual-oriented and prefer non-social situations. Chapella and Roberts (1986) argues that the field-independent learner should have the advantage for learning the language, and the field-independent learner have the advantage for acquiring the language as he divided the foreign language learning into the one inside the classroom, and the other outside the classroom which allows natural contact with the native speakers in society. Furthermore, both field-dependence and field-independence have a positive effect on all kinds of lingual abilities including the oral test, according to him. Bialystok and Frohlich (1978) said that both field-dependence and field-independence have favorable effect on the foreign language learning, indirectly though (Yun, 1991).

It can be found that the cognitive style of learners affect favorably to the learning of second language, when we look into the results from the overall researches. Therefore, it is required to develop a whole range of learning programs that consider such cognitive styles of learners.

3. Research on 'the Strategy to Learn the Vocabulary' & 'Language Learning'

The strategy to learn the vocabulary has different definition of concept depending on the researcher, but generally, a definition can be drawn that a specific behavior or method adopted by the learner to learn the vocabulary is the vocabulary learning strategy because that strategy is related to the

vocabulary learning for the foreign language learning. The vocabulary learning strategy means all kinds of strategies that the learners come up with while they deal with a new unfamiliar word, understand its meaning, record it in a simple way and store in the memory if necessary, etc. The vocabulary learning strategies are classified a little bit differently depending on the scholars. Kim (1999) classified the vocabulary learning into direct learning and indirect learning. Yun (1997) compared the context-oriented approach and definition-oriented approach and proved that the context-oriented didactics are more effective in learning the vocabulary and keeping the memory over the long term than the definition-oriented didactics. Higher English proficiency should mean higher ability to use the clue to the context. Shim (2000) pointed, for the example, to the dictionary type learning strategy and the strategy to learn with connected pictures, situated context, etc, which are commonly used in schools.

In general, scholars maintain that the definition-oriented learning would result only in learning the meaning of a word not in a comprehensive way and is likely to bring excessive reliance on the dictionary, relegating the vocabulary learning process to a passive and mechanical one. To the contrary, the context-oriented learning is claimed (Clarke & Nation, 1980) to be more an effective tool for learning the language because it allows learners to infer the meaning of new words from the clue to the context. Thus it is more economical in terms of time and effort that learners put in, and also allows them to understand the flexibility in the meaning of the words by inferring various meanings of them in the given sentences. Thornbury (1999) said that there should be the context in the sentences, situated context and cultural contexts. The term of 'context' used in this dissertation refers to the situation where the context is related to the sentences, and the situated context means a context from the situation. This research classifies the vocabulary learning strategy into definition-oriented vocabulary learning strategy, context-oriented vocabulary learning strategy and situated context-oriented vocabulary learning strategy, and presents the character of each.

1) Definition-Oriented Vocabulary Learning Strategy

Definition-oriented approach provides the meaning of a individual word and the definition at the same time and applies a way of teaching(didactics) ; learners look at the definition or synonyms, write the sentence and memorize the meaning. Such didactics do not work very well to promote the vocabulary learning or improve the reading ability of learners because dictionaries have inappropriate definitions of words and do not present the context in which the word is used. As a result, the learners come to have only the superficial understanding of the meaning. But it was proved that it could generate a positive result when highly useful vocabulary was chosen to go ahead with the class quickly. The selection of vocabulary to be learned is important to enhance the effect that the intensive definition-oriented vocabulary class would have, and it is thought that such an intensive way of teaching the vocabulary is the most suitable when teaching difficult or rarely appearing vocabulary with complicated concept that students do not see in routine days.

2) Context-Oriented Learning Strategy

The context-oriented didactics teaches students the general strategy to understand the meaning of unfamiliar vocabulary and trains them so as for the students to make most of the surrounding context and background, rather than the morphemic information. The presentation of vocabulary with the situation of context, which shows the target vocabulary in the sentences that the students have to learn, was regarded as very useful to overcome the limits of definition-oriented didactics.

Fisher (1994) says that a new meaning has to be appropriately created for the context, apart from the meaning of a word explained in the dictionary, to ensure the understanding of a word presented in a certain text. According to Robinson (1993), the vocabulary can be acquired when the procedural knowledge is obtained that enables learners to understand how the word is used in what kind of situations and make themselves understood, in conjunction with the declarative knowledge that enables learners to learn the meaning of the word. In comparison to the definition-oriented didactics that conveys only the

conceptional knowledge of vocabulary, the context-oriented didactics make sure the acquisition of the procedural knowledge in the process of learning declarative knowledge, and also checks again whether the declarative knowledge was actually acquired (Kim, 1998).

