❏   128

ANALYSIS OF DISTINGUISHING POWER ON MATHEMATICS SUBJECT TEST QUESTIONS IN FOURTH GRADE OF SDN 136 PEKANBARU

Raissa Khumaira*, Rully Rachmawati Ramadan, Sabrina Khairunnisa, Miftahul Jannah, Hendri Marhadi

Elementary School Teacher Education, Faculty of Teacher Training and Education, University of Riau, Indonesia.

ABSTRACT

Power different question is ability question for show difference students who master material with students who have not in its entirety control material said. Analysis Power different question can help measure effectiveness question in differentiate ability students, improve quality assessment, and support development quality test. Research This aiming for analyze Power different question test mathematics at SDN 136 Pekanbaru so that it can determine question test that has Power differentiator positive to stay effectively used in assessment next. Method research used is approach quantitative with technique documentation data collection, in the form of sheet answer students on the test eye lesson mathematics in Fourth Grades of elementary school. Research results This show that: question test Mathematics in Fourth Grades at SDN 136 Pekanbaru in the year 2023/2024 academic year from a total of 25 questions as many as 9 questions (36%) are of poor quality Well, as many as 7 questions (28 %) were of sufficient quality and as many as 9 questions (36 %) were of good quality. Based on Power different question test Mathematics in class IV SDN 136 Pekanbaru 9 quality questions Good can used back on test next and 11 questions quality enough and less Good must revised moreover formerly If want to be used in the test next so that the quality Power different question own Power different positive and steady effective used.

Correspondence:

Raissa Khumaira
Elementary School Teacher Education,
Faculty of Teacher Training and Education,
University of Riau, Pekanbaru, Indonesia.
Email: raissa.khumaira3074@student.unri.ac.id

1.   INTRODUCTION

Education according to Law Number 20 of 2003 concerning The National Education System is business conscious and planned For realize atmosphere learning and learning process so that participants educate in a way active develop potential himself For own religious spiritual power, control self, personality, intelligence, morals noble, and required skills himself, society, nation and state (Cristiana, 2021). Activities evaluation in the world of education is integral components in the learning program in addition to plan learning (curriculum), objectives learning, form learning, how to learning (methods), and tools learning (media), as well as method learning (Hadi et al., 2019). At least there is two objective held evaluation namely For to know / to prove how far is the understanding participant evaluation after process, and results evaluation made into as reject measuring For improve the process (Son, 2019). Evaluation Study can done during the learning process and at the end learning during learning process, evaluation done with observe attitude and ability think student (F. Khasanah, 2019).

Evaluation tools in education used For collect data can in the form of test or non-test (Muluki, 2020). Test defined as method or procedures that can used for measure and assess in field education (Aprilianti et al., 2022).

Test usually used For measure Already to what extent development or progress that has been made achieved after go through the learning process teach in term time certain (Saputri, 2023). Test is one of the form instruments used for do measurement consisting of on answer Correct or wrong, or all true, or part correct. Test done for measure the success of the learning process carried out so that the learning process next can formulated in a way right and proper with needs and capabilities students. Test results Study own two question formats that is test description and test choice double (I. Khasanah et al., 2023). Test in the format of your choice double be one of type the most tests used in the assessment process. Questions choice double is form a test that has alternative answers so that participant educate can choose the answer is considered Correct (Nurhalimah et al., 2022). Item questions on the test choice double must own quality Power different or Power good differentiator for questions the capable show students who master material learning and students who have not control material lesson.

Power differentiator is ability a question For show a smart student or capable tall with stupid student or capable low (Arikunto, 2021). Power differentiator is ability grain question for can differentiate between participants who have control the material being asked with less participants or Not yet control the material being asked (Fitriani, 2021). The more tall Power differentiator question means the more Good the matter in question differentiate students who have understand and not understand the material the (Dewi et al., 2019). Mathematics is field science that has role important for advance Power reason and think humans in the world of education. Because of that, in learning mathematics must implemented with the best (Aisyah et al., 2022).

