

# Analysis of Students' Numerical Ability in Solving Minimum Competency Assessment Questions in View of Cognitive Outcomes in Elementary Schools

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## ABSTRACT

This research was conducted to describe the relationship between students' numeracy abilities and cognitive outcomes in the implementation of the Minimum Competency Assessment and find out the comparison of the average value of students' Minimum Competency Assessment results in terms of the answer scheme. The type of research used in this research is quantitative research. This research is explained by using a survey method, where data is collected using questionnaires, interviews and documentation. The population used in this study were 5th grade students of public elementary schools in Cirebon City for the 2022/2023 academic year. The sample in this study consisted of 134 schools spread across five sub-districts in Cirebon City, including Kejaksan District (28 schools), Kesambi District (35 schools), Harjamukti District (38 schools), Pekalipan District (12 schools) and Lemahwungkuk District (21 schools). The results of this study indicate that 93% of the questions used are valid. This means that the numeration questions used have accuracy and accuracy as a measuring tool in making an assessment. Therefore, this numeracy problem is suitable for use in research. Likewise with the results of the reliability test of numeration questions. The Cronbach's Alpha value of 72% means that the numeration questions being tested are reliable or trustworthy. With a Cronbach's Alpha value of 72%, the numeration questions tested have a good degree of stability, consistency and accuracy so that they can produce reliable data. There is a difference in the average AKM score

for students who work on complete, incomplete and skipped Minimum Competency Assessment questions. From the elaboration of the conclusions of the analysis and discussion of the data above,  $H_0$  is rejected and  $H_1$  is accepted. The hypothesis of this study can be accepted empirically that the intervention of educators in solving AKM questions with complete, incomplete, and jumping answers affects the magnitude of the average AKM score.

**Keywords:** Minimum Competency Assessment, Numerical Ability, Cognitive Outcome

## INTRODUCTION

In creating a literacy culture, there needs to be a measuring tool that is able to determine the level of achievement of results. The government program that has been running in measuring the achievement of literacy culture results is the National Assessment (AN). The National Assessment was first carried out in 2021 by involving all elements of education in Indonesia, from elementary to secondary levels (GLN Team, 2017).

The National Assessment is an assessment program for the quality of education units from elementary to secondary level. The quality of the educational unit is assessed based on student learning outcomes, the quality of the teaching and learning process and the climate of the educational unit that supports the learning unit. The above information was obtained from three

instruments, namely the Minimum Competency Assessment (AKM), the Character Survey and the Learning Environment Survey. Information from the three elements above is expected to be able to carry out self-evaluations and planning for improving the quality of education in each educational unit.

The Minimum Competency Assessment is a part of the National Assessment designed by the Ministry of Education and Culture of the Republic of Indonesia (Kemdikbud) as a substitute for the national exam in Indonesia. The implementation of the Minimum Competency Assessment in Cirebon City was carried out for 2 periods during November 2021.

Various reactions emerged from each educational unit, especially the Elementary School (SD) level. Socialization is carried out periodically by the Cirebon City Education Office, as a stock of knowledge for teachers who are entrusted with overseeing Minimum Competency Assessment activities in their respective schools. The provision of knowledge provided is in the form of technical implementation of the Minimum Competency Assessment in schools and in the form of numeracy literacy Minimum Competency Assessment questions.

The form of questions in the Minimum Competency Assessment consists of objective and non-objective questions. Forms of objective questions in the form of multiple choice, complex multiple choice, matching and short entries. While the form of non-objective questions in the form of descriptions or essays. The cognitive level in the numeracy Minimum Competency Assessment questions consists of understanding, application and reasoning (AN Implementation POS, 2021).

The Minimum Competency Assessment measures students' numerical abilities at every level of education starting in grades 5, 8 and 11 with different levels (Arijanti, 2020). This research was conducted at the elementary school level with levels 2 and 3. The types of questions used were objective

questions. The form of objective questions is more practical in scoring and whoever checks it will give the same score, so that scoring errors can be small, especially using computerization in scoring (Susongko, 2010).

The form of non-objective questions in the form of descriptions or essays requires students to express ideas in the form of written descriptions. Essay tests in giving scores require a long time and are relatively more difficult, so that the description form is difficult to use for large-scale tests (Susongko, 2010). This form of question is not included, because students' essay or essay answers will have different scores according to the complexity of each answer.

The process of working on the questions above is carried out completely and sequentially, so that students get maximum results. The success of students understanding the items in the Minimum Competency Assessment begins with the learning process from a supportive learning framework (Meriana et al., 2021). The Minimum Competency Assessment score is determined by the achievement of indicators in each type of question. Therefore the Minimum Competency Assessment questions are arranged randomly with different levels for each student. The aim is to give students confidence in working on questions according to their abilities without having to ask their friends.

The implementation of the Minimum Competency Assessment which took place in 2021 turned out to have had a change in the pattern of learning mathematics. Minimum Competency Assessment is an assessment of the basic competencies needed by all students in order to be able to develop their own abilities and play an active role in social life in activities that have positive values (Mendikbud, 2020). One of the abilities tested in this Minimum Competency Assessment is students' numeracy skills. Especially for SD, the Minimum Competency Assessment is carried out at the 5th grade level.

Numeracy is the ability to think using mathematical concepts, procedures, facts and tools to solve everyday problems in various types of contexts that are relevant to individuals as citizens of Indonesia and citizens of the world. Facts on the ground, only a small proportion of students can utilize numeracy skills in everyday life. This can be seen from the various answers of students who were still confused when faced with open-ended questions, multiple choice questions, true-false questions and the reasons for which were similar to the Program for International Student Assessment (PISA) questions.