3) The Situated Context-Oriented Vocabulary Learning Strategy

The situated context-oriented learning strategy currently under spotlight, is a strategy to improve the retention of memory by making it possible for the learner to figure out the meaning of a word in the context of a given situation. It uses the sentences, episode, image and so forth, created in a structured situation, that are applicable to the real life and have something to do with learners when they learn foreign language, to promote their understanding of the context. Gagné and White (1978) said that the achievement behavior in the memory structure model was derived from the four factors of the proposition, image, episode, intelligence (Kim, 1994). This shows that the efficiency in learning foreign language would improve when the image and episode are applied that may represent the concept of word, as well as the lingual understanding of the concept of sentence. In addition to that, if the image and the episode representing the concept of word have something to do with what learners have experienced and if they were inferred from a situation related to the real life of learners, they are more effective for learning the foreign language. In this regard, the situated context learning would be a useful tool for learners when they learn foreign language, because it uses either image or episode related to the real life and experience of them (Shim, 2000).

4. Preceding Research on the Cognitive Style and the Vocabulary Learning Strategy

Brown (1987) pointed out that the field-independent learner is more adaptable to the formal class situation that provides an environment where the learners can analyze and practice, but to the contrary, the field-dependent learners would achieve more in terms of the communication through the language. Liu (1992) said in her research on the second language learning founded on the hypermedia

that compared to the field-independent learners and field-intermediate learners, the field-independent learner have the greatest inclination for the video media showing the situation where the target word is used, and the field-independent learners had success in the learning strategy that made clear the relation among words and the meaning of vocabulary by using the synonym and antonym. In addition to that, the field-independent learners with low ability were observed to have preference for the vocabulary learning that uses the definition, and by contrast, the field-dependent learners with high ability performed very well when they were given the example sentences that contained the target word. Namely, the cognitive style of the learner determined the learning strategy that they prefer, and the cognitive style and the learning strategy determined the difference in the achievement.

III. HYPOTHESIS OF RESEARCH

The following is the hypothesis this research tries to verify experimentally on the basis of the issue of research we presented before and the theoretical background.

1. The field-independent learning group and the field-dependent learning group will show the distinction in the level of achievement in the web-based learning.
2. The definition-oriented, context-oriented and situated context- oriented strategic group will display difference in the level of vocabulary learning achievement in the web-based learning.
3. The cognitive style and the vocabulary learning experience of learners will have interacting effect on the level of achievement in the web-based learning.

IV. METHOD OF RESEARCH

1. Subject of Research

Subjects were three classes of 103 first-year students at P technical high school in An-Yang city. We conducted the Group-Embedded- Figures-Test for them, and divided them into field-independent cognitive style group with test scores above the average, and the field-dependent cognitive style group with test scores below the average. One class in the experimental treatment group of 3 classes was categorized as the experimental treatment group for the definition-oriented vocabulary learning strategy, another class for the context-oriented vocabulary learning strategy and the other class for the situated context-oriented vocabulary strategy learning. This can be put into the form of diagram as Table 1 shows.

TABLE 1
Subject of Research

Learning Strategy Cognitive Style	Definition-Oriented	Context-Oriented	Situated Context-Oriented	Total
Field-Dependent	16	18	18	52
Field-Independent	17	17	17	51
Total	33	35	35	103

We conducted the prior test to check the level of learners' level of acquired knowledge for the contents to be dealt with in the web-based learning prior to starting the experiment. Table 2 shows the average and standard deviation and the verification of the difference for the three experimental treatment group.

TABLE 2
Pre-test of Vocabulary by Cognitive Style

Cognitive Style	N	M	SD	t	p
Field-Dependent	51	23.480	8.293	1.096	.276
Field-Independent	52	21.683	8.354		

The pre-test of the two groups does not show any significant difference (t=1.096, p>.05) as the Table 2 shows, so those groups can be said as homogeneous group.

