UNNES JOURNALS

Kreano, Jurnal Matematika Kreatif-Inovatif
Volume 14, number 1, 2023, pp. 136-159

Development of HoTS-Based Elementary Linear Algebra Course Test Instruments Charged with Islamic Character

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Abstract

This test is known as an evaluation tool or test instrument in the form of questions that are prepared in accordance with learning indicators. A lecturer should be able to provide questions that can trigger students to think at a higher level so that they can be more optimal in achieving learning objectives. This study aims to produce HOTS-based test instruments with Islamic characters by looking at the development procedures and quality of HOTS-based test instruments with Islamic characters developed. The type of development used is research research and development (R&D), namely the development of test instruments for linear algebra courses. The development model used is a formative research (Tessmer) model which goes through 4 stages, namely preliminary, self-evaluation, prototyping (expert review, one to one, small group), and field test. The test subjects in this study were students of mathematics education class PMAT B, Faculty of Tarbiyah and Teacher Training, UIN Alauddin Makassar with a total of 33 students. Based on the results of the trials conducted, it was obtained that: (1) the test instrument was declared "valid" with a very suitable category, the test instrument was declared reliable with a very high category (reliable), the test instrument had a fairly good difficulty level with a moderate category, the test instrument had a good distinguishing power with a good category. Thus, the test instruments of the HOTS-based elementary linear algebra course with Islamic characters are of good quality. Therefore, HOTS-based test instruments with Islamic characters can be used as evaluation tools in the form of exercises, quizzes, and semester exams to measure students' higher order thinking skills.

Keywords: *Development Instrument Test, HOTS, Character Islamic, Elementary Linear Algebra*

Information of Article

Subject classification	*97D60 Student assessment, achievement control, and rating (aspects of mathematics education)*
Submitted	*23 October 2022*
Review Start	*23 October 2022*
Round 1 Finish	*27 October 2022*
Round 2 Finish	*18 March 2023*
Round 3 Finish	*11 April 2023*
Accepted	*12 April 2023*
Published	*27 April 2023*
Similarity Check	*13%*

Abstrak

Tes ini dikenal dengan istilah alat evaluasi atau instrumen tes berupa soal-soal yang disusun sesuai dengan indikator pembelajaran. Seorang dosen hendaknya mampu memberikan soal-soal yang dapat memicu mahasiswa untuk berpikir tingkat tinggi agar dapat lebih optimal dalam mencapai tujuan pembelajaran. Penelitian ini bertujuan menghasilkan instrumen tes berbasis HOTS bermuatan karakter islami dengan melihat prosedur pengembangan dan kualitas instrumen tes berbasis HOTS bermuatan karakter islami yang dikembangkan. Jenis pengembangan yang digunakan ada-lah penelitian research and development (R&D) yaitu pengembangan instrumen tes mata kuliah aljabar linear. Model pengembangan yang digunakan adalah model formative research (Tessmer) yang melalui 4 tahap yaitu preliminary, *self evaluation, prototyping (expert review, one to one, small group), dan field test*. Subjek uji coba pada penelitian ini adalah mahasiswa pendidikan matematika kelas PMAT B, Fakultas Tarbiyah dan Keguruan, UIN Alauddin Makassar dengan jumlah 33 mahasiswa. Berdasarkan hasil uji coba yang dilakukan, diperoleh bahwa: (1) instrumen tes dinyatakan "valid" dengan kategori sangat sesuai, instrumen tes dinyatakan reliabel dengan kategori sangat tinggi (reliabel), instrumen tes memiliki tingkat kesukaran yang cukup baik dengan kategori sedang, instrumen tes memiliki daya pembeda yang baik dengan kategori baik. Dengan demikian, instrumen tes mata kuliah aljabar linear elementer berbasis HOTS bermuatan karakter islami memiliki kualitas yang baik. Oleh karena itu, Instrumen tes berbasis HOTS bermuatan karakter islami dapat digunakan sebagai alat evaluasi berupa latihan, kuis, dan ujian semester untuk mengukur kemampuan berpikir tingkat tinggi mahasiswa.

INTRODUCTION

Every activity that has been carried out requires an evaluation process in it. Evaluation is the activity of assessing the state of an object using instruments (Thoha, 2003). Evaluation activities are not just assessing, but an activity that is systematic and directed based on goals. To determine the value of the object being evaluated it is necessary to make measurements, and the form of such measurements is testing.

Evaluation in the world of education is better known as learning evaluation or evaluation of learning outcomes. There are three main reasons why education requires an evaluation process (Thoha, 2003). First, the purpose of education directs how the teaching and learning process should be carried out, and through evaluation it can be known whether the educational objectives have been achieved properly. Second, conducting learning outcome evaluation activities is one of the characteristics of professional educators. Third, when viewed from an institutional approach, education is a management activity that includes planning, programming, drafting, movement (actuating), control, and evaluation activities. If one of these management functions is not carried out, it can be ascertained that there are institutional deviations, so that the goal will not be achieved. Therefore, evaluation is indispensable in the world of education.

