



THE EFFECT OF VISUALIZATION STRATEGY IN READING OBSERVED FROM STUDENTS' COGNITIVE LEARNING STYLES

EFEKTIFITAS STRATEGI VISUALISASI PADA KEMAMPUAN MEMBACA DAN DITINJAU DARI GAYA BELAJAR KOGNITIF SISWA

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Abstract

Empirically visualizing the text being read into pictures, diagrams, or images evidently deepens students' reading comprehension. Given the evidence of its significance, this study aims to figure out the effect of visualizing the text upon the students' reading comprehension observed from their cognitive learning styles namely field dependent (FD) and field independent (FI). Due to its purpose, the experimental study, quasi-experimental research to be specific, was carried out. Fifty four fifth-semester students at Universitas Negeri Malang participated in this study. The findings were shockingly contradictory with the empirical evidence provided in previous studies. It is revealed that visualization strategy was proven to be significantly ineffective in enhancing students' reading comprehension on account for some factors. However, the mean score of FI students in experimental group was slightly above FD students.

Keywords: *Visualization strategy, field dependent, field independent, reading comprehension.*

Abstrak

Menurut teori yang ada memvisualisasikan teks yang sedang dibaca menjadi gambar atau diagram terbukti dapat memperdalam pemahaman membaca siswa. Berdasar pada bukti yang ada, tujuan dari penelitian ini yakni untuk mengetahui dampak dari strategi visualisasi pada teks yang sedang dibaca siswa terhadap pemahaman membaca mereka yang diamati dari gaya belajar kognitif. Gaya belajar kognitif tersebut dibagi menjadi dua yaitu *field dependent (FD)* dan *field independent (FI)*. Berkorelasi dengan tujuannya, penelitian eksperimental, lebih tepatnya penelitian quasi-eksperimental diterapkan dalam penelitian ini. Lima puluh empat mahasiswa semester lima di Universitas Negeri Malang berpartisipasi dalam penelitian ini. Hasil temuan yang didapat ternyata sangat bertentangan dengan bukti empiris yang diberikan dalam penelitian sebelumnya. Terungkap bahwa strategi visualisasi terbukti



tidak efektif secara signifikan dalam meningkatkan pemahaman membaca siswa dikarenakan oleh beberapa faktor, walaupun ditilik dari nilai rata-rata siswa FI dalam kelompok eksperimen sedikit di atas nilai rata-rata siswa FD.

Kata kunci: *Strategi visualisasi*, field dependent, field independent, *pemahaman membaca*.

A. INTRODUCTION

Topics about the effective reading strategy keep coming up in scholars' academic work. This topic has been an interest due to its significance which is to bridge reading comprehension (Anderson, 2000) and the source of input in learning a language (Krashen, 2003). Comprehension, as ultimate goal of reading, can be attained when there is interaction of old knowledge and the new knowledge from the text (1984). The old knowledge, commonly termed as background knowledge or prior knowledge, is the knowledge that the readers already possess before reading the text, while the new information is the information that the readers acquire while reading the text.

The significance of background knowledge in both listening and reading as receptive skills has been agreeably recognized and even confirmed as the best predictor of students' comprehension (Ovilia, 2019; Rahmaniah, 2015). In reading, readers try to bring their background knowledge in making sense of the text using various ways. One of which is creating mental image. Hobbs (2001) mentions that the readers may form mental images in their mind as they read the text in order to construct meaning from the text. Precisely, the images created and flitted in mind are triggered by experience involving five senses and feelings or emotions. This strategy is called visualization.

Visualization is one of the memory strategies in reading which involves specific actions, behaviors, steps or techniques used by the readers to enhance their own learning by utilizing and enhancing their memories (Oxford, 1990). More clearly, Arcavi (2003) defines visualization as *"the ability, process and product of creation, interpretation, and reflection upon pictures, diagrams, in our minds, on paper or with technological tools, with the purpose of depicting and communicating information, thinking about and developing previously unknown ideas and advancing understanding."*

It is apparent that visualization greatly depends upon our prior knowledge particularly from images that we see in our surroundings which are stored in our short and long-term memory and retrieved when it is needed. Gambrell & Jawits (1993) enunciate that when the readers can relate their prior knowledge and create visualization (mental imagery) coming with the illustration available in a text, it will greatly affect their understanding of the material. They further explain that the readers' images while reading a text can bring them to rich detail and it leads them to deep understanding. McNamara (2007) also remarks that visualization (imagery) usefully allows the readers to go beyond a text since doing visualization enables them to draw on ground ideas discussed in the text and their prior knowledge.

