

## **THE CORRELATION BETWEEN THE INTELLIGENCE LEVEL AND THE ABILITY TO COMPREHEND VISUAL MATERIALS**

*(Hubungan Antara Tingkat Intelegensi dan Kemampuan Memahami Materi Visual)*

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### ***Abstract***

*Penelitian ini merupakan penelitian korelasional. Populasi dalam penelitian ini terdiri dari siswa kelas satu Jurusan Keperawatan di SMK Darussalam Makassar. Sampel terdiri dari dua kelas jurusan Keperawatan. Penelitian ini menggunakan dua jenis instrumen untuk mengumpulkan data. Data kecerdasan siswa dan pemahaman materi visual mereka dianalisis dalam persentase dengan menggunakan statistik deskriptif korelasi product moment dan SPSS ver 15.0 for windows untuk mengetahui apakah ada atau tidak hubungan antara Tingkat Kecerdasan dan Kemampuan untuk Memahami Materi Visual SMK Darussalam Makassar. Hasil penelitian menunjukkan bahwa ada hubungan yang signifikan antara Tingkat Kecerdasan dan Kemampuan untuk Memahami Materi Visual siswa SMK Darussalam Makassar dikategorikan positif serta pemahaman mereka diklasifikasikan baik. Namun, data menunjukkan bahwa korelasi antara Tingkat Kecerdasan dan Kemampuan untuk Memahami materi Visual ada meskipun posisi moderat. Hal ini terbukti dari hasil analisis korelasi menunjukkan bahwa skor tes-r lebih besar dari nilai tabel-r. Oleh karena itu dapat diartikan bahwa hipotesis penelitian diterima.*

***Kata Kunci:*** Hubungan, tingkat intelegensi, memahami, materi visual

### **Abstract**

This research was correlational research. The population consisted of the First Year of Nursing Department at SMK Darussalam Makassar with two classes of Nursing Department as sample. This research employed two kinds of instruments for collecting data. Data on students' intelligence and their visual material comprehension were analyzed in percentage by using descriptive statistics persons' product moment correlation and SPSS ver 15.0 for windows to find out whether or not there was correlation between the intelligence level and the ability to comprehend visual materials of SMK Darussalam Makassar. The result of the research showed that there was a significant correlation between the intelligence level and the ability to comprehend visual materials of SMK Darussalam Makassar, as the students categorized into positive category, students comprehension classified into good classification. However, the data shows that the correlation between the intelligence level and the ability to comprehend visual materials exists. It was proved by the result of correlation analysis showing that score of r test was greater than r table value. Therefore it can be interpreted that the research hypothesis is accepted.

**Keywords:** correlation, intelligence level, comprehend, visual material

## A. INTRODUCTION

Different people have different way on their thinking. So, intelligence is determined students can success in learning process. Based on this statement, the writer tries to look for whether intelligence level correlates the comprehending ability to visual materials of the first year of Nursing Department at SMK Darussalam Makassar. Intelligence is defined as general cognitive problem-solving skills. A mental ability involved in reasoning, perceiving relationships and analogies, calculating, learning quickly... etc. "Intelligence is what you do when you don't know what to do." "Intelligence is a hypothetical idea which we have defined as being reflected by certain types of behavior." **Visual** may refer to works with a visual component, the production or use of such works, or the equipment involved in presenting such works. **Visual learning** is a teaching and learning style in which ideas, concepts, data and other information are associated with images and techniques.

Some of the teachers in Indonesia often use visual media to make the teaching process easier besides as means to test students' comprehension. But, most of the students still get the difficulties in understanding them. We have known that besides the external factors of the students, there is one possibility of

some internal factors, which causes the problem above where the teachers give material that is not suitable for their students' intelligence. But the next question, how much the effect of students' intelligence is in comprehending their teachers' materials.

Based on the researcher's observations, she finds also that this situation was found in SMK Darussalam Makassar, where most of the students were not able to comprehend the visual materials when their teachers gave it as materials in their teaching process. This research aimed at describing (1). How is the intelligence level of the First Year students of Nursing Department at SMK Darussalam Makassar. (2). How is the comprehension ability to the visual materials of the First Year Students of Nursing Department at SMK Darussalam Makassar. (3). to what extent intelligence level correlate the comprehending ability to the visual materials of the first year of Nursing Department at SMK Darussalam Makassar.

## B. The concept of intelligence

The concept of "intelligence" seems to be a broad field which has occupied many researchers for years without their reaching definite conclusions. On the other hand it is a concept with we are confronted on a

daily basis and which we operational in a relatively concrete manner. A teacher, for example, might talk about a very intelligent or a less talented student.

According to Luger the field of Cognitive Science is dedicated to finding the common set of principles underlying all instances of intelligence. Cognitive Science thus is an interdisciplinary field, including disciplines like Psychology, Neurobiology, Philosophy, Linguistics, Artificial Intelligence, Computer Science, and Education.

In our daily life, we often find the person who does something very past in a short time while it is difficult to do by another people. There is a question appeared, what factor causes it.

