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Students' Achievement in Mathematics: Investigating the Effects of Assessments Criteria, Instructional Model and Adversity Quotient

Mustamin Idris[a], Ahmad[b], Yusti Arini[c]
[s]Universitas Tadulako, Kampus Bumi Tondo Sulawesi Tengah Indonesia, [b]Universitas Gajayana, Jl. Mertojoyo Blok L Merjosari Malang Indonesia, [c]UIN Surakarta, Jl. Pandawa Kartasura Jawa Tengah Indonesia
Email: [a]Idris_tamin63@yahoo.co.id, [b]ahmad_t@unigamalang.ac.id, [c]arinivirgo29@gmail.com

This study aims to determine the effect of assessment criteria, learning models, and adversity quotient on mathematics learning outcomes. The sample consists of 280 junior high school students from SMP Negeri 1, SMP Negeri 2, and SMP Negeri 3 Palu taken by cluster random sampling technique. This is experimental research with a 2x2x2 factorial design. The research findings show that: (1) students' mathematics learning outcomes in the analytical assessment group are higher than those of the holistic assessment group without considering the adversity quotient, (2) students' mathematics learning outcomes in the PPKK model group are higher than those in the conventional learning model group without considering the adversity quotient, (3) specifically for the group of students given the PPKK model, the mathematics learning outcomes in the analytical assessment group are lower than those of the holistic assessment group, (4) specifically for the group of students given the conventional learning, the mathematics learning outcomes in the analytical assessment group are higher than those of holistic assessment group, (5) specifically for the group of students given an analytical assessment, the mathematics learning outcomes in the PPKK model group are higher than those of conventional learning group, (6) specifically for the group of students given a holistic assessment, the mathematics learning outcomes in the PPKK model group are higher than those of conventional learning group, (7) specifically for the group of students with high adversity quotient, mathematics learning outcomes in analytical assessment group are higher than those of holistic assessment group, (8) specifically for the group of students with low adversity quotient, mathematics learning outcomes of analytical assessment group are higher than those of holistic assessment group, (9) specifically for the group of students high adversity quotient given the PPKK model, mathematics learning outcomes of analytical assessment group are higher than those of holistic assessment group, (10) specifically for the group of the students high adversity quotient given conventional learning model, mathematics learning outcomes of the analytical assessment group are higher than those of the holistic assessment group, (11) specifically for the the group of the students with low adversity quotient given the PPKK model, the mathematics learning outcomes of the analytical assessment group are lower than those of the holistic assessment group, (12) specifically for the group of the students with low adversity quotient given the conventional learning model, mathematics learning outcomes of the analytic assessment group are higher than those of the holistic assessment group, (13) specifically for the group of the students with high adversity quotient given the analytical assessment, the mathematics learning outcomes of the PPKK model are higher than those of the conventional learning, (14) for the the group of the students with high adversity quotient given holistic assessment, the learning outcomes of mathematics of the PPKK model are higher than those of conventional learning.

Keywords: *Assessment Criteria, Learning Models, Adversity Quotient, Mathematics Learning Outcomes*

Introduction

The low quality of education at every level and education unit starting from elementary, secondary to tertiary levels is one of the educational problems being faced by Indonesians today, especially the mathematics achievement of students at the primary level, namely junior high, is still lower compared to Malaysia and Singapore whose number of teaching hours each year is less than Indonesia (Noor, 2008). This fact shows that in Indonesia, more hours are spent by students at school. Still, the level of students' achievement is low because most math problems done in the classroom are expressed in language and mathematical symbols whose teaching is not applied to everyday life. As a consequence, students feel bored and lazy to learn math.

Mathematics education has two problems; first, mathematics is difficult to learn because it has unique characteristics, and secondly, up to now it is still in the question mark how teaching and learning mathematics can be efficiently conducted. This has several underlying reasons, including: (1) in the traditional concept of the philosophy of mathematics education, a change and reflection between scientific disciplines are required because the mathematical paradigm is absolute, certain, with a rigid knowledge hierarchy in responding to every change, (2) the basic concept of mathematics is claimed to be unsafe, (3) technically the proposition produced as a formal truth system has not been considered a decision, and (4) there is no agreement between school mathematicians, experts, educators, and multidisciplinary groups with mathematical scientific professional groups that the basic concepts of mathematics are limited to mathematical knowledge as part of life (Ernest, 1994).

Mathematics and numeration are a crucial part of learning because of the importance of basic numeracy skills in everyday life. However, from the aspect of its use, mathematics including probability and statistics are very clear in marketing research, quality control analysis, econometrics and inference analysis, input-output analysis, and forecasting. It shows how important mathematics is in economics. Without sufficient knowledge in relevant mathematical material, a person will not be able to have a good knowledge of economics (Agung, 2009). Because mathematical characteristics can be deductive, logical, as a formal symbol system, extracted structure, symbolism, and is a collection of basic human reasoning or inspiration and as an activity of thinking. Thus it is said that mathematics is as a field of science which is a tool of thought, communication, as well as a tool to solve various practical problems, the elements of which are logic and intuition, analysis and construction, generality, and individuality, and have branches including arithmetic, algebra, geometry, and analysis (Uno, 2007).

Learning is a series of activities and thinking activities of an object to obtain a change in behavior as a result of the experience of individuals in interactions with their environment that involves cognitive, affective, and psychomotor (Gagne & Medsker, 1996). Therefore, Gagne (1977) says that learning is a process that allows individuals to change their behavior in a period that is not too long and in a relatively similar manner so that the same change does not have to be repeated in each subsequent situation (new situation). Learning mathematics is divided into two groups, namely: (1) learning problem solving is starting with capturing understanding (facts), then recognizing the naming (concept), then investigating its properties (principles), and finally conducting operations as well arranging the steps of work (operations and procedures), and (2) learning to shape knowledge through: firstly, good work habits (such as working systematically, flexible, imaginative, creative, independent in thinking and acting, working together, and in the right direction). Secondly, being positive (such as being interested, motivated, like working, confident in the ability to overcome problems, and trying to achieve maximum satisfaction from work). Thirdly, ability to use work methods (such as effective learning, investigation, problem solving, logical thinking, rational and critical, and appreciate order and beauty), and the last, positive values (good character), as in self-discipline, honest, efficient and effective, restless with contradictions, and always seeking the truth (Bell, 1978). Therefore, learning outcomes are seen from the extent to which the students' ability to carry out new activities that are permanent as a result of student interaction during the learning process and assessment process (Ahmad & Sastrawijaya, 2011). Bhatti and Ahmed (2015), assessment is defined as one or more processes that identify, collect, and prepare the data necessary for evaluation.

Assessment of learning outcomes can be interpreted as an evaluation of learning outcomes achieved by students. The teaching-learning process also contains an assessment of learning outcomes or the learning process, to what extent can both be assessed well. Actually, what is assessed is only the teaching-learning process but the assessment is carried out through a review of the results obtained by students after following the teaching-learning process of the components which together shape the teaching and learning process (Winkel, 2007).

Crawley et al (2014), the assessment process of student learning outcomes has four key phases: the specification of learning outcomes, the alignment of assessment methods with student outcomes and teaching methods, the use of different assessment methods to gather evidence of student learning, and the use of assessment evaluations to improve the educational program. Learning outcomes are the level of mastery achieved by students in participating in teaching and learning programs by established educational goals (Soedijarto, 1993). Based on that understanding, four things need to be considered in assessing student learning outcomes in science and technology subject groups: (1) educational assessment is intended to evaluate the students' learning outcomes as a whole, including cognitive and affective aspects, (2) educational assessment results can be used to determine achievement of competence and to conduct coaching and personal guidance of students, (3) assessments made by teachers aimed at fostering students' achievement and development, and (4) to obtain reliable data as a basis for decision making, it needs to use a variety of assessment techniques that are carried out repeatedly and sustainability (BSNP, 2007).