Moreover, voluminous studies have been undertaken to explore the outgrowth of students' comprehension using this strategy. Tomlinson (1997) conducted experimental study about the effect of visualization strategy. The results unveiled that doing visualization as students were reading a text enabled them to comprehend the text better. Additionally, Sadoski and Willson (2006) who had conducted a study for six years in a school district discovered that students' reading comprehension could be accommodated by doing visualization. The visualization in reading implemented by the students resulted in their better performance. Ghazanfari (2009) also conducted

study on the role of visualization in EFL learners' reading comprehension and recall of short stories at university level. There are fifty EFL students in English literature major at Sabzevar University of Teacher Education in Iran participated in this study. An image of the events, scenes, characters, or ideas described in the text was the product of visualization. The result showed that the reading comprehension test on the short stories and a recall test which was done two weeks later indicating that the visualizers had better performance than the non-visualizers on both tests.

Above-mentioned studies have proven the effectiveness of visualization, yet few studies provided information on how to effectively generate mental image. According to Pressley, Borkowski, and Johnson (cited by Almasi and Ullerton, 2012: 152), there are two methods of visualization instruction: representational instruction and transformational instruction. Representational instruction is defined as translating a text to an image directly. The content of the text is represented by the image. This instruction does not require additional text preparation and it becomes a plus point of this instruction. It can be done quite easily and in a short period of time. On the other hand, transformational instruction is an instruction which uses keywords, mnemonic method or other indirect links for representing a text. This instruction can assist students in retaining factual information including numbers and names. Nevertheless, it might not help on the students' comprehension of the whole text because the target is only on the keywords. Both of these instructions can use illustration in order to create mental imagery.

Gambrel (1982) conducted a study on visualization by giving instructions. To the experimental group, she gave instruction: "make picture in your head about what you read to help you to understand..." while to the comparison group she gave instruction: "think about what you read to help you remember..." The result showed that experimental group improved significantly in comprehending a text. Meanwhile, Oakhill and Patel (1991) in their study combined both of these imageries. They took three sessions on different days. On the first day, students read stories and portrayed representational imagery of the series of events. They were asked to picture image in their minds and discussed it. The story and image were put aside before the students gave the answer to question based on the story. In the second session, both images were used. Then the students answered questions after the story and pictures were put away. At last, the students were not shown any drawings. The result of study showed a significant effect of using the combination of mental imagery instruction because there were denoting differences between the experimental class and the control class.

Slightly different from above-mentioned studies, Bortolotto (2008) undertook an experiment using more complete instructions to primary school students. It is called 'RIDER reading activity'. The students were instructed to form a visual image which represented the content of text by doing 5 activities (RIDER—Read, Image, Describe, Evaluate and Repeat). These RIDER steps were proven to be beneficial to direct the students on the steps they had to go through as they read the text. Bortolotto found that after the students had been taught in the first session the ones in the experimental group really enjoyed doing this activity.

Similar to Bortolotto's study, the result of study conducted by Marta (2010) proved that RIDER strategy improved the overall comprehensions of underachieving third year students. Experimental group consisting of four students and control group consisting of three students were the participants. Both groups of students experienced noticeable difficulty in reading. The experimental group was taught using explicit instruction on visualization and control group was given conventional instruction. The result unveiled that all students (J,M, A and L) in experimental group

improved their ability to comprehend. Thus, the findings confirmed the affirmative effect of visualization strategy in enhancing students' comprehension.

In regard to learning strategies, it is widely known that there are some affective factors identified having impacts on the success or failure of learning process; one of which is learning style. Among numerous types of learning style categorized by experts, this study merely focuses on cognitive learning style which are classified into field independent (FI) and field dependent (FD). Cognitive style is defined as the way the information is perceived and processed by an individual (Riding and Rayner, 2000). Additionally, "cognitive style reflects an individual's preferred way of actively processing and transforming information, categorizing new knowledge, and integrating it within the memory structure" (Luk, 1998). Cognitive style is considered describing one's customary modes of observing, remembering, reasoning, and transforming information into knowledge. Due this fact, cognitive style is believed to govern the process of comprehending the information which leads to better comprehension.

The characteristics and how FI and FD students learn are very distinctive. Learners who have FI cognitive style are regarded as "analytical, competitive, individualistic, task oriented, internally referent, intrinsically motivated, hypothesis testing, self-structuring, linear, detail oriented, visually perceptive, left-brain, sequential and inductive learners." To process information, FI learners are likely better at analytical activities. They can solve complex problems, recall information, isolate facts and separate the relevant from the irrelevant, perceive an item as discrete from its background, impose structure when it is lacking from content, can generally encode information quickly and accurately, and do well on standardized tests (Bahar and Hansell, 2000).