One of the factors causing the situation above is the intelligence level of the person. This intelligence factor is very important and having big influence to other psychological aspects, such as thinking, motivation, interest, memory, observation, aptitude and learning process. However, some experts have been still debating about the influence of intelligence level of one to the learning process. Although they prefer to agree that there are many other factors influencing dominantly, the people still consider that the intelligence is the most important thing

in making the learning process successful or not. It is generally accepted that intelligence is inherited but can also be related to the environment. While studies showed that heredity is an important factor in determining intelligence; it was also suggested that environment is a critical factor in determining the extent of its expression.

### **1. Intelligence and education**

In the introduction, it was asked how it is possible to learn and pass knowledge on to others. In the book “The Teaching of Thinking”, Nickerson et al. (1985) describe intelligence from a pedagogical point of view as a multi-faceted concept which manifests itself in many ways. People considered intelligent are likely to give evidence of possessing a variety of intellectual skills. The authors try to describe these intellectual skills in an intuitive, additive way by listing up abilities which represent some of the functions of what an intelligent organism or artifact is able to perform. Six features are in their view definitely connected to the label ‘intelligent’:

- a. The ability to classify patterns
- b. The ability to modify behavior adaptively through learning

- c. The ability to reason deductively
- d. The ability to reason inductively
- e. The ability to develop and use conceptual skills
- f. The ability to understand

Generally, the fact that they talk about intellectual as well as cognitive skills indicates that they do not have a genetic understanding of intelligence. Rather, the relation between cognitive skills and knowledge becomes important. It indicates that there are tools for reasoning which can be maximized through learning and training. Intelligence, therefore, is seen as a potential subject to development.

## 2. Intelligence and Psychology

Sternberg (1985:5-30) regards the concept of intelligence to be a most elusive one similar to Nickerson et al. He also regards intelligence to be a dynamic concept. This concept in his opinion though can be described using information-processing theory of the nature of human intelligence and has to be viewed in terms of mental processes which contribute to 'cognitive task performance'. Relevant therefore is not the question about how well somebody performed but which factors and

mental processes contribute to successful performance.

Sternberg developed a triarchic model of intelligence according to which three different aspects of human information processing should be examined in relation to:

- a. The structures and processes that is inherent to intelligent behavior, addressing the mechanism of intelligent functioning.
- b. The application of these structures to the problem of reaching certain aims in the external world.
- c. The role of experience in forming intelligence and its application.

The behavior underlying the structures and processes are again divided into three categories:

- a. The meta components, deciding on the nature of a problem and selection of a strategy to solve it, which represents high-level management of problem-solving.
- b. Performance components, which are processes used to actually execute a problem-solving strategy.
- c. Knowledge acquisition components, which are processes used to acquire new information.

According to Sternberg, the factor-analytic approach has so far only looked at the first aspect of the triarchic model in trying to find criteria for intelligence and looking at the presence or absence of these criteria in a person in order to measure the level of intelligence. He criticizes their result-oriented focus on accuracy rather than process as it does not provide an insight into the potential of intelligence. Hence, it needs supplementation.

### **3. Intelligence and Verbal Ability**

In Sternberg's opinion the abilities forming intelligence should be looked at in regard to their functioning, e.g. the verbal, reading, second-language, mathematical, problem-solving ability etc. One of Sternberg's scholars, Hunt (1985:31), describes in his essay the verbal processes that contribute to cognitive task performance. Verbal ability is looked upon by most people as a given fact: "... for verbal intelligence, though, there is objective evidence that this ability exists." (Hunt (1985:32)),-

He concludes that comprehension is a complex process, composed of many sub processes, which range from automatic, involuntary acts of

lexical identification to planned strategies for text comprehension. The individual differences in all these sub-processes combine to produce individual verbal intelligence. As valid as this observation is – it includes, for example, knowledge, application strategies, and mental processes –, in my view, the method Hunt chooses is not that different from that of a factor-oriented approach.

### **4. Intelligence and Artificial Intelligence**

A particularly mathematical approach to Cognitive Science and intelligence is taken by Goertzel (1993:2). The aim of cognitive science, according to Goertzel, is the analysis of mental processes in terms of simple procedures as they are easily programmable. In his view, psychology and philosophy have not yet found a valid answer to the question of what intelligence is and how the mind is structured.

In agreement with Sternberg and Nickerson et al. he claims that the theories on intelligence are not theories of the same thing but represent different aspects of it. Yet the key to understanding the mind – so Goertzel says – cannot be found in contemporary psychology but in a

new field called “complex systems science” which is based on the idea that “complex systems are systems which – like immune systems, ecosystems, societies, bodies and minds – have the capacity to organize themselves.” (Goertzel (1993:3)

## **5. Intelligence and neurobiology**

An interesting contribution to the discussion is made by Roth (1996) in his book “Das Gehirn und seine Wirklichkeit” (The Brain and it’s reality). In contrast to the other theories presented, the author approaches the area of cognitive science by avoiding the qualifying term ‘intelligence’ and its definition and by relying on the concepts of ‘mind’ and ‘cognition’.

Intelligence for him is only a subjective criterion evaluating the behavior of others. In contrast to that cognition represents the phenomena of powers of cognition, like perception, thinking, understanding and judging, factors which are all connected to the orientation of an organism in its environment as the basis of adaptive behavior. He claims that ‘the mind’ does not exist.