Students' ability in numeracy is closely related to cognitive processes. Cognitive development is the basis of students' ability to think. In line with the opinion of Ahmad Susanto (2011) explaining that cognitive is a thought process, namely the individual's ability to relate, assess, and consider an event or event. So the cognitive process relates to the level of intelligence of students as indicated by ideas in solving Minimum Competency Assessment questions.

Ernawulan Syaodih and Mubair Agustin (2008: 20) cognitive processes related to the development of thinking and how students' thinking activities work. Students are faced with problems that require problem solving. Solving a problem is a complex step for students. Before students are able to solve these problems, they need to have the ability to find ways to solve them first.

The reality on the ground, the results of the Minimum Competency Assessment on numeracy skills on the [rapor.pendidikan.kemdikbud.go.id](http://rapor.pendidikan.kemdikbud.go.id) page in each education unit, especially Public Elementary Schools in Cirebon City, show that the average numeracy ability in educational units is below the minimum competency. This proves that students' numeracy skills need improvement in cognitive processes.

The basic concepts of mathematics students may have mastered, but skills in using these concepts in real conditions in everyday life

still need special intervention. The competence of students obtained is limited to the ability to solve problems according to mathematical concepts, but not to the stage of applying them to everyday life.

Students need to be given an understanding that how to work on Minimum Competency Assessment questions needs to be complete and coherent. However, due to the results of the education unit report cards in each school, more than 50% of schools received red report cards. It is possible that there are several factors, namely students who work on Minimum Competency Assessment questions are incomplete and jump or students do not understand the intent of the problem being worked on.

The average numerical value of students can be used as material for improvement in learning in the classroom, especially mathematics. The low average value of numeration is caused by several factors. One of them is the lack of accuracy of students in doing the work completely and sequentially. The reality on the ground, there are still students who do incomplete Minimum Competency Assessment questions and skip to the next question. This causes the results of the Minimum Competency Assessment, especially numeracy abilities on educational report cards in educational units to obtain the category 'below the minimum competency'.

## **LITERATURE REVIEW**

The focus of previous research used as a reference is the numeracy skills of students, how to solve Minimum Competency Assessment questions, and cognitive outcomes of students in elementary school. Research conducted by Rohim (2021) aims to provide knowledge about the concept of Minimum Competency Assessment (AKM) to improve the numeracy literacy skills of students in elementary schools. From the results of the study, it was found that the assessment is not based on the ability to master material according to the curriculum as in the national exam, but is designed to map and improve the overall quality of

education. Thus, the implementation of the Minimum Competency Assessment is expected to improve the numeracy literacy skills of students in primary schools.

Research conducted by Yusuf (2022) explains how to measure students' cognitive learning outcomes including reading literacy and numeracy literacy. Errors can be analyzed when solving questions on the Minimum Competency Assessment. The analysis was carried out using instruments in the form of tests and unstructured interviews. The results are analyzed using qualitative description analysis so that decision making is obtained from the conclusions obtained.

Research conducted by Mariamah (2021) has the aim of knowing the numeracy skills of male students and female students in solving Minimum Competency Assessment questions. The results of his research are that the numeracy skills of female students are better than male students based on the percentage of the results of working on questions which are then adjusted to the category. The numeracy skills of female students were in the high category at 18% while male students were 12.5%. This shows that the numeracy skills of female students are better than male students.

Research conducted by Salvia (2022) aims to determine the relationship between numeracy literacy skills and math anxiety experienced by students. Math anxiety that exceeds the normal level can make students unfocused and difficult to accept and understand the mathematical concepts conveyed by the teacher. Math anxiety usually occurs in learners who have poor math skills. The lack of confidence of learners and the absence of efforts to reduce this anxiety leads to low scores on their math exams. The low mathematical understanding of learners will affect their numeracy literacy skills. The lack of mathematical solution skills has a direct impact on the numeracy literacy skills of learners.

Research conducted by Yustinaningrum (2021) aims to determine the level of

students' understanding of numeracy in AKM questions in class V MIN 9 Aceh Tengah. The numeracy literacy questions were given to students and assessed based on the scoring guideline rubric that had been made by the researcher. Then the test results are classified based on the score interval. The results of this study are that all male and female learners are located in the  $\leq 40$  interval which is included in the low category for numeracy literacy skills. There are no learners who occupy the high or medium categories. So there is no difference in numeracy literacy skills based on gender. Research conducted by Y. Resti (2020) was to improve the ability of SDIT teachers in making assessments and measurements to assess the numeracy skills of elementary school students. This training activity was carried out by providing training materials to teachers. The results of the study were obtained by conducting pre-tests and post-tests for training participants by answering 20 questions with each question receiving a score of 5. So that the highest score obtained by the trainees was 100. Based on the results of the activities that have been carried out, it is concluded that the teachers at SDIT have mastered the material. This is reinforced by the results of the mean difference test. The mean difference test of the two groups of pre-test and post-test scores with a significance level of 5% shows that the two groups have significant differences.

Research conducted by Magfiroh (2021) is to describe the implementation of the learning process and the effectiveness of the PMRI approach on students' numeracy literacy in integer counting operations at UPT SDN 106 Gresik. This research was conducted on the grounds that integer material has basic competencies that contain material related to the operations of addition, subtraction, multiplication and division in everyday life.

Research conducted by Dantes (2021) is to describe the improvement of school literacy and numeracy literacy in grade V elementary school students in Singaraja City



through the Blended Learning learning model. Learning developed with a blended learning model allows for a knowledge construction process. Learning will be more meaningful if students construct their own knowledge and experience directly what they learn. The result is that there is an increase in literacy of grade V elementary school students with the implementation of the Blended Learning model.

