Vocabulary Learning
Through a Cooperatively Structured
Art-Based Task

スティーブ・マクガイア　*Steve McGuire*
（デザイン学部教養部会）

Introduction

"What's going on in this picture?" "What do you see that makes you say that?" "What more can we find?" Students answer these three carefully crafted but deceptively simple and intuitively powerful questions in Visual Thinking Strategies (VTS), a teaching method to help students acquire critical thinking and language skills through facilitated discussions regarding carefully selected and sequenced works of art. VTS has been shown to improve language skills of native speakers of all languages in their own languages and of nonnative speakers in ESL contexts (DeSantis & Housen, 2007; Sugibayashi, 2003), but this study is the first to focus on using artwork for English vocabulary learning with nonnative college students in EFL classrooms in Japan.

This article begins with a brief review of the literature regarding use of visual media in language learning. It then discusses the theoretical background for Visual Thinking Strategies. The paper continues with evaluations of the tasks carried out in this study with brief discussions of three areas of research regarding learning in general, language learning in particular, and finally vocabulary acquisition: a) Paul Nation's four strands approach to language teaching, b) Nation and Webb's technique feature analysis for tasks leading to vocabulary acquisition, and c) Johnson and Johnson's Learning Together approach to cooperative learning. We then will look at a pilot study that focused on just one artwork.

Visual Media in Language Learning

Using photographs, drawings, and other images for language learning is not a new idea. Bush (2007) traces the use of photographs, drawings, and other images for language learning to teach culture back to 500 B.C., but also touches on Paivio's Dual Coding Theory regarding the use of visuals and textual definitions to strengthen learning (Clark & Paivio, 1991; Paivio, 1991; Paivio & Desrochers, 1979). Scanlan (1980) explores how to use photographs in the language classroom. McGuire and Butto (2010) summarize language lessons using visual media. Other research using visual cues

includes Pica, Young, and Doughty (1987, p. 741) and Meara and Alcoy (2010).

Visual Thinking Strategies (VTS)

VTS is based on the work of Abigail Housen (1983) who worked with Philip Yenawine to apply her research to develop the five stages of art appreciation through which art viewers move from novice to expert to create VTS, a means that helps students acquire critical thinking skills through the use of facilitated art discussions (see McGuire, 2009; McGuire & Maeda, 2007; Yenawine, 1998).

Nation's Four Strands

Nation (2007) provides a four-strand approach to evaluating the efficacy of language courses for language learning that can be used to evaluate VTS. The first two strands are meaning-focused input and output. In VTS students exchange their own views in meaningful ways about artwork that requires both productive and receptive skills. One requirement is that students have control of over 95% to 98% of the vocabulary in these strands (Nation, 2007, p. 4) and research also suggests that students who know 3000 word families are capable of understanding slightly over 96% of unscripted spoken conversations when proper nouns are included (Nation, 2006, p. 77). These conditions are met in VTS if learners generally share the same vocabulary level, and if part of the language learning task is for students to make sure everyone understands the vocabulary. Saragi, Nation, and Meister (1978, p. 73) suggest that students with the same results on a vocabulary test may still have control of different vocabulary, which means even students at the same level may strengthen their depth of vocabulary knowledge even at the lower word frequency levels, and the use of visual media may help in comprehension.

The second two strands are language-focused learning and fluency development. In VTS activities learners focus on language features as they teach each other new vocabulary and they process those language features in "deep and thoughtful ways" (Nation, 2007, p. 6) as they share ideas. For fluency, they have the opportunity to meet the same vocabulary many times throughout the tasks.

Knowing a Word

Nation (2001) divides knowing a word into three main aspects that are then subdivided into three additional subcategories. The three main aspects (and their subcategories) are form (spoken, written, word parts), meaning (form and meaning,

concepts and referents, associations), and use (grammatical functions, collocations, and constraints on use). These are all then further subdivided by whether this knowledge is receptive or productive. In the VTS approach used here students focus mainly on meaning and concepts with some exposure to such aspects as grammar, spelling, and pronunciation.

McGuire (2009) found that the use of vocabulary in VTS is similar for native and nonnative speakers. Table 1 shows that 87.6% coverage by the first 3000 words for native speakers regarding VTS 1.1 compared to 91.0% for Japanese students. Table 1 shows that 9% of the word families, or 29 words out of 324, were above the 3000-word family level, which is also very similar to the 12% for native speakers, suggesting VTS is an authentic task for ESL/EFL classrooms at least in terms of vocabulary. Table 2 shows the data for students in the two classes over one semester in this study as they carried out a number of various tasks regarding 16 artworks. The data is strikingly similar to that described in Table 1, differing by only 1.3% for the first 1,000 words and by only 1.5% for the first 3,000 words altogether. This suggests a breadth of exposure to vocabulary for art-based tasks, but suggests the need for analysis at a more fine-tuned level.