Instead a multitude of different mental and psychological conditions exist. The experiencing ego, the self-conscious mind is a

multi-faceted construct, not a solitary phenomenon. Therefore, it cannot be ‘defined’.

This approach values only humans as well as artifacts as intelligent excluding animals. This restriction of the concept to human interest is not at all justified. The brain function and neurobiological design of human beings per se do not differ from those of other creatures, the uniqueness in the productive capacity of humans being rather a combinatory effect of biological features and language.

### **C. The Measurement of intelligence**

To measure the intelligence of somebody can be done by giving a test namely The Intelligence Test. Based on the test, we could know the intelligence’s level of somebody. Because the intelligence has a relevant relation to the learning achievement, especially in comprehending audio-visual materials, so the test can be used to forecast the success and the failure of one in learning.

Intelligence is a multifaceted construct that, for the purposes of this review, is operationalized as the standard IQ tests (eg, Wechsler Scales) used by schools and psychologists to measure cognitive functioning in a formal environment. Intelligence scores predict the ease with which people

learn in formal situations, but do not necessarily predict success in life or occupations. Measures of intelligence can be affected by fluency of language, access to educational stimulation, educational resources, motivation, and emotional functioning. Variability in terms of subtest or factor score performance may be a sign of a learning disability, but a simple discrepancy between verbal and nonverbal abilities is not sufficient to diagnose a learning disability.

The *Simon-Binet Scale*, originally designed for identification of children requiring special instructional attention, was transformed into an integral, far-reaching component of the American educational structure. Through Goddard's and Terman's efforts the notion that intelligence tests were accurate, scientific, and valuable tools for bringing efficiency to the schools resulted in assigning the IQ score an almost exalted position as a primary, definitive, and permanent representation of the quality of an individual. Hence, intelligence testing became entrenched in the schools

Alfred Binet explicitly defined intelligence as "the components of intelligence are reasoning, judgment, memory, and the power of abstraction." He measured intelligence as "general mental ability of individuals in intelligent behaviours." He described

intelligence testing as classifying, not measuring.

The Binet - Simon Test is one of them. This kind of test is the first test published in 1905, which was used to make different between the normal children and the idiot ones at the time. In 1908, Binet and Simon rearranged the test and divided it into groups according to the testee's age.

According to Binet – Simon Test in Wayan and Sumartana (1986: 181), the level of intelligence of the children could be classified into:

1. Superior Class is the psychics' age reached is more two years than chronological age. Psychic's age means the ability of the children to answer all tests, while the chronological one is their real age.
2. Normal Class is the physics age reached is the same or more one year than the chronological order.
3. Inferior Class is the physics age is fewer two years than the chronological age.

To make the measuring of the intelligence level becomes easier the experts make the pattern:

$$IQ = MA / CA \times 100$$

To the next year, the Binet – Simon Test became the model in making revision to the next tests, like being done by L. M Terman that making the test suitable with the condition of the

society in Netherlands. It was done because the intelligence of ones is also affected by their social lives and home environment. It means that the test applied in Netherlands is different from the test in Indonesia.

Actually, to measure the intelligence level of students in Indonesia, especially South Sulawesi it's difficult for the writer. So, the writer will correlate or will be helped by PPB UNM (Psikologi Pendidikan and Bimbingan Universitas Negeri Makassar) by using SPM (Standard Progressive Matrices) to analyze the test and to get the real data of the intelligence for students of first year of Nursing Department at SMK Darussalam Makassar.

#### **D. The Concept of the visual material**

The Visual materials cover the whole range of non-verbal and non-auditory materials. They encompass a wide range of forms: photographs, cinema and video films, videotapes, paintings, drawings, prints, designs, three dimensional arts. Visual material helps students:

1. Clarify thoughts, students see how ideas are connected and realize how information can be grouped and organized. With

visual learning, new concepts are more thoroughly and easily understood when they are linked to prior knowledge.

2. Organize and analyze information, students can use diagrams and plots to display large amounts of information in ways that are easy to understand and help reveal relationships and patterns.
3. Integrate new knowledge, according to research, students better remember information when it's represented and learned both visually and verbally.
4. Think critically, linked verbal and visual information helps students make connections, understand relationships and recall related details.

They may or may not be representational, and some may include writing or printing from English Grammar Book: picture for writing book 1 (one). However, only prints are used to examine the students' ability in comprehending visual materials. Prints are art works reproduced in multiple copies: this includes book illustration (pictures, vocabulary and order for sentence).

#### **E. The Concept of comprehending the visual material**

Comprehending visual material is one process giving meaning by continuing the interaction between the



reader and the material and the activity to give a response to the materials. The good reader has to have ability to recognize the reading automatically, especially when reading materials in different language. We have recognized one of famous proverbs that “A picture is worth a thousand words”. So, it needs the high ability to comprehend the picture as visual materials and making a response of it.