TABLE 3
Pre-test of Vocabulary by Learning Strategy

Learning Strategy	N	M	SD	F	p
Context-Oriented	35	22.93	9.165	.286	.752
Situated Context-Oriented	35	23.07	8.954		
Definition-Oriented	33	21.67	6.751		
Total	103	22.57	8.332		

The pre-test of the two groups does not show any significant difference (F=.285, P>.05) as the Table 3 shows, so those groups can be said as homogeneous group.

2. Tool of Research

The tools for the experiment that this research will use are the cognitive style test, prior vocabulary test, web-based vocabulary learning program and academic achievement test. The details are as follows :

1) Prior Vocabulary Test

This research is a test to see how much vocabulary they know, which they will learn by using the web-based vocabulary learning program. And it is also a test to prove that the three experimental treatment groups are same groups. 40 words were chosen directly by the researchers considering the achievement ability level of students who participates in the experiment on the basis of vocabulary for high school English book, EBS English conversation program, conversational English books.

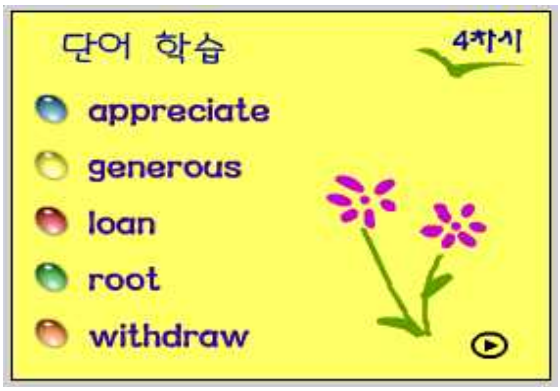
2) Group Embedded Figures Test

The Group Embedded Figures Test is a tool to measure the field-dependence and field-independence, developed jointly by Witkin, Oltman, Raskin, Karp (1971). This testing tool is designed to measure the ability to overcome the hindrance in the surroundings by using the internal frame of reference amid the complicated circumstances to measure the field-dependence and field-independence. Namely it is composed of 3 chapters with 25 questions about finding simple diagrams hidden in complicated diagrams. The correct answer adds 1 score and the incorrect answer 0 score. This research categorized upper score bracket of 50% as field-independent group and the lower score bracket of 50% as field-dependent group, because the higher scores testees get, the more they get field-independent in this research.

3) Web-Based Vocabulary Learning Program

We designed the learning program by using Flash MX and Premier. Subjects learn a total of 40 words, 10 words at each round of test in the total 4 rounds of test.

FIGURE 1
The Main Screen of Web-based Vocabulary Learning Program



Tests were designed as a program for the definition-oriented,

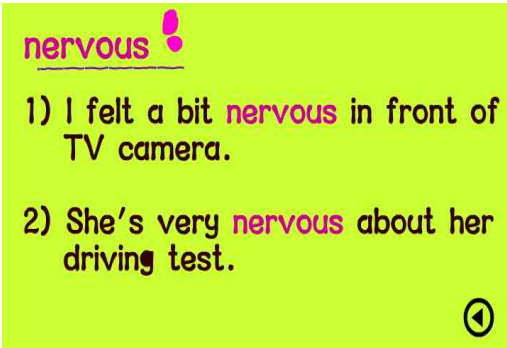
context-oriented and situated context-oriented vocabulary learning strategy respectively for the three experimental groups to learn. The main display of the web-based vocabulary learning program used in this research is like this : In the first place, this is the pictures commonly presented in each learning program.

If the vocabulary or the button is clicked one after another, a display shows up to let the learners learn the relevant vocabulary by using the learning strategy that varies depending on the vocabulary learning program.

FIGURE 2
The Screen of Definition-Oriented Vocabulary Learning Program

The definition-oriented vocabulary learning program provide details including the definition in mother tongue and synonyms as in the Figure 2. The definition in mother tongue adopted the meaning of word explained by the Naver web dictionary(http://endic.naver.com).

FIGURE 3
The Screen of Context-Oriented Vocabulary Learning Program



The context-oriented vocabulary learning program did not provide any definition in mother tongue but instead provided the sentence that is useful for inferring the meaning of word from the neighboring sentences, as in the Figure 3. Sentences for the reference were excerpted from the Cambridge web dictionary(http ://dictionary. cambridge.org) and textbooks.

