

## **INSTRUMENT DEVELOPMENT OF MATHEMATICS LEARNING OUTCOMES BY THE RASCH MODEL IN ELEMENTARY SCHOOL TO SUPPORT THE IMPLEMENTATION OF THE 2013 CURRICULUM**

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### **ABSTRACT**

This research aims to produce a grid design of mathematics learning outcomes instruments at the elementary school level in implementing the 2013 Curriculum. This research is expected to bring about the availability of grid design and supporting devices for the implementation of elementary school mathematics learning outcomes instruments. Output which obtained in this study is to help teachers in the development system of assessment that is sustainable, focussing on aspect of the analysis of the level of difficulty gains and the level of ability of students to use the model of Rasch. The sustainability implementation of Curriculum 2013, which may involve the heads of schools, teachers and students and the other relevant. In terms of the effectiveness, fostering sustainable used as the focus of a major system development as an instrument to validate test by the teacher and doing test try limited to the four schools in Palu. At the first stage, the design of instrument is carried out in the form of lattice and grain instruments, pieces of observation and questionnaires, test the construct, and the revision of the group of teachers and students of the school elementary grade IV. Result of test respondents (elementary School students in Palu) obtained that the point about the difficulty is the question number 26 (S26) with a value logit 2,08. While the matter of the most easily is the matter of number 3 (S3) with a value logit -1,84. Result output tables obtained information that does not exist grain matter which does not meet all the requirements fit (oufit MNSQ, outfit ZSTD and Pt Mean Corr) so that the point about including category fit or appropriate.

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### **INTRODUCTION**

Education is a process that greatly determines the development of individuals and society. The progress of a society can be seen from the development of education. The curriculum functions as a tool in the educational process in schools. (Priestley et al., 2014) In it not only contains the direction and goals to be

achieved.(Matlakala & Maritz, 2019). However, it also concerns the content, guidelines in compiling procedures or strategies to achieve goals to how to evaluate the success of achieving those goals.

Curriculum 2013 should be prepared comprehensively, because there is important aspect that becomes a point of debate in the world of education, even at the community and student levels, is the abolition of the national exam into a school-based school exam (USBN) and a school assessment that is handed over to schools or teachers who know closely the abilities/competencies of children or students.(Wahyudi & Chamdani, 2017). The UNJ national seminar on March 10, 2020 regarding independent learning, the Minister of Education and Culture stated that the assessment that will be carried out next year is mapping of minimum literacy and numeracy competencies and strengthening learning applications oriented to the PISSA and TIMSS sizes which are carried out at the education unit level, namely in grade 4 Elementary School, 8 Junior High School, and 11 Senior High School.

Aspects of development, the 2013 Curriculum authorizes the education unit to develop. The center prepares the curriculum as steadily as possible, and teachers have a room to develop it. At the implementation level, the government facilitates all curriculum components such as syllabus, textbooks and assessment guidelines(Wahyuni & Berliani, 2019). These statements are consistent with the idea of USBN being centered on schools. The granting of autonomy allows teachers to develop and express their own creativity, including the assessment system. However, there are no internal studies that describe the curriculum, the teacher is again faced the situation to implement the 2013 Curriculum. Of course it is not an easy job to change something that has been adopted and implemented, regardless of whether the implementation has been perfect or not.

Teachers as the holder of educational praxis control must be given many opportunities to continue learning, solving problems, developing creativity both from the experiences of other people's success and their own experiences.(Yuen et al., 2018)..(Wahyuni & Berliani, 2019). Thus, it becomes very urgent if in the implementation of the 2013 Curriculum, teacher readiness is really mature and supported by a conducive system.(Diana San, 2019) The preparation must be carried out on an ongoing basis based on the progress achieved at each stage.(Rusman, 2018).