On the contrary, learners with FD cognitive style are considered "group-oriented, global sensitive to social interactions and criticism, extrinsically motivated, externally referential, not visually perceptive, non-verbal, right-brain, simultaneous and deductive dimensions and passive learners who prefer external information structures (Hall, 2000)." These learners tend to rely on the surrounding perception field. They may find difficulties in restructuring new information and forging link with prior knowledge. When they are asked to recall the information, FD learner may also have difficulty in recalling information from long-term memory (Daniels, 2009). FD learners tend to perceive things globally. Because of these characteristics, field dependent learners "may prefer more direct instruction or definition of the material in situations that involve restructuring abilities." (Kahtz & Kling, 1999)

A lot of researchers have undertaken studies on the effect of cognitive learning style of learners toward students' reading comprehension. Maghsudi (2007) in his study discovered that FI learners scored higher than FD learners in an English achievement test. Furthermore, more recent study on reading comprehension related to cognitive learning style was conducted by Syafitri (2014) who carried out a quasi-experimental study. The purpose of her study was to investigate the effect of flipped classroom on reading comprehension observed from students' cognitive styles. She found out that FI learners had better reading comprehension than FD learners.

Theoretically speaking, there has not been any conclusive evidence saying that FI learners outperformed FD learners in reading comprehension taught using visualization strategy. Yet, looking at the characteristics of FI and FD learners, FI learners are likely receive more benefits if they are taught using visualization strategy as they are able to relate their prior knowledge in comprehending the text. To fill this gap and dig up this issue more comprehensively, this study was needed to carry out.

Thus, this study attempted to explore more about the effect of visualization strategy observed from their cognitive learning style namely field independent (FI) and field dependent (FD).

B. RESEARCH METHOD

Design and Participant

This study attempted to examine the effect of visualization strategy upon reading comprehension seen from students' cognitive learning styles. Due to the aim of the study, experimental research design was deemed suitable for this research, especially quasi-experimental research, since it is not possible to assign students randomly in group. Two kinds of variable involved were independent and dependent variable. Independent variable in this study was reading comprehension. In addition, there were two kinds of independent variables employed; active and attribute. Active independent variable is defined as the variable which is manipulated directly, while an attribute independent variable is the variable that is manipulated indirectly (Ary et al., 2010). The active independent variable was visualization, and the attributive independent variable was students' cognitive style. Further, the students' cognitive learning styles were differentiated into 2, Field Independent (FI) and Field Dependent (FD). Due to the involvement of attributive variable which makes it four factor-level combinations, factorial design that was 2x2 (22).

Fifty four fifth-semester students who were taking extensive reading course at Universitas Negeri Malang participated in this study. Due to the fact that these students have passed the advanced reading course, it was assumed that they were in the stage of 'reading to learn' not in the stage of 'learning to read' and have mastered the knowledge on how to read comprehensively. The students were then divided into two groups, experimental and control group. There were 26 students in experimental group, while control group consisted of 28 students. The selection of these samples was done using cluster random sampling since the groups have naturally existed.

Procedures

The genre of the text chosen was exposition text which they have learnt in previous semesters. The treatments for both experimental and control groups were carried out for five meetings. These groups received same materials, reading texts which have passed the readability test and instructional phases (pre, whilst and post reading). The mere difference was in the strategy implemented in which the experimental group was taught using visualization strategy, while control group was taught conventional strategy (pre, whilst and post reading phases). Finally, after the treatments have been done, the both groups were given post-test.

Instruments

There were two instruments in this study: GEFT test and reading comprehension test. The first instrument, Group Embedded Figures Test (GEFT), was to categorize students' cognitive learning styles (FI and FD). This test requires students to locate simple geometric figures within more complex geometric design within a specified time limit. The estimate of reliability of the GEFT is reported at .82 (Witkins, 1977). The test consists of three sections which have to be completed in twelve minutes. Students were asked to mark simple figures with a pencil or a color pen. The first section consisted of seven items to be answered in two minutes. It was given to make the students understand about the test instruction and also serve as practice purpose.

The second and the third section were the real test. Each section contained nine items that had to be carried out in five minutes for each section. The correct answer was scored 1 point, while the wrong answer had 0 point. The score of GEFT ranges from 0 (the most FD) to 18 (the most FI). Those who score above 12 out 18 are labelled as FI and those with a score of 11 or less than 11 are categorized as FD. In order to help students in answering the questionnaire, GEFT test has been translated into Bahasa Indonesia. The Indonesian translated version was adopted from Fitriani (2015). Fitriani's version has been reviewed by three experts and has been tried-out two times. The results showed that the GEFT test was feasible to be administered, and instruction and questions were understandable and clear. This test was given before the treatments. Moreover, the second test was reading comprehension text that was given after the treatments. The instrument was in a form of multiple choices that consisted of 40 questions. The passages used were expository text. For the readability of texts in the test, the Flesh-Kincaid Reading Ease was used to estimate the readability of the passages. Based the results of this test, all passages were standardized.