FIGURE 4
The Screen of Situated Context-Oriented Vocabulary Learning Program

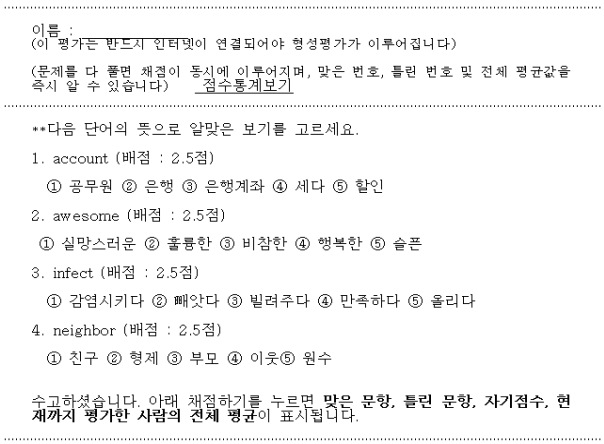
The situated context-oriented vocabulary learning used the English

conversation video clip skit of education broadcast(http://www.ebs. co.kr) and flash animation for the target vocabulary learning as the Figure 4 shows.

4) Academic Achievement Test

This research is the test to measure the achievement by learners after they learned through the web-based learning program. The academic achievement test was composed of 40 questions for which answer the testees choose among five given answers, by referring to what the learners learned throughout the experimental treatment. The full score was 100 score, and each had the score of 2.5 score. The testing tool was made by using the Front Page with the help of other teachers. Figure 5 is the screen showing the achievement.

FIGURE 5
The Screen of Academic Achievement Test


이름 :
(이 평가는 반드시 인터넷이 연결되어야 형성평가가 이루어집니다)

(문제를 다 풀면 채점이 동시에 이루어지며, 맞은 번호, 틀린 번호 및 전체 평균값을 즉시 알 수 있습니다) 점수통계보기

**다음 단어의 뜻으로 알맞은 보기를 고르세요.

1. account (배점 : 2.5점)

① 공무원 ② 은행 ③ 은행계좌 ④ 세다 ⑤ 할인

2. awesome (배점 : 2.5점)

① 실망스러운 ② 훌륭한 ③ 비참한 ④ 행복한 ⑤ 슬픈

3. infect (배점 : 2.5점)

① 감염시키다 ② 빼앗다 ③ 빌려주다 ④ 만족하다 ⑤ 올리다

4. neighbor (배점 : 2.5점)

① 친구 ② 형제 ③ 부모 ④ 이웃⑤ 원수

수고하셨습니다. 아래 채점하기를 누르면 **맞은 문항, 틀린 문항, 자기점수, 현재까지 평가한 사람의 전체 평균**이 표시됩니다.

Learners can check whether they gave the correct answers to the given questions and their own scores after they finished the test, and can also check the average score of others who participated in the test.

3. Design of the Experiment

The independent variable in this research is the cognitive style (field-dependence, field-independence) and the vocabulary learning strategy (definition-oriented learning strategy, context-oriented learning strategy, situated context-oriented learning strategy) and the subordinate variable is the achievement by the learners after they learned the program. The design of this research is shown in the Table 4.

TABLE 4
Design of the Experiment

O_1	(G_1)	O_2	X_1	O_3
O_1	(G_2)	O_2	X_2	O_3
O_1	(G_3)	O_2	X_3	O_3
O_1	(G_4)	O_2	X_1	O_3
O_1	(G_5)	O_2	X_2	O_3
O_1	(G_6)	O_2	X_3	O_3

O1 : Cognitive Style Test
O2 : Vocabulary Pre-Test
O3 : Academic Achievement Test
G1 G2 G3 : Group of Field Independent Cognitive Style
G4 G5 G6 : Group of Field Dependent Cognitive Style
X1 : Definition-Oriented Learning Strategy(Web-Based-Learning)
X2 : Context-Oriented Learning Strategy(Web-Based-Learning)
X3 : Situated Context-Oriented Learning Strategy(Web-Based- Learning)

4. Analysis Method of Material

This research carried out t-Test, one-way ANOVA, two-way ANOVA to find out the main effect and the interacting effect that the cognitive style and the learning strategy had on the academic achievement.

V. RESULT AND INTERPRETATION OF RESEARCH

This research assumed the hypothesis 1 to find any significant difference in the achievement by learners, depending on the cognitive style of learners, which characterizes the way of perception by individual learners, in the web-based learning. t-Test was used to verify any significant difference in the average test scores between two groups. Table 5 shows the result from the test in relation to the test scores between the field-dependent learning group and the field-independent learning group.

