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APPLYING PICTOLOGICS (PLS) METHOD IN TEACHING ENGLISH TO MALAYSIAN STUDENTS: A VYGOTSKIAN PERSPECTIVE

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ABSTRACT: *This paper examines the effects of applying Pictologics (PLS) method – developed by the author- on teaching English to Malaysian primary students (N=126, p≤.05). In a mixed methods design, students in two public primary schools in Penang, Malaysia participated in this study. The samples were almost equally divided into the treatment group which received their training with PLS, and the control group that received their training via a conventional method. The instrument was a10-item questionnaire in multiple-choice and open-ended formats. The data revealed that students under PLS had a more positive opinion towards learning style; that is, imaginative usage of pictures which is generally exercised by PLS. This paper also briefly introduces PLS in terms of its principles and potentials in a Vygotskian perspective. The author encourages teachers and students to use the ideas and techniques of this method in order to enhance teaching and learning English.*

KEYWORDS: Imagination, Pictures, Pictologics, Pls, Vygotsky

INTRODUCTION

A Brief Introduction to Pictologics method

Pictologics (PLS) is a newly-developed method which has been tried successfully with Iranian, Korean, Malaysian, and Taiwanese English language learners. For more information about Pictologics, please see Shirban Sasi (2004, 2006, 2009, 2012, 2017, 2018). This method is based on the following assumptions:

- The human mind is capable of thinking about almost anything.
- There is no limit to our imagination.
- We can perceive the world around us with at least one of the five senses of ***hearing***, ***sight***, ***smell***, ***taste***, and ***touch***.
- With just a few pictures, we can have endless combinations of pictures by which we can make/utter/write (communicate) endless structures/pieces of information.

If language practitioners learn to make imaginary connections between linguistic forms and a picture or picture combinations, and if they learn to make the best of their five senses, then they can produce many structures. That is, when we use more than one picture card at a time and make random combinations of two, three, four, and … cards, then we will have a very large number of combinations. Therefore, there will be chances for the students to produce (both oral and written) structures, and chances for the teachers to monitor the process. The following formula is applied:

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$\binom{n}{m}$ = Total number of possible combinations of picture cards = $\frac{n!}{m!(n-m)!}$

If we assume we are dealing with only 20 pictures in a hypothetical PLS class, applying the formula we will have more than two million possibilities each of which can be a good source for language production.

An example of limitless connections in Pls Method

What basically differentiates the usage of pictures in PLS from that in the other language teaching methods or approaches is that in PLS we can attribute anything to a certain picture through a series of imaginative questions. In the following example, please notice how a randomly-picked picture is used to introduce a new word (*combustible*). Please note that there are literally thousands of ways a teacher could do this in PLS. Also notice that the number of questions asked depends on the feedback of the students, time limit, English proficiency level, and so on. If needed, some of the questions (or answers) might be in the students' mother tongue.

Figure 1. Any picture of any clock.

Retrieved from Internet public domain (n.d.).

T: OK, what can you see in the picture?	**S:** A clock.
T: Do you have a clock at home?	**S:** Yes.
T: What is the use of it?	**S:** It shows time.
T: Do we need to know the time?	**S:** Yes.
T: Why?	**S:** To go to school in the morning.
T: Can you explain more?	**S:** It helps us to get up in the morning.
T: How?	**S:** It has an alarm.
T: Good! Do you know any other thing with alarm?	**S:** (no answer)
T: I mean anything with loud alarming sound?	**S:** Ambulance.
T: Fine! Any other thing?	**S:** A fire truck.
T: Excellent! What is a fire truck used for?	**S:** To put out fire.
T: What things catch fire easily?	**S:** Wood, plastic, paper,…
T: Do you know what we call all of these in English?	**S:** Fire catching?
T: Yes, something like that. Or better to say **combustible.**	**S:** (repeating the word)