Activity analysis grain question Enough seldom done by the teacher because influenced several factor. activity analysis grain question seldom done by the teacher because activity This Enough complicated For done and enough eat time (Yusuf, 2021). Power different need be noticed For determine effectiveness grain question in evaluate ability among group (Nasution, 2019). Question quality test is question tests that can functioning with good and effective in measure ability participant educate (Nafs et al., 2023). Analysis Power different question important done for ensure questions used in test effective used and have Power differentiator positive so that capable show students who have understand learning and students who have not understand lessons so that teachers can formulate an appropriate learning process ability every existing students as well as determine act carry on from question the test that has been done based on category question.

Therefore that, research This aiming for analyze ability Power different question in show, classify, differentiate capable students with students who are lacking capable in finish question test eye lesson mathematics class IV at SDN 136 Pekanbaru. With existence results analysis ability Power different questions on the test mathematics This later can helping teachers at SDN 136 Pekanbaru For determine question effective test used and have Power different positive on the assessment that will be implemented to front of it.

2.   RESEARCH METHODS

Method research used is method study quantitative. Research quantitative is research that emphasizes data analysis with use calculation number or *statistics* (Tarmizi et al., 2021). Descriptive meaningful as research conducted For get mark variable independent, good One variable or more without make comparison or link it up with other variables (Hanan et al., 2023). So that study This only describe a truly phenomenal phenomenon happen moment this and not present a hypothesis certain for tested. The approach used in this study is a quantitative approach. Study quantitative is approach research that uses data in the form of numbers and science Certain For answer hypothesis study (Marinu, 2023). Approach with use quantitative Because use numbers, start from data collection, interpretation against the data, and appearance from the result (Iyus Jayusman & Oka Agus Kurniawan Shavab, 2020).

The data collection technique used by the researcher is the documentation technique. The data analyzed in this study is in the form of answer sheets for the 2023/2024 school year's fourth grade math test at SDN 1 36 Pekanbaru totaling 20 students with question format test choice double as many as 25 questions. The data was analyzed based on Power different question. Differential power question interpreted as the ability of a questions in distinguishing students who have understood the material well and are in the top group and students who have not understood the material well. both those who are in the lower group based on their learning outcomes. The numbers that show the magnitude of the differentiating power in the questions called index discrimination. The discrimination index is obtained through the following formula:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

Where:
J = Number of test participants
J_A = Number of participants in the upper group
J_B = Number of participants in the lower group
B_A = The number of participants in the upper group who answered the question correctly

B _A = The number of participants in the lower group who answered the question correctly

B $_A$ = The number of participants in the lower group who answered the question correctly
P $_A$ = Proportion of participants in the upper group who answered correctly
P $_B$ = Proportion of lower group participants who answered correctly

After analyzing the discriminant power, the next step is to interpret it in the form of sentences to find out the category of questions that have been analyzed.

Table 1. *Interpretation Index Different Power*

Power Differentiator	Classification	Interpretation
0.70-1.00	Excellent	Good Very
0.40-0.69	Good (Good)	Good
0.20-0.39	Satisfactory	Enough
0.00-0.19	Poor (Weak)	Not good
Marked Negative	-	Bad Very

3.   RESULTS AND DISCUSSION

The results of the analysis of the differentiating power of questions from the answer sheets of 20 students in the Mathematics subject test in class IV of SDN 136 Pekanbaru show that the following results : Research results shows that the math test questions for class IV at SDN 136 Pekanbaru have 3 categories question based on ability Power different Regarding the question, of the total of 25 questions, 9 questions (36%) were of poor quality. well, as many as 7 questions (28 %) were of sufficient quality and as many as 9 questions (36 %) were of good quality.