Research conducted by Aprilianti (2022) was conducted to analyze the ability of elementary school teachers in developing numeracy literacy test questions based on Education for Sustainable Development (ESD). The instruments used were interview guidelines, observation sheets, documentation study sheets and questionnaire sheets. The result is that there is a need for improvement in developing numeracy literacy test questions because these questions include High Order Thinking Skills (HOTS) type questions. The solution is to provide appropriate training between ESD-based learning development and appropriate assessment.

Research conducted by Ozkan and Ozaslan (2018) with the original title Student Achievement in Turkey, According to Question Types Used in PISA 2003-2012 Mathematic Literacy Tests. The achievement of students in Turkey, based on the types of questions used in the 2003-2012 International Program for Student Assessment (PISA) mathematics literacy test aims to determine the level of achievement of the number of students participating in the PISA test. In this study, mathematical literacy tests were classified into 4 groups, namely multiple choice, complex multiple choice, true-false answers, and correct description answers. The results showed that the question type with the highest average success in the 2003 PISA test was multiple choice and learners scored the highest on complex multiple choice questions in the 2012 PISA test.

## **MATERIALS & METHODS**

The type of research used in this study is quantitative research. According to Margono (Samsu, 2017) quantitative research is a process of growing knowledge that uses data in the form of numbers as a means of finding information about what we want to know. The type of approach that researchers use in this research is explanatory research. The object of reviewing explanatory research (explanatory research) is to test the relationship between hypothesized variables.

According to (Purwo Susongko, 2010), explanatory research is research that explains the relationship between research variables and tests previously formulated hypotheses. In this study there is a hypothesis that will be tested. The hypothesis describes the relationship between two variables, to determine whether or not a variable is associated with other variables, or whether or not the variable is influenced by other variables (Sani, 2021).

This research is explained using a survey method, whose data is collected using questionnaires, interviews and documentation. The survey method is a method that takes data from a population and uses a questionnaire as the main data collection tool so that survey research has the aim of knowing the respondents, the data to be obtained from sampling in the population to be studied.

Population is all the characteristics that become the object of research from these characteristics with all groups of people, events, objects being the center of attention for researchers, or objects and subjects that have certain qualities and characteristics set by researchers to study and then draw conclusions (Sugiyono, 2017). The population used in this study were 5th grade students of public elementary schools in Cirebon City in the 2022/2023 academic year.

The sample is part of the number and characteristics of the population (Sugiyono,

2017). Based on data obtained by researchers from the Cirebon City Education Office, the sample in this study amounted to 134 schools spread across five sub-districts in Cirebon City, including Kejaksan District (28 schools), Kesambi District (35 schools), Harjamukti District (38 schools), Pekalipan District (12 schools) and Lemahwungkuk District (21 schools).

Data is a set of information, facts, or symbols that explain the state of the object of research (Arikunto, 2002). In a study, it must be stated where the data is obtained from. The main data collection technique used in this study was a test. The main data is primary data obtained directly from the object of research. While the supporting data is obtained from observation and documentation studies.

## RESULT AND DISCUSSION

Research that has been conducted in elementary schools in Cirebon City aims to measure the numeracy skills of grade V students in the 2022/2023 academic year in terms of cognitive outcomes. Data collected through questionnaires distributed using Google Form, obtained 336 respondents

spread across five sub-districts in Cirebon City. Respondents were categorized based on the domicile of the students' school, to provide an overview of the ability level of students in each sub-district in Cirebon City. The instrument used for data collection in this study is a test. Before conducting research, the instrument to be used is tested for validation first, namely the validation test of the test questions by three expert validators by giving their opinions about the instruments that have been prepared by researchers. After the instrument was tested for validation by expert validators, it was continued with the instrument trial.

The research was conducted in approximately three months starting from September to December 2022. The instrument distribution was carried out using Google Form in five sub-districts in Cirebon City. The number of respondents who entered from Harjamukti District 20 respondents, Kejaksan District 91 respondents, Kesambi District 97 respondents, Lemahwungkuk District 56 respondents and Pekalipan District 72 respondents. Can be illustrated with a pie chart below,

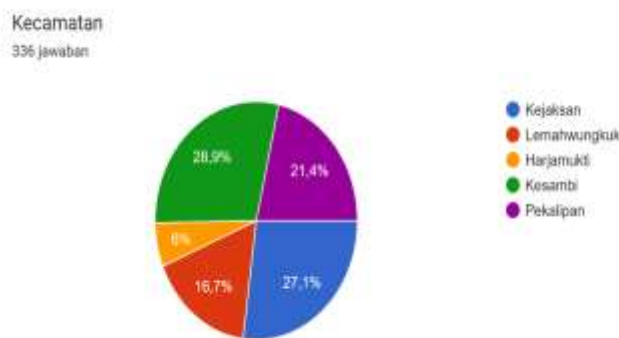


Figure 1. Distribution of the number of respondents

The research data collection process was assisted by the homeroom teacher, especially homeroom teacher V. The V homeroom teacher distributed the Google Form link online through the Class Group Chat and was done independently by students honestly. The researcher gave learners the opportunity to ask questions

before the process was accompanied by the homeroom teacher. During the process of working on AKM questions, students are not allowed to use calculation aids such as calculators or cellphones.

### Analysis of Learners' Numeracy Skills with Cognitive Outcomes in the Implementation of Minimum Competency Assessment

This research was conducted for approximately 3 months, from September to December 2022. The distribution of research question instruments was carried out by directly visiting the schools that were sampled in each sub-district. The selection of sample schools is based on the main school in each sub-district, so that in the main school there is a complex school that is the target of the research.