Evaluation of learning in education aims to find out the abilities of students (Ahmad, 2015). In higher education, students are better known as students and educators are lecturers, so that the evaluation of learning outcomes in higher education is used to measure student abilities and find out the success of lecturers in teaching. This form of testing to assess the magnitude of a person's abilities is called a test (Arifah & Yustisianisa, 2012). This test is known as an evaluation tool or test instrument in the form of questions that are arranged according to learning indicators.

A lecturer should be able to provide questions that can trigger students to think at a high level to be more optimal in achieving learning goals. This is because the ability to think can affect a person's level of material mastery. Low student thinking ability triggers difficulties in mastering the material obtained (Andriyani & Yenni, 2019).

Based on the results of pisa (Program for International Students Assessment) 2018 research, the average score of Indonesian students is 379 out of 489 average scores (OECD, 2018) and Indonesia is in 71st position out of 78 participating countries (Faridah et al., 2018). This shows that the performance of Indonesian students is still relatively low. The reason is that Indonesian students are not used to doing HOTS-based questions (Nizar dkk., 2018). Therefore, compiling questions that trigger for higher-level thinking is the right effort to improve the performance of Indonesian students.

Higher Order Thinking Skills (HOTS) is the ability to process information by thinking critically, evaluating, and solving a problem (Kenedi, 2018; Rahmawatiningrum, Kusmayadi, & Fitriana, 2019). Mathematics is one of those lessons that requires a person to think at a high level (Mazana, Montero, Casmir, 2019; Büchele & Feudel, 2022). As Windia Hadi and Ayu Faradillah said in their research, that "A high level thinking ability is a basic ability that must be developed in mathematics learning". That is, the ability to think at a higher level is a basic ability that must be developed in mathematics learning (Hadi & Faradillah, 2019).

Before carrying out evaluation activities, it is necessary to establish material as a basis for developing test instruments. Elementary linear algebra is one of the mathematics courses whose material is very much loved by students. Students' love for elementary linear algebra materials shows a positive attitude, as can be seen from the results of calculating the student's positive attitude score is greater than a neutral attitude (Simanjuntak, 2016). Although there are still students who are not happy with the course. Elementary linear algebra is also the basis for mastery of other higher-level courses (Apriyani, 2015). This means that success in mastering the material in elementary linear algebra courses can make it easier for students to study other courses.

Instruments of elementary linear algebra courses are needed to trigger students to think at a high level. The same thing was obtained by the researcher from the results of his interview with students of the mathematics education study program, UIN Alauddin Makassar. "Students really need questions that can train their thinking skills, especially prospective teachers," said Afifa, a 4th semester student who has gone through linear algebra courses. In addition, her study partner, Diah Nadila, explained the reality that occurs that the elementary linear algebra questions given by the lecturer are only based on existing textbooks or modules, usually the questions are in the form of fills and descriptions. Based on the reality obtained by researchers, the solution offered is to create an instrument based on HOTS.

In addition to improving cognitive abilities, learning mathematics is also expected to be one of the means for achieving predetermined educational goals, namely changes in the attitudes and behaviour levels of students which include religious awareness or in other words, through learning mathematics can be instilled religious values in children (Salafudin, 2015). To achieve this, a lecturer must be able to implement mathematics learning with the insertion of Islamic Academic Culture to achieve attitude competence in accordance with Islamic teachings (Maharani, 2012). Therefore, to achieve these two things in this study, a test instrument that contains Islamic values to form a good personality needs to be developed. As a Muslim, students who are in Islamic universities should get a stimulus of Islamic values in every learning. As expressed in a word that "science without religion is blind and religion

without science is limping" so that both must be the basis of any learning (Maarif, 2015).

Based on this, the researcher intends to develop a HOTS-based test instrument with Islamic character. This not only trains students to think at a high level but can also have a positive impact in the form of instilling Islamic values in students. Students as the next generation should be accustomed to doing questions that trigger to think high-level and get stimulus to strengthen their character. Because this habit can be a provision for these students when taking on roles in the future. The test instruments developed are in the form of questions that can be used as practice assessments and quizzes.

This research is very important to be carried out to assist lecturers in developing HOTS-based test instruments with Islamic character that are in accordance with learning objectives and produce valid, reliable, practical, and effective evaluation results. The results of this study can be used as an evaluation tool that has a positive impact on students.

Based on the description above about the importance of HOTS-based test instruments and Islamic character-charged as a tool for evaluating learning outcomes, the researcher will conduct a research "Development of HOTS-Based Elementary Linear Algebra Course Test Instruments Charged with Islamic Characters".

Research And Development

Research and Development (Research and development) is a type of research used to produce a product that has good quality. Developing a product can take the form of updating an existing product or creating a new product (which has never existed before) so that the development does not only develop a product (Sugiyono, 2016). Therefore, development research is a research method whose final result will produce a product that is beneficial to its users.

Tessmer Development Model

Tessmer's formative research type development model consists of four stages, namely the preliminary stage, the self-evaluation stage, the formative evaluation stage (prototyping) which includes expert reviews, one-to-one, and small groups, as well as the field test stage (Jurnaidi & Zulkardi, 2013). The preliminary stage is the stage of collecting references relevant to the research. After obtaining information from these references, the place and subject of the research trial are determined. The self-evaluation stage is divided into two stages, namely the analysis stage and the design stage. The products created and developed will be evaluated by 3 groups at the prototyping stage, namely Expert review, One-to-one, and Small group. The revision results of the Expert review and One-to-one are called prototype II, while the revision results of the Small group group are referred to as prototype III. Furthermore, at the field test stage, field trials of products that have been developed and have been revised will be carried out.