Table l 2. *Analysis Results Differential Power of Questions*

Category	Amount	Presentation
Good Very	-	-
Good	9	36%
Enough	7	28%
Not good	9	36%
Bad Very	-	-

Analysis Power different It means to study questions test from aspect ability test the in differentiate students who are included to in category low and category high. Power differentiator grain is ability a grain test For can differentiate between capable *testee* tall and capable low (Magdalena et al., 2021) . Based on the table above, it is known as many as 0 questions (0%) are of good quality Good once. On the question test Mathematics used at SDN 136 Pekanbaru No there is question with category Good once. A total of 9 quality questions (36%) not enough good. Item incoming questions to in category not enough Good among them question number 1, 2, 5, 6, 7, 12, 18, 22, 25. A total of 7 questions (28%) items question including category enough. Item incoming questions to in category Enough among them question numbers 3, 8, 11, 16, 21, 23, 24. And as many as 9 questions (36%) items question quality good. Item incoming questions to in category Good among them question number 4, 9, 10, 13, 14, 15, 17, 19, 20. A total of 0 questions (0%) are of good quality Bad once. On the question test Mathematics used at SDN 136 Pekanbaru No there is question with category Bad once. Question test eye lesson Mathematics used in class IV SDN 136 Pekanbaru only own three category question based on Power the difference that is, the question quality okay, about quality enough and matter quality not enough Good.

Power different grain question is index that shows level ability grain question differentiate high achieving group tall from high achieving group low among the participants test (Fatimah & Alfath, 2019) . For to obtain Power different questions, students shared in two group. Group or class above which consists of on students who answer true most and group or class bottom consisting of on students who answer Correct lesser. Answer sheet group above and group lower analyzed the grains For know group on answer correct in the question number How many only, so also the sheet answer group lower analyzed student group lower answer correct on the question number How many only. From the sheet answers are also analyzed the most questions answered correct by students' group above and students group lower as well as the least question answered correct by students' group above and students group lower or even No There is student from group on and also under the

capable answer Correct. Testing Power differentiator aiming for know whether A test capable show difference participant educate in class on with class below. Power test assumptions different is questions that can be done students in class above, should be No Can done students in class lower (Pradita et al., 2023) . Students group on assumed as group student with score tall Because has prepare self for follow test and understand material learning with Good whereas student group lower assumed as group students who are lacking prepare self and not yet understand material learning with Good so that get low score.

Criteria conclusion quality good question based on Power differentiator is question with Power differentiator Good or very good that is questions that have index above 0.70 (Halik et al., 2019). Question with category Power good differentiator or very good is question that is capable differentiate in a way clear student from group on with student from group down. So that question with Power differentiator Good or very good only can answered correct by students' group on just Because student group on has control material learning. From the results analysis sheet answer students on the test mathematics Class IV of SDN 136 Pekanbaru there are 2 questions only can answer correct by students' group above, but after analyzed Power different question the mark index discrimination second question the is at below 0.70 so that No including category question with quality Power different Good once. This happens Because student group on only only a few people are capable answer Correct whereas student group on other Not yet capable answer question the with Correct so that index discrimination questions the low and not including category question with Power different Good once. With so on the question test eye lesson mathematics used by Fourth Grades teachers at SDN 136 Pekanbaru in the year quality 2023/2024 teaching Good very No There is.

Criteria conclusion quality question Good based on Power the difference is question with Power a good differentiator, namely question with index discrimination between 0.40-0.69, namely question with quality Power different good. From the results analysis sheet answer students on the test mathematics Class IV of SDN 136 Pekanbaru 9 questions found with index discrimination between 0.40-0.69. Question the more Lots answered correct by students group on from students group down, so that ability question the for differentiate student group on with student group lower classified as good. With so on the question test mathematics used by class IV teachers at SDN 136 Pekanbaru There are 9 questions, namely question number 4, 9, 10, 13, 14, 15, 17, 19, 20. So there are 9 questions the enter into the category good question based on Power differentiator Because own index discrimination high positive.

Criteria conclusion quality enough questions Good based on Power differentiator is question with Power sufficient differentiator, namely question with index discrimination between 0.20-0.39. Quite a question Good is the question that is still can differentiate students who master material with students who do not control material. Questions categorized Enough Good Because Still Not yet can differentiate in a way clear student group on with student group down. Students group lower capable answer Correct question the Because guess just No Because He has understand learning the in a way Good so that question that no capable differentiate in a way clear student group on with student group below. From the results analysis sheet answer students on the test mathematics Class IV of SDN 136 Pekanbaru 7 questions found quality Enough based on ability Power different Question. Question the can answered correct by students' group above and students' group below, with composition student group lower half or more from student group for those who answer right. So that question the Still Not yet capable differentiate student group above and students group lower in a way clear. With so on the question test eye lesson mathematics used by Fourth Grades teachers at SDN 136 Pekanbaru in the year quality 2023/2024 teaching Enough based on Power differentiator contained in the question number 3, 8, 11, 16, 21, 23, 24.