Note: T=the teacher; S=a student/students

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VYGOTSKY IN RETROSPECT

Preview

Although, apparently, no theory of cognitive development alone is adequate to explain human behavior, Lev Vygotsky (1896-1934)'s theory has contributed greatly to our understanding about child development. However, what makes his theory most relevant to this study is his emphasis on the socio-cultural context of human development. While Jean Piaget (1896-1980)'s cognitive constructivism emphasized the individual processes necessary for learning and understanding knowledge, Vygotsky focused on the social construction of knowledge through society, culture, and language. Although knowledge is still believed to be constructed, Vygotsky emphasized the role of other learners, teachers, parents, and society in constructing knowledge and understanding. In Vygotsky's opinion, the cognitive development begins with an interaction between the child and a more knowledgeable other, and the social processes are then transformed into the child's internal mental processes. Both Piaget and Vygotsky realize socialization as a means by which children develop understanding about the world. Language is a crucial part of that social interaction, hence also to children's cognitive development.

Human Mental Process

According to Vygotsky (1981, 1986), every human mental process is arbitrated to psychological tools such as language, signs, and symbols. These tools are invented by human society, and are acquired by children via interpersonal communication with adults and more experienced peers. After being obtained and internalized by children, these tools then function as mediators of the children's higher mental processes. Vygotsky (1997) argues that a real concept is an image of an objective thing in its complexity. We can develop a concept only when we recognize the thing in all its connection and relation; only when this diversity is synthesized in a word, in an integral image through so many determinations. Likewise, Kozulin (1998) asserts that through formal schooling, people in almost all societies become exposed to a vast number of symbolic tools that not only become essential as cognitive tools, but also to a certain extent form the very 'reality' of the modern individual. According to (Vygotsky, 1998, p.42) the youngsters who think conceptually, discover the "whole world of deep connections that underlie external, outward appearances, the world of complex interdependencies and relations within every sphere of activity and among its separate spheres." He also postulates, "Where researches thus far saw either simple discovery or a simple process of the formation of a habit, the true study discloses a complex process of development" (Vygotsky, 1997, p. 95). Frawley (1997, p.96) points out that the foundation of Vygotsky's theory is his conception that the human mind is mediated by symbolic artifacts which means that the external world is never directly apprehended but recast and deferred.

Social Interaction

Vygotsky (1978) believes that social interaction is essential to the development of language and thought. He asserts that social relationships and dialogue elevate levels of understanding. Through this interaction, children are able to achieve higher levels of cognition than they would achieve independently. He thought of instruction as a true motor of children's cognitive development. Freire (1972) takes a similar stand. According to him, mere narration turns students into 'containers', to be filled by the teacher. The more completely he fills these containers, the better. Freire then further adds, "Knowledge emerges only through invention, hopeful inquiry men pursue in the world, with the world, and with each other" (p.45). Freire

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emphasizes that it is only through communication that human life becomes meaningful. The teacher's thinking is substantiated by that of the students. Moreover, according to Freire and Shor (1987), through communication, although the process of communicating, knowing, and changing has an individual dimension, we should conduct it socially. And that the individual aspect is not enough to explain the process.

ZPD

Vygotsky (1978) describes a child's development in terms of a Zone of Proximal Development (ZPD). He defines this concept as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Quoting Vygotskian scholars, Wink and Putney (2002, p. 153) present us with more details of ZPD the most important of which might be: "ZPD is a theory of intellectual development that acknowledges that children undergo quite profound changes in their understanding by engaging in joint activity and conversation with other people." Vygotsky (1978) encourages educators to utilize the process of scaffolding as a means of gradually guiding the learner through experiences to increase knowledge and skills while striving to make connections to existing schemas.

Similarly, in PLS the teacher is not the sole active mind in the class. Far from it, most activities are done collectively with the students mainly involved. For instance, the key technique of imaginary questioning and answering (pertinent to Socratic debate) cannot materialize without cooperative participation of the students under the supervision of the teacher as the 'adult guide' or the 'more capable peer' in Vygotskian terminology.

METHODOLOGY

The purpose of the data collected in this mixed methods study was to investigate the Year Six Malaysian primary school students' opinion towards English language learning through usage of pictures and imagination (PLS method). A total of 130 Year Six Malaysian primary students almost equally distributed in two public schools, started the experiment. Due to experimental attrition effect, some of them could not be accounted for in the final analysis. Thus, there were 126 students present; 60 in the treatment and 66 in the control group.