Table 1

Visiting British Students' Oral Production Compared to Nonnative Japanese Students on VTS 1.1

Level List	British Students' Oral Production						Japanese Students' Written Production					
	Token	Token %	Type	Type %	Group	Group %	Token	Token %	Type	Type %	Group	Group %
1	633	86	175	72.61	148	69.8	2153	92	320	76.7	237	73.2
2	43	5.8	31	12.86	29	13.7	111	4.7	50	12	43	13.3
3	23	3.1	9	3.73	9	4.3	33	1.4	18	4.3	15	4.6
0	37	5	26	10.79	26	12.3	44	1.9	29	7	29	9
TOTAL:	736		241		212		2341		417		324	

15 words in the foreigners' output were in the above 3000-word level, with an additional 5 words not being on the lists at all.

Table 2

Summary data for 16 art description tasks for one full semester

Level List	Token	Token %	Type	Type %	Group	Group %
1	2155	92.2	322	77.2	239	74.5
2	111	4.8	51	12.2	44	13.7
3	33	1.4	18	4.3	14	4.4
4	19	0.8	11	2.6	9	2.8
5	4	0.2	4	1	4	1.3
6	1	0	1	0.2	1	0.3
7	4	0.2	4	1	4	1.3
8	7	0.3	2	0.5	2	0.6
12	1	0	1	0.2	1	0.3
15	1	0	1	0.2	1	0.3
0	2	0.1	2	0.5	2	0.6
TOTAL:	2338		417		321	

A Technique Feature Analysis (TFA) of the Cooperatively Structured Visual Thinking Strategy Task

Nation and Webb (2011) describe a point-based system for evaluating a task in terms of vocabulary acquisition based in part on Laufer and Hulstijn's (2001) Involvement Load Hypothesis. Space is limited here, but Table 3 shows the five main categories of Technique Feature Analysis (TFA): motivation, noticing, retrieval, generation, and retention, and the subquestions for each category. Relevant to VTS is that students choose the vocabulary themselves, are required to interact regarding ideas (noticing), and retrieve vocabulary and generate original sentences in meaningful ways (instantiation) in relation to visual images (imaging).

Table 3

An Analysis of Art-Based Vocabulary Tasks Using Technique Feature Analysis

Criteria	Score
Motivation	
Is there a clear vocabulary learning goal?	1
Does the activity motivate learning?	1
Do the learners select the words?	1
Noticing	
Does the activity focus attention on the target words?	1
Does the activity raise awareness of new vocabulary learning?	1
Does the activity involve negotiation?	1
Retrieval	
Does the activity involve retrieval of the words?	1
Is it productive retrieval?	1
Is it recall?	1
Are there multiple retrievals of each word?	1
Is there spacing between retrievals?	1
Generation	
Does the activity involve generative use?	1
Is it productive?	1
Is there a marked change that involves the use of other words?	1
Retention	
Does the activity ensure successful linking of form and meaning?	1
Does the activity involve instantiation?	1
Does the activity involve imaging?	1
Does the activity avoid interference?	1
Total	18

Research on Use of Cooperative Learning in Language Learning in Japan

A literature search in a study on cooperative learning carried out by McGuire (1992) found only one empirical research study in English regarding cooperative learning in Japan by Hirose and Kobayashi (1991) who looked at cooperatively structured discussions. Fushino (2008) added only three studies carried out in Japan in her exhaustive search of the literature on cooperative learning (Gobel, 2004, Kimura & Ohtake, 2006, and Ohtake & Kimura, 2005). All reported limited success with cooperative learning but all beg the question of the degree their tasks were truly cooperative.

Issues in Research Design

One of the main attractions of VTS in its pure form is that the teacher/facilitator provides no structure, instead the teacher merely paraphrases and notes common threads without comment on the quality or accuracy of students' observations. Having students provide the vocabulary is supported by the TFA and is not unprecedented in research. Slimani (1989) designed an instrument based on Allwright's definition of uptake which makes students' interactions the source of learning and accounted for the fact that students would learn language that the teacher did not expect (see also Eckerth, 2006; Ellis, 1995). Swain and Lapkin (1998) also followed this idea in creating posttests based on the language that occurred without teacher intervention in students' conversations.

Some might raise concerns regarding having students provide self-evaluations regarding their vocabulary learning, but Ellis (1995) found that with few exceptions students were sincere and accurate in their reports on their vocabulary learning in research that he based on Slimani, (1989).