The number of respondents who entered through Google Form media amounted to 336 respondents from 4,020 population in Cirebon City. Taking the number of respondents based on the calculation of the Slovin Formula with a tolerable level of leeway in sampling of 5%. After the question instrument is distributed to respondents, the calculation of the validity test of the question instrument is carried out using the Product Moment correlation

formula. The data analyzed were obtained from the test results of the instrument answers of students who answered completely, incompletely and jumped as many as 15 questions.

### Research Results

The numeracy skills of students in the implementation of the Minimum Competency Assessment in Cirebon City Public Elementary Schools in the 2022/2023 academic year are still not optimal. This is indicated by the results of the education report card on the Dapodik Education Unit, the achievement results on numeracy state below the minimum competency in yellow. It can be defined that the percentage of students based on the ability to think using mathematical concepts, procedures, facts and tools to solve everyday problems in various types of relevant contexts. Based on a survey in November 2022 the implementation of the minimum Competency Assessment in Cirebon City is shown in Table 1.

Table 1. Data Distribution of Numeracy Ability

Subdistrict Name	Mahir	proficient	Basic	Need Intervention
Kejaksan	7.14	47.71	42.86	2.35
Kesambi	6.23	16.67	60.43	16.67
Lemahwungkuk	3.33	16.67	68.55	11.45
Pekalipan	1.73	36.67	45.53	16.07
Harjamukti	4.93	18.86	60.15	16.06

Source: processed data 2022

### Research Discussion

The results show that the level of numeracy skills of primary school students in Cirebon City is still at the basic stage. The percentage above is based on the survey results of the proctors who are responsible for implementing the AKM in their respective education units, which were

distributed through Google Form. The data outlines the achievement value of the numeracy skill indicators in the education unit. Because it is confidential, the researcher only displays the overall accumulation in each sub-district globally, not per school.

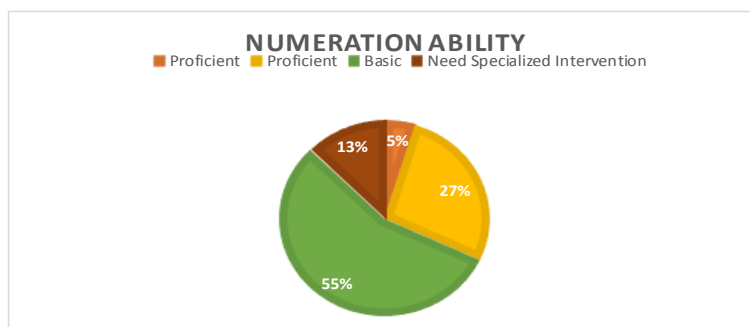


Figure 2: Percentage Results of Numeracy Ability

The diagram above shows that the numeracy skills of students in Cirebon City are predominantly at the basic stage at around 55%, and the rest are scattered at the advanced, proficient and need special intervention stages. The results of numeracy skills in the implementation of AKM in November 2021, students who were classified as proficient reached 5%, at the proficient stage 27%, and at the stage of needing special intervention amounted to 13%.

Minimum Competency Assessment is an assessment of the basic competencies needed by learners to develop their ability to self-capacity and participate positively in society. The word minimum indicates that the size possessed by learners can be reviewed from reading literacy and numeracy which are competencies that must at least be possessed for someone to function productively in life (Hermiyanty, Wandira Ayu Bertin, 2017). Researchers focus on the numeracy skills of learners. The goal is that students have a higher level of thinking in dealing with various problems that exist when facing AKM questions. So that there is an increase in the cognitive results of students on the education report card in their respective education units.

Simple correlation analysis is used to determine the relationship between two variables and to determine the direction of the relationship that occurs. Simple correlation analysis with the Pearson method is commonly referred to as Pearson's Product Moment. The value of r ranges from 1 to negative 1. The closer the number 1 or -1 means that the relationship between the two variables is getting stronger, on the other hand, if the value of r is close to 0, the relationship between the two variables is getting weaker. There are

positive and negative values indicating a unidirectional relationship or vice versa. A positive value indicates a unidirectional relationship, if X increases then Y also increases, while a negative value indicates an inverse relationship, if X increases, then Y decreases. According to Sugiyono (2009) the guidelines for providing interpretation of the correlation coefficient are described in table 2. below.

**Table 2. Interpretation of Correlation Coefficient**

Interval Coefficient	Level of Relationship
0,00 – 0,199	Very Low
0,20 – 0,399	Low
0,40 – 0,599	Medium
0,60 – 0,799	Strong
0,80 – 1,00	Very Strong

Pearson's product moment correlation coefficient, researchers find by using the following formula:

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

$r_{xy}$  = Correlation index number between variable X and variable Y  
 N = Number of samples  
 $\Sigma X^2$  = Sum of squares of variable X  
 $\Sigma Y^2$  = Sum of squares of variable Y  
 $\Sigma XY$  = The sum of the multiplication results between the X score and the Y score  
 $\Sigma X$  = Number of X variables  
 $\Sigma Y$  = Number of variables Y

The results of calculations using the SPSS version 25 application obtained the correlation coefficient of numeracy skills with the cognitive results of students on the implementation of the Minimum Competency Assessment in State Elementary Schools in Cirebon City. As illustrated in table 3. below.

**Table 3. Simple Correlation Analysis**

Correlations			
		Numeracy_Skill	Cognitif_Outcomes
Numeracy_Skill	Pearson Correlation	1	.934**
	Significance(2-tailed)		.000
	N	336	336
Cognitive_Outcomes	Pearson Correlation	.934**	1
	Significance(2-tailed)	.000	
	N	336	336

\*\* . Correlation at 0.01(2-tailed):...