Procedure

Prior to the experiment, the author consulted some Malaysian primary and secondary school teachers to see which schools to choose as the sample. Subsequently, two public primary schools in the Bukit Mertajam district in the state of Penang were chosen based on their almost being representative of typical Malaysian public primary schools. The details are:

- Necessary permissions from the Educational Planning and Research Division of the Malaysian Ministry of Education (EPRD), the State Educational Department (JPN), as well as the school principals were obtained.
- The two public primary schools were randomly assigned to the treatment and control groups by flipping a coin.

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- All the ten teachers of English in the treatment school were trained by the author to learn how to use the PLS method during a 2-session workshop. The selected teacher for the PLS method was privately instructed in three more sessions for more details.
- Both control and treatment teachers were females, and approximately of the same age and teaching experience.
- Based on the records of the students' achievement levels in the two schools, all the highest and the middle rank achiever in Year Six level in both schools were selected for the experiment. There were two classes in each school, and 30 to 35 students present in each class.
- Both groups were exposed to the treatments for ten 1-hour sessions held two or three times a week. The classes in both schools were held mostly in the morning.

The Control Group

The students in the control group were taught by a local teacher and with a conventional method. The identical teaching materials were incorporated by the author into certain sections of a book which students were going to study in near future, that is, *English Form One Textbook*. The reasons as to why this book was chosen follow:

- This source has been approved by the Malaysian Ministry of Education.
- There are various sections which try to touch all the language skills.
- The students were familiar with the format of the book.
- The teacher was accustomed to teaching this book.

The author randomly picked 9 lessons in two parts of this book: *READ AND THINK*, and *LITERATURE*.

RESEARCH INSTRUMENTS

A: Multiple-Choice Questionnaire (Quantitative Section)

This questionnaire was administered after the last session to receive the subjects' opinion towards imaginative usage of pictures in learning English (Appendix A). The questionnaire was developed by the author based on his two former experiences in conducting similar experiments jointly with UNESCO in Iran. The original questionnaire was validated by the UNESCO Tehran Cluster Office (Shirban Sasi, 2017). Nonetheless, in order to meet the requirements of the Malaysian students, the items in the questionnaire were rephrased. Also, the whole questionnaire was translated into Malay in order to minimize any possible misunderstanding on the part of the students. The translator was a primary school teacher of the Malay language with 16 years of experience, who also had a very good command of English. The results obtained by the questionnaire were scored based on the 'Likert Scaling'. According to Babbie (1979, p.410), applying Likert Scale, the respondents are presented with a statement in the questionnaire and are asked to choose whether they *strongly agrees*, *agrees*, *disagrees*, *strongly disagrees*, or are *undecided*. With five response categories, scores of 0-4 or

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1-5 will be assigned, taking the direction of the items into account, e.g. starting from 'strongly agree' to 'strongly disagree'. In this study, a 1-5 scale was applied.

B: Open-Ended Questionnaire (Qualitative Section)

This questionnaire was basically an open-ended version of the previously mentioned questionnaire. It was administered only to the treatment group after the experiment. This time, only the English version was used in order to avoid probable differences in interpretation of the students' opinion (Appendix B).

Pilot Study

Prior to the main experiment, and in order to both modify the research questionnaire, and also witness the feasibility of the application of PLS method in the Malaysian primary schools, a pilot study in the same district had been conducted. The participants were 51 Year Six primary school students. Consequently, applying the Cronbach's α formula, the coefficient was calculated as 0.93 which showed a high internal consistency in the questionnaire.

Research Questions And Hypotheses

A: Quantitative Section

$H_0$1- There is no significant difference in the students' opinion towards English language learning through usage of pictures and imagination between the control and treatment groups of the Malaysian Year Six primary school students after the experiment.

H_1- The Malaysian Year Six students who are taught with PLS will have a more positive opinion towards learning English through usage of pictures and imagination than those Malaysian Year Six students who are taught with a conventional method.