TABLE 5
t-Test of Academic Achievement by Cognitive Style

Cognitive Style	N	M	SD	t
Field-Dependent	51	78.69	11.12	1.688
Field-Independent	52	74.37	14.59	

According to the Table 5, there is no significant difference in the test scores between the field-dependent learning group and the field-independent learning group in the web-based learning (t= 1. 688, p>.05). In a word, the field-dependent learning group and the field-independent learning group showed the difference in the average test scores, the hypothesis 1 was denied because that difference does not have statistical meaning.

Hypothesis 2 was assumed to find any significant difference in the achievement depending on the vocabulary learning strategy of learners in the web-based learning. One-way ANOVA was used to find any significant difference in the average test scores among the three experimental groups. Table 5 shows the result from the test in relation to the definition-oriented learning strategy, context-oriented learning strategy and situated context-learning strategy.

TABLE 6
One-Way ANOVA of Academic Achievement by Learning Strategy in Web-Based-Learning

Learning Strategy	N	M	SD	F
Definition-Oriented	33	72.55	12.03	
Context-Oriented	35	75.31	14.32	
Situated Context-Oriented	35	81.43	11.50	4.396*
Total	103	76.50	13.10	

* p<.05

According to the result from the experiment which is indicated in the Table 6, there was a significant difference in the achievement scores among the definition-oriented learning strategy group, context-oriented learning strategy group and situated context-learning strategy group (F=4.396, p<.05). This shows that each different learning strategy had different effect on the achievement of learning groups. In order to verify the difference among each learning strategy group in detail, we conducted post hoc test(Scheffé). The result from that test is as follows.

TABLE 7
Post hoc Test of Academic Achievement by Learning Strategy in Web-based Learning

	Definition-Oriented	Situated Context-Oriented
Definition-Oriented		*
Context-Oriented		
Situated Context-Oriented	*	

* p<.05

From the ex post facto test, it was found that there was a significant difference at the significance level of 5% between the situated context-oriented learning strategy group and the definition-oriented learning strategy group. The group that used the situated context-oriented vocabulary learning achieved

higher achievement scores than the group that used the definition-oriented vocabulary learning strategy. Therefore, the hypothesis 2 was held valid.

Hypothesis 3 was assumed to find any interacting effect on the performance achievement from the cognitive style and vocabulary learning strategy in the web-based learning. In the first place, it is required to look into the average and the standard deviation of their achievement scores in this research. Table 8 shows the analysis on the achievement by the cognitive style.

TABLE 8
Descriptive Statistics of Academic Achievement by Cognitive Style in Web-based Learning

Cognitive Style	Learning Strategy	N	M	SD
Field-Dependent	Definition-Oriented	17	70.18	12.10
	Context-Oriented	17	78.47	6.03
	Situated Context-Oriented	17	87.41	6.77
	Total	51	78.63	11.12
Field-Independent	Definition-Oriented	16	75.06	11.81
	Context-Oriented	18	72.33	18.88
	Situated Context-Oriented	18	75.78	12.32
	Total	52	74.37	14.59
Total	Definition-Oriented	33	72.54	12.03
	Context-Oriented	35	75.31	14.31
	Situated Context-Oriented	35	81.43	11.50
	Total	103	76.50	13.10

Two-way ANOVA was conducted to verify the hypothesis 3. Table 9 shows the result.

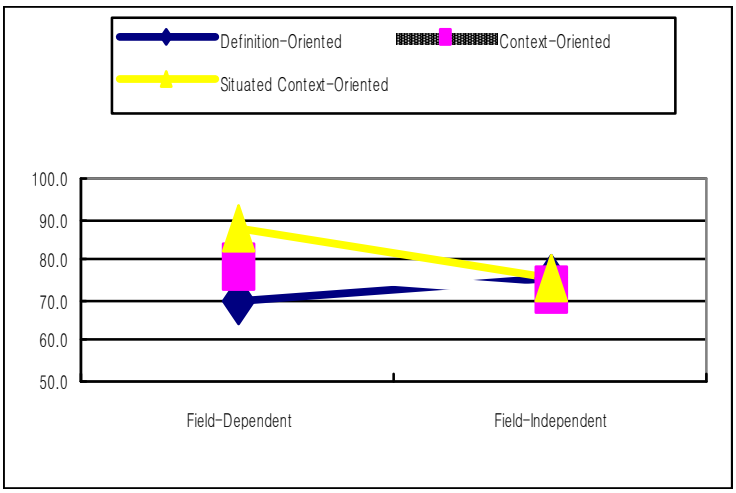
TABLE 9
Interactive Effects of Cognitive Style and Learning Strategy on Academic Achievement