This preliminary study will seek to answer four research questions: 1) What is the range of vocabulary generated based on artwork used in a Visual Thinking Strategies discussion; 2) What is the degree of uptake as a result of the tasks; 3) How well do the measures capture the students' learning; and 4) How well do students recall what they have learned.

Method

Participants

Students were all first-year students in two intact English classes at a competitive national university, one for students with the same major and one with various majors.

The VST shows participants averaged about 4,330 words out of the first 7,000 words (see Table 4). Nation (2006) suggests that students who know 3000 word families might be capable of understanding slightly over 96% of unscripted spoken conversations when proper nouns are included (p. 77). Therefore, the students in this study should be able to comprehend unscripted comments by fellow students who are at roughly the same vocabulary level.

Table 4

Vocabulary Size Test Data for Friday 3 & 4

	Friday 3							Friday 4						
	1000	2000	3000	4000	5000	6000	7000	1000	2000	3000	4000	5000	6000	7000
Average	8.2	6.2	6.5	6.7	5.6	4.8	5.6	8.3	7.2	6.8	6.5	5.5	4.1	4.6
St. Dev.	1	1.8	1.3	1.6	1.7	2.3	1.4	1.1	1.4	1.4	1.3	1.8	1.7	1.3
Variance	0.99	3.1	1.8	2.4	3	5.4	2	1.3	2.1	2.1	1.8	3.3	2.9	1.8
Max	10	10	9	9	9	9	7	10	10	9	9	9	7	7
Min	6	3	5	3	1	1	3	5	4	4	4	2	1	3
n	21	21	18	19	20	14	9	21	21	21	21	21	19	14
Total	820	1440	2090	2760	3320	3800	4360	830	1550	2230	2880	3430	3840	4300

Materials and Procedure

The following five instruments were used in this study.

1. Vocabulary Size Test (VST). Research shows that students generally acquire vocabulary according to the frequency in which it occurs in speaking and writing so that higher frequency vocabulary is more likely to be acquired first. The VST consists of 14 sets of 10 questions each, with each set representing 1000 words arranged in sets of increased frequency (Nation, 2006). In this study the first 7 sets are used as suggested by the Rasch analysis carried out on the by Beglar (2009).

2. Student individual comments. Students type in their answers to the two Visual Thinking Strategy questions into Moodle (see Procedures below).

3. Visual Thinking Activities Worksheet. This worksheet consists of three parts. In Part 1 students listed the words in Step 2 above. In Part 2 they list any new or useful language and ideas that arose in the Letter Group session. In Part 3 they do the same in Number Groups (see Appendix A for Parts 1 and 2—Part 3, the Number Group is the same as in Part 2 and is not shown here).

4. Uptake Recall Chart and Uptake Identification Probe. These two measurements from Slimani (1989) were combined into one form (see Appendix B). After the VTS tasks were finished students identified the words and phrases, grammar, spelling, and pronunciation that arose in the session and identified the degree to which the language forms were interesting.

5. Vocabulary Knowledge Inventory (VKI). The VKI (see Appendix C) is based on the Vocabulary Knowledge Scale (VKS) developed by Pariah and Wesche (1997). There have been criticisms leveled at the VKS (see Nation & Webb, 2011, p. 229; Schmitt, 2000, pp. 175–176; Waring, 2002), but this study avoids many of those problems in that the main purpose of the VKI is to examine vocabulary use in a somewhat limited sphere in regards to a particular artwork by students who are generally at about the same vocabulary level, and to provide a first step in researching VTS and vocabulary learning.

The VKI consists of four parts. Part 1 is comprised three questions adapted from the VKS: 1) I don't remember having seen or heard this word before; 2), I have seen or heard this word before, but I don't know what it means; and 3) I have seen or heard this word before and I think I know what it means.

In Part 2 students translate from Japanese to English, and in Part 3 from English to Japanese. In Part 4 students write sentences about an artwork in English using the provided vocabulary words. Care was taken that answers to earlier questions did not appear in later parts of the VKI.

Procedure

Students first worked individually. They typed in their answers to the Visual Thinking Strategies questions about an artwork (Seurat, G., 1891, see Figure 1) for about 15 to 20 minutes either using a simple online dictionary or their own electronic or

Figure 1

Artwork Used for this Article
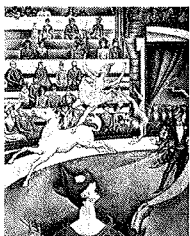
Georges Seurat, 1891; Oil on canvas
73 x 59 1/8 in; unsigned
Musee d'Orsay, Paris

paper dictionaries. They recorded the words they looked up on the first section of the VTS Worksheet, "Individual New or Useful Language."

Students then shared their ideas with other students in randomly selected small groups chosen by letter ("Letter Groups") and explained any unknown vocabulary. Students in each letter group were then randomly assigned to a "Number Group" where they again shared their ideas and vocabulary. Finally, students returned to their original Letter Groups. The goal was that every student in the class would be exposed to all new vocabulary and ideas.