Assessment of the achievement of students' mathematics learning outcomes not only involves cognitive aspects but also considering the application, as well as affective aspects concerning attitudes and internalization of values that need to be instilled and fostered through mathematics. Therefore, one alternative is the assessment that emphasizes more on the process of learning, so that students' performance can be controlled and focused on the teaching materials while the teacher is providing alternatives to improve assessment and learning. Performance appraisal is an assignment procedure for students to gather information on how far students have learned. In contrast to traditional tests, performance assessment requires students to apply their knowledge and skills in several fields to demonstrate their mastery of learning objectives (learning targets). Thus, it means that the performance appraisal requires students to do a task or create a separate response, for example, performance evaluation in writing requires students to write in actual terms (Nitko, 1996).

Based on this concept, Muijs and Reynolds (2008) said that to assess student performance, teachers need to develop a clear and detailed scoring rubric based on the elements that the teacher wants to evaluate, such as attitudes, skills, and cognitive processes. The results of a clear assessment can be used by teachers to record the expected behavioral and cognitive development of students. Formally, the rubric definition is a scoring guideline consisting of assessment criteria, specifically used in evaluating students' work which is commonly called performance appraisal. The rubric is a special format of instrument scores commonly used in evaluating performance appraisals or the final results of a performance task (Mertler, 2000). The criteria level can be created by individual class teachers or by a group of teachers at the department level and determines the characteristics, values, details, and skills that each student must demonstrate to receive a certain letter grade. It goes on to say that before giving assignments, the teacher must determine the level of skill requested, and this is often made based on the teacher's personal experience and expectations (Arter & McTighe, 2000). Therefore, the fundamental purpose of each assignment is not to trap or confuse students, but for the teacher to measure students' knowledge, the criteria must be clearly defined and outlined (Kulm, 1994).

An analytical rubric is each learning outcome (performance) scores, and then the individual scores are summed to obtain a total score (Egodawatte, 2010). It was further explained that analytical rubrics are usually more desirable scoring that focuses on fairness judgments based on the types of answers needed (Moskal, 2002). Therefore, performance tasks that can be accepted as students' answers may be scored one or two, although creativity is not an essential feature of student answers (Mertler, 2000). A similar opinion is said that analytic scores are final after reports, where each component of the score is obtained independently. In other words, the total score is the total of each component evaluated. Therefore, the use of analytic scores is treated in each component separately to avoid the assessment deviations that lead to the overall measurement results (Anon, 2008).

Holistic rubric, which requires the teacher to scale the learning outcomes as a whole, without considering other components. It is further said that a holistic rubric is usually exploited when something goes wrong in some parts of the process that is acceptable through higher overall quality. In other words, the holistic rubric is more appropriate when the achievement of the task requires students to create several kinds of responses. Among those responses, there is no correct answer (Mertler, 2000).

Individual and Small Group Learning Model (PPKK) has special characteristics, namely individual activities and group activities. Thus, during individual activities, students must work independently and are not allowed to disturb other friends (here there may be competition between students) so that if students face difficulties, they can only ask the teacher. However, if students are allowed to ask their friends during individual activities, the independent work time for students who are questioned will be reduced. As a result, the student may not be able to complete the task on time. Whereas during group activities, students should work in groups (working in groups may occur in cooperation or competition might occur). At this time, students can ask for help from other friends outside the group members provided that they do not interfere with the group activity being asked for help. Conventional learning tends to be used by teachers if in the learning process more forms of presentation of the material from the teacher. The presentation emphasizes to explain something material that is not yet known or understood by students. Alternative methods tend to be varied between lecture and question and answer methods or other methods that are possible according to the characteristics of the subject matter and the activity of the mental processes of students to see the linkages contained in the subject matter. States that conventional learning is a learning that is built on the old foundation, which is based on the assumption that learners are consumers, achievement depends on individuals, compartmentalization (people and subject matter), centralized bureaucratic control, trainers/teachers as program implementers, learning is verbal and cognitive, and learning programs follow a centrally determined process pathway (Maier, 1995). Based on the description above, the purpose of this study is to determine the effect of the assessment criteria, learning models, and adversity quotient on mathematics learning outcomes in state junior high schools in Palu.

Methods

The method used in this research is the experimental method. The response variable is the students' mathematics learning outcomes, while the treatment factors are: (1) assessment criteria, (2) learning models, and (3) adversity quotient, each of which has two levels of treatment. The design used was a 2 X 2 X 2 factorial design with a univariate cell mean model with an analysis of variance (ANAVA) with a design that is presented in Table 1. And contrast coefficients between student groups based on factors *A, B*, and *C* can see in Table 2.

Descriptive statistics include samples of each cell, average values, variance, maximum, and minimum. The line diagram aims to see the success of the data and can detect outliers of data based on a single data structure for each cell. The data is divided into four equal parts from which the data has been sorted, each 25%. There are three quartiles, namely K1 (lower quartile), K2 (middle or median quartile), and K3 (upper quartile).

The one-way ANAVA procedure in this section is carried out to test hypotheses about: (1) differences/similarities of all mean parameters of students' mathematical learning outcomes, and (2) testing hypotheses about each contrast defined. To test the above hypothesis one variant analysis model (ANAVA) is applied with the following equation:

$$Y_{ijkl} = \mu_{ijk} + \varepsilon_{ijkl}$$

Y_{ijkl} stated the value/score of the observation to-l in cell- ($_{ijk}$), the i-th treatment of the evaluation criteria factors for the i-th variable; jth treatment of the learning model factors for the jth variable; and the k-th treatment of the adversity quotient factor for the k-th variable. μ_{ijk} represents the mean parameters of the Y_{ijk} population and the random error term ε_{ijkl} from the model assuming ε_{ijkl} - NII (0, δ2), where l = 1, 2, 3, ... n_{ijk}, and univariate variant analysis with GLM procedures, the most complete model is as follows: $Y_{ijkl} = \mu + A_i + B_j + C_k + (AB)_{ij} + (AC)_{ik} + (BC)_{jk} + (ABC)_{ijk} + \varepsilon_{ijkl}$.

Based on the above equation, hypothesis testing is carried out on mathematics learning outcomes by contrast in Table 2.

Results and Discussion

Figure 1 shows the results of learning mathematics obtained with an average value of an analytical assessment of 61.30 and a holistic assessment of 57.96, as well as outlier data appearing at the maximum and minimum values in the analytical evaluation as listed in Figure 1 and Table 3.

Mathematics learning outcomes of students with the acquisition of the percentage of the number of students in categories 1 to 5 specifically for analytical and holistic assessment displayed in Table 4 show that from the scores of mathematics learning outcomes of students in analytical assessment, there are 18.6% of students whose scores under 50 or there are 26 students from 140 students, and there are 39.3% of students whose scores below the average value, namely in groups 1 and 2 which are considered low categories. However, for the high category, it has the same percentage. There are 39.3% of students who are above the average score, displayed in groups 4 and 5.