In this study, the aspect of teacher readiness and ability becomes a priority and as a basis for designing an assessment system in preparing instruments for mastering the competencies of each student that supports the implementation of the 2013 Curriculum.(Winarti Dwi Febriani., Geri Syahril Sidik., 2013) This research focuses on developing instruments for learning mathematics outcomes as an effort to support one aspect of the assessment, namely development of instruments based on the syllabus of mathematics learning at the fourth or fifth grade elementary school before completing studies in elementary school.(Oktaviani & Wulandari, 2019)

This research was developed at least as complementary or even as an alternative to the assessment system prepared by the Ministry of Education and Culture, namely the preparation of *standardized tests* through a design of assessment grids and instrument items. In this case, a primary school teacher assessment system will be developed that includes aspects of material, competence, grids and assessment structures based on the readiness and ability of teachers to map students' abilities using the Rasch modelling application.(van de Grift et al., 2019)

The purpose of this study is to develop an instrument to obtain a grid and instrument items that were validated by construct by the teacher based on the criteria

for the assessment system and teacher preparation in implementing the 2013 Curriculum. At the same time mapping students' abilities based on the level of difficulty of the questions.

However, the ideal and perfection 2013 Curriculum, especially the standard of assessment as a curriculum document, its success really depends on the implementation process carried out by teachers in schools. Based on a study conducted with students who have collected instruments and an assessment system carried out by teachers at the Elementary School in Palu, it turns out that the test instrument used is still very low in the level of achievement of cognitive abilities and does not use criteria in compiling the test so that the instrument used was found to have several problems. Testing a test, dominantly is a weakness at the implementation level that is not able to reveal the competence of students.

This study has a strategic position in order to contribute to the successful implementation of Curriculum 2013 for providing assessment system in achievement of each competency learning of the existing system so that the principles of sustainable development (*continuous improvement*) can be met.

The curriculum development approach is based on a management system, target focus and competence. (Ikhsan & Hadi, 2018). When it is viewed from the management system, curriculum development is distinguished between centralized (centralized) and dispersed (decentralized) management systems. In the context of development. The principles of curriculum development including: goal-oriented principles, relevance, efficiency and effectiveness, flexibility, continuity, balance, integration and quality principles. (Hairon et al., 2018)(Purwadhi, 2019)

To support the implementation of the curriculum in terms of developing assessment instruments, the program developed is a teacher assessment system. Teacher training is a program aimed at helping teachers develop the knowledge, skills and attitudes they need to teach competently. (Tronsmo, 2019). In its development, the term teacher training is widely used in developing countries which includes teacher preparation programs (*pre-service training*), skills *upgrading* and/or teacher qualifications (*in-service training*). In industrialized countries, training tends to mean a form of education that focuses on specific *outcomes* obtained through a series of stages within a certain period. It based on the assumption that through mastering discrete skills, teachers will be effective in the classroom, (Yani Achdiani & Rusliyani, 2017).

The implementation of the assessment system for teachers is how to measure changes in the cognitive aspects of students at each level of education which is the responsibility of the school, therefore, to measure it of course requires a valid and reliable measuring instrument. So far, there is no valid measuring instrument to measure the ability of students in mathematics in elementary schools.

Steps taken in developing the instrument: 1) developing a concept definition, 2) developing an operational definition, 3) choosing a technique for giving a scale, 4) conducting a review of item justification based on a predetermined scale, 5) selecting the response or sample size, 6) developing instructions for the response, 7) preparing a draft of the instrument, 8) conducting an initial trial, 9) analysing the initial trial data, 10) revising the instrument, 11) conducting an extended or final trial, 12) producing instruments, 13) performing validity and reliability analysis, 14) preparing test manuals. (DeMonbrun et al., 2017), (Yuyun Dwi Haryanti & Dudu Suhandi Saputra, 2019),

Several steps to develop the instrument, so that the tool is feasible to use, 1) defining the insight or latent aspect to be measured, 2) determining the user or

respondent, 3) specifying the content covering the topic, 4) determining the item format., types of responses and scoring procedures, 5) planning trials for item analysis, 6) determining the procedures used for standardizing measuring instruments, 7) forming a draft test implementation guide.(Kearney, 2016)., (Muñiz & Fonseca-Pedrero, 2019).