B: Qualitative Section

How does PLS help increase Malaysian Year Six primary students' positive opinion towards learning with pictures and imagination?

Methods And Discussions

Chi-Square Test For Independence

This test is used when we wish to explore the relationship between two categorical variables. Each of these variables can have two or more categories. In this study the two categorical variables for each question are as follows:

• Group (Control/Treatment);

• Response to questions (strongly agree/agree/undecided/disagree/strongly disagree).

Procedure

The most important assumption of Chi-square test is the "minimum expected cell frequency"; that is to say, each cell should be 5 or more, or at least 80 percent of the cells should have expected frequencies of 5 or more. Since in the current study, each of the 10 questions (items) of the multiple-choice questionnaire of the students' opinion has been inspected by separate

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Chi-square tests, with the exception of question number seven, the other questions did not meet this assumption. The solution to this problem according to Clegg (1982) is to pool the adjacent cells (categories). Consequently, the author grouped the categories (cells) of "strongly disagree" and "disagree" for item seven; and the three categories of "strongly disagree", "disagree", and "undecided" for the other nine items in order to avoid violation of this assumption. Thus, a chi-square test was run for each of the 10 items in the questionnaire as summarized in Table 1 below ($p \leq .05$):

Table 1. Summary of the Chi-squared test results for the 10 items of the students' opinion questionnaire

Item	Pearson Chi-square value	*p*	Significantly Different or Non-Significant
1	6.245	.044	Significant
2	14.961	.001	Significant
3	7.146	.028	Significant
4	6.108	.047	Significant
5	7.263	.026	Significant
6	10.355	.006	Significant
7	6.078	.108	Non-Significant
8	10.593	.005	Significant
9	12.357	.002	Significant
10	1.744	.418	Non-Significant

As seen in Table 1, the associated significance level of each chi-squared test has been juxtaposed to its counterpart Pearson chi-squared value. Furthermore, we know that in order to be significant, each Sig. value should be .05 or smaller. Thus, on the right column of the table, the results have been revealed. These results illustrate that among the ten items of the questionnaire, only items 7 and 10 have been answered almost similarly (with no significant difference) between the treatment and control groups.

Mann-Whitney U Test

This statistical test is used to investigate the differences between two independent groups on a continuous measure. For instance in this study, the measure is the overall opinion towards using pictures and imagination in the learning process. Mann-Whitney U test is run to find out whether the students in the control and treatment groups differ in terms of their overall opinion towards imagination and usage of pictures in the learning process. See Table 2 below.

Table 2. Ranks

	Group	N	Mean Rank	Sum of Ranks
Overall Opinion	Control	66	48.89	3226.50
	Treatment	60	79.58	4774.50
	Total	126		

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According to Pallant, (2005, p.291), Mann-Whitney U test is the non-parametric alternative to the t-test for independent samples. It compares medians instead of means. It converts the scores on the continuous variable to ranks, across the two groups. It then evaluates whether the ranks for the two groups differ significantly. As the scores are converted to ranks, the actual distribution of the scores does not matter. See Table 3.

Table 3. Test Statistics

	Overall Opinion
Mann-Whitney U	1015.500
Wilcoxon W	3226.500
Z	-4.722
Asymp. *p* (2-tailed)	.000

According to Table 3, the Z value is –4.72 with a significance level of *p*=.000. The probability value (*p*) is less than or equal to .05, so the result is significant. Therefore, we can conclude that the null hypothesis is rejected. Furthermore, since all of the 10 items of the questionnaire were of the same direction (i.e. the structure of each individual question conveyed a 'positively-directed' meaning), then, by looking at the output table of the ranks (Table 2), we can see that the mean rank of 79.58 of the treatment group is larger than the mean rank of 48.89 of the control group. Likewise, the sum of ranks of 4774.50 of the treatment group is larger than the sum of ranks of 3226.50 of the control group respectively. In other words, by these data we can infer that 1) there is a statistically significant difference in the opinions of student towards usage of pictures and imagination among the two groups; and 2) the treatment group feels more positive towards this usage of pictures and imagination as compared to the control group.