After the VTS Worksheets were collected, students filled out the Uptake Recall Chart using the Uptake Identification Probe. They were asked to list as much vocabulary and language they could recall from the activities. In a slight divergence from Slimani (1989), students were additionally asked to make a plus mark (+) next to any language they felt they was useful to them.

The choice as to which words to evaluate in the VKI was based on the results of running students' self-reports through AntWordProfiler (Anthony, 2012). The resulting frequency data and teacher observations were used as a basis regarding which vocabulary to include and in which part of the VKI, including some words at the 1000 level if students marked the 1000 level words were useful, for example.

The following week students were asked to complete the VKI and then the exact same VKI again two weeks after that.

Analysis

Vocabulary Size Test (VST). See the participants section for the VST data. Not all students in these two groups took all seven levels, but two later groups that took eight levels of the VST (although in other departments) averaged even higher at 4455 and 4695 words.

Visual Thinking Strategy Image Comments. The data for the two classes on VTS 2.05.1 are in Table 5. This study examines vocabulary use at the word family level, since the focus here is on the students' knowledge of vocabulary meaning rather than on the depth or range of forms. Focusing on the word family means different occurrences of the same word are counted only once, as compared to counting tokens, which would count each occurrence separately. For example, the word *panic* might appear as *panic*, *panicked*, and *panicking*, but would be counted as one word.

Table 5

Statistics for Individual Comments for Visual Thinking Strategies

Artwork 2.05.1, The Circus, by Seurat

Level List	Friday 3						Friday 4					
	Token	Token %	Type	Type %	Group	Group %	Token	Token %	Type	Type %	Group	Group %
1	795	83.9	203	72.2	156	69.6	788	84.2	209	70.4	172	68.53
2	79	8.3	38	13.5	31	13.8	81	8.7	50	16.8	41	16.33
3	19	2	13	4.6	12	5.4	19	2	13	4.4	13	5.18
4	25	2.6	6	2.1	5	2.2	20	2.1	4	1.4	4	1.59
5	10	1.1	5	1.8	5	2.2	5	0.5	5	1.7	5	1.99
6	6	0.6	5	1.8	4	1.8	12	1.3	5	1.7	5	1.99
7	1	0.1	1	0.4	1	0.5	2	0.2	2	0.7	2	0.8
9	2	0.2	2	0.7	2	0.9	2	0.2	2	0.7	2	0.8
12	1	0.1	1	0.4	1	0.5	2	0.2	2	0.7	2	0.8
13	4	0.4	3	1.1	3	1.3	3	0.3	3	1	3	1.2
14	2	0.2	1	0.4	1	0.5	1	0.1	1	0.3	1	0.4
15	2	0.2	1	0.4	1	0.5						
0	2	0.2	2	0.7	2	0.9	1	0.1	1	0.3	1	0.4
Total:	948		281		224		936		297		251	

*The two words not on the first 16 level words lists were "BGM," short for background music, and "handstand."

*The one word not on the first 16 level word lists was "exempted."

The data shows that nearly 83.5% of the vocabulary used by the Friday 3 group and 84.9% of the vocabulary used by the Friday 4 group were from the first 2000-word level of vocabulary frequency. This suggests that having access to a dictionary did not lead to overuse of higher level vocabulary. This spread also compares well to native speakers carrying out an art description task on similar artwork. If the first 3000 word levels are included, the Friday 3 group comes in at 88.8%, Friday 4 at 90.0%, and the native speakers at 93.6%.

Vocabulary Knowledge Inventory, part 1. The descriptive data in Table 6 is from Part 1 of the VKI given one week after the class viewed and discussed the artwork. The data shows unsurprisingly that the students' reported knowledge of the vocabulary seems to relate to the vocabulary words' frequencies and to the students' scores on the

VST. The data is broken into basewords 1 through 5 (that is, the first 1000 to 5000 words), then from basewords 6 through 15 and up. The number of words in Part 1 from each baseword list is given as "VKI N." The three questions asked in Part 1 were "% Never Seen," "% Seen Don't Know," and "% Know."