Based on the data from the output of simple correlation analysis with SPSS version 25, it is known that the correlation value is 0.934. This means that the correlation value of variable X, namely the numeracy skills of students with variable Y, namely the cognitive outcomes of students, is at a very strong level of relationship. Indicated by the

correlation value is in the range of values 0.80 - 1,000.

To test the significance of the correlation coefficient of the numeracy ability variable on the cognitive outcomes of students in elementary school on the implementation of the Minimum Competency Assessment, it was carried out using the SPSS application as follows:

**Table 4. Correlation Model Summary**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934 <sup>a</sup>	.873	.872	6.751

a. Predictors: (constant) Numeracy\_Skill

The table above explains that the magnitude of the correlation value between numeracy skills and the cognitive outcomes of students is 0.934 and it is also explained that the percentage of the influence of the independent variable (numeracy skills) on the dependent variable (cognitive outcomes of students) is called the coefficient of determination which is the result of

multiplying the value of R. From the output results above, the coefficient of determination (R<sup>2</sup>) is 0.873 which means that the influence of the independent variable (numeracy skills) on the dependent variable (cognitive outcomes) is 87.3%, while the rest is influenced by other variables.

**Table 5. Significance Test**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	104452.796	1	104452.796	2291.650	.000 <sup>b</sup>
	Residual	15223.630	334	45.580		
	Total	119676.426	335			

a. Dependent Variable: Cognitive\_Outcomes

b. Predictors: (constant) Numeracy\_Skill

Table 5 above explains whether there is a real or significant influence between the numeracy ability variable (x) on the variable cognitive outcomes of students on the implementation of Minimum Competency Assessment in Cirebon City. From the

output it can be seen that the calculated F value is 2291.650 with a significance or probability level of 0.000 < 0.05, so the regression model can be used to predict the participation variable.

**Table 6. T-test**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant)	9.991	.949		10.527	.000
	Numeracy_Skill	2.066	.043	.934	47.871	.000

a. Dependent Variable: Cognitive\_Outcomes

In table 6 above, column B in Constant, namely Cognitive results (a) is 9.991 while the value of numeracy skills (b) is 2.066, so the regression equation can be written as follows:

$$Y = a + b X$$

$$Y = 9.991 + 2.066 X$$

The coefficient b is called the regression direction coefficient and expresses the average change in variable Y, for each change in variable X by one unit. The

regression equation above can be translated 1) a constant of 9.991 states that if there is no value of Numeracy Ability then the value of Cognitive Outcomes is 9.991 and 2) the regression coefficient X of 2.066 states that every time there is an addition of one unit of Numeracy Ability value then the value of Cognitive Outcomes increases by 2.066.

In addition to describing the regression equation, the SPSS output above can display a significance test using the t test, which is to determine whether there is a real influence (significant) between the numeracy ability variable (X) on the Cognitive outcome variable (Y) on the implementation of the Minimum Competency Assessment at the Cirebon City Public Elementary School.

Ho: There is no real (significant) influence between the Numeracy Ability variable (X) on the Cognitive Outcome variable (Y).

H1 : There is a real (significant) influence between the Numeracy Ability variable (X) on the Cognitive Outcome variable (Y).

From the output above, it is known that the t value is 47.871 with a significance value of  $0.000 < 0.05$ , so Ho is rejected and H1 is accepted. This means that there is a real (significant) influence between the Numeracy Ability variable on the Cognitive Outcomes variable of students on the implementation of the Minimum Competency Assessment in public elementary schools in Cirebon City.

### Comparison of the Average Score of AKM Learners Viewed from the Answer Scheme

#### Research Results

The question instruments that were tested amounted to 15 numeracy questions consisting of multiple choice questions, multiple choice compound, matching and

short form. From the results of the question validation test, it was determined that the types of questions used were multiple choice consisting of 6 questions, compound multiple choice consisting of 3 questions, matching consisting of 3 questions and short form consisting of 3 questions. The total number of questions tested was 15 questions.

The results of the validation of questions spread across five sub-districts in Cirebon City show the results that there are still students who work on incomplete questions and some are even skipped or skipped. The following is the distribution of questions from the analysis in the field.

Table 7. Distribution of Questions in Five Sub-districts

Problem	Complete	Incomplete	Skipp	Incorrect
1	29	-	-	307
2	236	-	-	100
3	73	190	3	70
4	203	130	3	-
5	166	-	-	170
6	234	-	-	102
7	54	240	2	40
8	124	-	-	212
9	152	46	10	28
10	232	-	3	101
11	218	-	-	118
12	97	-	6	233
13	158	-	1	177
14	224	-	3	109
15	101	191	1	43

Source: Processed data, 2022

Based on the results of table 7, it shows that from the number of respondents who entered 336 students, it can be concluded that students who work completely on each question will get maximum results compared to students who work incompletely and jump.

To prove the above statement, the data was processed using linear dummy regression data in SPSS version 25. The AKM score acts as the dependent variable or the influenced variable, while the independent variable or the influencing variable is the type of complete, incomplete and skip answers. It can be seen from Table 8. the following SPSS output results:

Table 8. SPSS Output Results

Model	Coefficients <sup>a</sup>			
	Unstandardized Coefficients		Standardized Coefficients	t
	B	Std. Error	Beta	Sig.

1	(Constant)	70.112	.614		114.122	.000	
	Incomplete Answer	-19.405	1.047		-.428	-18.527	.000
	Skip Answer	-39.637	.914		-1.003	-43.381	.000
a. Dependent Variable: AKM average score							

### Research Discussion

Validity is the quality that shows the correlation between the measurement and the meaning of the criteria or learning behavior (Purwanto, 2002). Validity refers to the determination of evaluation tools for the concept to be evaluated (Sudjana, 2014). In order for the research measuring instrument to be trusted as a data collection tool, a reliability test is carried out. Reliability is a term commonly used to indicate that the measurement results are relatively consistent if the measurement is carried out repeatedly (Umar, 2009). According to Sekaran (2011) Reliability is a measurement of the stability of a measurement consistency.

