

Any Correlation between Visual-Spatial Intelligence and English Learning Achievement?

Agrissto Bintang Aji Pradana¹, Athia Fidian²
 agrisstobintang@ummgl.ac.id¹, athiafidian@ummgl.ac.id²

Universitas Muhammadiyah Magelang^{1,2}

Abstract. Media can assist teaching and learning process. There is a number of various alternative media which could be possibly used by teachers in the classroom activities. Using media in teaching will give positive atmosphere and facilitate the students in understanding the material. Most of teachers prefer using visual media rather than other types of the aids. It also occurs in EFL classrooms. They suggest it is the simplest and most affordable aids. This present study was aimed at investigating the relationship between students' visual-spatial intelligence and English learning achievement. 26 students of the State Elementary School 1 of Secang, Magelang were assigned as the participants. Data were students' visual-spatial intelligence profile obtained through questionnaire which consisted of 25 items of Telee MI inventory test and achievement scores were gathered from their summative scores. Simple linier regression analysis was employed to analyze the data. The value of $R = 0.562$ and the coefficient of determination (Rsquare) counted to 0.426 while the coefficient results showed a significance value of $0.000 < 0.05$. The results revealed that visual-spatial intelligence of the participants had significant positive relationship with the English learning achievement. It means that the use of visual media in the classroom activities contributes to the students' comprehension on the provided materials. Regarding that, the English teachers may proceed to use visual media in their teaching.

Keywords: achievement, English, visual-spatial intelligence

1 Introduction

Multiple Intelligence is an important issue in educational settings in the last decade. A number of educational institutions from various levels has been trying to give considerable attention to students' intellectual capabilities in their learning process. It becomes an important factor to gain better learning achievement. Each person owns their intelligences and the amount was different in various students [1]. Regarding with that, some research studies have been conducted to explore the roles of individual's intelligence and its implications in teaching and learning [2]–[6].

Theory of Multiple Intelligence proposed by Gardner [1] views that everyone has an ability to overcome their problem and to give benefits to others in one or more cultural settings. It gives a great contribution toward the educational implication which views the students' learning from the existence of their own styles [7] and teachers should be aware of these [8]. It deals with practical problems and its productions for society demands. It activates

multiple ways of mean-making though the use of strategies related to those various intelligences [9]. Measuring intelligence by IQ was unconsciously limited, actually there are many ways to be intelligent [1].

Howard Gardner's theory also contributes to language teaching and learning. Furthermore, it also could be a predictor of students' performance. Particularly in English, some studies attempt to investigate the relationship between students' MI profile and English learning achievement. A study conducted in 2012 [10] investigated the correlation between MIs and grammatical and writing accuracy of foreign language learners. Results revealed that both intrapersonal and interpersonal were correlated to the variables. Hence, they were confirmed as the predictors grammar accuracy while intrapersonal intelligence statistically contributed to writing accuracy.

Another study in 2013 [11] examined the correlation between students' MI profile and writing achievement. Results showed that only linguistic intelligence had significant positive relationship with writing achievement of Iranian high school students. It was confirmed that this type of intelligence could be the best predictor of learners' writing achievements.

In line with the previous study, [12] tried to explore any possible correlation between intermediate students' MIs and reasoning-gap type of writing task. Based on statistical calculation, there was a significant and positive relationship between students' performance on writing task and logical-mathematical, intrapersonal and interpersonal intelligences.

A study conducted by [13] explored the use of Multiple Intelligence – based teaching and compared it to traditional method in writing development. It was conducted in elementary school level. It found that MI-based teaching gave more positive effects on the learning activities than the traditional one.

A study regarding MI and English proficiency was also conducted in 2015 [14]. It investigated the relationship between MI elements and grammar tests. It employed a Nelson English language test, Michigan grammar test, and Telee Inventory for MI. The results revealed that linguistic intelligence was the best predictor of grammatical accuracy.

In an attempt to examine the relationship between students' MI and academic performance, [15] investigated their achievement and MI profile. The profile was measured using Douglas and Ham's questionnaire. Findings revealed that logical-mathematical, visual-spatial, intrapersonal, bodily-kinesthetic, verbal-linguistic, interpersonal, and naturalistic intelligences had a significant and positive relationship with students' academic performance. The study stated that visual-spatial, verbal-linguistic, and interpersonal intelligences could predict the academic performance achievement. While, musical intelligence was confirmed as a negative predictor for academic performance.