Grouping scores on mathematics learning outcomes against assessment criteria, learning models with adversity quotient that forms eight cells between factors A, B, and C with n = 35 shows that the lowest minimum score is 34 in cells *A1B1C2* and *A2B1C1*, the highest maximum score is 90 in cells *A1B1C1*, range of data 90 - 34 = 56, the average of each cell has a quite significant difference, especially in the highest cell that is in cell *A1B1C1* with a score of 68.46, while the lowest score is in cell *A2B2C2* which is 51.54. To sum up, each statistical recapitulation has the same score because everything is the same, N total = 280 with the total average = 59.63, the maximum score = 90, and the minimum score = 34.

Homogeneity test analysis was done using the Bartlett test. It was found that $\chi^2_{corrected} = 12.3$, with degree of freedom: V = db = t - 1 = 7. Therefore, it can be concluded that $\chi^2_{corrected} = 12.3 \leq \chi^2_{table}(0.05; 7) = 14.1$. Based on this finding, the eight cell groups as described above show that $\chi^2_{corrected}$ is smaller than χ^2_{table}, which means that H0 is accepted at the level of significance α = 0.05. It can be concluded that the data support the truth of the hypothesis proposed. Thus, it is concluded that the variance of the eight cell groups is the same or homogeneous.

Hypothesis Testing

Based on Table 5, the statistical F-test is Fo = 10.855 with df = 7/272 and the index of p = 1.149x10-11, then H0 is rejected at the significance level α = 0.05. It is concluded that the eight average sub-population cells are stated that the main factors *A, B*, and *C* as well as their interaction factors have a significant influence simultaneously on mathematics learning outcomes.

The t-test results of the analysis based on contrast coefficients are summarized as follows:

1. On the 1st contrast, the value of t_0 = 2.858 and the value of p = 0.005 / 2 = 0.0025 <α = 0.05; it means that H0 is rejected, so it can be concluded that the mathematics learning outcomes in the analytical assessment criteria group are significantly higher than those in holistic assessment group.
2. On the 2nd contrast, the value of t_0 = 5.930 and the value of p = (9,167.10-9) / 2 = 4,58344.10-9 <α = 0.05; it means that H0 is rejected, so it can be concluded that the learning outcomes of mathematics in the PPKK model group are significantly higher than those in the conventional learning group.
3. On the 3rd contrast bar, the value of t_0 = -2.087 and the value of p = 0.038 <α = 0.05; it means H0 is rejected, so it can be concluded that the assessment criteria and learning models have a significant interaction effect on mathematics learning outcomes.
4. On the 4th contrast line, the value of t_0 = 0.545 and the value of p = (0.586 / 2) = 0.293> α = 0.05; it means that H0 is accepted, which means the data do not support the research hypothesis (H1). This states that the group of students in analytical assessment have higher mathematics learning outcomes than the group of students in holistic assessment.
5. On the 5th contrast line, the value of t_0 = 3.497 and the value of p = (0.00055 / 2) = 2.75.10-4 <α = 0.05. it means that H0 is rejected, so it can be concluded that specifically for the group of students who are given a conventional learning model, the learning outcomes of mathematics in the analytical assessment group are significantly higher than those in the holistic assessment group.
6. On the 6th contrast, the value of t_0 = 2.718 and p-value = 0.007 / 2 = 0.0035 <α = 0.05; it means that H0 is rejected. So it can be concluded that specifically for the group of students who are given an analytical assessment, the learning outcomes of mathematics in the PPKK learning model group are significantly higher than those in the conventional learning group.
7. On the 7th contrast line, the value of t_0 = 5.669 and the value of p = (3.661x10-8) / 2 = 1.8305x10-8 < α = 0.05; it means that H0 is rejected. So it can be concluded that specifically for the group of students who are given a holistic assessment, the mathematics learning outcomes of students in the PPKK model group are significantly higher than those in the conventional learning model group.

8. On the 5th contrast line, the value of $t_0 = 3.360$ and the value of $p = 0.038 < \alpha = 0.05$; it means H0 is rejected, so it can be concluded that the assessment criteria and adversity quotient have a significant interaction effect on mathematics learning outcomes.
9. On the 9th contrast line, the value of $t_0 = 4.397$ and the value of p = (1.576x10-5) / 2 = 0.788x10-5 < α = 0.05; it means that H0 is rejected, so it can be concluded that specifically for the high adversity quotient students group, the mathematics learning outcomes in the analytical assessment group are significantly higher than those in the holistic assessment group.
10. On the 10th contrast line, the value of $t_0 = -0.355$, because this hypothesis is a right-side hypothesis and the t-test statistical value obtained is negative, and the conclusion that H0 is accepted. which means the data do not support the research hypothesis (H1), which states that specifically for the group of the students with low adversity quotient, mathematics learning outcomes in the analytical assessment criteria group are higher than those in the holistic assessment group.
11. On the 11th contrast line, the value of $t_0 = -0.643$ and $p = 0.521 > \alpha = 0.001$; it means that H0 is accepted, it can be concluded that the data does not support the research hypothesis (H1), which states that the assessment criteria and adversity quotient influence mathematics learning outcomes.
12. On the 12th contrast line, the value of $t_0 = 3.739$ and the value of p = (0.00225 / 2) = 1.125x10-3 <α = 0.05; it means that H0 is rejected, so it can be concluded that for the group of students who have high adversity quotient, the learning outcomes of mathematics in the PPKK model group are significantly higher than those in the conventional learning group.
13. On the 13th contrast, the value of $t_0 = 4.648$ and the value of p = (5.231x10-6) / 2 = 2.6155x10-6 <α = 0.05; it means that H0 is rejected, so it can be concluded that specifically for the group of students with low adversity quotient, mathematics learning outcomes in the PPKK model group are significantly higher than those in the conventional learning group.
14. On the 14th contrast line, the value of $t_0 = 2.454$ and $p = 0.015 < \alpha = 0.05$; it means that H0 is rejected, so it can be concluded that the assessment criteria, learning models, and adversity quotient have a significant interaction effect on mathematics learning outcomes.
15. On the 15th contrast line, the value of $t_0 = 3.293$ and the value of p = (0.001 / 2) = 0.0005 <α = 0.05; it means H0 is rejected, so it can be concluded that specifically for the group of students with high adversity quotient given PPKK learning model, mathematics learning outcomes in the analytical assessment group are higher than those in the holistic assessment group.
16. On the 16th contrast line, the value of $t_0 = 2.925$ and p = (0.004 / 2) = 0.0002 <α = 0.05; it means that H0 is rejected, so it can be concluded that learning for the group of students with high adversity quotient given conventional learning, mathematics learning outcomes

in the assessment criteria group are significantly higher than those in the holistic assessment group.