The Qualitative Section

In the following section, the data gathered from the open-ended questionnaire on the students' opinion are qualitatively analyzed with initial descriptive codes being assigned to each response. Related codes are grouped according to categories and common themes (Bogdan & Biklen, 2007). The following procedure was carried out when analyzing the open-ended questionnaire:

- All answers to each question were compiled into a group.
- Thematic codes were identified for each question based on the regularity in occurrences.
- The frequency of each code was calculated and tabulated by percentage in Table 4.
- Some codes overlapped as they were repeated over different responses.

Table 4 provides a list of all the frequent key words which have been compiled together for each item in the questionnaire. As the students were not proficient in English, we might consider each individual word as the unit of analysis. That is to say, with reference to the question being asked, each word can be considered as a single answer by the student per se.

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Table 4. The coded responses to each item in the questionnaire

Question 1: How can your five senses (hearing, sight, smell, taste and touch) help you in learning English?									
Key word	remember	learn	understand	imagine	creativity	easy	fast	think	Misc.
%	15.25	20.33	23.72	18.64	8.47	28.81	8.47	3.38	3.38

Question 2: How can your imagination increase your positive feelings?								
Key word	happy	positive	increase	think	imagine	picture	neg.	Misc.
%	13.55	23.72	23.72	10.16	33.89	35.59	3.38	13.55

Question 3: How can activating your power of imagination increase your interest in the English class?								
Key word	can	understand	imagine	picture	learn	no ans.	neg.	Misc.
%	20.33	5.08	18.64	38.98	16.94	3.38	3.38	30.50

Question 4: How can transferring ideas or feelings through pictures be helpful to motivate you in the language class?							
Key word	increase	imagine	picture	attention	no ans.	neg.	Misc.
%	13.55	20.33	23.72	10.16	5.08	3.38	27.11

Question 5: How is it possible to develop your imagination by using pictures?									
Key word	happy	possible	understand	imagine	think	picture	no ans.	neg.	Misc.
%	6.77	15.25	5.08	28.81	10.16	35.59	6.77	6.77	25.42

Question 6: How can a single picture be used in clarifying various meanings and thoughts?					
Key word	imagination	words	not understand	no answer	Misc.
%	52.54	8.47	5.08	3.38	28.81

Question 7: How can imagination help you learn many English words and structures?						
Key word	using pictures	mental friend	link to experience	place	no answer	Misc.
%	18.64	6.77	5.08	5.08	1.69	47.45

Question 8: How can using pictures and imagination be applied to strengthen your communication skills?							
Key word	vocabulary	think	pretend	many meanings	confident	no ans.	Misc.
%	28.81	5.08	3.38	3.38	8.47	10.16	33.89

Question 9: How can imagination help you think better?						
Key word	picture	easily	idea	interesting	no answer	Misc.
%	15.25	6.77	16.94	10.16	5.08	42.37

Question 10: How can you use your imagination in learning your other courses?							
Key word	yes	negative	essay	other subjects	think	no answer	Misc.
%	10.16	11.86	13.55	Malay: 8.47 Science: 11.86 Math: 5.08	11.86	10.16	32.20

As mentioned earlier, upon determining the key words in the students' answers, the author counted and calculated them in all the answers one by one. The percentage of the key words appearing in the responses to each question may reveal some facts as to what the students' opinion is. For instance, in Question 1 in Table 4, the key word 'easy' has the highest frequency of %28.81. This might mean that the students thought that the most important role of the usage of the five senses (as applied in PLS) is that it would make lessons somehow easier. On the contrary, in the same question, the key word 'think' has the lowest frequency of %3.38 which

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might mean that the students did not recognize any direct link between thinking and the usage of the five senses.