According to(Ulfah & Felicia, 2019), in the results of their research using the 4-D model or Thigarangan model which consists of 4 main components; *define*, *designed*, *develop*, and *disseminate*, it shows that it is very effective in developing cognitive development test instruments in physics learning with the results expert assessment of 3.89, which means that all aspects asked are very valid, although the trials carried out are very limited and did not reach *stage 4*, namely *disseminate* which means not conducting expanded trials to see the extent to which the level of testability or reliability of the instruments developed.

from the opinion of the experts on almost all the experts believe things are equal, the point in the process of development of the instrument originated from the assessment theories that continue to define the constructs, dimensions and indicators. Furthermore, make grating and develop instruments, validated by the content and construct to the experts, revised and then test try in test validation and reliabilities later revisions and tested back over and continued so until the end fulfilledlimit the maximum value of the validity and reliabilities grain.

Stages of development instruments outcomes studied mathematics based on learning process of mathematics at the level of elementary school, especially class grade 4 can be describe as follows:

- a. Development of the conceptual and operational definition are based on basic competence study and indicators of achievement of mathematics learning process.
- b. Preparation of grain instrument by grating the result of learning mathematics, followed confirmation legability grain of instruments to the expert.
- c. Readability test on the expert panellist group as *judges* for the selection of items based on the scale value (S).
- d. Test try on students at four elementary schools in Palu, followed by analysis of the model application Rusch.

The application of the model in the trial can provide data about the effectiveness of using the instrument. Effectiveness is determined based on quantitative analysis of the result of the observation of the implementation of the validation.

Observing recent developments that it is very rare to develop instruments for learning mathematics outcomes in elementary schools based on the implementation of the 2013 curriculum in the field, this research is important to do and provide up-to-date information on the practical use of instruments at the elementary school level. In addition, with the existence of high-level cognitive development at the elementary school level, this research is an initial illustration in mapping the quality of learning mathematics and at the same time supporting the development of minimum ability assessment at the elementary school level.

## METHOD

The analysis that used to process the result of the test is a model Rash were presented by Goeorg Rash (Erling B. Andersen, 1982), stated that the opportunity to be able to resolve the problem with the right to rely on the ratio between the ability of the people and the level of the question difficulty. Furthermore, he states that an individual who has a level of ability or *abilitas* are more substantial than individuals more should have a big opportunity to answer correctly. With the principle that each

item that is more difficult to cause the chances of individuals to afford answer becomes small. In the mathematical probability of Odd-Ratio and Rasch logit be in formulated as follows:

$$\text{Odd Ratio} = P/(NP)$$

P is the amount of matter that is done with the right (total score); N is the number of questions were given. In mathematical using functions logarithms were called logarithm odd unit or plain called logit embodied in the question:

$$\text{Logit} = \log(P/(NP))$$

## RESULTS AND DISCUSSION

### 1. Overview of 2013 Curriculum Implementation

Curriculum 2006 (SBC) developed into the curriculum in 2013 to be based thinking challenge period before a nation that is marked by centuries of science knowledge, knowledge-based society is based on thinking about the challenge period ahead, the perception of society, the development of knowledge and pedagogy, competencies future ahead, and the phenomenon of negative that surfaced. In order for the implementation of Curriculum 2013 can run with both, has done training for teachers who will implement the curriculum are on the teachings of 2014/2015 to 2018/2019 is an elementary school, junior high, and high school/vocational school teachers. The development of the instrument in the implementation of Curriculum 2013 began with the activities of preparation (syllabus and grating instruments were designed by researchers), the implementation of the validation, evaluation and development of instruments in the field to involve four schools in Palu.