Instrument validity is related to the degree to which it is appropriate to measure what is intended by the measurement, and reliability is related to the extent to which the measurement is reliable based on its consistency (Hikmah & Muslimah, 2021). Validation of the Minimum Competency Assessment questions distributed in five sub-districts in the city of Cirebon, represented by several main schools, was declared valid. This is evidenced by the

processing of SPSS output results conducted by researchers.

The level of validation of the Minimum Competency Assessment questions, especially about the numeracy skills of students in terms of complete, incomplete and skipping answer schemes. Produces the average value of the Minimum Competency Assessment. The ability of students to answer questions is still low, as evidenced by the negative results on incomplete and skipping answers.

The validity test is used to measure whether a test is valid or not. The question is said to be valid if the items on the questionnaire are able to reveal something that will be measured in the study. The provisions for instrument validation are measured based on the validity criteria which states that if  $r \text{ count} \geq r_{\text{table}}$  then the instrument is said to be valid, but if  $r \text{ count} \leq r_{\text{table}}$  then the instrument is said to be invalid. It is known that the  $r$  table uses a significance level of  $\alpha = 5\%$  with  $n = 336$ , so the  $r_{\text{table}}$  value is 0.113, as illustrated in the product moment table.

Table 9.

Tabel Nilai r Product Moment

N	Taraf Signif		N	Taraf Signif		N	Taraf Signif	
	5%	10%		5%	10%		5%	10%
3	0,997	0,999	27	0,381	0,487	55	0,266	0,345
4	0,950	0,990	28	0,374	0,478	60	0,254	0,330
5	0,878	0,959	29	0,367	0,470	65	0,244	0,317
6	0,811	0,917	30	0,361	0,463	70	0,235	0,306
7	0,754	0,874	31	0,355	0,456	75	0,227	0,296
8	0,707	0,834	32	0,349	0,449	80	0,220	0,286
9	0,666	0,798	33	0,344	0,442	85	0,213	0,278
10	0,632	0,765	34	0,339	0,436	90	0,207	0,270
11	0,602	0,735	35	0,334	0,430	95	0,202	0,263
12	0,576	0,708	36	0,329	0,424	100	0,195	0,256
13	0,553	0,684	37	0,325	0,418	125	0,176	0,230
14	0,532	0,661	38	0,320	0,413	150	0,159	0,210
15	0,514	0,641	39	0,316	0,408	175	0,148	0,194
16	0,497	0,623	40	0,312	0,403	200	0,138	0,181
17	0,482	0,606	41	0,308	0,398	300	0,113	0,148
18	0,468	0,590	42	0,304	0,393	400	0,098	0,128
19	0,456	0,575	43	0,301	0,389	500	0,088	0,115
20	0,444	0,561	44	0,297	0,384	600	0,080	0,105
21	0,433	0,549	45	0,294	0,380	700	0,074	0,097
22	0,423	0,537	46	0,291	0,376	800	0,070	0,091
23	0,413	0,526	47	0,288	0,372	900	0,065	0,086
24	0,404	0,515	48	0,284	0,368	1000	0,062	0,081
25	0,396	0,505	49	0,281	0,364			
26	0,388	0,496	50	0,279	0,361			

The validity test of the questions will be explained through the results of SPSS output through tables and question distribution charts, as well as explaining how each question is said to be valid or invalid using SPSS version 25 data processing.

**Table 10 Problem Validation Results**

Case Processing Summary			
		N	%
Cases	Valid	336	100.0
	Excluded <sup>a</sup>	0	.0
	Total	336	100.0

a. Listwise deletion based on all variables

The results of item validity using SPSS 25 with 336 respondents. The number of numeracy items tested for validity was 15 questions with 6 multiple choice questions, 3 compound multiple choice questions, 3 matching questions and 3 short fill questions.

**Table 11 Problem Validation Test Results**

Problem	r count	r table	Keterangan
1	0.335	0.113	Valid
2	0.567	0.113	Valid
3	0.507	0.113	Valid
4	0.646	0.113	Valid
5	0.526	0.113	Valid
6	0.520	0.113	Valid
7	0.661	0.113	Valid
8	0.479	0.113	Valid
9	0.633	0.113	Valid
10	0.299	0.113	Valid
11	0.4	0.113	Valid
12	0.235	0.113	Valid
13	0.274	0.113	Valid
14	0.081	0.113	Not Valid
15	0.547	0.113	Valid

Source: SPSS 2022 Processed Data

The results of SPSS 25 output say that question item no.1 is said to be valid because r count is greater than r table, about 0.335 greater than 0.113. With respondents who answered correctly as many as 29 students and who answered incorrectly 307 students. Respondents who answered correctly, did the questions completely so that they got the maximum score. Meanwhile, respondents who answered incorrectly, worked on the problem briefly so that the score was not maximized.

Question item no.2 with r count 0.567 is greater than r table, so question no.2 is said to be valid. The number of respondents who

answered completely as many as 236 obtained the maximum average AKM score. Item no. 3 to item no. 13 the value of r count is greater than r table, so that the item is said to be valid.

In contrast to item no.14, the r value is 0.081 smaller than r table, so item no.14 is said to be invalid. Item no.15 r count is 0.547 greater than r table, so the item is said to be valid. Overall, the tested r value is greater than r table, so it is said that the items in this study are valid.