In contrast, [16] tried to find the relationship between EFL learners' MI and writing ability. Writing samples were gathered through an IELTS writing task. The statistical analysis revealed that MI components did not have a significant relationship with writing ability.

These studies implied that Multiple Intelligence and English language proficiency have relationship though there is a small amount of researches which revealed in contrast. Therefore, students' MI profile can be assumed as predictor of English learning achievement.

There is a question whether students who perceive strong visual-spatial intelligence can achieve greater English performance than others with lower one. Visual – spatial is described as ability to possess visual – spatial words. Those who perceive this intelligence are sensitive to colour, form, shape, line, and their relationship [6]. Large numbers of English teachers included in Indonesia use visual aids to deliver their materials. It could be assumed that these aids are easier and affordable to be applied in their teaching. These kind of media are closely related to visual-spatial intelligence. They could be in the form of pictures, flashcards, maps,

storybooks, comics, etc. Those who perceive this intelligence will have sensitivity to color, line, shape, space, form, and the existences [6]. They are also easy to recognize and use the patterns of wide space [3] so visual aids or media in teaching will be really helpful for those who perceive this type of intelligence. When visual media are used in long period, it could strengthen students' visual-spatial intelligence. It is also confirmed that environmental factors for instance where the individual lives, the culture they acquire, and the communities they interact play a great role in bounding individual's intelligence [1].

However [17] tried to investigate the relationship between grammar, listening, and writing performance of students of Erciyes University's School of Foreign Languages. It revealed that grammar test score has negative but significant relationship to spatial, bodily - kinesthetic, and intrapersonal intelligences. [18] found that visual type was not the most factors in predicting the learning strategies. It investigated male and female's MI types and its correlation with their vocabulary learning strategies (VLS). [19]-[20] found it different. Results revealed that male's interpersonal and linguistic types became predictors of their VLS. While females' bodily and naturalist type significantly predicted the VLS use. Another research was conducted by Poursaberi & Mohammadi [19]. they examined the relationship between MI types and students' academic performance. Existential, intrapersonal, interpersonal, and verbal intelligence were the most possessed by the students. Furthermore, verbal intelligence was most associated to the academic performance than others. [20] found that students with logical mathematical intelligence had better results of English performance.

This study attempt to investigate relationship between visual-spatial intelligence profile and English learning achievement. The results give brief explanation of how this type of intelligence becomes a possible predictor of students' English learning achievement. They could highlight the necessity of taking students' intelligence into consideration in English language teaching. With regard to Multiple Intelligences and English learning achievement, the following research question was addressed:

How is the relationship between students' visual-spatial intelligence and their achievement? In response to this question, the hypothesis was formulated as follow:
Ho: there is no positive significant relationship between students' visual-spatial intelligence and their achievement.

2 Method

This study was conducted with students of the State Elementary School 1 of Secang, Magelang Regency, Indonesia as the population. The fifth grade was assigned as the sample. It consisted of 26 students chosen with purposive sampling technique.

In the present study, there were two kinds of data, 1) students' visual-spatial intelligence profile; and 2) English learning achievement. The visual-spatial intelligence profile was obtained through questionnaire while the English leaning achievement was gathered through documentation technique.

The present study employed two instruments. Firstly, a form of English achievement was used to gather students' English learning achievement. Here, the achievement was collected from the English summative scores from the present semester. The second one was a Likert type Visual Spatial Intelligence questionnaire adapted from Inventory Test proposed by Gardner [3]. It contained 30 related questions providing 4 considerable options for each. However, it was reduced into 25 questions after validation. The students were ordered to

choose statements ranging from 1 to 4. These options represented the level of agreement of the students. They were explained as follow:

- 1 indicates respondent mostly disagree
- 2 indicates respondent slightly disagree
- 3 indicates respondent slightly agree
- 4 indicates respondent mostly agree

The objective of the questionnaire was to investigate the students' visual-spatial Intelligence profile. The statements of the administered questionnaire were clearly rephrased into Indonesian instead of using English in order the students understand what they were actually mean.