Criteria conclusion quality question not enough Good based on Power differentiator is question with Power differentiator not enough Good or index low discrimination that is between 0.00-0.19. Question with quality Power different the missing question Good This is question that is not capable show student group above and students group lower in a way right. Question the capable answered correct by students' group above and students group lower with composition student group on more Lots One student compared to student group lower in answer Correct question said. Even in some question the comparison the same between students who answer Correct from group above and group below. From the results analysis sheet answer students on the test mathematics Class IV of SDN 136 Pekanbaru 9 questions found quality not enough Good based on Power different the difference. Question the capable answered correct by students from group above and students from group lower with a total of 19 answers student Correct from 20 students participated test. This is show that question the No capable show capable students low with student capable high Because all over participant test capable answer it with right. With so on the question test eye lesson mathematics used by Fourth Grades teachers at SDN 136 Pekanbaru in the year quality 2023/2024 teaching not enough Good based on Power differentiator contained in the question number 1, 2, 5, 6, 7, 12, 18,22, 25.

Criteria conclusion quality question that is not good (bad) based on Power differentiator is question with Power differentiator Bad or unbelievably bad or own index discrimination marked negative. Bad question is question that is not can differentiate students who master materials and students who do not control material.

Questions categorized No Good Because No anyone can answer Correct question the Good from student group on and from student group down. That thing can be due to Because material the Not yet taught or not yet fully accepted and understood by students so that no anyone can answer right. Question with category No good also can be due to Because question the can answered correct by students group lower However No can answered correct by students' group above. This can happen Because student group lower only guess correct answer just from the available options. From the results analysis sheet answer students on the test mathematics Class IV of SDN 136 Pekanbaru No found question that is not capable answered correct by students' group on and also student group below, and the only question answered correct by students group below. With Thus, the question tests used by teachers in test eye lesson Mathematics in class IV of SDN 136 Pekanbaru in the year 2023/2024 academic year no there is question with category No good (bad).

Table l 3. *Recapitulation of Analysis* Results *Differential Power of Questions*

Category	Index Discrimination	Item Question	Amount	Presentation
Good Very	0.70-1.00	-	-	-
Good	0.40-0.69	4, 9, 10, 13, 14, 15, 17, 19, 20	9	36%
Enough	0.20-0.39	3, 8, 11, 16, 21, 23, 24	7	28%
Not good	0.00-0.19	1, 2, 5, 6, 7, 12, 18,22, 25	9	36%
Bad Very	Marked Negative	-	-	-

Questions that have level Power different low recommended for replaced However Still Can used with revised. While For level Power different category okay, can direct used (Hidayati & Nisa', 2023) . Question with criteria enough and less Good still can used in the test next However must fixed moreover first to have Power high and capable difference differentiate student group on and students group lower in a way clear. With thus act carry on from three category question test based on ability Power different the question that has been used by class IV teachers at SDN 136 Pekanbaru on the subject lesson mathematics of the total 25 questions, 9 are of good quality. Good namely question number 4, 9, 10, 13, 14, 15, 17, 19, 20, can saved for used again on test next without need fixed. 16 questions others consisting of top 7 quality questions Enough that is question number 3, 8, 11, 16, 21, 23, 24 and 9 questions quality not enough Good that is question number 1, 2, 5, 6, 7, 12, 18,22, 25 need fixed moreover first to have Power differentiator positive For capable differentiate in a way clear student from group above and students from group down and can used For test next.