### Reliability Test

Ghozali (2009) states that reliability is a tool for measuring a questionnaire which is an indicator of variables or constructs. A questionnaire is said to be realibel or reliable if a person's answer to a statement is stable over time. Measurements that have high reliability are measurements that can produce reliable data. The high and low reliability is indicated by a number called the reliability coefficient value. High reliability is indicated by an r value close to 1. Reliability testing in this study uses the SPSS version 25 application which refers to Alpha Cronbach. The following are the results of the SPSS 25 output reliability test.

**Table 12. Reliability test**

Reliability Statistics	
Cronbachs Alpha	N of Items
.720	15

If the alpha value is more than 0.90, it means perfect reliability. If the alpha is between 0.70 - 0.90, it means high reliability. If alpha is 0.50 - 0.70, it means moderate reliability. If alpha is less than 0.50 it means low reliability. Researchers can conclude based on the results of SPSS 25 output with a total of 15 items, the statistical result of Alpha Cronbach in this study is 0.72. This means that all the numerical items are reliable, because the alpha value is more than 0.70.

## Regression Analysis with Dummy Variables

Regression analysis is used to measure how much influence between the independent variable and the dependent variable. In this study, there is more than one independent variable. Then the analysis used is multiple

linear regression. Multiple linear regression is a regression model that involves more than one independent variable. Multiple linear regression analysis is performed to determine the direction and how much influence the independent variable has on the dependent variable (Ghozali, 2009).

**Table 13. Research variables**

Variables Entered/Removed <sup>a</sup>			
Model	Variables Entered	Variables Removed	Method
1	Problem Category, District Name <sup>b</sup>	.	Enter
a. Dependent Variable: AKM Average Value			
b. All requested variables entered.			

The table above shows that the independent variables are the question category and the name of the sub-district. The question categories here consist of numeracy question categories with complete,

incomplete and skip answers. Meanwhile, the dependent variable is the average AKM score. The removed variable column is not filled or empty. This means that there are no variables that are discarded.

**Table 14. Model Summary**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.922 <sup>a</sup>	.850	.849	7.347
a. Predictors: (Constant), Jumping Answers, Incomplete Answers				

The table above explains the magnitude of the influence of all independent variables on the dependent variable. The effect is symbolized by R (Correlation). The magnitude of the correlation or relationship value (R) is 0.922 and explains the percentage of the influence of the independent variable on the dependent variable called the coefficient of determination which is the result of

multiplying R. From the results of the SPSS output, the coefficient of determination (R<sup>2</sup>) is 0.850. This means that the influence of the independent variable (complete, incomplete and jumping answers) on the dependent variable (AKM average score) is 85%, while the remaining 15% is influenced by other factors outside variable X (independent variable).

**Table 15. Anova**

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	101703.245	2	50851.623	942.159	.000 <sup>b</sup>
	Residual	17973.180	333	53.974		
	Total	119676.426	335			
a. Dependent Variable: AKM Average Value						
b. Predictors: (Constant), Jumping Answers, Incomplete Answers						

This ANOVA table explains whether there is a significant influence between the independent variable (numeracy question category) on the dependent variable (AKM average score) together (simultaneously). From the table above, it can be seen that the F count is 942.159. After finding the F count, the researcher then looked for the F table by calculating the number of df listed

in the ANOVA output results. To find the F table, the SPSS application is needed. Attached.

The output result of the F table is 3.02. Researchers compared the F table value with the calculated F value. If the value of f table is smaller than F count, then all independent variables affect the dependent variable and vice versa. If the F table is



greater than F count then the independent variable has no effect on the dependent variable.

The table above shows that F count 940.524 is greater than F table 3.02, so the researcher

concludes that the independent variables (category of numeracy questions with complete, incomplete and skip answers) simultaneously affect the AKM average score.

Table 17. Coefficient Table

Model		Coefficients <sup>a</sup>			t	Sig.
		Unstandardized Coefficients	Std. Error	Standardized Coefficients		
		B		Beta		
1	(Constant)	70.112	.614		114.122	.000
	Incorrect Answer	-19.405	1.047	-.428	-18.527	.000
	Jumping Answer	-39.637	.914	-1.003	-43.381	.000

a. Dependent Variable: AKM Average Value

Outpun this table provides an overview of the equation or regression model. This analysis is used to determine the direction of the relationship between the independent variable and the dependent variable. Whether each independent variable is positively or negatively related and to predict the value of the dependent variable if the value of the dependent variable increases or decreases. The data used is interval or ratio scale.

The coefficient table shows that the constant value has a positive value of 70.112. The positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable. This shows that if all independent variables which include incomplete answers ( $\chi_1$ ) and jumping answers ( $\chi_2$ ) are 0 or do not change, then the average value of AKM is 70.112. From the explanation above, the multiple linear regression equation can be described, namely,

$$Y = \alpha + \beta_1 D_2 + \beta_2 D_3$$

Description:

Y = Dependent variable (AKM average value)

$\alpha$  = Constant (the value of Y if  $\chi_1 \chi_2 = 0$ )

$\beta_1 \beta_2$  = Regression coefficient

D1 D2 = Independent variable (Incomplete answers = D2 and skip answer = D3)

Can be explained as follows:

$$Y = 70,112 - 19,405 D_2 - 39,637 D_3$$

The dummy regression coefficient value for variable D2 (incomplete answer) is -19.405. This value shows a negative or opposite

effect between the incomplete answer variable and the average value of AKM. This means that if the incomplete answer variable increases by one unit, the AKM average value variable will decrease by 19.405. Vice versa, if the incomplete answer variable decreases by one unit, the AKM average value variable will increase by 19.405. Assuming that the jump answer variable (D3) is considered constant.