17. On the 17th contrast line, the value of t0 = -2.522, because this hypothesis is a right-side hypothesis and the t-test statistic value obtained negatively and the conclusion that H0 is accepted. This means the data do not support the research hypothesis (H1), which states that specifically for the group of students with low adversity quotient is given PPKK learning, mathematics learning outcomes in the assessment criteria group are significantly higher than in the holistic assessment group.
18. On the 18th contrast line, the value of t_0 = 2.020 and the value of p = (0.044/2) = 0.022 <α = 0.05, means H0 is rejected; it can be concluded that specifically for the group of students with low adversity quotient is given conventional learning, mathematical learning outcomes in the analytical assessment criteria group are significantly higher than those in the holistic assessment group.
19. On the 19th contrast line, the value of t_0 = 2.828 and the value of p = (0.005 / 2) = 0.0025 <α = 0.05; it means that H0 is rejected, so it can be concluded that specifically for the group of students with high adversity quotient given analytical assessment, mathematics learning outcomes in the PPKK model are significantly higher than those in a conventional learning group.
20. On the 20th contrast line, the value of t_0 = 2.460 and the value of p = (0.015/2) = 0.0075 <α = 0.05; it means that H0 is rejected, so it can be concluded that specifically for the group of students with high adversity quotient given holistic assessment, mathematics learning outcomes in the PPKK model group are significantly higher than those in a conventional learning group.
21. On the 21st contrast line, the value of t_0 = 1.016 and the value of p = (0.311 / 2) = 0.1555> α = 0.05; it means that H0 is accepted, which means the data do not support the research hypothesis (H1). This states that specifically for the group of students with low adversity quotient is given analytical assessment, mathematics learning outcomes in the PPKK learning model group are higher than those in a conventional learning group.
22. On the 22nd contrast bar, the value of t_0 = 5.557 and the value of p = (6.540x10-8 /) 2 = 3.27x10-8 <α = 0.05; it means that H0 is rejected, so it can be concluded that specifically for the group of students with low adversity quotient is given holistic assessment, mathematics learning outcomes in the PPKK model group are significantly higher than those in a conventional learning group.

Assessment criteria are to measure the students' learning outcomes directly and not just assess the students' learning outcomes achieved through tests that only choose the correct answer from a series of answer choices that have been provided. Analytical assessment is an assessment system integrated with the learning process in helping direct student abilities through the results of learning activities that have been skipped. Analytical assessment makes learning more relevant to students' lives in the real world. Therefore, analytical assessments are always based on active students' participation, tasks that are given or that students do are inseparable from the whole learning process. Analytical assessment is not just to find out the position of students at a time in the learning process, but more than that. Analytical assessment is intended to improve the learning process itself through feedback made by the teacher. Through analytical assessment, students are more competent in solving problems, i.e. students are trained in their abilities to be able to think logically and be able to communicate their ideas.

In connection with the previous, in analytical assessment, the teacher always compiles mathematical problems not only to measure understanding of the principles, memories, and applied formulas, but the questions compiled are also questions that require structured reasoning through several stages that must be planned with carefully thought out. If possible, the stages of each other's questions are conditional so that students are accustomed to solving mathematical problems systematically and logically. Therefore, analytical assessment in the process of learning mathematics is an exercise for students to improve their competence through exercises in imitation (perception), compiling (manipulating)), doing procedures (precision), doing well and precisely (articulation), and taking action naturally (naturalization). Finally, the role of analytical assessment in mathematics learning can give students a deeper understanding of solving mathematical problems so that they can provide practical values in real life.

In analytical assessment, the questions given to students, in general, are in the form of story questions, proving mathematical applications that contain several mathematical concepts, and these concepts can be linked to other concepts so that students can find patterns or steps that must be passed. Mathematical problems in analytical assessment have a relatively similar mindset as problem solving, that is analytical thinking skills are needed. With these abilities, mathematical concepts contained in story problems can be manipulated in the form of simpler mathematical models with simple mathematical models. Students are getting easier to answer and less likely to be mistaken both in the process of solving problems and in the results of calculations.

Holistic assessment in mathematics learning leads most teachers who teach in class only rely on questions that are ready to use in textbooks or books circulated among students in general. So the questions given to students are relatively not challenging to think at a higher level (highest in the application aspect and relatively few story problem models). As a consequence, if a problem requires a higher thought process for a group of students who are given a holistic assessment, it allows the questions given are not answered correctly. This is consistent with the results of research which states that the results of mathematics learning group of students given an analytical assessment is higher than the results of learning mathematics group of students given a holistic assessment.

Further research findings reveal that the learning process in the classroom still uses many conventional approaches (mechanical), where a teacher actively teaches mathematics, then provides examples and exercises; on the other hand, students function like machines, they listen, take notes, and do the tasks provided by the teacher. This fact shows that not a few students who still consider mathematics as a subject that makes "stressed", makes the mind confused, time-consuming, and tends to just fiddle with formulas that he thinks are not useful in life. As a result, mathematics is seen as a hard science that does not need to be learned. Furthermore, it is explained that there is rarely found a process of learning mathematics that is directly related to real life. That students need the student worksheet to learn mathematics. The sheet should use varied examples and simple language (Yerizon, Putra, and Subhan, 2018). Russo and Russo (2019: 714) assumed that creating and delivering interest based units of work would allow teachers to experience greater enjoyment when teaching mathematics, by enabling teachers to introduce mathematical content through a topic area in which they were highly passionate.

In conventional learning, there are still teachers who are apathetic so that the learning process is monotonous. In the end, students feel bored and often become not interested in learning mathematics. The existence of the PPKK learning model is felt to be able to improve conventional learning conditions by changing a dry and mechanical approach to be more enjoyable and meaningful for both teachers and students. Therefore, organizing PPKK learning effectively can make students excited about practicing the PPKK learning model. Gamit, Antolin, and Gabriel (2017) in their research concluded Cooperative learning activities such as group activities, peer tutoring/mentoring, group games, and problem solving activities help the learners understand the concept and gain long term mastery skills in Mathematics.

The interaction effect between the assessment criteria and the learning model on mathematics learning outcomes at a 95% confidence level shows that this study supports the truth of the proposed hypothesis. Based on this, it provides an understanding that differences in mathematics learning outcomes are primarily determined by differences in assessment criteria and learning models that indicate : (1) specifically for the group of students given analytical assessment, mathematics learning outcomes in a group of PPKK learning model is higher than students' mathematics learning outcomes in a group of the conventional learning model. (2) Specifically, for the group of students given holistic assessments, learning outcomes of mathematics in the PPKK learning model group are higher than mathematics learning outcomes in the conventional learning model group. (3) Specifically for the group of students given PPKK learning model, mathematics learning outcomes in analytical assessment group is higher than mathematics learning outcomes of students in the holistic assessment group, and (4) specifically for the group of students given a conventional learning model, the learning outcomes of mathematics in the analytical assessment group is higher than the mathematics learning outcomes of students in the holistic assessment group.

The interaction effect between assessment criteria and adversity quotient on mathematics learning outcomes at a 95% confidence level shows that this study supports the truth of the proposed hypothesis. The results of the analysis provide an understanding that differences in students' learning outcomes in mathematics are primarily determined by differences in assessment criteria and adversity quotient that indicate: (1) specifically for the group of students given analytical assessment, students' learning outcomes in the high category adversity quotient group are higher than the results of learning mathematics in the low category adversity quotient group, (2) specifically for the group of students given a holistic assessment, students' mathematics learning outcomes in the high category adversity quotient group is lower than the mathematics learning outcomes of students in the low category adversity quotient group. (3) Specifically for the group of students with high adversity quotient category, the mathematics learning outcomes of students in the analytical assessment group is higher than mathematics learning outcomes in holistic assessment group, and (4) specifically for the group of students with low adversity quotient category, mathematics learning outcomes in analytical assessment group are higher than mathematics learning outcomes in holistic assessment group.