4. CONCLUSION

Based on results study Power different the question that has been researcher do on the question test eye lesson Mathematics in Fourth Grades of SDN 136 Pekanbaru year 2023/2024 academic year in form choice double with a total of 25 questions, 9 questions (36%) were of good quality good, 7 questions (28%) are of good quality sufficient, 9 questions (36%) are of good quality not enough OK. Question with category Power differentiator Good contained in the question number 4, 9, 10, 13, 14, 15, 17, 19, 20. Question with category Power differentiator Enough contained in the question number 3, 8, 11, 16, 21, 23, 24. Question with category Power differentiator not enough Good contained in the question number 1, 2, 5, 6, 7, 12, 18, 22, 25. Question test with category Power good differentiator can saved For used in the test next and question test with category Power sufficient and insufficient differentiator Good must fixed formerly If want to used by teachers to test mathematics next. The deep matter this is on the question test mathematics class IV of Pekanbaru Elementary School 136 Pekanbaru year 2023/2024 academic year from a total of 25 questions choice double, as many as 9 questions test mathematics can direct used without improvements and 16 questions test mathematics need repair before used back to test eye lesson mathematics next.

REFERENCES

Aisyah, N., Alim, JA, & Alpusari, M. (2022). Development of Animation Videos on Flat Building Materials Based on Malay Culture in Elementary Schools. In *Technology, Engineering, Art, and Mathematics Education* (Vol. 1, Issue 1). https://doi.org/https://dx.doi.org/10.31258/ijsteame.1.1.45-60

Aprilianti, W., Hamdu, G., & Mulyadiprana, A. (2022). Elementary School Teachers' Ability in Developing Numeracy Literacy Test Questions Based on Education for Sustainable Development. *EDUKATIF: JOURNAL OF EDUCATIONAL SCIENCES, 4* (1), 1408–1416. https://doi.org/10.31004/edukatif.v4i1.2139

Arikunto, S. (2021). Basics of Educational Evaluation 3rd Edition. In *Bumi Aksara.*

Cristiana, E. (2021). Digitalization of Education Reviewed from a Legal Perspective. *Proceedings of the National Seminar, 3,* 58–66. https://doi.org/https://doi.org/10.33363/sn.v0i3.89

Dewi, SS, Hariastuti, RM, & Utami, AU (2019). Analysis of Difficulty Level and Distinguishing Power of Junior High School Mathematics Olympiad (Omi) Questions in 2018. *Transformation: Journal of Mathematics and Mathematics Education, 3* (1), 15–26. https://doi.org/10.36526/tr.v3i1.388

Fatimah, LU, & Alfath, K. (2019). Analysis of Question Difficulty, Differentiating Power and Distractor Function. *Al-Manar, 8* (2), 37–64. https://doi.org/10.36668/jal.v8i2.115

Fitriani, N. (2021). Analysis of Difficulty Level, Discriminating Power, and Effectiveness of Distractors for Maternal and Neonatal Emergency Awareness Training Questions. *Paedagoria: Journal of Educational Studies, Research and Development, 12* (2), 199–205. https://doi.org/10.31764/paedagoria.v12i2.4956

Hadi, K., Dazrullisa, Manurung, B., & Hasruddin. (2019). Analysis of Differential Power of High-Order Thinking Test Questions Based on Local Wisdom on Biodiversity Material for Grade X High School. *Bionatural: Scientific Journal of Biology Education, 6* (2), 85–91.

Halik, AS, Mania, S., & Nur, F. (2019). Analysis of Final School Exam (UAS) Question Items for Mathematics Subject in the 2015/2016 Academic Year of SMP Negeri 36 Makassar. *Al Asma: Journal of Islamic Education, 1* (1), 11. https://doi.org/10.24252/asma.v1i1.11249

Hanan, MP, Jannah, RR, & Alim, JA (2023). Analysis of Mathematics Question Items on KPK and FPB Material Based on Stories at SDN 111 Pekanbaru. *Journal of Educational Learning and Innovation (ELIa), 3* (192–106). https://doi.org/10.46229/elia.v3i1.538

Hidayati, K., & Nisa', ZEK (2023). Analysis of Final Semester Mathematics Assessment Items. *AKSIOMA: Journal of Mathematics Education Study Program, 12* (3), 3516. https://doi.org/10.24127/ajpm.v12i3.7575

Iyus Jayusman, & Oka Agus Kurniawan Shavab. (2020). Student Learning Activities Using Edmodo-Based Learning Management System (LMS) Learning Media in History Learning. *Artifact Journal, 7* (1), 13.