The regression coefficient value for the D3 dummy variable (jumping answer) is -39.637. This value also shows a negative effect on the average value of AKM. If the jumping answer variable increases by one unit, the AKM average value variable decreases by 39.637. Conversely, if the jumping answer variable decreases by one unit, the AKM average value variable increases by 39.637.

From the dummy regression data given by the SPSS output results, it can be analyzed as follows:

$$Y = 70.112 - 19.405 D_2 - 39.637 D_3$$

That

D2 = 1 Incomplete answer

D2 = 0 Other answers

$$Y = 70,112 - 19,405 (1) = 50,71$$

The regression coefficient value for the dummy variable D2 is that the incomplete answer increases by one unit, the average value of AKM is 50.71. This means that learners who answer AKM questions incompletely will get a minimum score of 50.71. The higher the answer of Learners who answer incomplete, the smaller the average value of AKM.

D3 = 1 Answer jumps

D3 = 0 Other answers

$$Y = 70,112 - 39,637 (1) = 30,475$$

The regression coefficient value for the D3 dummy variable is that the jumping answer increases by one unit, the average value of AKM is 30.48. This means that learners who answer AKM questions by jumping will get a minimum score of 30.48. The higher the answer of Learners who answer jumping, the smaller the average value of AKM.

D2 and D3 = 0 Complete answer

$$Y = 70,112 - 39,637 (0) - 39,637 (0) = 70,112$$

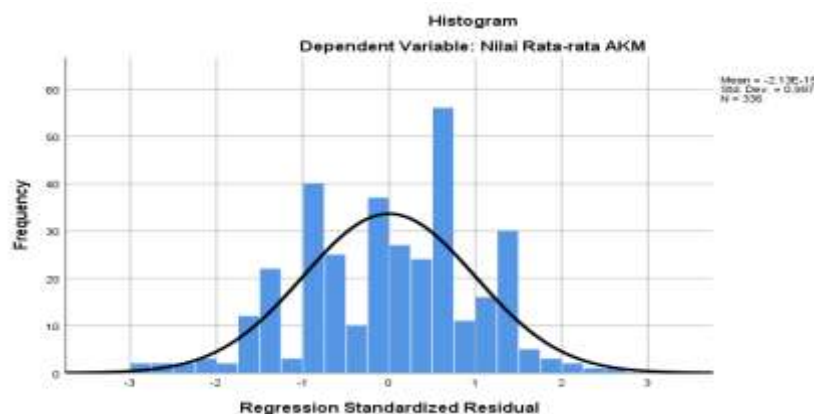
The regression coefficient value for the dummy variable D2 is a constant incomplete answer and D3 a constant jumping answer, then the average value of AKM is 70.11. This means that learners who answer AKM questions with complete answers will get a maximum score of 70.11. The higher the answer of Learners who answer incomplete and jump, the smaller the average value of AKM. Vice versa, if the Learners answer with incomplete answers and jumping has decreased by one unit, then the average value of AKM has increased.

From the overall analysis results using the SPSS version 25 application, it can be concluded that the numeracy items tested to respondents are all valid and reliable. So

that the results of the answers of respondents who answered numeracy questions completely, incompletely and skipped had an effect on the AKM average score.

Intervention from educators has an effect on the average value of AKM. This can be seen from the results of the SPSS output, the more respondents who answer numeracy questions completely, the greater the average value of the respondent's AKM. The more respondents who answered numeracy questions incompletely and jumped, the smaller the AKM value of these respondents.

Based on the description above, it can be concluded that the implementation of the Minimum Competency Assessment in the numeracy domain of class V State Elementary School there is a significant comparison between students who work on complete, incomplete and jumping AKM questions. The findings above are in line with the opinion of Probowening et al. (2014) that implementing learning with innovative and interesting models, methods and tailored to the abilities and characteristics of students, they will feel valued for their abilities so as to provide learning motivation that can optimize student learning outcomes.



## CONCLUSION

This study aims to determine whether respondents (students) who answer numeracy questions completely, incompletely and jumping affect the average

value of the AKM. Based on the data analysis and discussion carried out in the previous chapter, the researcher obtained conclusions regarding the numeracy ability of students in solving AKM questions in

terms of cognitive processes in public elementary schools in Cirebon City in the 2021/2022 academic year as follows:

The results of this study indicate that 93% of the questions used are valid. This means that the numeracy questions used have accuracy and accuracy as a measuring tool in conducting assessments. Therefore, this numeracy question is suitable for use in research. Likewise with the results of the numeracy question reliability test. The Alpha Cronbach's value of 72% means that the numeracy questions tested are reliable or trustworthy. With an Alpha Cronbach's value of 72% the numeracy questions tested have a good degree of stability, consistency and accuracy so that they can produce reliable data.

The complete answer variable on numeracy questions has a positive constant coefficient value of 70.112 indicating that there is a unidirectional influence between the independent variable and the dependent variable. While the incomplete answer variable shows a negative effect of 19.405. This means that if the incomplete answer variable increases, the AKM average value variable decreases. The same is the case with the jump answer variable which is worth -39.637. Has a negative or opposite effect between the jumping answer variable and the AKM average value variable. The more respondents with incomplete and skipping answers decrease, the higher the average value of AKM.

There is a difference in comparing the average value of AKM in students who work on Minimum Competency Assessment questions completely, incompletely and jumping. From the description of the conclusions of the data analysis and discussion above,  $H_0$  is rejected and  $H_1$  is accepted. The hypothesis of this study can be accepted empirically that the intervention of educators in solving AKM questions with complete, incomplete, and jumping answers affects the average value of AKM.

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