Table 6

Vocabulary Knowledge Inventory Part 1

Friday 3 (F3) and Friday 4 (F4)

Artwork 2.05.1, The Circus, by Seurat

					Friday 3			Friday 4		
	VKI N*	F3 N	F4 N	Both N	% Never Seen	% Seen Don't Know	% Know	% Never Seen	% Seen Don't Know	% Know
Baseword1	6	1	4	1	0.0	2.6	97.4	4.0	7.9	88.1
Baseword2	26	6	16	3	3.3	10.7	86.1	6.0	8.8	85.0
Baseword3	10	4	6	0	6.2	19.2	74.6	8.6	13.3	78.1
Baseword4	6	1	5	0	16.7	19.2	64.1	26.7	29.5	43.8
Baseword5	5	3	2	0	40.0	23.1	36.9	26.7	29.5	43.8
Baseword6+	16	5	9	2	41.3	24.5	34.1	37.2	25.0	37.8

Note. "VKI N" indicates the total number of words from each baseword list that appeared in Part 1 of the Vocabulary Knowledge Inventory. "F3 N," "F4 N" and "Both N" indicate the number of words on the VKI from F3, F4, or both.

Looking at the descriptive data it is possible to see some apparent differences for individual words as to whether a student will report having seen or knowing them, but there does not seem to be much difference over all. For example, Table 7 shows the data for two words, *antic*, which is in the baseword09 list, and *wicked*, which occurs in baseword04. *Antic* occurred in the Friday 3 class and not in Friday 4, and the reverse is true for *wicked*. The data shows that students in Friday 3 were slightly more likely to know *antic* and students in Friday 4 were more likely to know *wicked*, but this difference is washed out if the number of students who reporting having seen the word are included.

Table 7

Sample Selection of Two Words from Friday 3 and Friday 4

antic [F3, BW09]

Class/Hour	% Never	% Seen,	% Know
Friday 3	53.8	30.8	15.4
Friday 4	66.7	28.6	4.8

wicked [F4, BW03]

Class/Hour	% Never	% Seen,	% Know
Friday 3	30.8	46.2	23.1
Friday 4	19.0	33.3	47.6

Table 8 shows the results of a comparison between parts 1 and 2 on the VKI for the same vocabulary. Data was organized into 3 main categories in which: a) students showed no change between administrations, meaning they showed no loss (A/A, B/B, C/C); b) students showed a loss (B/A, C/A, C/B); and c) students showed gains (A/B, A/C, B/C). Overall students showed very little change between administrations in terms of gains or loss, which is encouraging in that it suggests students retained the vocabulary at the levels they reported knowing it as displayed in Table 6.

Table 8

A Comparison in Responses to Two Administrations of Part 1 of the VKI

Data for Basewords Provided both as a Sum and Broken Down

	No Change					Decrease					Gain					
Base-word	A/A	B/B	C/C	No Ch.	% No Ch.	B/A	C/A	C/B	Loss	% Loss	A/B	A/C	B/C	Gain	% Gain	Total
1	0	2	175	177	89.4	0	5	9	14	7.1	1	1	5	7	3.5	198
2	3	32	713	748	87.3	3	36	47	86	10.0	2	3	18	23	2.7	857
3	4	21	237	262	79.4	13	9	27	49	14.8	4	0	15	19	5.8	330
4	5	22	128	155	78.3	8	3	18	29	14.6	3	3	8	14	7.1	198
5	27	69	302	398	74.1	33	19	46	98	18.2	8	10	23	41	7.6	537
6+	99	74	179	352	66.7	71	24	42	137	25.9	15	12	12	39	7.4	528
Baseword 6 and Above																
1	35	29	103	167	72.3	17	7	21	45	19.5	5	5	9	19	8.2	231
7*	9	6	4	19	57.6	7	3	2	12	36.4	2	0	0	2	6.1	33
9	10	16	37	63	63.6	15	5	10	30	30.3	4	1	1	6	6.1	99
12*	13	5	1	19	57.6	10	2	0	12	36.4	1	1	0	2	6.1	33
13	61	16	13	90	70.3	17	5	6	28	21.9	3	5	2	10	7.8	128
14*	0	2	21	23	69.7	5	2	3	10	30.3	0	0	0	0	0.0	33

Note. A = Never Seen; B = Seen Don't Know; C = Know

*Indicates only one word in this category

Vocabulary Knowledge Inventory, part 2 (English-Japanese translation). The English-Japanese translations in Part 2 suggest the degree students are able to actively produce the English form of the word. As with the other words, there is a general trend towards fewer students reporting knowledge of the words as the words' frequency decreases. Anomalously, as with the other parts of the test, words such as *sparse* is probably known depending on the groups in which it was used, and words such as *garment*, which is a relatively infrequent word is nevertheless known by many, perhaps because it figures so prominently in the image. Words may also be known because they are loan words in Japanese. Loan words can help and hinder, since some are false friends with words used as katakana words in Japanese having different uses than the students

expect. In future analysis students' vocabulary lists and uptake reports can be examined to see whether the words were reported as new, remembered, and learned.