The interaction effect among the assessment criteria, learning models, and adversity quotient on mathematics learning outcomes at a 95% confidence level shows that this study supports the truth of the proposed hypothesis. The results of the analysis provide an understanding that differences in student mathematics learning outcomes are primarily determined by differences in assessment criteria, learning models, and adversity quotient. Analytical assessment is usually used to assess the quality of students' work in completing an assignment, for example, assessing tasks performed by students so that the teacher can have complete information about his or her students. Therefore, analytical assessment becomes very important for teachers to observe the students' learning progress, and also to assess the ability and achievement of students' learning outcomes. The teacher immediately determines the learning outcomes to be assessed, designs and makes appropriate assessment instruments, carries out the assessment, and analyzes the results of the assessment to ensure the development of the individual's potential as a whole and is integrated from the intellectual and emotional aspects by the learning objectives of mathematics.

The analytical assessment used in a group of high category adversity quotient students aims to measure mathematics learning that cannot be measured properly when using objective tests. Analytical assessment requires students to demonstrate what they know actively. Most importantly, analytical assessment can motivate to improve learning, understanding what they need to know, and what they can do. This is in line with the cognitive learning theory put forward by experts who say that analytical assessment should follow a scheme consisting of hierarchical structure, progressive differences, and integrative reconciliation.

Analytical assessments applied to high category of adversity quotient students group, concept maps, and integrative reconciliation are shown with cross links between groups and then given a rule to do: (1) numerical assessment with clear scoring (rubric) with the aim of: first, scoring is based on valid prepositions. (2) Calculation with valid hierarchical levels and scoring each level as many relationships are made. (3) Crosslinks that show valid relationships between two different sets (segments) are more important than hierarchical levels because this might be a sign of integrative adjustments, and (4) students are expected to be able to provide specific examples in some cases to ensure that students know events or objects that are indicated by the concept label.

The concept of an assessment carried out on high category adversity quotient student groups as described above leads more to a realistic mathematical approach known as a didactical assessment, which is an assessment aimed at supporting the learning process. The assessment is closely related to the group of students who have high category adversity quotient that is part of everyday educational practice in the classroom. In the assessment, the purpose is didactical, meaning that the teacher tries to gather convincing data about students and their learning processes to make specific educational decisions. The content of the assessment is also didactical meaning. The content of the assessment is not only specific to skills that are easily assessed but some of the objectives contained in KTSP 2006. The assessment procedure is also didactical, meaning that the procedure applied is an integration of learning and assessment and is a phase in the teaching-learning process. The technique is expected to provide information on the learning process and learning outcomes as clearly as possible so that the teacher gets information about what students are thinking and how students learn to understand the material as clearly as possible.

The above research findings, when we compare it with conventional mathematics learning conducted at school, show that the activities are started with the teacher's activities explaining a particular learning topic, then proceed with giving exercises to students. If many students can work on the practice questions as described, the teacher feels satisfied and considers himself successful. But if on the contrary or just say that many students have not been able to work on the problem, the teacher sometimes experiences emotional changes that result in changes in the learning atmosphere. Students are made scapegoats for the success or failure of the learning process with the argument that students do not pay attention to what has been explained, students are lazy to learn, and so forth, then the teacher takes a firm attitude and creates a military-style learning atmosphere, students must be silent when the teacher teaches and explains so quick to understand. As a result, most students find it difficult to learn mathematics because of the tense of the atmosphere when they are studying. Its consequences on the phenomenon that mathematics becomes a scary and boring lesson. Even though more than 80% of students exhibit a positive attitude towards mathematics, the majority are failing their mathematics examinations (Mazana, Montero, and Casmir, 2019). The result was consistent with Capuno, et al (2019), students expressed that math is essential in their life because they can apply these concepts in some of their daily activities. The overall weighted mean of 3.88 with a standard deviation of 0.929. This indicates that the respondents had positive attitudes in terms of the value of math.

Students with high category adversity quotient have sufficient strategy to be developed to make learning more productive and meaningful, without having to change the existing curriculum and order. With students invited to work and experience, students will easily understand the concept of material, and later, students are expected to be able to use their reasoning to solve existing problems. Thus students can easily understand the learning process in class and can be continued with other groups. They are interested in learning mathematics by paying attention to students in the high category adversity quotient group so that the class comes alive, and students feel healthy competition in their learning to see the challenges given by the teacher. The result was consistent with Peteros, et al (2019), the effectiveness of the Mathematics instruction can be measured through the academic achievement of the students, which in terms of knowledge and skills acquired and developed, the researchers found out that the average grade of the respondents was 79.37 percent, which is described as reasonably satisfactorily.

Further research findings explained that although the application of the PPKK learning concept is to place students as subjects of learning, where students are expected to play an active role in each learning process by finding and exploring their subject matter, for example, students are expected to learn through group learning, discussion, mutual acceptance and giving, but the reality in the class is not all students have high motivation to learn; consequently, students' mathematics learning outcomes are low. It was further explained that one of the steps in solving mathematical problems that are difficult for students to feel is to find relevant knowledge or concepts and the resolution of possibilities that lead to resolution because the relationship between analytical assessment and the high level of ability of students in adversity quotient categories is expected to be applied in the learning process as expected in the analytical assessment.

This is when compared to the ability of low category adversity quotient students. There are some weaknesses found, namely: (1) students are quickly bored if given challenges or complex problems and gradually become uninterested in learning mathematics, and (2) students in working on problems or the task are very dependent on the existing textbook, where the quality of the questions in the book mostly measures only the level of understanding and the highest application of the formulas that have been studied previously. Thus, when faced with an analytical assessment model that requires high analysis, most students are not able to complete it. Besides, in the learning process in the low category adversity quotient students, the learning patterns are too much dependent on the teacher, especially in the transformation of knowledge to students. The process of learning mathematics is still mostly done monotonously or, in other words, the creativity of students to improve students' understanding of mathematics according to what is expected is still lacking. The learning model causes many students to become apathetic without creativity so that students' learning outcomes end in incomplete eventual learning outcomes, and the math learning outcomes are low.

Furthermore, in the learning process by using a holistic assessment of problem solving using a theoretical approach to determine definite answers, previously the examples of solutions have been widely discussed by the teacher in class. Besides, the assessment of students' basic competencies is done by the teacher at the end of the learning unit which allows students to be better prepared in facing the tests that will be given by the teacher, and, in the end, the students' mathematics learning outcomes will be high. This is consistent with the results of the study, which states that for the group of students with low category adversity quotient ability in the conventional learning model, mathematics learning outcomes in the analytical assessment is higher than mathematics learning outcomes in the holistic assessment group.

Based on these findings, it can be explained that the teacher in implementing mathematics learning becomes the subject and determinant of everything in the process of learning mathematics. While students only become objects like an empty container that is ready to be filled by anything; in fact, what students get from the conventional mathematics learning process resembles that of a child two years old who is learning to say numbers one, two, three, and do not know what those numbers mean. It is ironic again if students do not understand the purpose of the material being studied because they only accept several materials provided by the teacher. When students are asked to re-express what they have learned they just stay quiet, because students never been trained to explore solving mathematical problems both in class and outside the classroom, in terms of the educational process that should be that students are given the freedom to determine what, how, why, and when to learn mathematics. As a result, students become quiet and cannot do anything, so that the learning outcomes of mathematics are low.

Based on that fact, when students are confronted with mathematical problems that require high analysis, most are not able to solve them, so the students' assumption that mathematics is difficult is following Soedjadi (2000) opinion that the current mathematics curriculum clearly emphasizes on what must be taught. Still, it does not lead to how to interpret the teaching material. In terms of the curriculum arranged to be able to meet the demands of life and the demands of the development of science so rapidly and technological developments that have directly affected daily life.