Visual learners also prosper when shown graphs, graphic organizers, such as webs, concept maps and idea maps, plots, and illustrations such as stack plots and Venn plots, are some of the techniques used in visual learning to enhance thinking and learning skills. Visual learners usually possess these qualities:

1. Have great instinctive direction
2. Can easily visualize objects and the past

By representing information spatially and with images, students are able to focus on meaning, reorganize and group similar ideas easily, make better use of their visual memory. In a study entitled *Graphic Organizers: A Review of Scientifically Based Research*, The Institute for the Advancement of Research in Education at AEL evaluated students and concluded that visual learning

improves student performance in the following areas:

1. *Critical Thinking*--Graphic organizers link verbal and visual information to help students make connections, understand relationships and recall related details.
2. *Retention*--According to research, students better remember information when it's represented and learned both visually and verbally.
3. *Comprehension*--Students better comprehend new ideas when they are connected to prior knowledge.
4. *Organization*--Students can use diagrams to display large amounts of information in ways that are easy to understand and help reveal relationships and patterns.

Visualizing data - When working with data, students build data literacy as they collect and explore information in a dynamic inquiry process, using tables and plots to visually investigate, manipulate and analyze data. Visual may refer to works with a visual component, the production or use of such works, or the equipment involved in presenting such works.

#### **F. The Measurement of comprehension to the visual materials**

The comprehension as a result of learning is more complex to be tested

than knowledge. This activity involves the activity of explaining something read using the students' sentences themselves and giving another example from the previous given example.

The comprehension ability can be classified into three categories:

1. The translating comprehension that is translating material of one foreign language to our native language.
2. Understanding comprehension that connecting the parts explained before with the next or connecting the graph with the events given.
3. Extrapolating comprehension that someone is able to predict and broader the perception of something (Sudjana, 1995: 24).

To measure the comprehension of the students, the tester will apply the test of expressing theme or topic that is same to the example given before. Relating to the comprehension of visual materials, the test had been arranged in types of reading picture for visual materials. To know about whether the students understood the material or not, they were asked to answer the given question by writing and reading picture the correct answer in the answer paper.

## **G. METHOD**

In this research, the writer used the descriptive method by correlation analysis. Correlational research involves collecting data to determine whether and to what degree, a relationship exists between two or more quantifiable variables. The degree of relationship is expressed as a correlation coefficient. If a relationship exists between two variables, it means the scores within a certain range on one variable are associated with scores within a certain range on the other variable. Correlational research typically investigates a number of variables believed to be related to a major, complex variable, such as achievement. correlational research provides a numerical estimate of how related two variables are clearly the higher the correlation. The closer the relationship between the two variables. This research using inferential statistics namely simple correlation test in describing to what extent the intelligence level of the students correlated the comprehending ability to the visual materials and to what extent the comprehending ability of the students is affected by the intelligence levels of them.

The population of this research was taken from the first year students of Nursing Department at SMK Darussalam Makassar that lies on Jl. Perintis Kemerdekaan kilometer 10,

Sudiang, Makassar where SMK Darussalam has many Departments, but the writer focuses one of department namely Nursing Department. Nursing Department has two classes which both are divided into two classes namely class 1 KPR 1 and 1 KPR 2. Each class has 30 students, so the number of the population consists of 60 students and all of them will be taken as the research sample.

The process of taking sample above is called Purposive sampling where only one department will be taken as the sample of this research, namely class 1 KPR 1 and 1 KPR 2. It is caused by the students from other department get on the job training in other sectors or industries for one semester or six months. They are busy for training in other sectors or industries. So, the total number of samples will be 60 students.

The writer used instrument to collect data in this research is test. The test is divided into two kinds; The Intelligence Test is SPM (Standard Progressive Matrices) from PPB UNM and the Reading picture from English Grammar Book: picture for writing book 1 (one) for visual materials comprehension test.

The Intelligence Test gave is based on SPM (Standard Progressive Matrices) from PPB UNM and Reading

picture Comprehension Test from English Grammar Book: picture for writing book 1 (one) is applied by giving visual materials in order to be comprehended by the students. The comprehension Test includes test of comprehension to reading picture for visual materials.

The procedure of collecting data from descriptive method is arranged as follows: there are two classes from the First Year Students of Nursing Department at SMK Darussalam Makassar (X KPR 1 and X KPR 2) which the writer chooses as the sample. The samples are 60 students. The writer chooses to collect the data on Saturday, 21 march 2009 for Intelligence test (SPM test) by PPB FIP UNM during 30 minutes. And Monday, 23 march 2009 for Visual material comprehension test during 40 minutes.

The Classification of the Intelligence Level, the writer was helped by PPB UNM to analyze the test by using SPM (Standard Progressive Matrices) and to get the real data of the intelligence for students of first year of Nursing Department at SMK Darussalam Makassar.