Test Instruments

A typical technique for conducting an evaluation or assessment is to give a test (Yoong, 2015). In general, a test can be interpreted as a tool for measuring the mastery of a measuring object against a certain set of content (Ahmad, 2015). Test instruments are one of the tools used to detect the abilities of learners. The test is a collection of questions to be answered, tasks to be done, and questions to choose from (Sa'idah et al., 2019). Test, measurement, and evaluation are concepts used in

education to explain how the progress of learning and the final learning outcomes of students are assessed (Adom, Mensah, & Dake, 2020)

Hots (Higher Order Thinking Skills)

HOTS (Higher Order Thinking Skills) or higher order thinking abilities are a type of non-algorithmic thinking (analytical, evaluative, and creative thinking) that involves metacognition (Hadi & Faradillah, 2019). HOTS is a thought process that involves the mental in an effort to explore complex, reflective and creative experiences that are carried out consciously in achieving goals, namely obtaining knowledge that includes levels of analytical, synthesis, and evaluative thinking (Hidayat et al., 2020). HOTS is defined by critical, logical, reflective, metacognitive, and creative thinking (Ramadhan et al., 2019). HOTS can train learners in connecting their ideas or ideas and expand their thinking beyond just remembering the information obtained (Kenedi, 2018).

Islam of Character

Islamic character is human attitudes, deeds, or behaviors based on the Qur'an and hadith. Islam teaches that reason is not the only tool used to study, but it requires the demands of a holy heart (Akil, 2018). Strengthening islamic character in students should be considered to give birth to a heart that is free from darkening rust. This is so that the student's journey in gaining knowledge can be useful properly. Because through strengthening character education, it can shape human dispositions to be better.

Elementary Linear Algebra

Algebra is a part of mathematics that studies the relationships and properties of numbers using common symbols, for example x,y, and z in algebraic equations. The symbols are used to shorten the writing of the problem in the question. Elementary linear algebra is a subject that has variables, constants, and coefficients that concern including the material of linear equation systems, matrices, determinants, vector spaces, linear transformations, and multiplication spaces in (Dwiputra & Pujiyanta, 2014).

METHOD

The type of research used in this research is development research (Research and Development). Research and Development with Tessmer's development model. Tessmer's formative research type development model consists of the preliminary stage, self-evaluation stage, formative evaluation (prototyping) stage which includes expert reviews, one-to-one, and small groups, as well as the field test stage (field trials). Tessmer's formative research development model was chosen because the steps used are clearer and systematic. This development model will produce better test instruments than other development models because at the self-evaluation stage there are several stages that are not found in other development models, namely: curriculum, learners, and material analysis. Then in this development model there are three trials, this is also not done in other development models, the trials are expert review, one-to-one, and small group to produce pro-totype III which will then be tested in the field so that the resulting test is valid and reliable. In addition, the Tessmer development model is more commonly used for the development of assessment instruments. The following is the research procedure:

Preliminary Stage

At this stage the researcher collects references that are relevant to this research.

After obtaining information from these references, the place and subject of the research trial were determined.

Self Evaluation Stage

This stage is carried out by the researcher himself on the linear algebra instrument that will be developed by the researcher. This stage is divided into two stages, namely:

Analysis stage

At this stage the researchers analyzed the curriculum, students, and materials. In the curriculum analysis, researchers conducted a review of the learning curriculum at the university where the research took place. Furthermore, in the analysis in the student analysis, the researcher collected information about the number of students and the characteristics of the students. In the material analysis, the researcher traces, compiles, and details the main materials that students will learn according to the curriculum that has been analyzed.

Design Stage

At this stage, researchers designed, compiled, and developed HOTS-based linear algebra course instruments with Islamic characters. The researchers designed the grids and test instruments along with the answer keys and scoring guidelines. The results of this product design focus on two characteristics, namely religion and material.

Prototyping Stage

This stage is the validation, evaluation, and revision stage. The instruments created and developed will be evaluated by 3 groups, namely Expert review, One-to-one, and Small group whose results will be used as revision material.

Expert Review

Expert Review is input from experts to improve instruments and products. At this stage the validity test is carried out by experts. They will provide an assessment of the instrument provided by the researcher. The assessment is accompanied by responses and suggestions written on the vali-dation sheet and then used as revision material. The assessment is also used as material to determine whether the product design is valid or not.

Students (One-to-one)

At this stage, the researcher asked 3 students as testers to answer the HOTS-based instrument with Islamic characters that had been developed by the researcher. The three students have high, medium, and low ability levels. After answering the test instrument, students will be asked to comment on the questions they have answered, such as the difficulty level of the questions, the clarity of the learning indicators, and the ease of use of the product. The comments are then used as revision material.