C. RESULT AND DISCUSSION

The post test was given to both control and experimental groups in the form of reading comprehension test. Based on the result of the posttest in the control and experimental group, it was shown that the mean scores for the control and experimental groups were 54.91 and 56.25 respectively. The difference of mean score between two groups is presented in following table.

Table 1 Descriptive Statistics of Post test Data in the Control and in the Experimental Groups

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Control	28	45	32.50	77.50	54.91	12.67
Experimental	26	50	32.50	82.50	56.25	13.72

The mean score of experimental group was slightly higher than control group. The result showed that the difference shown from the mean scores of both groups was not big enough, 1.34. Then, Independent Sample t-test was conducted and it showed that the significance value was .411 which was greater than the significance value of .05 (sig .411 > sig .05). This means that reading comprehension of students with different cognitive learning styles in both experimental and control groups had no difference. Thus, the effect of visualization on students' comprehension was not significant.

In addition, based on the analysis on the students' score in GEFT it was revealed that the FI students in the experimental group were 9 while the FD students were 17. FD students outnumbered the FI students in experimental group. Detail explanation of students' score observed from cognitive learning style is presented in the following table.

Table 2. Descriptive Statistics of Data of FI and FD Students in Experimental Group

	Cognitive Style	N	Minimum	Maximum	Mean
Experimental	FI	9	47.5	77.5	59.16
	FD	17	32.5	82.5	54.85

Based on the results presented in table 2, it is shown that the mean score of FI students (59.16) was greater than the mean score of FD students (54.85). Based on these findings, apparently FI students had more benefits than the FD learners taught by using visualization strategy. Yet, this difference, after doing testing analysis using ANOVA test, was proven to be insignificant.

Based on the result of posttest and t-test analysis, it is proven that students taught using visualization strategy was not significantly better than the students taught without visualization strategy. This result, however, is shockingly opposite to previous studies undertaken by others researchers such as Tomlinson (1997), Sadoski and Willson (2006), Ghazanfari (2009), Bortolotto (2008), Marta (2010). Ghazanfari (2009), for example, carried out experimental studies for 3 intense weeks in which there were 3 stories discussed every week. Similar to Ghazanfari, Marta (2010) also chose narrative text in her study. Furthermore, Bortolotto (2010) trained primary students to visualize the story which lasted for 10 sessions. These studies proved that this strategy worked well in narrative text, not in exposition text which is more complicated than narrative. Thus, the results of present study are very contradictory with aforementioned studies.

This result, however, is in line with what Ziegler and John (2004) say “unlike other strategies, visualization is not necessarily easy for older students who may not have been taught to use it in the earlier grades (Zeigler & John, 2004).” Apparently this strategy needs more practice to enable students to picture what is on the text and relate the picture to what they already know. Reference to the amount of practicing they had, 5 meetings seem not enough to practice visualization strategy, unless they have done this before. Obviously, this was the first time they were engaged in this kind of strategy.

Besides, the fact that FD students outnumbered the FI students in experimental group, to some extent, affected the result of this study since the FD students hardly recall their prior knowledge without giving the trigger (Daniels, 2009) as they prefer explicit instruction (Kahtz& Kling, 1999). Looking at their characteristics, FD students need stronger trigger to retrieve and visualize the memory that they have concerning the topic discussed. Referred to this finding, it is implicitly shown that the trigger given in this study was not beefy enough to build mental image on their mind. Yet, if we compare the results of FI and FD students, FI students evidently outperformed FD students. This is in line with the findings in Magsudi’s (2007) and Syafitri’s (2014) studies which showed that FI students did better than FD students in comprehending reading materials. Yet, the difference result of FI and FD students was not big enough to proclaim it significant.

D. CONCLUSION

Visualization is strategy in which the readers visualize what they read into a lively pictures, diagrams and images. The visualization process is, to some degree, deeply interrelated to the background knowledge of the readers; especially the pictures and images they see and observe in their surroundings. Theoretically and empirically speaking, this strategy is effective to enhance the students’ reading comprehension. Thus, this visualization strategy was implemented in this study which then observed from their cognitive learning style; field independent (FI) and field dependent (FD). However, the results of this study showed that visualization strategy was proven to be ineffective to improve students’ reading comprehension. This insignificant effect is very likely on account for some factors. Firstly, the duration of the implementation is

quite short compared to previous studies. Secondly, it is related to the result of students' cognitive learning style in which FD students outnumbered FI students in experimental group. The characteristics of FD which have difficulty in recalling the background knowledge are believed, insofar as, to be factor affecting the implementation process. The last, interrelated to the background knowledge of the readers was different from each other.

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