Table 1. The score of the intelligence level test were classified:

Total Score	Raw	The Intelligence Classification
<24		Below Normal
25 – 36		Normal

37 – 48	Average
49 – 60	High Average
>61	Superior

Source: PBB FIP UNM

In the next test, the students will be given the task of comprehending reading picture. The score of the visual material comprehension test were classified into:

Very good	81 - 100
Good	61 - 80
Average	41 - 60
Poor	21 - 40
Very poor	1 – 20

Furthermore, the writer will use correlation analysis in order to get the correlate of the result of the first variable which used to predict the result of the second one. Generally, the pattern of correlation can be written into:

Formulation =

$$r_{xy} = \frac{\sum XY - N.M_x.M_y}{\sqrt{(\sum X^2 - N.M_x^2)(\sum Y^2 - N.M_y^2)}}$$

- $r_{xy}$  = Correlation between X and Y
- N = Number of cases
- $M_x$  = Mean of X variable score
- $M_y$  = Mean of Y variable score
- $M_x^2$  = quadrate mean of X variable score
- $M_y^2$  = quadrate mean of Y variable score
- $\sum XY$  = amount of item score X and Y

$(\sum X^2)$  = amount of item score X is squared

$(\sum Y^2)$  = amount of item score Y is squared

(Sudjiono (1987: 211))

To interpret the result of the correlation analysis of Pearson product moment correlation coefficient described as following table:

Table 2. Pearson Standard Correlation

No.	Standard	Interpretation
1.	0,000 – 0,200	Very Low
2.	0,200 – 0,400	Low
3.	0,400 – 0,600	Moderate
4.	0,600 -0,800	Substantial
5.	0,800 -1,000	High

Correlation of coefficient is merely a measure of relationship and may or may not show that one variable is the cause of other (Gay et al, 2006; 189). If the  $r_{xy}$  lies between 0,000 – 0,200, it means that the correlation between the intelligence level and the visual material comprehension is very low. If the  $r_{xy}$  lies between 0,200 – 0,400, it means that the correlation between the intelligence level and the visual material comprehension is low. If the  $r_{xy}$  lies between 0,400 – 0,600, it means that the correlation between the intelligence level and the visual material comprehension is moderate. If the  $r_{xy}$  lies between 0,400 – 0,800, it means that the correlation between the intelligence level and the visual

material comprehension is Substantial. If the  $r_{xy}$  lies between 0,800 – 1,000, it means that the correlation between the intelligence level and the visual material comprehension is high. On the other hand, if the  $r_{xy}$  lies between 0,400 – 1,000,  $H_1$  is accepted. It means that there is significant the correlation between the intelligence level and the visual material comprehension. If the  $r_{xy}$  lies between 0,000 – 0,400,  $H_1$  is rejected,  $H_0$  is accepted. It means that there is no significant the correlation between the intelligence level and the visual material comprehension. Based on the previous hypothesis, the data was processed through SPSS 15.0 for version of windows.

### H. Result of the research

In these findings are two kinds of analysis presented namely: (1). the result of data analysis by using descriptive statistic and presenting the characterization of score distribution. (2). the result of data analysis by using SPSS 15.0 for windows (SPSS in.2007) in terms of test criteria analysis and test hypothesis.

#### (1) Description of students' intelligence level

To know the intelligence level of the First Year Students of Nursing Department at SMK Darussalam Makassar, as the first step, the instructor of PBB FIP UNM applied the

intelligence test in order to know their intelligence level by Standard Progressive Matrices (SPM) as the valid research instrument. The result of the test can be seen as follows:

Based on the table in appendix A, the intelligence score of the First Year Students of Nursing Department at SMK Darussalam Makassar can be classified into four levels, (1). Below Normal. (2). Normal. (3). Average (4). High Average.

Table 3. The Intelligence Raw Score

Total Raw Score	The Intelligence Classification	Students	Percent
<24	Below Normal	2	3%
25 – 36	Normal	17	22%
37 – 48	Average	35	60%
49 – 60	High Average	6	10%
	Total	60	100%

We can see the Intelligence score of the students in the first year of Nursing Department at SMK Darussalam Makassar got Below Normal 2 students 3%, Normal 17 students 22%, Average 35 students 60%, and High Average 6 students 10%. The total percent is 100%. So, the students in the first year of Nursing Department at SMK Darussalam Makassar got the good score only two students got below normal, it means

that the most of student got the good intelligence score.

Table 4. Case Processing Summary

		N	%
Cases	Valid	60	100,0
	Excluded(a)	0	0
	Total	60	100,0

A Listwise deletion based on all variables in the procedure.

Source: the result of SPSS 15.0 for windows Program

The table above shows the case processing summary that the total data (N) are 60 students. So, the data valid is 100%.

In appendix A, the frequency of each score of the intelligence test given. It describes that from 60 samples, there was only two students (3,3%) could reach the students highest score, 51. while the lowest score, 16, were got by one student (1,7)%. The modus score appeared is 39 that were reached by five students (8,3%).

Table 5. Descriptive Statistics of intelligence level

	N	Min	Max	Mean	Std. D
Score Intelligence Test	60	16	51	39,77	6,995
Valid N (listwise)	60				

Source: the result of SPSS 15.0 for windows Program

The table above shows that in Intelligence test (X variable), the minimum score of intelligence is 16 and maximum score of intelligence is 51. The mean score of the intelligence test scores of 60 samples is 39,77 and standard deviation is 6,995.