Khasanah, F. (2019). Analysis of Odd Semester Exam Questions for Indonesian Language Subject for Grade VII of SMP Negeri 2 Tapung Hilir, Tapung Hilir District, Kampar Regency, Academic Year 2018/2019. In *Repository of Riau Islamic University*.

Khasanah, I., Fuady, A., & Sunismi. (2023). Analysis of Multiple Choice Mathematics Daily Test Questions. *Mathema Journal, 5* (2), 110–125.

Magdalena, I., Fauziah, SN, Faziah, SN, & Nupus, FS (2021). Analysis of Validity, Reliability, Difficulty Level and Distinction Power of Final Semester Exam Questions for Theme 7, Grade III of SDN Karet 1 Sepatan. *BINTANG: Journal of Education and Science, 3* (2), 198–214. https://ejournal.stitpn.ac.id/index.php/bintang

Marinu, W. (2023). Educational Research Approach: Qualitative Research Method, Quantitative Research Method and Mixed Method Research Method. *Tambusai Education Journal, 7* (13). https://jptam.org/index.php/jptam/article/view/6187%0A%0A

Muluki, A. (2020). Analysis of the Quality of Odd Semester Test Items for Science Subjects for Fourth Grades MI Radhiatul Adawiyah. *Elementary School Scientific Journal, 4* (1), 86. https://doi.org/10.23887/jisd.v4i1.23335

Nafs, H., Sridana, N., Hikmah, N., & Soeprianto, H. (2023). Analysis of the Quality of Final Semester Exam Questions for Mathematics Subjects for Class VII of SMPN 6 Mataram in the 2022/2023 Academic Year. *Scientific Journal of Educational Professions, 8* (4), 2324–2331. https://doi.org/10.29303/jipp.v8i4.1785

Nasution, W. and H. (2019). Analysis of Cognitive Levels on the Distinguishing Power of Indonesian Language and Literature Education Comprehensive Exam Questions at STKIP Bina Bangsa GETSEMPENA. *Metamorphosis Journal, 8* (5), 55.

Nurhalimah, S., Hidayati, Y., Rosidi, I., & Hadi, WP (2022). The Relationship Between Item Validity With Discriminatory Power And Difficulty Level Of Multiple Choice Questions. *Natural Science Education Research, 4* (3), 249–257. https://doi.org/10.21107/nser.v4i3.8682

Pradita, E., Megawanti, P., & Indraprasta PGRI, U. (2023). Analysis of Difficulty Level, Distinguishing Power, and Distractor Function of Mathematics PTS SMPN Jakarta. *Himpunan: Scientific Journal of Mathematics Education Students, 3* (1), 109–118.

Saputri, HA (2023). Analysis of Assessment Instruments: Validity, Reliability, Level of Difficulty, and Differentiation Power of Question Items. *Scientific Journal of PGSD FKIP Universitas Mandiri, 9* (5), 2986–2995.

Son, AL (2019). Mathematical Problem Solving Ability Instrumentation: Analysis of Reliability, Validity, Difficulty Level and Differentiation Power of Question Items. *Gema Wiralodra, 10* (1).

Tarmizi, P., Setiono, P., Amaliyah, Y., & Agrian, A. (2021). Analysis of Multiple Choice Questions on the Theme of Health is Important for Grade V of Elementary School 04, Bengkulu City. *ELSE (Elementary School Education Journal): Journal of Elementary School Education and Learning, 4* (2), 124. https://doi.org/10.30651/else.v4i2.7090

Yusuf, R. (2021). Analysis of the Quality of National Examination Questions for Middle School Mathematics Subjects. *Journal of Didactic Mathematics, 1* (3). https://doi.org/10.34007/jdm.v1i3.417