The presence of the PPKK learning model is felt to be able to improve conventional learning conditions by changing dry and mechanistic approaches to be more fun and meaningful for both teachers and students. Therefore, organizing PPKK learning effectively and can make students excited to follow it is something that cannot be bargained anymore to go to a nation that is capable of excelling in human resources. By practicing the PPKK learning model, it is expected that the spirit of mathematics can be saved. In other words, students become happy to learn mathematics and are free from the phobia of mathematics. By knowing the relation of mathematics to the realistic world, surely students are eager to learn mathematics.

Based on the above concept, there are three things that teachers should do in class: (1) the teacher emphasizes the process of student involvement in the learning process so that every mathematical problem is related to the subject being studied, and students find their solutions, (2) to facilitate the steps in solving mathematical problems, students are trained to use a model approach to concretize problems that are still abstract (concepts) so that students easily solve these problems, and (3) learning is associated with real life, the teacher not only expects students to understand the material learned but how the subject matter can color his behavior in everyday life.

The process of solving a mathematical problem in principle can be started from informal mathematics arranged systematically into formal mathematics. Informal mathematics presents a variety of freedom of thought in obtaining ideas and expressing ideas so that a mathematical solution is drawn, and an informal mathematical solution can be obtained by elaborating the ability to think that is more real and easy to understand. The completion of mathematics in an informal way can be an inspiration for the completion of mathematics in a formal way. These ideas are then arranged systematically step by step so that each stage becomes clear and orderly. The rearrangement of the draft that has been poured is intended for the following purposes: (1) helps students remember more quickly, (2) helps reduce the process of solving mathematical problems, (3) helps to elaborate, add and complete, and (4) helps students become more understanding.

Explanation of the above research findings, in line with the results of the study which state for the group of students with high adversity quotient in the holistic assessment, mathematics learning outcomes in the PPKK learning model group are higher than the mathematics learning outcomes in the conventional learning model group.

Conclusion

Based on the findings taking into account the limitations of the study, several conclusions are taken as follows: (1) students' mathematics learning outcomes in the analytical assessment group are higher than those in the holistic assessment group, (2) students' mathematics learning outcomes in the PPKK model group are higher than those in the conventional learning model group, (3) there is an interaction effect between the assessment criteria and learning models on mathematics learning outcomes, (4) specifically for the group of students given the PPKK model, mathematics learning outcomes in analytical assessment group are lower than those in holistic assessment group, (5) specifically for the group of students given conventional learning, mathematics learning outcomes in analytic assessment group are higher than those in holistic assessment group, (6) specifically for the group of students given analytical assessment, mathematics learning outcomes in PPKK model group are higher than those in conventional learning group, (7) specifically for the group of students given the holistic assessment, mathematics learning outcomes in the PPKK model group are higher than conventional learning group, (8) there is an interaction effect between the assessment criteria and adversity quotient on mathematics learning outcomes, (9) specifically for the group of students with high adversity quotient, the mathematics learning outcomes in the analytical assessment group are higher than those in the holistic assessment group, (10) specifically for the group of students with low adversity quotient, mathematics learning outcomes in analytical assessment group are higher than those in holistic assessment group, (11) there is no interaction effect between learning models with adversity quotient on mathematics learning outcomes, (12) there is an interaction effect between assessment criteria, learning models, and adversity quotient on mathematics learning outcomes, (13) specifically for the group of high adversity quotient students given the PPKK model, the mathematics learning outcomes in the analytical assessment group are higher than those in the holistic assessment group, (14) specifically for the group of high adversity quotient students given the conventional learning model, the mathematics learning outcomes in the analytical assessment group is higher than those in the holistic assessment group, (15) specifically for the group of low adversity quotient students given the PPKK model, the mathematics learning outcomes in the analytical assessment group are lower than those in the holistic assessment group, (16) specifically the group of low adversity quotient students given conventional learning model, mathematics learning outcomes in analytical assessment group are higher than those in holistic assessment group, (17) specifically for the group of high adversity quotient students given analytical assessment, mathematics learning outcomes in PPKK model group are higher than those in conventional learning group, (18) specifically for the group of high adversity quotient students given holistic assessment, mathematics learning outcomes in the PPKK model group are higher than those in conventional learning group, (19) specifically for the group of low adversity quotient students given the analytical assessment, mathematics learning outcomes in the PPKK model group are lower than those in conventional learning group, and (20) specifically for the group of low adversity quotient students given holistic assessments, mathematics learning outcomes in the PPKK model group are higher than those in conventional learning group.

Implications

Analytical assessment is an assessment system that is integrated with the mathematics learning process in helping direct students' abilities through the results of learning activities that have been passed (learning experience). Analytical assessment makes learning more relevant to students' lives in the real world. Therefore, analytical assessment is always based on the active participation of students; tasks given or undertaken by students are inseparable from the whole learning process. Analytical assessment is not just to find out the position of students at a time in the learning process, but more than that, analytical assessment is intended to improve the process of learning mathematics itself through feedback made by the teacher. Therefore, by applying analytical assessment in mathematics learning, students are expected to be more competent in solving problems, be able to think logically and be able to communicate their ideas.

Noting the things that have been described, then in the learning process in class, three things need to be done by the teacher: (1) the teacher emphasizes the process of student involvement in the learning process so that every mathematical problem is related to the subject matter being studied, students find their solutions, (2) to facilitate the steps in solving mathematical problems students are trained to use a model approach to concrete problems that are still abstract (concept) so that students easily solve these problems, and (3) learning is associated with real life, the teacher not only expects students to understand the material learned but how the subject matter can color their behavior in everyday life.

Thus the results of this study provide the implication that in the process of learning mathematics in junior high school, it is expected that the mathematics teacher applies the PPKK model in mathematics learning. By doing so, the teacher can improve the learning process as well as improve the mathematics learning outcomes to make students as human beings having the ability to learn can develop their potential, and develop further knowledge for their benefits in the future.

The purpose of the assessment in the learning process is to measure how far the level of success of the teaching and learning process that has been implemented, developed and implanted in schools and can be internalized, practiced/applied, and maintained by students in everyday life. Besides, the assessment also aims to find out how far the teacher's success in implementing the learning process, which is used as feedback for teachers in planning the next learning process. This is intended to maintain, improve, and complete the learning process implemented. This assessment must be conducted honestly and transparently to reveal real information.

Nothing the explanation above, to assess the students' learning progress according to curriculum standards, assessment criteria have the following characteristics: (1) assessment is not to classify students (discrimination), but to serve individual students in developing their abilities. (2) Using reference assessment criteria (criterion-referenced assessment), not assessment norm reference (norm-referenced assessment). (3) The main reference assessment is the basic competencies formulated in the curriculum. (4) Applying various ways of assessment, including portfolios, products, and performance, and (5) the results of evaluating student learning progress are presented in a student competency profile, containing complete information, and is easily understood by students, parents, other teachers, and graduates users.

Furthermore, it was also explained that conventional learning makes it easy for teachers to organize subject matter because in conventional learning, in general, the subject matter is uniformly absorbed by students, both in sequence and in its scope. Be informative or fact, mainly intended to provide information or as an introduction in the teaching and learning process. So that in the learning process, students listen more or ask questions about the subject matter. The conventional learning process can shape the ability of students to attend and form the ability to ask questions. Therefore, for the success of conventional learning, the teacher always tries to link the stimulus and response in the teaching and learning process through question and answer that allows for interaction and educational communication. The most important thing to consider in conventional learning is the process of learning with questions and answers, including students must first know the basic information through reading or listening about the material to be discussed. As a result, the teacher easily directs an incorrect answer to the correct answer. Ways and good attitudes from the teacher can arouse students' motivation and confidence in asking and answering.