Small Group

The results of the expert review and one-to-one revisions (Prototype II) will be used as a small group trial. At this small group stage, there are 6 students, namely 2 people with high abilities, 2 people with moderate abilities, and 2 people with low abilities. The information that will be obtained from this stage is whether the students can solve the problem in a rationally efficient time, whether the students can use the product easily, whether the problem is too difficult, and whether the product is interesting or vice versa.

Field Test Stage

At this stage, a virtual field test will be conducted using the developed and revised instrument products. This stage will be tested on research subjects.

Trial Design

The design of the HOTS-based instrument trial with Islamic character is in the form of story problems on linear algebra course material. The trial design image based on Tessmer's formative research type development model can be seen below.

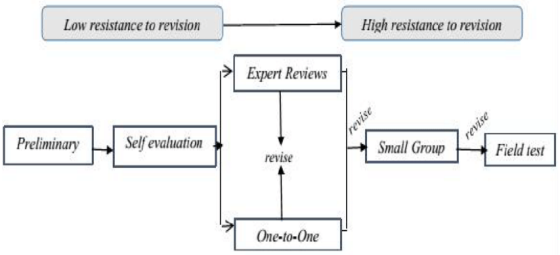

Figure 1. Trial design

The test design of this formative research development model starts from a low level of resistance to the revision process, namely the preliminary stage, collecting information relevant to this research. Then, to the self-evaluation stage to analyze and design the product. Next, to a higher level of resistance, namely the prototyping stage. At this stage, the questions developed will be validated by several validators and tested on three students. The results of this prototype question are used as evaluation material for revision. After revision, the question was tested again in a small group or small group and then revised again. When the validation results from the experts' state that the questions are valid, they are ready to be used in the field test stage or field test to the research subjects.

Test Subjects

The test subjects of the HOTS-based linear algebra course instrument development products containing Islamic characters were second semester students of mathematics education study program class B, Faculty of Tarbiyah and Keguruan, UIN Alauddin Makassar who took linear algebra courses and numbered 33 people.

Research Instrument

Research instruments are measuring instruments in the research process to collect data in a study. The instruments in this study were test instruments, test instrument validation sheets, response questionnaires, and observation sheets.

Data Analysis Technique

The data analysis technique in this research is the analysis of the content validity of the questions. **1)** The analysis of the content validity of the questions was carried out to determine the suitability of the questions with the meaning used as the basis for making the questions. The content validity test used is the Content Validity Ratio (CVR). According to Lawshe, CVR is a content validity analysis approach to measure the degree of agreement of experts regarding the suitability of question items with the material (Hendryadi, 2017). To calculate the CVR, the following formula was used (Bashooir & Supahar, 2018)

$$CVR = \frac{2ne}{N} - 1$$

Description: ne = The number of expert reviews that state valid; N = Number of expert reviews who conducted the assessment

Based on the CVR results, it can be determined which questions are accepted in the development of HOTS-based test

instruments with Islamic characters. Where the question is declared valid if it has CVR ≥0.99. After the CVR calculation, then the overall validity value of the question can be determined using the CVI (Content Validity Index) with the following formula (Bashooir & Supahar, 2018)

$$CVI = \frac{\sum CVR}{The\ number\ of\ problems}$$

The category of the results of the CVI calculation is in the form of numbers 0-1 which can be categorized as follows (Kristiani et al., 2017).

Table 1. Categories of CVI Calculation Results

Assessment	Criteria
$0 - 0.33$	Not suitable
$0.34 - 0.67$	Suitable
$0.68 - 1$	Very Suitable

2) analysis of student and lecturer responses. This response questionnaire is used by researchers to find out how the responses of lecturers and students as a guide to assess the practicality of the instruments developed by giving questionnaires to lecturers and students using the following scale.

Table 2: Student Response Score

Score	**Answer Options**
5	Strongly Agree
4	Agree
3	Disagree
2	Disagree
1	Strongly Disagree

The questionnaire results can be analyzed using the following formula (Sugiyono, 2016).

$$P = \frac{f}{N} \times 100\%$$

Description: P = Percentage; f = Number of scores from data collection; N = Number of criterion scores

Then, from the results of the analysis obtained, the next step is to conclude the results of the calculation based on the following aspects (Khairiyah, 2019)

Table 3. Attractiveness Criteria

Assessment	Criteria
$85\% \leq x < 100\%$	Very positive
$70\% \leq x < 85\%$	Positive
$50\% \leq x < 70\%$	Less positive
$x < 50\%$	Not positive

3) Analysis of student activity observation sheets. This observation sheet is used by researchers to find out how the Islamic character activities of students during the activities of working on the LKM. Analysis of the results of observations of student Islamic character activities includes giving scores to statement items that match the activities carried out by students. The next step is to calculate the percentage of student activity description with the following formula (D. D. Lestari et al., 2017).

$$Percentage = \frac{Points\ earned}{Maximum\ points}\ x\ 100\%$$

Data can be analyzed by calculating the percentage of points obtained by students and determining the criteria for student activity through the following table.