Similarly, in Question 2, the key word 'picture' has the highest frequency of %35.59 as opposed to the low frequency of %3.38 for the key word 'negative'. This might mean that the students have been able to benefit from the imaginative usage of pictures in PLS, and that they have very little negative feeling towards this special way of using pictures in learning English. Likewise, the key word 'picture' has the highest occurrence of %38.98 in the third question. In the same question, the unanswered items and the key word 'negative' have the lowest percentage of 3.38. Moreover, in Question 4, the key words 'imagine' and 'picture' occur more than the other key words. It is also interesting that the miscellaneous answers to this question; that is, several other opinions on the part of the students that could not be compiled under common concept, make up the highest percentage of 27.11.

Furthermore, in the fifth question, the key words 'imagine' and 'picture' appear almost three times more than the average frequency of the other key words. In the same question, the students have used the key words of 'happy', 'possible', and 'think' almost remarkably. This might mean that the students have a rather positive feeling towards usage of imagination via pictures. Then, as for Question 6, we can see that the key word 'imagination' has occurred in 52.54 percent of the answers. This high number shows the importance of imagination in PLS. However, the replies to Question 7 show that students did not come up with a unanimous range of responses, for the miscellaneous category of the key words for this question exceeds all the other key words at 47.45 percent. Another interesting fact in this question is the key word 'mental friend' at %6.77. This notion might be taken into consideration particularly when we are dealing with the aim of communication which is very important in learning languages.

Then, in both the eighth and ninth questions we can see that the miscellaneous category of the key words have the highest frequency. Based on the nature of these two questions, it might be deducted that the students have various opinions as to how imagination can be used for communication, as well as thinking more efficiently. Finally, the replies to Question 10 can show that firstly, many students agree that the PLS method can be used to learn other subjects, and secondly, they believe that Science (% 11.86) would be a good discipline for PLS to be applied.

CONCLUSION

The findings of the current study showed that students in the treatment group had a more positive opinion towards learning English with imaginative use of pictures. We might say that in any given class, students do not learn as isolated individuals because the social interactions of the students can be easily pointed out. PLS allows and, in fact, tantalizes the students to learn from each other, and to share their knowledge with one another. In Vygotskian terminology, the social interaction is essential to the development of language and thought, and that social relationships and dialogue promote levels of understanding. Moreover, the author believes that learning can be an enjoyable process if the students notice that they are capable of producing something. The challenge itself is a magnet. Finally, this study demonstrated that PLS method might be more efficient, at least to some extent, than the conventional method. Being administered by a local Malaysian teacher, it became clear that this method can be practiced by the local teachers (teachers just need to be trained for a few hours which can also be done

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via training video films). Thus, the author suggests that applying the techniques of PLS, alone or in conjunction with the already existing conventional techniques and methods be considered by the educational authorities.

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Appendix A: ***Multiple-Choice Opinion Questionnaire (English Version)***

Sex: Male ☐ female ☐

Instruction: Based on your own opinion, please mark the most suitable choice in the following items:

1- Knowing that your five senses (hearing, sight, smell, taste and touch) help you in learning, can be effective in learning English.

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

2- Your imagination can increase your positive feelings.

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

3- It is possible to increase your interest in the class by activating your power of imagination.

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

4- Transferring ideas through pictures can be helpful to motivate you in the language class.

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

5- It is possible to develop your imagination by using pictures.

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a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

6- A single picture can be used in clarifying various thoughts.
a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

7- Imagination can help you learn many English words.
a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

8- Using pictures and imagination can be applied together to strengthen your communication skills.
a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

9- Imagination can help you think better.
a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

10- You can use your imagination in learning all of your other courses.
a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

Appendix B: Open-Ended Opinion Questionnaire
Instruction: Based on your own opinion, please answer the following questions:

1- How can your five senses (hearing, sight, smell, taste, touch) help you in learning English?

2- How can your imagination increase your positive feelings?
3- How can activating your power of imagination increase your interest in the English class?
4- How can transferring ideas or feelings through pictures be helpful to motivate you in the language class?

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5- How is it possible to develop your imagination by using pictures?
6- How can a single picture be used in clarifying various meanings and thoughts?
7- How can imagination help you learn many English words and structures?
8- How can using pictures and imagination be applied to strengthen your communication skills?
9- How can imagination help you think better?
10- How can you use your imagination in learning your other courses?

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