Thus the results of this study have implications that in the process of learning mathematics in junior high school, it is expected that mathematics teachers apply holistic assessments with conventional models in mathematics learning so that they can improve the learning process while improving mathematics learning outcomes to make students as human beings who have the learning ability can develop their potential and develop further knowledge for their benefits in the future.

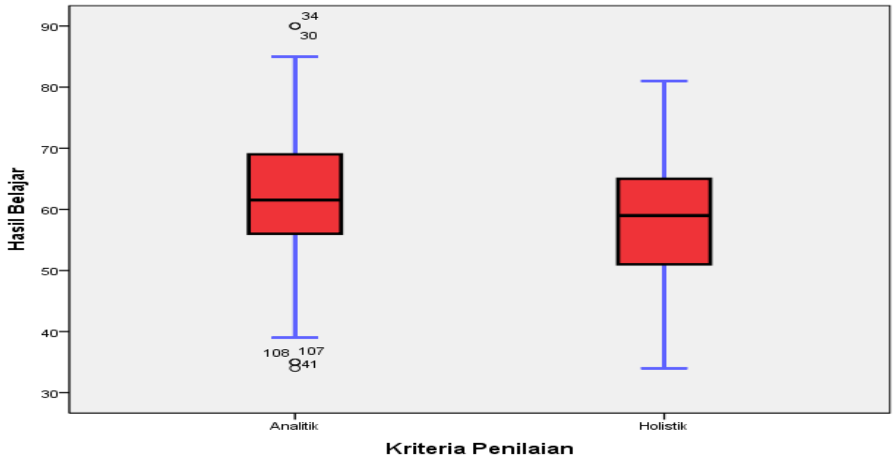

Figure 1. Boxplot of Mathematics Learning Outcomes Scores for Group of Analytical Assessment and Holistic Assessment Criteria

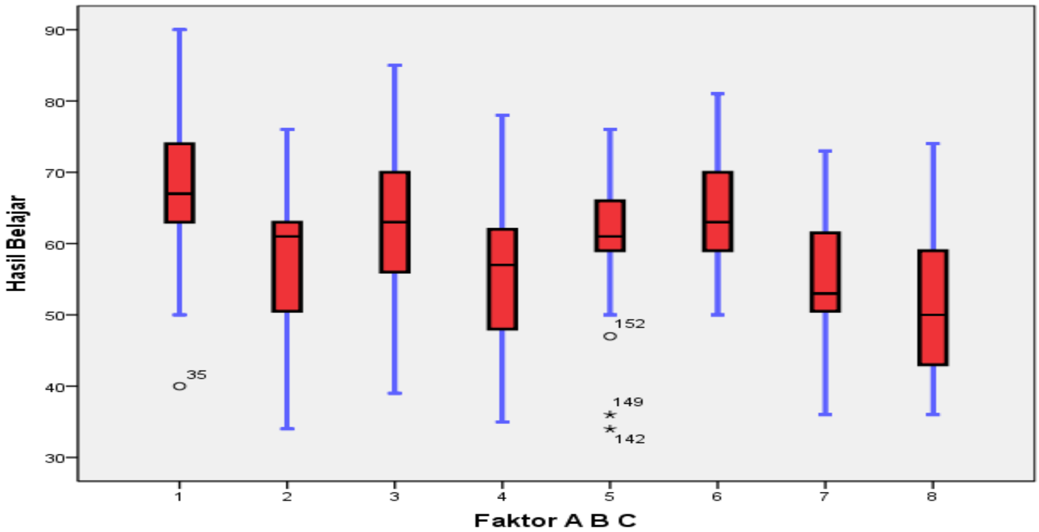

Figure 2. Boxplot of Mathematics Learning Outcomes Scores on Assessment Criteria Factors, Learning Models, and Adversity Quotient

Table 1. Factorial Experimental Design 2 X 2 X 2

Adversity Quotient (*C*)	**Learning Model (*B*)**	**Assessment Criteria (*A*)**	
		Analytical (A_1)	**Holistic (A_2)**
High (C_1)	PPKK (B_1)	$[\ Y\ ]_{111k}$ $k = 1, 2, ..., n_{111}$	$[\ Y\ ]_{112k}$ $k = 1, 2, ..., n_{112}$
	Conventional (B_2)	$[\ Y\ ]_{121k}$ $k = 1, 2, . . ., n_{121}$	$[\ Y\ ]_{122k}$ $k = 1, 2, . . ., n_{122}$
Low (C_2)	PPKK (B_1)	$[\ Y\ ]_{211k}$ $k = 1, 2, . . ., n_{211}$	$[\ Y\ ]_{212k}$ $k = 1, 2, . . ., n_{212}$
	Conventional (B_2)	$[\ Y\ ]_{221k}$ $k = 1, 2, . . ., n_{221}$	$[\ Y\ ]_{222k}$ $k = 1, 2, . . ., n_{222}$

Information:
Y = scores of students' mathematics learning outcomes, k = number of observations for each cell

Table 2. Contrast Coefficients between Student Groups based on Factors *A, B*, and *C*

Contrast	***A* = 1**				***A* = 2**			
	***B* = 1**		***B* = 2**		***B* = 1**		***B* = 2**	
	***C* = 1**	***C* = 2**	***C* = 1**	***C* = 2**	***C* = 1**	***C* = 2**	***C* = 1**	***C* = 2**
	111	**112**	**121**	**122**	**211**	**212**	**221**	**222**
1	1	1	1	1	-1	-1	-1	-1
2	1	1	-1	-1	1	1	-1	-1
3	1	1	-1	-1	-1	-1	1	1
4	1	1	0	0	-1	-1	0	0
5	0	0	1	1	0	0	-1	-1
6	1	1	-1	-1	0	0	0	0
7	0	0	0	0	1	1	-1	-1
8	1	-1	1	-1	-1	1	-1	1
9	1	0	1	0	-1	0	-1	0
10	0	1	0	1	0	-1	0	-1
11	1	-1	-1	1	1	-1	-1	1
12	1	0	-1	0	1	0	-1	0
13	0	1	0	-1	0	1	0	-1
14	1	-1	-1	1	-1	1	1	-1
15	1	0	0	0	-1	0	0	0
16	0	0	1	0	0	0	-1	0
17	0	1	0	0	0	-1	0	0
18	0	0	0	1	0	0	0	-1
19	1	0	-1	0	0	0	0	0

Contrast	*A* = 1				*A* = 2			
	B = 1		*B* = 2		*B* = 1		*B* = 2	
	C = 1	*C* = 2	*C* = 1	*C* = 2	*C* = 1	*C* = 2	*C* = 1	*C* = 2
	111	112	121	122	211	212	221	222
20	0	0	0	0	1	0	-1	0
21	0	1	0	-1	0	0	0	0
22	0	0	0	0	0	1	0	-1

Table 3. Recapitulation of Mathematics Learning Outcomes in Assessment Criteria

Assessment Criteria	Statistics						*95% CI*	
	N	*Minimum*	*Maximum*	*Mean*	*Std.Dev*	*S.E*	*L.B*	*U.B*
Analytical	140	34	90	61,30	11,178	0,945	59,43	63,17
Holistic	140	34	81	57,96	10,400	0,879	56,23	59,70
Total	280	34	90	59,63	10,905	0,652	58,35	60,92