Teachers who have followed the equation perception regarding the validation of the instrument, as mentioned above, it is necessary the implementation and development of instruments that Brazilians tool measurement to evaluate the standard of competence and competence base each level on the level of unit training base. In this research, grade 4 of elementary school became the target. In this case, teacher becomes an instrument which designed based on the 2013 curriculum and syllabus with consideration of time and budget are very limited, the participants are elementary school teachers who represented every school that exist in Palu by assuming schools are already implementing the curriculum in 2013 as a whole from grade 1 to 6. Grade 6 becomes the target object of research, because it is considered as the students that are already able to resolve the problem of mathematical basis on grade high as an attempt to determine the achievement of competencies basic to choose 4 schools in Palu.

Implementation of the development of instrument -level primary school based curriculum in 2013 is involve several components, including lecturers as researchers vice universities high and teachers as a validator that is tasked to inspect the instrument based on lattice problems and instruments with plilihan yes or no , then followed statements by a matter that troubled with make clarifications / improvements aagar about the bisamenjadi instrument representative measure the ability of the participant students . The following is the place and name of the elementary school for carrying out the research as follows:

School Name	Place (district)
SD Inpres Palupi	South Palu

SD Inpres 4 Birobuli	East Palu
SD Inpres I Lolu	East Palu
SD Inpres Bumi Bahari	West Palu

## 2. Instrument Development Goals

Basically, the focus of this research is the target students and teachers in implementing the 2013 curriculum, both in the validation process and carried out in schools so that there is continuity by involving the principal, students as a means of controlling the extent to which students' abilities change or the expected goals of the 2013 curriculum. Furthermore, the interested parties are the community, especially parents of students who have experienced directly in accompanying their children so that parental involvement can provide very important information in the development of the 2013 curriculum.

To the effectiveness of coaching curriculum in 2013 sustainably, then the necessary mentoring elementary school teachers to work with a groups of working teachers (KKG) that there is any sub-district or equivalent cluster schools with the terms of the school 's core as the centre of activities of teachers to discuss all issues relating to the improvement of the quality of learning process to teach and systems assessment. Moreover, it is necessary to consider the 2013 curriculum development pattern as follows: (1) Following the school/cluster-based modified-lesson study system., (2) Doing revision and improvement of validation instrument carried out by researchers and teachers., dan (3) Evaluating and monitoring of every step or stage are given.

Data assessment of authenticity can be analysed by qualitative and quantitative methods. Qualitative analysis of assessment authentic in the form of narrative or description on the achievements of the results of study participants learners. For example, about the advantages and weaknesses, motivation, courage argued, and so on. Quantitative analysis of the data assessment authentically applies a rubric score or analysis about the selection of multiple (dichotomy data) which is derived from the right answers and one that is encoded into a number 1 or 0 which is derived from about multiple choices with a selection of answers to four to five answers that truth is only one. Device software that is used (software) is ministep for modeling Rasch with system Microsoft Windows.

## 3. Wright Map Analysis (Person-Item Map)

This analysis will produce a picture of the distribution of the ability of the students / respondents and the level of difficulty of the same scale, based on the data in Table 1 will produce a map of the following:

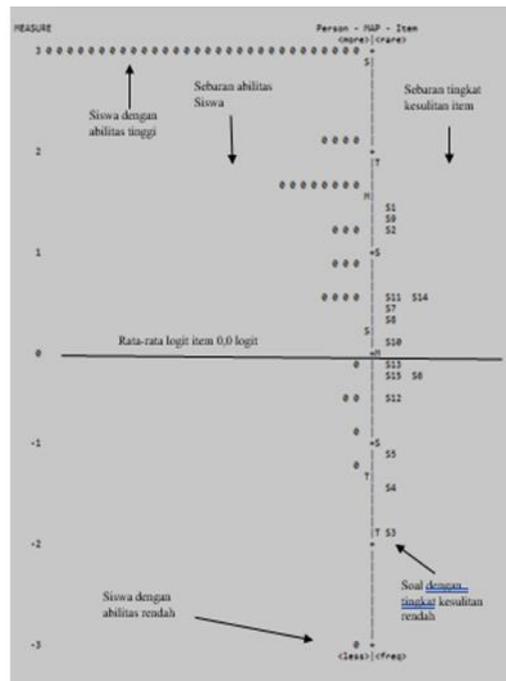


Figure 1. Wright Map of Distribution of Ability and Difficulty of Problems

Data on the distribution of student logit (person) or item logit can be described by a normal curve. It is the distance between the average in the middle (mean) and one standard deviation (Grade 1) is 34% the amount of data so that if the average value. + Grade 1 and -Grade 1 which means there is a distribution of 68% of the data in it. if + Grade 2 and – Grade 1, then the distribution of the data in it is 95%. If the logit value is found outside of the distance + Grade 2 and – Grade 1, this condition can be called an outlier.

#### a. Distribution of Student Ability

Analysis above contains of the abilities of students who are on the Wright map on the left has a scale with the same distance (equal interval) which means that a position at +3.0 logit can be compared to an ability of about 0.0 logit. students who are at +3.0 are three times that of students who are in a position of ability around 0.0 logit.

Based on the students who have high ability, almost all the questions can be answered correctly, because the ability with logit + 2,24 including high-ability students that show the image on top of obtained information that the students with high capability are found in these numbers 4, 7, 21, 25, 26, 31, 38, 39 43, 47, 49 and 51 with logit (2,24). Low ability respondent is found in student number 1 with logit (-4,16).

#### b. Distribution of Item Difficulty Level (Item)

Then from the Wright map on the right above, it can also explain the distribution of the logit value of the item with the highest level of difficulty, which means that the probability of all students doing this problem correctly is very small, while the other lowest logit problem in this case illustrates that almost all students can work on this question correctly. Highest logit indicates the high level of difficulty. This is corresponded with the total score is declared how the number of correct answers. Each question that is given will be analysed and divided into questions which are relatively difficult and which are easily done by students. Modeling Rasch with program

ministep can perform the analysis as quickly and accurately as a good measurement information, because it can specify each item about by logit item measurement.

Based Respondents 1-58 about 1 up to 30 above obtained information that the point about the difficulty is the question number 26 (S26) with a value logit 2.08. While the matter of the most easily is the matter of number 3 (s3) with a value logit -1.84 which can in see Figure 2 and Table 1. The average logit value of the item is always set in 0.0 logit which indicates the initial reference point of the scale; Average logit person found to be 0.40 logit shows in over 0.0 logit. The case shows the achievements of students in the upper grades the average level of difficulty standard matter compared with the value of the average are located in under 0.0 logit shows the achievement of students are in the carry value of the average level of difficulty.

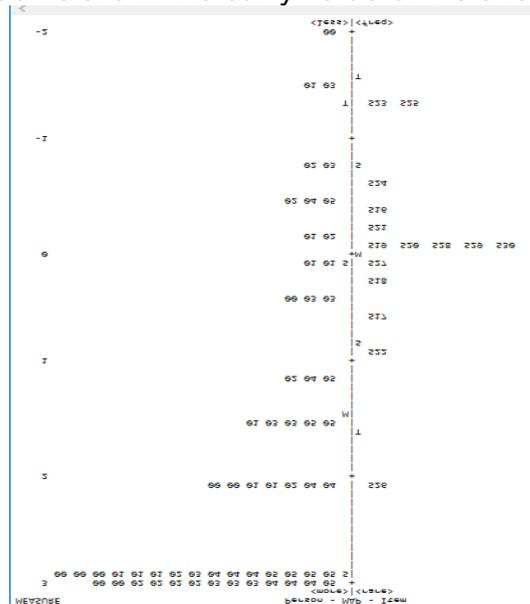


Figure 2. Wright Map of Distribution of Ability and Difficulty of Problems

Map grains provide information about the level of difficulty grains (in scale logit) for each question. Logit value inherent in each item about an information that is valuable in the preparation of the bank problem, it is very useful for teachers preparing a new test, because tests are either contains the level of difficulty about that diverse.