To prove into formulation about Mean and Standard Deviation of Intelligence Test (X):

For Mean score of X

$$M_x = \frac{\sum X}{N} = \frac{2386}{60} = 39,77$$

For Standard Deviation:

$$SD = \sqrt{\frac{\sum X^2}{N} - M_x^2}$$

$$M_x^2 = 39,77^2 = 1581,65$$

$$SD = \sqrt{\frac{97770}{60} - 1581,65}$$

$$= \sqrt{1629,50 - 1581,65}$$

$$= \sqrt{47,85}$$

$$= 6,995$$

## (2). Description of students visual material comprehension

To know the Visual Material Comprehension of the First Year

Students of Nursing Department at SMK Darussalam Makassar, as the second steps, the writer applied the visual material test in order to know their visual material comprehension. The result of the test can be seen as follows:

Based on the table in appendix B, the visual material comprehension score of the First Year Students of Nursing Department at SMK Darussalam Makassar can be classified into four levels, (1). Poor. (2). Average. (3). Good. (4). Very Good.

As the next step, the students were given the visual Material Comprehension Test in order to know their ability to comprehend the visual materials. Therefore, to make the data analysis easier, the result of the Visual Material Comprehension Test of the student is shown according to the classification of their intelligence levels as below:

Table 6. The Visual Material comprehension Score

The Visual Material Classification	Total Score	Students	Percentage
Very good	81	10	16,7%
Good	61	43	71,9%
Average	41	5	8,4%
Poor	21	2	3%

Total 60 100%

The Visual Material comprehension score of the students in the first year of Nursing Department at SMK Darussalam Makassar got Poor 2 students 3%, Average 5 students 8,4%, Good 43 students 71,9%, and Very good 10 students 16,7 %. The total percent is 100%. So, the students in the first year of Nursing Department at SMK Darussalam Makassar got the good score only two students got poor, it means that the most of student got the good Visual Material Comprehension score.

Table 7. Case Processing Summary

		N	%
Cases	Valid	60	100,0
	Excluded(a)	0	0
	Total	60	100,0

a Listwise deletion based on all variables in the procedure.

**Source: the result of SPSS 15.0 for windows Program**

The table above shows the case processing summary that the total data (N) are 60 students. So, the data valid is 100%.

The table shows in appendix B, the score of the visual material

comprehension test given to the students. Based on the table in appendix B, we can know that there was one student (1,7%) who reached the highest score, 92, and one student also (1,7%) who reached the lowest score, 38. the modus scores appeared was 64 that reached by ten students for each.

Table 8. Descriptive Statistics of the visual material comprehension

	N	Min	Max	Mean	Std. Dev.
Score Visual Material Comprehension	60	38	92	70,17	11,195
Valid N (listwise)	60				

Source: the result of SPSS 15.0 for windows Program

The table above shows that in the Visual Material Comprehension (Y variable), minimum score of the visual material comprehension is 38 and the maximum score of the visual material comprehension score is 92. The mean score of in Y variable, the mean score of the visual material comprehension test scores 60 samples is 70,17 and standard deviation, 11,195.

To prove into formulation about Mean and Standard Deviation of the visual material comprehension Test (Y):

For Mean score of Y

$$M_x = \frac{\sum Y}{N} = \frac{4210}{60} = 70,17$$

N 60

For Standard Deviation:

$$SD = \sqrt{\frac{\sum Y^2}{N} - M_x^2}$$

N

$$M_x^2 = 70,17^2 = 4923,83$$

$$SD = \sqrt{\frac{302796}{60} - 4923,83}$$

60

$$= \sqrt{\frac{5046,6}{60} - 4923,83}$$

$$= \sqrt{123}$$

$$= 11,195$$

### (3) The Correlation between The intelligence Level and the Ability to Comprehend Visual Materials of SMK Darussalam Makassar.”

The formulation of hypothesis which is stated in this research is “there are significant correlation between the intelligence Level and the Ability to Comprehend Visual Materials of SMK Darussalam Makassar.”

Table 9. Correlation

		Score Intelligence Test	Score Visual Material Comprehension
Score Intelligence Test	Pearson Correlation	1	,417(* *)



	Sig. (2-tailed)		,001
	N	60	60
Score Visual Material Comprehension	Pearson Correlation	,417(**)	1
	Sig. (2-tailed)		,001
	N	60	60

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Source: the result of SPSS 15.0 for windows Program**

The result of correlation analysis (in the table above) between the intelligence Level (X) with the Ability to Comprehend Visual Materials (Y) of Nursing department at SMK Darussalam Makassar showing that score  $r_{test}$  as much as 0,417.