Table 4. Student Activity Criteria

Assessment	Criteria
$85\% \leq x < 100\%$	Very good
$70\% \leq x < 85\%$	Good
$50\% \leq x < 70\%$	Fairly Good
$x < 50\%$	Not Good

When the percentage of student activity is in the good and very good categories, it means that student activity can be maintained. However, when the average percentage of student activity is in the other category, then students must change their activities by paying attention to the aspects that have not been fulfilled. Furthermore, observations of students' Islamic character activities are carried out

again, then analyzed again. And so on, until the average percentage of student activity is at least in the good category. 4) Data analysis of instrument test results. The test of the test instrument consists of several parts, namely:

Reliability

The reliability of this instrument uses the Chronbach-alpha formula, an assessment with the following reliability criteria (Cahyanti, Farida, & Rakhmawati, 2019).

Table 5. Reliability Criteria

Assessment	Criteria
$0{,}90 < r \leq 1{,}00$	Very High
$0{,}70 < r \leq 0{,}90$	High
$0{,}40 < r \leq 0{,}70$	Medium
$0{,}20 < r \leq 0{,}40$	Low
$0{,}00 < r \leq 0{,}20$	Very Low

Furthermore, the assessment results were calculated using the Cronbach Alpha formula as follows (Lestari, Purwanto, & Sakti, 2019).

$$r = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum si^2}{st^2}\right)$$

Description: r : reliability; si^2: variance of item I; st^2 : variance of the test; n: number of item.

Test the Level of Difficulty

The instrument difficulty index number can be obtained with the following formula (Salmina & Adyansyah, 2017).

$$TK = \frac{Mean}{Maximum\ Score}$$

Meanwhile, the criteria for the difficulty index are as follows (Purwanti, 2014).

Table 6. Criteria for the Index of Difficulty

Assessment	Criteria
$0{,}71 - 1{,}00$	Easy
$0{,}31 - 0{,}70$	Medium
$0{,}00 - 030$	Difficult

Distinguishing Power Test

The distinguishing power of the items is calculated using the following formula (Salmina & Adyansyah, 2017).

$$DB = \frac{Xt - Xr}{Xmaks}$$

Description: DB = Distinguishing power; Xt = High group average score; Xr = Average score of low groups; Xmax = Maximum Score

Meanwhile, the criteria for item power are as follows (Cahyanti, Farida, & Rakhmawati, 2019).

Table 7. Criteria for Distinguishing Power

Assessment	Criteria
$0{,}50 < x \leq 1{,}00$	Excellent
$0{,}30 < x \leq 0{,}49$	Good
$0{,}20 < x \leq 0{,}29$	Fair
$0{,}00 < x \leq 0{,}10$	Not Good
$x \leq 0{,}00$	Not Good

Student Test Data Analysis

Analysis of student test data is carried out to determine students' higher order thinking skills by correcting answers based on predetermined scoring indicators. Then, determine the score obtained with the following formula (Sugiyono, 2016).

$$P = \frac{f}{N} \times 100\%$$

Description: P = Percentage; f = Number of scores obtained; N = Maximum number of scores.

Furthermore, it can be determined the category of student ability with the category table as follows (Makmur, 2020).

Table 8. Categories of Student Ability

Score	Category
$90 < score \leq 100$	Very High
$75 < score \leq 90$	High
$60 < score \leq 75$	Medium
$40 < score \leq 60$	Low
$0 < score \leq 40$	Very Low

RESULTS AND DISCUSSION

Development Process

The process of developing test instruments for elementary linear algebra courses based on HOTS with Islamic characters is to use a formative research (Tessmer) development model.

Preliminary Stage

This stage begins with the collection of references related to this research, which is about the development of test instruments for elementary linear algebra courses based on HOTS charged with Islamic characters. Furthermore, activities are carried out to determine the place and subject of the trial. The place of trial in this study was the Faculty of Tarbiyah and Teacher Training UIN Alauddin Makassar. Meanwhile, the test subjects in this study were students of mathematics education class B, totaling 33 people.

Self Evaluation Stage

This stage consists of two parts, namely the analysis stage and the design stage. The analysis stage consists of curriculum analysis, student analysis, and material analysis.

Curriculum Analysis

Curriculum analysis is carried out to find out the basic problems in the form of how the learning plan as a reference in the process of developing HOTS-based test instruments is charged with Islamic character. The learning model that will be used in the elementary linear algebra class of mathematics education B semester 2 is an e-flipped classroom with the support of the Lantern platform and Google Meet.

Student Analysis

The student's analysis was focused on PMAT B UIN Alauddin Makassar class students who were used as trial subjects. The number of students in the PMAT B class is 33 people who have different abilities. Some are high-ability, and some are low-ability.

Material Analysis

At this stage, the researcher identifies, compiles, and details the materials that students will study that will be used in the test. Based on the results of the material analysis, it was obtained that the questions to be developed were questions that were in accordance with the material based on the learning indicators in the elementary linear algebra textbooks used in the classroom. Such materials include SPL and matrices, determinants, vectors in two-dimensional spaces and three-dimensional spaces, Euclidean vector spaces, general vector spaces, deep multiplication spaces, eigenvalues and eigen vectors, and linear transformations.
After the researcher goes through the analysis stage, the next stage is the design stage. At this stage, researchers design and design test instruments consisting of grids, story questions in the form of descriptions, answer keys, and scoring guidelines. After creating a grid that contains the subject matter, learning indicators, question indicators, measured aspects, cognitive level, question numbers, and question shapes, then the researcher designs the questions based on the grids that have been made. Researchers designed a story in the form of a description that is HOTS-based and charged with Islamic characters. The initial design of the product that has been developed can be seen in appendix A1.