Map of person grain that is produced can be based on the type of sex or type of matter that is used by Taxonomy Bloom as follows: Condition map shows there is a level interval of difficulty grains can be in to be a level of difficulty item that is the level of cognitive memory, comprehension and application. This information serves to create a question bank in the National final exam based on its content. Likewise, the distribution of student abilities can be detected on gender, school, or area of origin.

Table 1 Level of Difficulty Grain Problem (item measures)

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-CORR.	AL-EXP.	EXACT OBS%	MATCH EXP%	Item
11	31	58	2.08	.36	1.36	2.20	1.53	1.57	.52	.65	63.6	72.8	S26
7	40	58	.89	.38	1.01	.14	1.14	.60	.63	.64	79.5	77.8	S22
2	42	58	.60	.39	1.01	.11	.96	-.04	.63	.63	79.5	78.9	S17
3	44	58	.30	.40	1.02	.16	.81	-.46	.63	.62	72.7	79.9	S18
12	45	58	.14	.41	1.16	.76	1.12	.44	.56	.61	75.0	80.5	S27
4	46	58	-.03	.42	1.23	1.03	1.25	.69	.53	.60	72.7	81.3	S19
5	46	58	-.03	.42	.81	-.82	.55	-1.16	.68	.60	81.8	81.3	S20
13	46	58	-.03	.42	1.45	1.84	1.54	1.25	.45	.60	72.7	81.3	S28
14	46	58	-.03	.42	.83	-.72	.66	-.78	.66	.60	86.4	81.3	S29
15	46	58	-.03	.42	.70	-1.40	.58	-1.04	.70	.60	90.9	81.3	S30
6	47	58	-.21	.43	.94	-.18	1.41	.95	.58	.59	84.1	82.1	S21
1	48	58	-.40	.44	.84	-.63	.55	-.91	.65	.58	86.4	83.0	S16
9	49	58	-.60	.46	.87	-.47	1.13	.41	.59	.56	86.4	84.2	S24
8	52	58	-1.31	.53	.68	-1.03	.28	-.96	.63	.51	93.2	89.1	S23
10	52	58	-1.31	.53	.82	-.50	.64	-.22	.57	.51	93.2	89.1	S25
MEAN	45.3	58.0	.00	.43	.98	.0	.94	.0			81.2	81.6	
P.SD	4.9	.0	.80	.05	.22	1.0	.38	.9			8.3	3.9	

c. Level of Compliance Item Problem (Item Fit)

The level of difficulty level of each item can be observed by looking at the quality of the item's suitability with the model or item fit, explaining whether the item can be used to measure or not. If the questions do not fit the data, this is an indicator that students have misconceptions about the items that function to improve the quality of teaching, so that misconceptions can be avoided during the learning process.

Table 1 shows that from the main menu the Output table shows sequentially the items that have unfit criteria. Based on the table above shows information that does not exist grain matter which does not meet all three requirements fit (oufit MNSQ, outfit ZSTD and Pt Mean corr) so that the point about including fit or appropriate.

According to Boone et al. (2014) the criteria used to check the suitability of items that do not fit (outliers or misfits) are:

1. The outfit mean square (MNSQ) value received is  $0.5 < MNSQ < 1.5$
2. Accepted Z-standard outfit value (ZSTD):  $-2.0 < ZSTD < + 2.0$
3. Point measure Correlation (Pt Mean Corr) value:  $0.4 < Pt\ measure\ Corr < 0.85$

It should be noted that the ZSTD value is greatly affected by the sample size, if the sample size is very large ( $N > 500$ ), then the ZSTD is always above 3 so that some experts do not recommend not using ZSTD.

