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Analysis of Numeracy Ability of Class VI Students at State 2 Elementary School of Kotamobagu

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ABSTRACT

This research aims to analyze students' numeracy abilities in elementary schools. The research used is quantitative research with experimental methods. The subjects in this research were class VI students at SDN 2 Kotamobagu involving PPG Daljab UNIMA Category 1 Batch 2 students as actors in the learning process and researchers acting as observers in the research. Data collection techniques use learning outcomes evaluation tests and observations regarding students' skills and attitudes during the learning process. The instruments used are evaluation test questions consisting of 5 questions and a skills observation sheet consisting of 3 assessment aspects, namely measurement, modeling, and presentation. As well as observing students' attitudes which consist of 3 aspects, namely activeness, cooperation, and creativity. Data analysis in this research uses the Rasch Model. The research results show that numeracy ability is an ability that needs to be continuously improved and is not enough if only applied once or twice. Numeracy skills require continuous habituation and appropriate instruments or measuring tools to stimulate increased numeracy skills.

Keywords: Ability, Elementary School, Numeracy

INTRODUCTION

The development of the era marked by the progress of internet-based information technology with the name Industrial Revolution 4.0 has become one of the challenges for every teaching staff in

developing and forming knowledgeable people, improving the quality of human resources, and achieving national development goals following the Constitution of the Republic of Indonesia 1945, namely to make the nation's life more intelligent (Anderha et al., 2021) based on the press release of the Ministry of Education, Culture, Research and Technology number: 697/sipers/A6/XII/2023 Indonesia's ranking in PISA 2022 rose 5-6 positions compared to 2018 where literacy reading, Indonesia's ranking in PISA 2022 rose 5 positions compared to before. For mathematics literacy, Indonesia's ranking in PISA 2022 also rose 5 positions, while for scientific literacy it rose 6 positions, this brings fresh air for improvement and improvement in the quality of education services.

However, improvements in the PISA (International Student Assessment Program) program have not fully overcome existing problems, such as the implementation of teaching and learning activities in the formal world has not been comprehensive in promoting students' numerical skills, which is the result of students' low numerical skills (Nasution, 2023). Numeracy can be defined as the ability to apply number concepts and arithmetic operation skills in daily life both at home, at school, and in society. Numeracy skills are needed by students, including students in elementary schools, because it is one of the competency demands that must be mastered in this era of independent curriculum (Rohim et al., 2023). Studying numeracy is not about memorizing or reading words but relating the results obtained from previous experiences and combining them with concepts received during learning (Anggraini & Wulandari, 2021). Mathematics is one of the important subjects in the world of education. The numeracy abilities of students who have low mathematical abilities, these students cannot understand the problems in mathematics and have difficulty analyzing them. Not planning the work according to instructions, so that the solution does not lead to mathematical concepts. Finally, the results obtained are invalid. This is one of the reasons behind students' low numeracy abilities.

To improve students' numeracy skills, learning can be carried out and evaluation activities can be carried out using appropriate techniques and analyzed to determine the increase in students' numeracy skills. In this case, assessment instruments are very necessary in considering decisions regarding the achievement of student learning achievements by educators and schools (Stiadi et al., 2023). Students need to have numeracy skills because this cannot be acquired quickly but requires intense guidance and practice. so that the instruments used to measure students' numeracy abilities need to be analyzed for the level of their relationship to existing indicators (Sari et al., 2023).

based on previous research, several studies regarding numeracy abilities, namely research (Irwan & Masrul, 2023), namely about analyzing students' numeracy abilities in mathematics learning in elementary schools, namely research that focuses on quantitatively describing students' numeracy abilities in mathematics learning, based on the research focus So the research carried out focuses on methods, benefits and how to provide basic literacy for students and improve the quality of mathematics learning carried out by elementary school teachers in the classroom through the implementation of learning models so that they affect improving the numeracy skills of elementary school students. The difference with what researchers do is that it is more about analyzing measuring instruments that are right on target, which are useful, and useful for teachers in the classroom to use in measuring students' numeracy abilities.