Table 9. Validator Suggestions and Revisions

Validators	Instruments	Revision suggestions
Validator 1	HOTS-based test questions with Islamic characters	a. Strive for each question to be clearly depicted islamic character in it. b. Some questions should be adjusted to the verses or hadith used c. Each material indicator should be adjusted to what Islamic character you want to apply d. Consider the length of the questions made with the set time e. Make sure that the Islamic character to be achieved is ever integrated in the learning process
Validator 2	HOTS-based test questions with Islamic characters	Strive for each question to be clearly depicted islamic character in it.
	Scoring Guidelines	The use of vocabulary is improved.

Prototyping Stage

This stage begins with the collection of references related to this research, which is about the development of test instruments for elementary linear algebra courses based on HOTS charged with Islamic characters. Furthermore, activities are carried out to determine the place and subject of the trial. The place of trial in this study was the Faculty of Tarbiyah and Teacher Training UIN Alauddin Makassar. Meanwhile, the test subjects in this study were students of mathematics education class B, totaling 33 people.

Expert Review

Instrument validation is carried out by providing a validation sheet of the research instrument in the form of a test grid, test questions, and test answer keys to validators. Validators consist of two people, namely lecturers of Islamic religious education UIN Alauddin Makassar (expert 1) and lecturers of mathematics education UIN Alauddin Makassar (expert 2). Here are some revision suggestions from validators presented in table 1.

One to one

As the test instrument was validated by experts, the question was also tested on 3 6th semester mathematics education students who had gone through the elementary linear algebra course. The three students consist of students with high, medium, and low abilities based on data obtained from student study result cards. After the test instrument was tested on the three students, the student then filled out a questionnaire and wrote a comment about the HOTS-based test instrument with Islamic character.

Small Group

The revised results of expert reviews and student comments one to one are called prototype II. Then, prototype II was tested on 6 mathematics education students in semester 4. The trial was carried out for eight days, namely the trial of SPL and matrix matter questions on the first day, determinant matter on the second day, dimensional vector space matter on the third day, euclides vector space matter on the fourth day, general vector space material on the fifth day, inner result space matter on the sixth day, value matter and eigen vector on the seventh day, and the

linear transformation material on the eighth day. Furthermore, the six students filled out a questionnaire to provide a review of the HOTS-based test instrument with Islamic character charged.

Field Test Stage

This stage begins with the collection of references related to this study, namely. At this stage, the prototype III design was tested in the 2nd semester B mathematics education class which totaled 33 people. Trials for SPL and matrix material questions were carried out on March 15, 22, and 29, 2021. Then, trials for determinant material questions were carried out on April 5 and 12, 2021, dimensional vector space material questions on April 19, 2021, euclides vector space materials on May 3, 2021, general vector space materials on May 17 and 24, 2021, and internal space matter on June 7 and 14, 2021, the question of value matter and eigen vector on June 21, 2021, and the problem of linear transformation material on June 28, 2021.

On the last day of the trial, researchers distributed a questionnaire in the form of a google form to find out the attractiveness and practicality of the products that have been developed.

Development Results

The validation analysis method uses the CVR (Content Validity Ratio) and CVI (Content Validity Index) methods. The results of the validation analysis can be seen in appendix A2.

Based on the table in appendix A2, it was obtained that from the 74 question items studied by two experts have shown that these items support the validity of the test content. Then from the CVR results obtained a CVI value of 1 meaning that hots-based test instruments with Islamic characters are very suitable (valid) with the material or topic being measured.

Student Response Questionnaire Analysis

The results of the analysis of student responses in the one-to-one trial obtained an average score of 72.86%. The score is included in the interpretation criterion of 70% ≤x<85% with the category "Positive". Meanwhile, in the small group trial, an average score of 85.69% was obtained. The score is included in the interpretation criterion of 85% ≤x<100% with the category of "Very Positive" attractiveness. It can be concluded that the readability of the questions is good and can be continued to the field trial stage. From the three stages of testing that have been carried out, the results of student responses to the HOTS-based elementary linear algebra test instrument with Islamic character can be seen in chart 1 below.

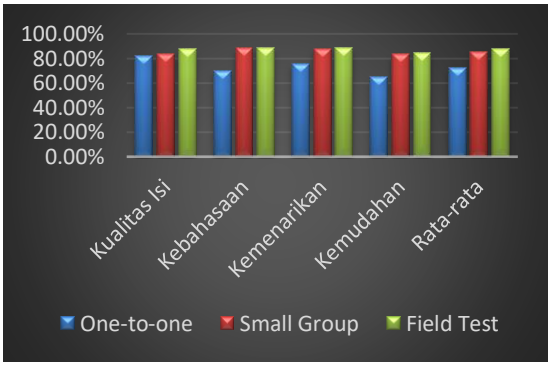

Chart 1. Analysis of Student Response

Based on the student response analysis graph above, the average assessment indicators (content quality, language, attractiveness, and convenience) show a response value above 70%. This means that the student response to the elementary linear algebra course test instrument is "Positive", so that the developed product meets the criteria of practicality.