In the table above, it can be seen that the topmost item, namely S1 shows a fit value, that is, it meets the requirements for the Mnsq outfit (1.36) and the point measure correlation (0.52), while the ZSTD outfit value is still within the allowed limits, therefore S1 questions are maintained and do not need to be changed or replaced, as well as other questions all meet the three conditions mentioned above so that all items are fit or appropriate and are recommended to be maintained or do not need to be changed, this is in accordance with the results of validation by teachers who are members of West and South Palu cluster.

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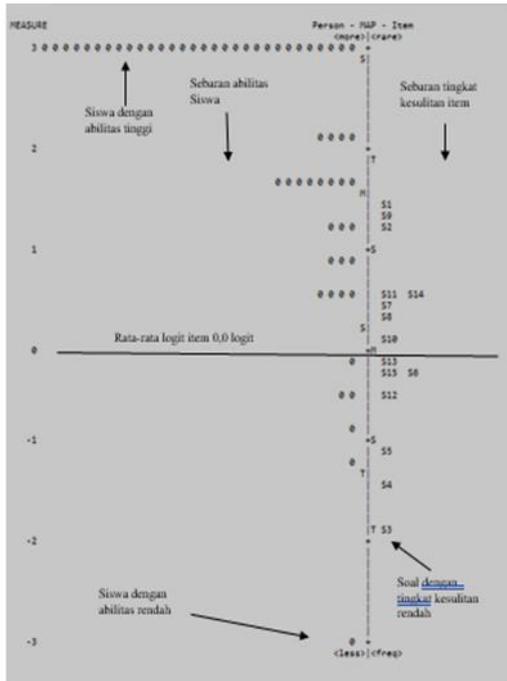


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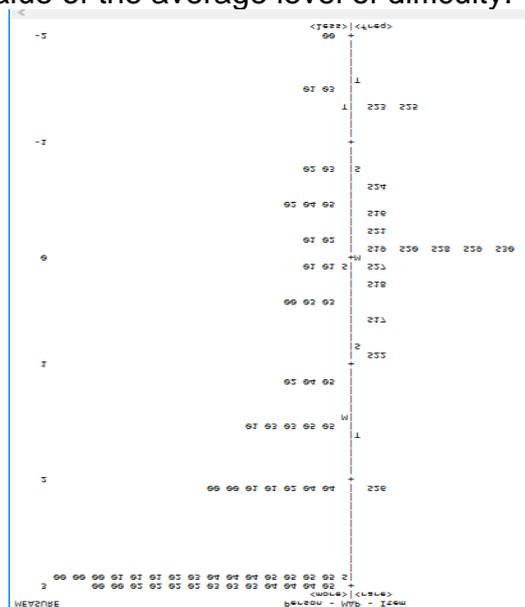


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ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	TOTAL MEASURE	MODEL		INFIT		OUTFIT		PTMEASUR-AL		EXACT MATCH		Item
				S.E.	MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%		
11	31	58	2.08	.36	1.36	2.20	1.53	1.57	.52	.65	63.6	72.8	S26	
7	40	58	.89	.38	1.01	.14	1.14	.60	.63	.64	79.5	77.8	S22	
2	42	58	.60	.39	1.01	.11	.96	-.04	.63	.63	79.5	78.9	S17	
3	44	58	.30	.40	1.02	.16	.81	-.46	.63	.62	72.7	79.9	S18	
12	45	58	.14	.41	1.16	.76	1.12	.44	.56	.61	75.0	80.5	S27	
4	46	58	-.03	.42	1.23	1.03	1.25	.69	.53	.60	72.7	81.3	S19	
5	46	58	-.03	.42	.81	-.82	.55	-1.16	.68	.60	81.8	81.3	S20	
13	46	58	-.03	.42	1.45	1.84	1.54	1.25	.45	.60	72.7	81.3	S28	
14	46	58	-.03	.42	.83	-.72	.66	-.78	.66	.60	86.4	81.3	S29	
15	46	58	-.03	.42	.70	-1.40	.58	-1.04	.70	.60	90.9	81.3	S30	
6	47	58	-.21	.43	.94	-.18	1.41	.95	.58	.59	84.1	82.1	S21	
1	48	58	-.40	.44	.84	-.63	.55	-.91	.65	.58	86.4	83.0	S16	
9	49	58	-.60	.46	.87	-.47	1.13	.41	.59	.56	86.4	84.2	S24	
8	52	58	-1.31	.53	.68	-1.03	.28	-.96	.63	.51	93.2	89.1	S23	
10	52	58	-1.31	.53	.82	-.50	.64	-.22	.57	.51	93.2	89.1	S25	
MEAN	45.3	58.0	.00	.43	.98	.0	.94	.0			81.2	81.6		
P_SD	4.9	.0	.80	.05	.22	1.0	.38	.9			8.3	3.9		