Table 9 shows preliminary data for Part 2 from Posttest 2. It gives the total number of answers for the two classes, the percent of attempts to answer questions, the % correct, and the % blank. The range of answers shows the difficulty of creating a test on the fly and then rating it. For example, although every student was able to translate *orchestra* correctly, perhaps because it's a loan word, very few of the students were able to spell it correctly, with only 29.4% getting it right. The translations of the word for *vampire* in Japanese were generally correct, but many substituted *Dracula*. Some students assumed that *piero* in Japanese must be a loan word from English and wrote that as their translations rather than *clown*. A range of answers for *noble* were marked correct from *aristocracy* to *royal*, although *royal* was considered a little off by a native speaking consultant. Finally, for some reason every single student translated the word for *lightning* as *thunder* in the Friday 3 class, an anomaly perhaps caused by thunder and lightning often occurring together, or perhaps because of a dictionary definition. One student in the Friday 4 class suggested *flash* for lightning, which seems to show at least a sense of the meaning of the word.

Table 9

VKI Posttest 2 Part 2 Japanese-English Translation

Japanese	English	Base-word	Friday 3 (N=17)						Friday 4 (N=19)					
			% Ans.	% Cor.	% Blnk	N Ans.	N Cor.	N Blnk	% Answ.	% Cor.	% Blank	N Ans.	N Cor.	N Blnk
カーテン	Curtain	2	76.5	76.5	23.5	13	13	4	100	94.7	5.3	19	18	1
オーケストラ	Orchestra	3	100	100	11.8	17	17	2	73.7	73.7	26.3	14	14	5
サーカス	Circus	4	100	100	0	17	17	0	100	100	5.3	19	19	1
ピエロ	Clown	5	58.8	35.3	41.2	10	6	7	73.7	21.1	31.6	14	4	6
貴族	Noble	5	88.2	70.6	17.6	15	12	3	84.2	78.9	21.1	16	15	4
空いている	Vacant	5	100	88.2	0	17	15	0	89.5	89.5	10.5	17	17	2
稲妻	Lightning	6	100	0	0	17	0	0	100	15.8	0	19	3	0
アクロバット	Acrobat	7	76.5	76.5	23.5	13	13	4	84.2	84.2	15.8	16	16	3
吸血鬼	Vampire	10	88.2	82.4	11.8	15	14	2	63.2	63.2	42.1	12	12	8

Vocabulary Knowledge Inventory, part 3 (English-Japanese translation). Table 10 shows the descriptive data for Part 3 of the VKI, which asked students to translate from English to Japanese. The answers show similar difficulties to those reported in part 2. For example, many students referred to the building shown in the picture using the word *colosseum* (no control was made for British or English spelling). Whether *colosseum* itself is a correct word for the structure shown in the painting is not relevant if we are being careful to not control students' observations and vocabulary use. The word does seem to convey the sense of the artwork, that is, it seems to be a wide open space with features similar to a colosseum. Some students referred to the building as an auditorium.

The backtranslations for colosseum included the katakana word for coliseum 6 times across the two classes along with words in Japanese with the meanings in English of *coliseum* in katakana (n=6), *stadium* in katakana (n=1), *amphitheater* (n=1, and this "best" translation taught in the schools for coliseum), square (n=1), dressing room (n=1), fighting arena (n=1), stadium (n=6), arena (n=16). Of these only dressing room might really be considered absolutely wrong. The word *hiroba* as a translation for coliseum conveys the sense of an open space and seems connected to the artwork, although it is not the best translation. Perhaps two scores are necessary, one for the degree the translation correlates to the picture, and a separate score for whether the translation was correct or not. For example, strike was translated both with katakana for strike, but also with the sense of "it struck me that we need to do this," or a striking appearance, which are actually less common meanings than the one evinced by the artwork.

Other difficult decisions are whether the answer *mukidashi* given in Japanese for *wicked* is a correct answer. The word means to show something, for example, a dog may show its teeth or a décolleté dress might show a lot of skin. Was the student who wrote *mukidashi* thinking about the expression showing a lot of skin and that that was wicked? In this case the student apparently felt it did and it was counted as correct.

Many students just left spaces blank when faced with words they didn't recognize, but some did try to guess. This led to such guesses for *garment* as *German, government, engagement, jewelry,* and *gomi* (garbage). These might make good distracters for a multiple-choice test. Students were encouraged to match the meaning of their answers with the painting as a guide, but it was not always clear that they did so with the single word translations.

As with the tables above, Table 9 shows the number of attempted answers (N Ans.),

the number correct, scored very loosely (N Corr.), the number of blank responses (N Blnk.), and percentages for each of these for both the Friday 3 and Friday 4 classes.