Analysis of The Response Questionnaire of Potent Lecturers

The results of the lecturer response analysis obtained an average score obtained by the percentage of lecturer responses of 92%. This percentage falls under the interpretation criteria of 85% ≤x<100% with the category of "Very Positive" attractiveness. This indicates that the test instrument meets the practical criteria.

Analysis of Observation Sheets on Islamic Character Activities of Students

The results of the analysis of the observation sheet on the activities of Islamic characters of students can be seen in appendix 3.

Based on the table in appendix 3, the average percentage of student Islamic character activity was obtained at 80.64%. The percentage falls under the criteria of 70% ≤x<85% with the category "Good". This shows that hots-based test instruments charged with Islamic character meet the effective criteria of the affective aspect of students.

Test The Reliability of Test Instruments

Based on the results of the reliability analysis of HOTS-based test instruments charged with Islamic characters using SPSS Statistics 22, it was obtained that the test instruments were classified as reliable with an average value of Cronbach's alpha 0.968 with a very high interpretation.

Test Instrument Difficulty Level

The following are the results of the analysis of the difficulty level of the HOTS-based test instruments with Islamic characters presented in table 1 Based on Following results analysis level difficulty instrument test-based HOTS charged character Islamic.

Table 10. Test Instrument Difficulty Level Analysis

Subject Matter	Average Difficulty Rate	Category
SPL and Matrix	0.72	Easy
Determinants	0.7	Keep
Dimensioned Vector Space	0.69	Keep
Euclides Vector Space	0.7	Keep
Common Vector Spaces	0.7	Keep
Inner Times Room	0.7	Keep
Eigenvalues and Vectors	0.67	Keep
Linear Transformations	0.69	Keep
Late Average	0.69	Keep

Based on Table 10, it was obtained that the average difficulty level of the test instruments of the HOTS-based elementary linear algebra course charged with Islamic characters was 0.69. This means that the test instrument is at a criterion of 0.31-0.70 with a moderate category, meaning that the overall difficulty level is good.

Differentiating Power of Test Instruments

The following are the results of the analysis of the differentiating power of hots-based test instruments charged with Islamic characters presented in Table 11.

Table 11. Test Instrument Differentiating Power Analysis

Subject Matter	Average Power Difference	Category
SPL and Matrix	0.41	Good
Determinants	0.44	Good
Dimensioned Vector Space	0.45	Good
Euclides Vector Space	0.47	Good
Common Vector Spaces	0.43	Good
Inner Times Room	0.5	Good
Eigenvalues and Vectors	0.47	Good
Linear Transformations	0.47	Good
Late Average	0.46	Good

Based on Table 11, it was obtained that the average differentiation power of the test instruments of the HOTS-based elementary linear algebra course charged with Islamic characters was 0.46. This

means that the test instrument is at a criterion of 0.30-0.49 with a good category.

Data Analysis of Student Test Results

Student test result data is seen based on the scores obtained when doing the questions with the aim of knowing the student's high-level thinking ability. If the average student's score is below 60, then it is declared low-ability and if the average student's score is above 75, it is declared high-rated. Meanwhile, if the average student's score is at 61 to 75, it is declared to be of moderate ability. The results of the analysis of the HOTS-based test instrument with Islamic character can be seen in the following chart.

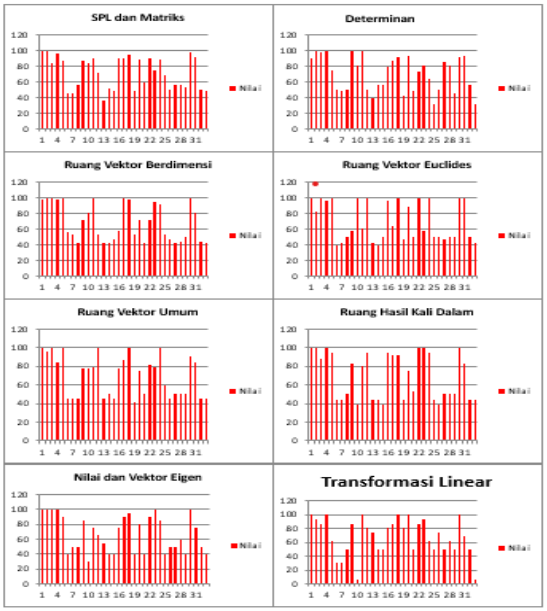

Chart 2. Test Result Analysis

Based on the graph above, the average score obtained by students is in the good category. Meanwhile, based on table A4, the average percentage of the number of students who obtained scores above 60 was 54.55% and those who obtained scores below or equal to 60 were 45.45%. Then, the average student score is 69.49%. This means that the high-level thinking ability of PMAT B class students is in the quite capable category.

Discussion

Development of test instruments for HOST-based elementary linear algebra courses with Islamic characters using a formative research (Tesmerr) development model that has a series of stages including the preliminary stage, self-evaluation stage, formative evaluation stage (prototyping) which includes expert reviews, one-to-one, and small groups, as well as the field test stage (field trials). Before the development process is carried out, researchers have set the quality criteria of the test instrument as a guideline in determining the extent of success of the developed product.