Source of Variance	SS	df	MS	F
Cognitive Style(A)	474.257	1	474.257	3.197
Learning Strategy(B)	1445.018	2	722.509	4.870**
A×B	1194.513	2	597.256	4.026*
Error	14390.872	97	148.360	
Total	620374.000	103		

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

According to the result from the experiment indicated in the Table 9, it turned out that the cognitive style and the vocabulary learning strategy had interacting effect on the achievement in the web-based learning (F=4.026, p<.05). In a word, the effect that the learning strategy would have on the achievement varies, depending on the cognitive style.

FIGURE 6
The Screen of Academic Achievement Test



As the Figure 6 shows, the field-dependent learning group had higher level

of achievement than the field-independent group when the situated context-oriented vocabulary learning strategy was used. When we compared the context-oriented learning strategy and the definition oriented learning strategy, field-dependent learning group performed better with the context-oriented learning strategy but by contrast, the field-independent learning group performed better with the definition-oriented learning strategy. Therefore the definition-oriented vocabulary learning strategy is more effective for the field-independent learners, and the situated context-oriented vocabulary learning strategy works more effectively for the field-dependent learners.

VI. CONCLUSION AND RECOMMENDATION

1. Conclusion

The following is the summary of the research conducted through the experiment to substantiate the hypothesis based on the issue of this research.

1) The hypothesis 1 was denied. Namely, though the field-dependent learning group had higher achievement scores than the field-independent learning group in the web-based learning, the difference was not significant ($t=1.688$, $p>.05$). Therefore, the cognitive style did not affect the achievement scores.

2) Hypothesis 2 was verified as valid. There was a statistically significant difference in the achievement scores between the context-oriented learning strategy group and the situated context-oriented learning group in the web-based learning ($F=4.396$, $p<.05$). Therefore, the learning strategy affects the achievement scores.

3) Hypothesis 3 was substantiated as valid. The cognitive style and the vocabulary learning strategy turned out to have interacting effect on the achievement scores in the web-based learning ($F=4.026$, $p<.05$). Therefore, the cognitive style and the vocabulary learning strategy have effect on the achievement scores.

When we put together the result from this research, the following results and suggestions can be made.

First, this research found no statistically significant difference in the

achievement scores between the field-independent learning group and the field-dependent learning group. Such result from the research indicates that the cognitive style of learners do not have effect on the achievement scores. It is a contrast to a plenty of current researches observing that the field-independent learner had higher level of achievement than the field-dependent learner, and it can be assumed that the vocabulary learning strategy has effect on the achievement depending on the cognitive style.

Second, the vocabulary learning strategy has effect on the achievement in the web-base learning. The situated context-oriented vocabulary learning strategy is shown to have more effect on the achievement than the definition or context-oriented vocabulary learning strategy. It can be found that providing a significant context similar to the real lingual situation works well in the web-based vocabulary learning.

Third, the field-dependent learners show higher level of achievement than the field-independent learners when the context-oriented learning strategy and the situated context-oriented learning strategy, which uses the context, are used in the web-based learning. This points out that the field-dependent people are more skilful user of the context when they learn foreign language than the field-independent people.

2. Recommendation

We make the following recommendations from our research.

First, vocabulary for first-year high school students who were subjects of this research was selected. Therefore, this research is required to be followed up with the subsequent research on various level of students and different contents of learning.

Second, this research did not clearly identify the main effect of cognitive style. In this regard, additional research is required to identify the factors that cause the difference.

Third, a research needs to be conducted to identify more effective language learning strategy that varies depending on the type and character of vocabulary to be learned and the language skill of the learners.

Fourth, various and in-depth research needs to be conducted on the gender, motive, behavior, style of learning and aptitude, etc, as well as the learning strategy, which are among the factors contributing to the difference in the achievement.

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