To prove into formulation of correlation is:

$$r_{xy} = \frac{\sum XY - N \cdot M_x \cdot M_y}{\sqrt{(\sum X^2 - N \cdot M_x^2)(\sum Y^2 - N \cdot M_y^2)}}$$

$$r_{xy} = \frac{169344 - 60 \times 39,77 \times 70,17}{\sqrt{(97770 - 60 \times 1581,65)(302796 - 60 \times 4923,83)}}$$

$$= \frac{1904,35}{\sqrt{(97770 - 94899,00)(302796 - 295429,80)}}$$

$$= \frac{1904,35}{\sqrt{(2871,00)(7366,20)}}$$

$$= \frac{1904,35}{\sqrt{21148360,20}}$$

$$= \frac{1904,35}{\sqrt{21148360,20}}$$

$$= \frac{1904,35}{\sqrt{21148360,20}}$$

$$= \frac{1904,35}{4598,74} = 0,417$$

The result of correlation analysis in the table and in the formulation get the same correlation score between the intelligence Level (X) with the Ability to Comprehend Visual Materials (Y) of Nursing department at SMK Darussalam Makassar showing that score  $r_{test}$  as much as 0,417. Therefore it can be interpreted through Pearson standard correlation table that students score in moderate interpretation, where moderate interpretation of the table is ranging from 0,400 – 0,600. It can be concluded that the research hypothesis ( $H_1$ ) is accepted. This matter indicates that there is correlation between the intelligence Level and the Ability to Comprehend Visual Materials. It means that, there is significant and positive correlation between the intelligence Level and the Ability to Comprehend Visual Materials.

The table in appendix B, shows that the model is significant. Because the F value with p (Prob. /F), 0,001, is lower than  $\alpha$  (0,05). We have known that if the  $p < \alpha$ , the model would be said as significant.

Based on the table in appendix B, the relation between coefficient correlation and coefficient regress Y to

X (R) is 0,417. Because R square means the prediction ability of model, so from the table above we can say that the ability of the intelligence level (X variable) to explain the ability to comprehend visual materials of the students (Y variable) is 17,4 % (0,174). We can make the interpretation that the ability of X Variable to predict the Y variable is 17,4 %.

Based on the result above, we can make conclusion that there was significant correlation of students' intelligence level to their ability in comprehending visual materials, the result of hypothesis test of this research found that the correlation existed. So, for  $df = n - 2 = 60 - 2 = 58$  in significant 1%  $r_{test}$  is 0,417 and than in significant 5%  $r_{table}$  is 0,324. It was supported by the significant result of X variable 0,001, that was less than the standard significant of 5%, 0,05 ( $0,001 < 0,05$ ) until we can say that The Correlation between the Intelligence of the First Year Students of Nursing Department at SMK Darussalam Makassar Level was significant correlation to their Ability to Comprehend Visual Materials.

To interpret the result of the correlation analysis of Pearson product moment correlation coefficient described as following table:

Table 10. The Result of Pearson Standard Correlation

No.	Standard	Interpretation
1.	0,000 – 0,200	Very Low
2.	0,200 – 0,400	Low
3.	0,400 – 0,600	Moderate
4.	0,600 – 0,800	Substantial
5.	0,800 – 1,000	High

If the  $r_{xy}$  lies between 0,400 – 0,600, it means that the correlation between the intelligence level and the visual material comprehension is moderate. On the other hand, if the  $r_{xy}$  lies between 0,400 – 1,000,  $H_1$  is accepted. It means that there is significant the correlation between the intelligence level and the visual material comprehension.  $H_0$  is rejected. It means that there is significant the correlation between the intelligence level and the visual material comprehension. Based on the previous hypothesis, the data was processed through SPSS 15.0 for version of windows.

To be clearly, the conclusion of all data can be seen as follows:

To process the data above completely, the writer used from SPSS 15.0 for windows that gave the result of analysis from the data as follows:

Table 11. Frequencies Statistics

		Score Intelligence Test	Score Visual Material Comprehension
N	Valid	60	60
	Missing	0	0
Mean		39,77	70,17
Std. Error of Mean		,903	1,445
Std. Deviation		6,995	11,195
Variance		48,928	125,328
Range		35	54
Minimum		16	38
Maximum		51	92
Sum		2386	4210

**Source: the result of SPSS 15.0 for windows Program**

## F. DISCUSSION

When doing this research, the writer divided the samples into two classes in order to keep the comfortable situation during the test. In the first day, the writer and the researcher from PBB FIP UNM gave the intelligence test based on Standard Progressive Matrices (SPM), the samples were given 30 minutes to do the intelligence test. The time was given based on the pointed time in the intelligence test of SPM. The writer's purpose took SPM from PBB FIP UNM because the writer took it as valid research instrument. The visual material comprehension test was given in the next day and the samples had 40 minutes to do the test.

After collecting the result of two tests, the researcher classified the

student' score of the visual material comprehension test based on their intelligence levels. The data showed that only 2 students were in the below level of intelligence, 52 of them were in the normal level of intelligence and 6 of them in the high average level of intelligence.

The data collected were showing that the maximum score of the intelligence test reached by the students was 51, while the minimum one was 16 and in the visual material comprehension test, the maximum score was 92 and the minimum one was 38. In the normal level of intelligence describes that from 60 samples, there was only two students (3,3%) could reach the students highest score, 51. while the lowest score, 16, were got by one student (1,7)%. The modus score appeared is 39 that were reached by five students (8,3%). the score of the visual material comprehension test given to the students. Based on the table above, we can know that there was one student (1,7%) who reached the highest score, 92, and one student also (1,7%) who reached the lowest score, 38. the modus scores appeared was 64 that reached by ten students for each. The percentage above describes that the high score of the visual materials comprehension test also can be reached by most of the students.