Table 10

VKI Posttest Part 3 English-Japanese Translation

	Base-word	Friday 3						Friday 4					
		N Ans.	N. Corr.	N. Blnk.	% Ans.	% Corr.	% Blnk.	N Ans.	N. Corr.	N. Blnk.	% Ans.	% Corr.	% Blnk.
strike	1	15	14	2	88.2	82.4	12.5	16	16	3	94.1	84.2	15.8
instrument	3	17	13	0	100.0	76.5	0.0	17	15	2	100.0	78.9	11.8
sicked	3	11	8	6	64.7	47.1	42.9	11	7	8	64.7	36.8	53.3
spectator	6	16	13	1	94.1	76.5	7.1	20	18	0	117.6	90.0	0.0
wizard	6	10	8	7	58.8	47.1	46.7	17	17	2	100.0	89.5	10.5
garment	7	8	4	9	47.1	23.5	69.2	6	3	13	35.3	15.8	81.3
auditorium	9	11	11	6	64.7	64.7	35.3	7	5	12	41.2	26.3	70.6
troupe	13	4	0	13	23.5	0.0	100.0	3	2	16	17.6	10.5	88.9
colosseum	15	16	15	1	94.1	88.2	6.3	17	16	2	100.0	84.2	11.1

F3 Total Respondents=17

F4 Total Respondents=20

Vocabulary Knowledge Inventory, part 4 (writing English sentences). In the English sentence-writing section students were asked to write sentences that related to the artwork based on the VTS questions in hopes that it would make it easier to ascertain whether they understood the meaning of the words or not. There were some clear cases where students did give reasons for their observations using "because" or "so" clauses as in "The spectator is noble. Because they wear formal clothes." However, in many cases students did not give reasons, such as "This picture is antic." which could mean they thought the word they wanted was "antique." The sentence "The man play antics" seems to suggest the sense of the word because of the word *play*. Is the answer "I'm in panic" correct? Some students showed their vocabulary level through such sentences as "The horse has strenuous muscle." Strenuous is a word from the 6000-word frequency level and was used on the test without benefit of a dictionary.

The words for which students were asked to write sentences and the number of answers (that is, not left blank) are shown in Table 11. As before, there seems to be a

relationship between the word's frequency and the likelihood the student could write a sentence about it, but there were exceptions. The words *render* and *restive* were remembered by relatively few students, probably only the students in the groups in which they was used, meaning that they didn't spread across the groups. *Technique* may have been easy for them since it is a loanword in Japanese (Daulton, 2003). The word *baste* from baseword 12 was a teacher-introduced error. The student likely meant *beats*.

Table 11

VKI Posttest 2 Part 4 Sentences in English

Word	Base-word	Friday 3						Friday 4					
		N Ans.	N. Corr.	N. Blnk	% Ans.	% Corr.	% Blnk	N Ans.	N. Corr.	N. Blnk	% Ans.	% Corr.	% Blnk
stick	1	11	11	6	64.7	64.7	35.3	18	18	2	90.0	90.0	10.0
muscle	2	14	13	3	82.4	76.5	18.8	17	17	3	85.0	85.0	15.0
technique	2	15	15	2	88.2	88.2	11.8	20	20	0	100.0	100.0	0.0
panic	3	14	14	3	82.4	82.4	17.6	19	19	1	95.0	95.0	5.0
solid	3	7	4	10	41.2	23.5	71.4	13	11	7	65.0	55.0	35.0
witch	4	10	7	7	58.8	41.2	50.0	16	16	4	80.0	80.0	20.0
noble	5	14	13	3	82.4	76.5	18.8	18	16	2	90.0	80.0	10.0
render	5	2	0	15	11.8	0.0	100.0	1	0	19	5.0	0.0	95.0
ritual	5	5	5	12	29.4	29.4	70.6	4	0	16	20.0	0.0	80.0
spectator	6	15	15	2	88.2	88.2	11.8	18	18	2	90.0	90.0	10.0
antic	9	7	1	10	41.2	5.9	90.9	4	1	16	20.0	5.0	80.0
baste	12	1	0	16	5.9	0.0	100.0	2	0	18	10.0	0.0	90.0
restive	13	2	0	15	11.8	0.0	100.0	2	1	18	10.0	5.0	90.0

F3 Total Respondents=17

F4 Total Respondents=20

Generally, having the artwork available did seem to make it easier for students to show their knowledge of the word and made it easier to rate whether the usage was correct. Table 12 shows illustrative examples for the word *stick*. Does "I picked my friend by a stick" show understanding of the word *stick*?

Table 12.