### c. Level of Compliance Item Problem (Item Fit)

The level of difficulty level of each item can be observed by looking at the quality of the item's suitability with the model or item fit, explaining whether the item can be used to measure or not. If the questions do not fit the data, this is an indicator that students have misconceptions about the items that function to improve the quality of teaching, so that misconceptions can be avoided during the learning process.

Table 1 shows that from the main menu the Output table shows sequentially the items that have unfit criteria. Based on the table above shows information that does not exist grain matter which does not meet all three requirements fit (oufit MNSQ, outfit ZSTD and Pt Mean corr) so that the point about including fit or appropriate.

According to Boone et al. (2014) the criteria used to check the suitability of items that do not fit (*outliers or misfits*) are:

1. The outfit mean square (MNSQ) value received is  $0.5 < \text{MNSQ} < 1.5$
2. Accepted Z-standard outfit value (ZSTD):  $-2.0 < \text{ZSTD} < + 2.0$
3. Point measure Correlation (Pt Mean Corr) value:  $0.4 < \text{Pt measure Corr} < 0.85$

It should be noted that the ZSTD value is greatly affected by the sample size, if the sample size is very large ( $N > 500$ ), then the ZSTD is always above 3 so that some experts do not recommend not using ZSTD.

In the table above, it can be seen that the topmost item, namely S1 shows a fit value, that is, it meets the requirements for the Mnsq outfit (1.36) and the point measure correlation (0.52), while the ZSTD outfit value is still within the allowed limits, therefore S1 questions are maintained and do not need to be changed or replaced, as well as other questions all meet the three conditions mentioned above so that all items are fit or appropriate and are recommended to be maintained or do not need to be changed, this is in accordance with the results of validation by teachers who are members of West and South Palu cluster.

## CONCLUSION

1. Based on the results of the test respondents (elementary school students in Palu) obtained information that the point about the difficulty is the question number 26 (S26) with a value logit 2.08. While the matter of the most easily is the matter of number 3 (s3) with a value logit -1.84.

2. The output table is obtained information that does not exist grain matter which does not meet all three requirements fit (oufit MNSQ, outfit ZSTD and Pt Mean corr) so that the point about including fit or appropriate.
3. Respondents 1-58 questions 1-15. The output map wright or images obtained information that the students with high capability are number 4,7, 21, 26, 31, 38, 39, 49 and 51 with a logit (2,24). Low ability student is in number 1 with logit (-4,16).
4. Respondents 59-116 about 1- 15, obtained information that the students with high capability are number 1, 2, 4, 6, 13, 17, 20, 23, 26, 29, 33, 39, 49 and 52 with a logit 4,40). Student with low ability is number 14 with logit (-0.86).

### Suggestions

1. Item analysis is very important to do in working on exam questions, namely the analysis of student abilities which helps teachers a lot to be more effective in helping the learning process.
2. High ability levels have a different response rate pattern with low ability levels. Students can be identified who play guessing or cheat
3. Item analysis can detect questions that are difficult and easy to work with, so that the questions provide a consistent pattern of responses and bias occurs, such as difficult questions that can be solved with low ability and vice versa.
4. The function of information measurement can connect the test and individual who tested. It can identify the students with high and low capability.

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