The table also shows that the mean of the intelligence test score is 39,77, while the mean of visual material comprehension test is 70,17.

On the other hand, if the  $r_{xy}$  lies between 0,400 – 1,000,  $H_1$  is accepted. It means that there is significant the correlation between the intelligence level and the visual material comprehension. If the  $r_{xy}$  lies between 0,000 – 0,400,  $H_1$  is rejected,  $H_0$  is accepted. It means that there is no significant the correlation between the intelligence level and the visual material comprehension.

About the X variable in predicting the score of Y variable (score visual material comprehension) through the table of correlation it has 0,417. So, if the  $r_{xy}$  lies between 0,400 – 1,000,  $H_1$  is accepted. It means that there is significant the correlation between the intelligence level and the visual material comprehension. The conclusion is the intelligence level has correlation to their ability visual material comprehension is 0,417 scores (moderate). So,  $H_1$  is accepted and  $H_0$  is rejected.

We have tested the standard coefficient 5 % which proves that the Prob/F. 0,001, is less than F table. 0,05. ( $0,001 < 0,05$ ),  $H_1$  is accepted. So we can say that the correlation of the intelligence level to the First Year

Students of Nursing Department at SMK Darussalam Makassar was significant to their Ability to Comprehend Visual Materials. Five percent (5%) means that if we make the test one hundred times, possibility to make the wrongness is five times. The percentage of R square (the ability of X variable to predict Y variable) shown is little. It means that the ability to comprehend the visual materials of the First Year Students of Nursing Department at SMK Darussalam Makassar is only 17,4 % influenced by their intelligence level. So, in fact, there are 82,6% of other factors that influence the comprehension ability of the student to reach high position.

The description of data collected through the two tests shows that the intelligence level of the first year had enough correlation to their ability in comprehending the visual materials. Because, there are some students in the below normal level of intelligence, could get the higher score in the visual material comprehension test.

Oppositely there are some students also in the normal level intelligence, in fact reached the low score in their visual material comprehension test. We can see the correlation is 0,417. So, for  $df = n-2 = 60-2 = 58$  in significant 1%  $r_{test}$  is 0,417 and than in significant 5%  $r_{table}$  is

0,324, ( $0,417 > 0,324$ ), it describes that the previous hypothesis in chapter two said: Null Hypothesis ( $H_0$ ): There is no correlate of the intelligence level of the first year students of Nursing Department at SMK Darussalam Makassar to their ability to comprehend visual materials. Alternative Hypothesis ( $H_1$ ): There is correlate of the intelligence level of the first year students of Nursing Department at SMK Darussalam Makassar to their ability to comprehend visual materials.

We can conclude that  $H_1$  is accepted. So, there was correlation between the intelligence level of the first year of Nursing department at SMK Darussalam Makassar to their ability in comprehending the visual material, is received. The correlation was significant, even though in moderate position. So, there are possible some factors to correlate them in reach position high correlation.

Talking about other factors that are possible to correlate the students' ability in comprehending visual material, there are some factors could appear. They might come from the educational background of the students, their family background, and their interests to study English or their teachers' performance and ability to teach well.

We have known that understanding is a process of giving meaning to the interaction between the base knowledge of the reader and the read material and one activity to give response to the read material. It means that if one student has a good base knowledge (schema) of something read, the process of comprehension will occur well.

Everybody must have schema about one event or object that has been found in his life. Schema is made and enriched by the experience. If a reader does not have any experience about reading material, his schema will; not help to process the meaning of the read material (Arshad, 2001; 1-2).

Based on the theory above, we can analyze that the comprehension of somebody to the reading material, especially the visual materials, is merely correlated by his intelligence and also correlated by his experience about reading material.

The experience of the students may come from their teachers' ability to choose the good and interesting materials and activities, the availability of the good facilities in their school, their interest to learn the materials and other factors. So, the more the experiences about reading materials of the students are, the more meaningful the read materials are.

## A. CONCLUSION AND SUGGESTION

1. The intelligence level of the First Year Students of Nursing Department at SMK Darussalam Makassar was classified into four levels: (1). Below Normal. (2). Normal. (3). Average (4). High Average
2. The ability to comprehend the visual materials of the students was classified into: (1). Poor. (2). Average. (3). Good. (4). Very Good.
3. There was significant correlation between the intelligence level of students and their comprehension ability of the visual materials.

Based on the findings and conclusion described above, the researcher states the following suggestions:

1. The researcher suggest that when applying the visual materials as supported media in teaching, the English teachers of SMK Darussalam Makassar do not have to depend on merely to the intelligence level of the students because there are some factors which correlate the comprehension ability of them, to get the high correlation.
2. Even though the Correlation between the Intelligence Level and the Ability to Comprehend Visual Materials of the First Year Students of Nursing

Department at SMK Darussalam Makassar was found significant, the researcher does hope that the other researchers would research what other factors the affecting the students' comprehension to visual materials.

3. The other factors that can be researched because having possible correlate to the students' comprehension ability might come from their educational background, their family backgrounds, their interest to learn English, and their teachers' intelligence and performance.

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