METHODS

This research aims to analyze students' numeracy abilities in elementary schools. This type of research is quantitative research with experimental methods. The subjects in this research were class VI students at SDN 2 Kotamobagu involving PPG students in UNIMA Category 1 Class 2 positions as actors in the learning process and researchers acting as observers in the research. The data collection technique in this research uses learning outcomes evaluation tests and observations regarding students' skills and attitudes during the process. The instruments used in this research are evaluation test questions consisting of 5 questions and a skills observation sheet consisting of 3 assessment aspects, namely measurement, model making, and presentation. As well as observing students' attitudes which consist of 3 aspects, namely activeness, cooperation, and creativity. Data analysis in this study used the Rasch model method.

RESULTS AND DISCUSSION

This research was carried out at SDN 2 Kotamobagu on class VI students involving PPG students in UNIMA Category 1 Class 2 positions as actors in the learning process and researchers acting as observers in the research. Based on the results of observations made, it was found that the numeracy abilities of class VI students at SDN 2 Kotamobagu were still low, this was caused by several problems that occurred in the classroom, including students who were still not trained enough to complete tests for numeracy abilities, mathematics assessments that focused on numeracy abilities were lacking. very rarely done, the questions given to students rarely contain questions that require numeracy skills, and the use of questions in the context of everyday life is still rarely done and has not been developed with valid and reliable instrument rules. So based on the problems that occur, the problem-solving carried out by researchers is the first, namely carrying out data analysis on instruments used as assessments in the teaching and learning process, both in the form of tests and non-tests. Data analysis was used using Winstep software to see the reliability and consistency of answers on test and non-test instruments.

The test instrument used consists of evaluation test questions consisting of 5 questions. Below are the results of the data analysis as shown in Table 1.

Table 1. Instrument Analysis Results

SUMMARY OF 5 MEASURED (NON-EXTREME) Item

	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	413.0	25.2	.00	.09	.96	-.78	.99	-.79
SEM	20.0	.4	.15	.00	.45	1.54	.48	1.55
P.SD	40.1	.7	.29	.01	.90	3.08	.96	3.09
S.SD	44.8	.8	.33	.01	1.01	3.45	1.08	3.46
MAX.	490.0	26.0	.26	.09	2.32	3.88	2.46	3.86
MIN.	385.0	24.0	-.50	.08	.15	-3.59	.12	-3.63

REAL RMSE	.10	TRUE SD	.27	SEPARATION	2.67	Item	RELIABILITY	.88
MODEL RMSE	.09	TRUE SD	.28	SEPARATION	3.20	Item	RELIABILITY	.91

S.E. OF Item MEAN = .15

Item RAW SCORE-TO-MEASURE CORRELATION = -.96
Global statistics: please see Table 44.
UMEAN=.0000 USCALE=1.0000

Based on the results of data analysis using ministeps software, there are 5 instrument items. It can be seen that the quality of the questions in the research instrument is very good. This can be seen from the item reliability value which is between 0.91-0.94. The instrument developed has a very good reliability coefficient value seen from Cronbach's alpha value > 0.80 as seen in the table above. Other data that support the results of data analysis regarding item reliability values is based on the reliability criteria in Rasch modeling (Sumintono, 2016). The following is presented in Table 2.

Table 2. Reliability Criteria in Rasch modeling

Reliability Value(*Pearson/Item)*	Interpretation
>0.94	Special
0.91 – 0.94	Very good
0.81 – 0.90	Good
0.67 – 0.80	Enough
<0.67	Weak

Based on the results of the reliability criteria table in Rasch modeling with the results of data analysis of the reliability item values, it is between 0.91-0.94, so it is in the Special interpretation. This means that the quality of the questions in the instrument has a very good reliability aspect. Instrument reliability is the same as the extent to which the results of a measurement are consistent and reliable as well as the extent of the instrument's reliability in measuring a variable (Situmorang & Purba, 2019). So a quality instrument is an instrument whose validity has been tested (Erlinawati, 2019).