Table 4. Scores of Mathematics Learning Outcomes on Assessment Criteria Factors

Assessment Criteria		**Total Mathematics Learning Outcomes**					**Total**
		1	**2**	**3**	**4**	**5**	
Analytical	**Amounts**	26	29	30	29	26	140
	%	18,6	20,7	21,4	20,7	18,6	100
Holistic	**Amounts**	32	42	29	21	16	140
	%	22,9	30,0	20,7	15,0	11,4	100
Total	**Amounts**	58	71	59	50	42	280
	%	20,7	25,4	21,1	17,9	15,0%	100

Table 5 F-Test on the Effects of All Factors *A, B, C*, and Interactions on Y-Mean Parameters

Source	**JK**	**Df**	**RJK**	**F**	**P**
Corrected Model	7244,711(a)	7	1034,959	10,855	$1,149 \times 10^{-11}$
Intercept	995677,889	1	995677,889	10442,67	$6,57 \times 10^{-221}$
A	778,889	1	778,889	8,169	0,005
B	3353,432	1	3353,432	35,171	$4,156 \times 10^{-9}$
C	1007,004	1	1007,004	10,561	0,00677
A*B	415,289	1	415,289	4,356	0,038
A*C	1076,432	1	1076,432	11,290	0,000461
B*C	39,375	1	39,375	0,413	0,521
A*B*C	574,289	1	574,289	6,023	0,015
Error	25934,400	272	95,347	-	-
Total	1028857,000	280	-	-	-
Corrected Total	33179,111	279	-	-	-

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Biography

Mustamin Idris, born in Pare-Pare, Bacukiki District, South Sulawesi in 1963, the third child of four siblings to the couple of Mr.Idris Makkalu (late) with Mrs. Hj. Sunduseng. Completed Pare-Pare 35 Public Elementary School / MIN Pare-Pare (1975), Pare-Pare State Junior High School/ M.Ts (1979), State Senior High School 2 of Pare-Pare (1982), Mathematics Education S1 (Bachelor Degree) FPMIPA IKIP Ujung Pandang (1987) , in 1997 continued his pre-Master Education in Statistics and S2 (Master Degree) at PSL FMIPA IPB, in 2007 he continued his S3 (Doctoral Degree) major at Educational Research and Evaluation Study Program of Jakarta State University (UNJ). His recent occupation is becoming a civil servant since 1990 at the Mathematics Education Study Program FKIP Tadulako University, Central Sulawesi Province. Work experience: (1) Secretary of the Central Sulawesi PWM Dikdasmen (2006-2010), (2) Lecturer Non-Pendend UT UPBJJ-Jakarta (2007-2011), (3) Lecturer at Muhammadiyah University of Palu (UMP) (2003-2007) , (4) Chairperson of Asa-Pena of Central Sulawesi Province (2007-2009), (5) Research Team on the Impact of School Accreditation on R & D Education Middle School Education Units (2011), and (6) Secretary of the Formation of Model / Leading Schools in Primary Education Unit in Palu City (2004-2007). Married to Andi Agusniatih Maddolangan (1993), blessed with four children, namely Rahmi Fadhilah – a student of IPB at Marine Science and Technology, Fachrul Ichsan – a student of Bogor BBS High School, Naflah Ariqah Taruna Andhiga – a student of Junior High School Bogor, Muh. Zidane – a student of SD Negeri 4 Bogor Police.

Ahmad, born in Bima, West Nusa Tenggara, December 3, 1985. Alumnus of STKIP Bima in 2009. In the same year, he continued his study at Jakarta State University major at Educational Research and Evaluation study program graduated in 2011, and in 2016 he completed his Doctoral Program in the same study program and campus. This alumnus of Jakarta State University serves as a lecturer at the University of Gajayana Malang, in addition to being a BAN PAUD and PNF Assessor, Education Consultant, an active member of the Indonesian Lecturers Association (ADI), an active member of the Indonesian Educational Evaluation Association (HEPI), and the Central Board of the Indonesian Doctoral Association Association Forward (PDIM). Research studies that had been conducted and resulting in the form of books include: (1) Evaluation of the Implementation of Accreditation in Improving School / Madrasah Quality, published by BAN S / M in 2011, collaborative research of the PEP PPs UNJ Study Program with Ministry of Education and Culture, (2) Policy Coordination Study Higher Education Funding, published by Ministry of Education and Culture Expert Staff of Ministry of Education and Culture in 2012, (3) Study on Improving Competence of Educated Personnel in Indonesia, Published by Ministry of Education and Culture Expert Staff of Ministry of Education and Culture in 2014, (4) Study on Program Performance Improvement Indonesia Smart Card Awarding, published by Ministry of Education and Culture Ministry's Expert Staff of Ministry of Education and

Culture in 2015, (5) Study Results of Competency Test for Junior High School (SMP) Mathematics Teachers in East Jakarta City, Research Grant of the Directorate General of Teachers and Education Personnel in 2015. (6) Parenting Program Implementation of Educational Children OF Education In Malang Raya with the Stufflebeam Approach Collaborative Research with SEAMEO CECCEP Indonesia, (6) Evaluation of Early Childhood Education. Journal works that have been published, among others, are: (1) The Implementation of Higher Education Funding in Indonesia, (2) Evaluation of Entrepreneurial Student Programs using the CIPP Model in Brawijaya University and State University of Malang, (3) Performance of Smart Indonesia Programs through Smart Indonesia Cards (Survey in 6 Provinces in Indonesia), (4) Measurement of Indonesian Education For All Development Index (EDI) for 2011-2015, (5) Analysis of Higher Education Financial Management in terms of Single Tuition (UKT) in Higher Education, (6) Classroom Assessment And Integrated Learning Models in Social Studies Learning, (7) The Influence of Knowledge and Skill on Performance through Entrepreneurship Competency in Malang SME Entrepreneurs in Leading Products, and (8) Determinants of Company Value with Firm Size and Leverage as Moderating to Construction Companies.

Yusti Arini, born in Metro, Lampung, August 29, 1975. Alumnus of English Education Department of Yogyakarta State University in 1999. In 2000, she continued her study at Yogyakarta State University major at Educational Research and Evaluation study program graduating in 2011, and in 2016 she completed her Doctoral Program at the Educational Research and Evaluation of Jakarta State University. Now she works as a lecturer at the Surakarta State Islamic University, in addition to becoming a member of Indonesian Lecturers Association (ADI), and Indonesian Educational Evaluation Association (HEPI). Research studies that had been conducted include, among others: (1) Students' Writing Ability viewed from Learning Technique, Self-Concept, and Their Vocabulary Mastery, (2) Implementing Kahoot to Increase the Students' Critical Reading Ability and Their Learning Autonomy, (3) Using Blog Media to Improve the Students' Ability in Writing English Research Proposal, (4) Stories of Muhammad in Bilingual Application: Developing Islamic Stories for Kids, (4) Applying Team-Assisted Individual (TAI) to Increase the Students' English Writing Ability, (5) Constructing a Localized Instrument to Measure the English Learner Autonomy based on Rasch Model Analysis: An Exploratory of IRT Modelling Approach Considering Person and Item Characteristics, (6) Using Mind Map Technique to Improve the Learners' Ability in Doing TOEFL Test, and (7) Exploring the Religious Tolerance in the Community of Badran Rau, Lampung Province.