The questionnaire was validated with Product Moment Pearson Correlation. It was calculated using SPSS. The item was valid if $r_{xy} > r$ table Product Moment. Since the total of respondents was 26 students, r table of Product Moment is 0.329. Based on the count value, 5 statements were confirmed to be invalid. In other word, 25 statements of the questionnaire were valid to be administered as the instrument.

Then the reliability of the questionnaire was tested using Cronbach's Alpha with SPSS. The table reliability coefficient was 0.60. The questionnaire was assumed to be reliable if the alpha coefficient was higher than it. The alpha coefficient showed 0.742 so the questionnaire was statistically confirmed to be reliable. The statistical result of Cronbach's Alpha Test was presented as follow:

Table 1. Cronbach's alpha test

Reliability Statistics	
Cronbach's Alpha	N of Items
.742	25

As the requirements, data should be analyzed using normality and linearity tests. Kolmogorov-Smirnov test was employed to ensure that data were distributed normally while linearity test was used to ensure that variables (X and Y) were related each other. The value of Asymp. Sig was $0.200 > 0.05$ so the data of visual-spatial intelligence profile were normal. The data of English learning achievement perceived a value Asymp.Sig. of $0.200 > 0.05$ so they were also confirmed to be normal. Then linearity test showed Sig. Deviation from linearity of $0.079 > 0.05$. It indicated that visual-spatial intelligence and English learning achievement are linearly dependent. Based on normality and linearity tests, the data fulfilled the requirement of regression test. Then simple linear regression analysis was employed to examine the relationship between the variables. When the Sig. value < 0.05 , H_a was accepted. It stated that there was significant effect between visual-spatial intelligence and English learning achievement.

3 Results and Discussion

The research question was proposed to investigate whether or not there was a significant relationship between visual-spatial intelligence and students' English learning achievement. After being analyzed using simple linear regression, the results are as follows:

Table 2. Results of model summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562 ^a	.426	.007	6.407

a. Predictors: (Constant), visual-spatial intelligence

The results illustrated in **Table 2** showed that the value of $R = 0.562$ and the coefficient of determination (Rsquare) counted to 0.426. It suggested that the English learning achievement was affected by 42.6% by the visual-spatial intelligence. While the rest was influenced by other causes.

Table 3. Coefficients results

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	102.965	23.620		4.359	.000
	Visual-spatial intelligence	.252	.285	.162	.885	.000

a. Dependent Variable: English learning achievement

The results illustrated in **Table 3** revealed a significance value of $0.000 < 0.05$. This showed H_0 was rejected and could be said that the visual-spatial intelligence significantly affected on students' English learning achievement.

With regard to the relationship between visual-spatial intelligence and English learning achievement, findings in the present study confirmed the results of the study conducted by Ahvan & Pour [15]. It revealed that visual-spatial was one of the intelligence which had significant and positive relationship with the achievement. Though this intelligence was not the greatest predictor of the achievement. Meanwhile the present study was not confirmed by Naseri & Ansari [11] in their study results which revealed that only linguistic intelligence gave a great contribution toward the achievement. The results indicated that it had significant positive relationship and was a predictor of students' achievement. A study conducted by Sadeghi & Farzizadeh [16] also reported in contrast with the present study. It revealed that the intelligence had no relationship with students' English performance.

Considering the results of the statistical analysis, students' visual-spatial intelligence contributed 42.6% toward their English learning achievement. Null hypothesis was rejected or there was significant positive relationship between those variables. In other words, increasing this intelligence could improve the achievement. Gardner [3] stated that students with visual-spatial intelligence would recognize shape, patterns, and other visual aids. Teachers could promote it by considering these characteristics in delivering the materials. As surroundings were also factors of improving the type intelligences [1], the use of visual media probably improved their visual-spatial intelligence. Thus, as the predictor of students' English learning achievement, strong level of this intelligence could bring the achievement up as well. However, there were some other factors that influenced the achievement. They might come from the family and educational background, interests, and classroom atmosphere.

4 Conclusion

Everyone possesses their own personal traits including their intelligences. Multiple Intelligence Theory viewed that students should be threat by the existence of their own styles. It gives better implication in optimizing their potentials. Based on the results, students' visual-spatial intelligence was a predictor and had a significant positive relationship with English learning achievement. It could be assumed that English teachers may apply strategies based on visual – spatial styles. However, the present study only examined visual-spatial intelligence correlated to English achievement. There might be more possible areas which still remained to be explored in the future studies.

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