The next stage is to look at the instrument reliability coefficient value using Cronbach Alpha analysis which is presented in table 3.

Table 3. Results of Cronbach Alpha Analysis.

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     SUMMARY OF 26 MEASURED (EXTREME AND NON-EXTREME) Person
-------------------------------------------------------------------------------
|          TOTAL                          MODEL         INFIT        OUTFIT    |
|          SCORE     COUNT     MEASURE    S.E.      MNSQ   ZSTD   MNSQ   ZSTD |
|-----------------------------------------------------------------------------|
| MEAN      79.4       4.8        -.16     .22                                 |
|  SEM       2.7        .1         .06     .02                                 |
| P.SD      13.3        .6         .29     .12                                 |
| S.SD      13.5        .6         .30     .13                                 |
| MAX.      90.0       5.0         .15     .83                                 |
| MIN.      20.0       2.0       -1.30     .18                                 |
|-----------------------------------------------------------------------------|
| REAL RMSE    .27 TRUE SD     .10  SEPARATION   .37  Person RELIABILITY  .12 |
|MODEL RMSE    .25 TRUE SD     .15  SEPARATION   .59  Person RELIABILITY  .26 |
| S.E. OF Person MEAN = .06                                                   |
-------------------------------------------------------------------------------
Person RAW SCORE-TO-MEASURE CORRELATION = .93
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = 1.00
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From the table 3, it can be seen that the person reliability value is <0.67. This shows that students' numerical abilities are still weak. Other data that supports that the analysis results show a weak category is by using the Instrument Reliability Correlation Coefficient criteria which are presented in Table 4.

Table 4. Instrument Reliability Correlation Coefficient Criteria

Correlation coefficient	Correlation	Interpretation/Reliability
$0.90 \leq r \leq 1.00$	Very high	Very regular/excellent
$0.70 \leq r \leq 0.90$	Tall	Still/good
$0.40 \leq r \leq 0.70$	Currently	Fair enough/Good enough
$0.20 \leq r \leq 0.40$	Low	Not constant/bad
$r < 0.20$	Very low	Very unstable/very bad

Based on the criteria for the reliability correlation coefficient with the results of the analyzed data, the person reliability value is <0.67 so that it is in a medium correlation with interpretation/reliability, namely quite constant/good enough so that the question items are considered reliable because they meet the correlation coefficient. (Ndiung & Jediut, 2020) to obtain a good instrument, the procedure for developing instruments in research must go through procedures following scientific principles. This is in line with research conducted by (Suriyani & Wahyuni, 2021) on the preparation of instruments, teachers are required to be able to produce questions and answers that follow the 3 characteristics that are the focus of the instrument, namely content, constructs, and language that must be appropriate, where the content requires questions and answers that are following indicators of numeracy ability, constructs that require clear instructions on numeracy questions, creating scoring guidelines that are following indicators of numeracy ability, and language that must be made in language that is easy to understand.

CONCLUSION

Based on the results supported by data analysis of the instruments used to measure students' numeracy abilities, it can be concluded that the instruments used are quite good in measuring the numeracy abilities of class VI students at SDN 2 Kotamobagu. This is proven by the results of the evaluation test consisting of 5 questions using Minsteps software. The quality of the questions in the research instrument is very good. This can be seen from the item reliability value which is between 0.91 and 0.94, the reliability coefficient is very good, as seen from Cronbach's alpha value > 0.80, and the person reliability value is < 0.67, so it is in moderate correlation with interpretation/reliability, namely quite constant/quite good. So that students' numeracy ability instruments can be held accountable for their results to measure students' numeracy abilities.

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