Sample Sentences for All Students for Two Words

***Stick* and *Spectator* from VKI Part 4**

for VTS 2.05.1, Seurat's *The Circus*

Stick

A girl who ride a house has stick. I hit stick. The man who is in the right side of the picture have a long stick. The crown in center has stick or scarf. A man has a stick. Head person has stick. The man on the right of this picture has a stick and strike it the horse. The woman on the horse is a conductor because she has a white stick. The man has a stick. The clown has stick. He has a stick. The woman has a stick. A woman stick something. The woman on the horse has a stick. This stick is very long. He attacked the lion with the stick. A stick which the woman has has magical power. The little girl on the white horse has a magical stick. A person on a horse has a stick. Dancer girl has magical stick. A man having the stick is the head of dancers. The man on right side stick to left person. The woman has a stick. The person on the horse has a stick. The stick woman have have wonderful power. The woman on the horse has a stick. I picked my friend by a stick. I stroke my brother with stick. The yellow cloth the man has stick the yellow curtain.

Discussion

This study offers a brief first look at one set of data collection for one artwork using VTS. It suggests the range of vocabulary generated in carrying out the task is similar to that of native speakers. It shows that students do well at noticing and recalling the vocabulary,

One limitation of the current study was the VKI included vocabulary from two different sections of students carrying out the same art-based tasks who made different observations of the artwork, so some vocabulary was new for students in each section. Also, vocabulary did not always disperse throughout each class. Researchers always lament that they did not carry out cooperative learning well enough, and that is because it takes time to learn how to help students do it well. This pilot study suggests several ideas for making the tasks more cooperative, including adding clearer roles for students, such as asker (VTS q. 1), checker (VTS q. 2), recorder, and observer. Making the task more cooperative may lead to more checking of learning and understanding so that

more students in the class as a whole experience and learn the same vocabulary.

This writer made much of not providing vocabulary for students to use for fear it would guide student's to ideas, but if the vocabulary can be diffused across the class, then particular vocabulary can be chosen for testing and the VKI can still serve as a means to check students' awareness and learning of vocabulary. If carried out this way, a control group could even be asked to carry out the VTS task individually and be asked to learn the same vocabulary. Finally, a more fine-tailed study videotaping one or two groups carrying out the tasks followed by a stimulated recall task and individual interviews will allow more fine-tuned insight into the vocabulary learning.

Visual Thinking Strategy-based lessons work well in terms of encouraging students to produce and learn language. The continuing task is to actually measure and show how well these tasks work.

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Appendix A
Visual Thinking Activities Worksheet

Artwork: _____

Part 1: Individual Writing

Individual New or Useful Language (words and phrases, spelling, grammar, pronunciation, ways of using the language, other)

Part 2: Letter Groups

Group   A   B   C   D   E   F   (circle)

Group Members' Names

Letter Groups' New or Useful Language (words and phrases, spelling, grammar, pronunciation, ways to use the language, other)

Letter Groups' New Ideas

Appendix B
Uptake Identification Probe and Uptake Identification Chart
Based on Slimani, 1989
(Reformatted [compressed] for this article)

Class: Mon   Tue   Thu   Fri

Date: _____

Hour: 1   2   3   4   5

Uptake Recall Chart

Question: What points have come up in today's lesson? You can write on the back of this page, if you need more space.

1. Words and phrases

2. Grammar:

3. Spelling:

4. Pronunciation:

Please look carefully at your "Uptake Recall Chart" and do the tasks below. What did you learn today?

Put a circle (○) in front anything that was really **new** to you.

Put an underline (__) under anything that was **not new**, that you already knew a little.

Put an X (×) next to anything you remember, but **did not really learn.**

Put a zigzag line (____) under anything you did not learn because you **knew before** today.

Put a plus (+) next to anything you felt was most useful to you.

Appendix C

Vocabulary Knowledge Inventory (#1)

for Visual Thinking Strategies 2_05.1

Part 1

	A	B	C
	I don't remember having seen or heard this word before	I have seen or heard this word before, but I don't know what it means	I have seen or heard this word before and I think I know what it means
antic			

Words used in Part 1:

anxious, atmosphere, attract, audience, auditorium, backstage, baste, boring, chorus, colosseum, company, complain, coordinate, doll, dream, empty, entertain, fairy, famous, float, flow, forefront, formal, gallop, garment, guest, instrument, motor, muscle, pain, pale, panic, passage, perform, pose, position, public, render, restive, rich, ritual, rod, row, satisfy, scarce, scarf, scene, separate, skin, solid, sparse, spectator, stick, strike, stunt, sustain, tamer, technique, theatre, thunder, tight, trick, troupe, tuxedo, wicked, wire, witch, wizard

Part 2: Please translate the following words into English

アクロバット	
See Table 7 for list of words and their translations.	

Part 3: Please translate the following words into Japanese

auditorium	
See Table 8 for list of words.	

Part 4: Please write an English sentence for these words based on the artwork

antic	
See Table 9 for the list of words	