The initial stage of the formative research model is the preliminary stage, where researchers look for references to HOTS-based test instruments charged with Islamic characters. The next stage is self-evaluation, where researchers carry out curriculum analysis, student analysis, material analysis, design, and develop test instruments for elementary linear algebra courses based on HOTS loaded with Islamic characters in the form of grids, question designs, answer keys, scoring guidelines, and other research instruments.

The results of the development of test instruments are consulted with the supervisor to produce prototype I. Next, the prototyping stage which includes assessments from expert reviews, one-to-one, and small groups. The results of prototype I are given to validators as expert reviews to be assessed. Along with that, prototype I was also tested on three 6th semester mathematics education students. The assessment results from validators and student comments in the one-to-one stage are used to revise prototype I which produces prototype II. Then, prototype II was tested on six mathematics education students in semester 4. The

results of the small group stage are used to revise prototype II and produce prototype III which is then tested at the field test stage. The test instruments developed before and after the revision can be seen in appendix A5.

The last stage is the field test stage, where HOTS-based test instruments charged with Islamic character are tested about the study, namely PMAT B students in semester 2. During the trial, researchers gave observation sheets to two observers as observers who supervised student activities during the process of working on the questions. After that, researchers distributed student response questionnaires and lecturer response questionnaires to be filled in which will then be analyzed to find out how the practicality of HOTS-based test instruments is loaded with Islamic characters.

Based on the results of the analysis of student responses, the average percentage of student response questionnaires was 87.40% and the lecturer response questionnaire was 92% with a very positive category, so that the test instrument was said to meet the criteria of practicality. A product is said to be practical if it gets a good response (Milala, Endryansyah, Joko, Agung, 2022). Therefore, it can be concluded that the HOTS-based elementary linear algebra course test instrument with Islamic character content that has been developed has the following characteristics.

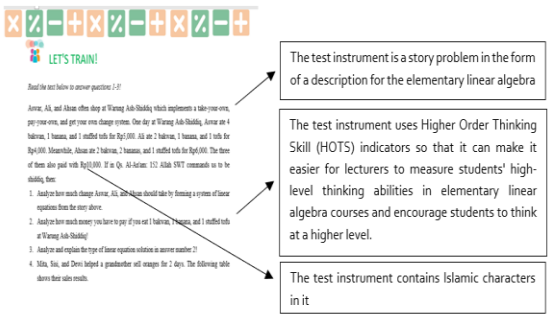

Figure 2. Problem characteristics

Furthermore, the effectiveness criteria of the test instrument are seen based on student test results and student Islamic character activity observation sheets. Based on the test results of PMAT B semester 2 students, the final average test score is 69.49 which is included in the medium ability category, so that the test instrument can meet the effective criteria in the cognitive domain of students. Meanwhile, based on the results of the analysis of the student Islamic character activity observation sheet, the average percentage of student Islamic activity is 80.64% with a good category, so that it can meet the effective criteria in the affective domain of students. Based on the results of the evaluation that has been carried out, it is found that the questions that contain Islamic characters that have been developed have a positive effect because they are in accordance with the vision and mission of the Mathematics Education Study Program which aims to produce Bachelor of Mathematics Education with Islamic civilization. Learning mathematics integrated with Islam can lead students to have knowledge and behavior in accordance with Islamic values (Imamuddin, Musril, Isnaniah, 2022; Naim, Aziz, Teguh, 2022; Supa'at & Azmi,2019).

The quality of the test instruments for elementary linear algebra courses based on HOTS charged with Islamic characters can be seen based on predetermined criteria. The validation results of the test content obtained a CVR value for each question item, namely 1 and the CVI value, which was 1. this means that hots-based test instruments charged with Islamic characters are valid. Furthermore, the response of students in the one-to-one trial obtained an average score of 72.86%. The score is included in the interpretation criterion of 70% ≤x<85% with the category "Positive". Meanwhile, in the small group trial, an average score of

85.69% was obtained. The score is included in the interpretation criterion of 85% ≤x<100% with the category of "Very Positive" attractiveness. It can be concluded that the readability of the questions is good and can be continued to the field test stage. Lecturer response analysis obtained an average score obtained by the percentage of lecturer responses of 92%. This percentage falls under the interpretation criteria of 85% ≤x<100% with the category of "Very Positive" attractiveness. This shows that the test instrument meets the practical criteria.

The analysis of the observation sheet of student Islamic character activities obtained an average percentage of student Islamic character activities of 80.64%. The percentage falls under the criteria of 70% ≤x<85% with the category "Good". This shows that hots-based test instruments charged with Islamic character meet the effective criteria of the affective aspect of students.

The results of the reliability analysis of HOTS-based test instruments charged with Islamic characters using SPSS Statistics 22 obtained that the test instruments were classified as reliable with an average value of Croncbach's alpha 0.968 with a very high interpretation. the results of the analysis of the difficulty level of the HOTS-based test instruments charged with Islamic character there are questions that have low and medium difficulty levels.

The average result of the difficulty level of the test instrument was 0.69 with a moderate category. the results of the analysis of the different power of each question item from the test instrument developed, referred to the average result of the differentiation power of 0.46 with a good category, so that the test instruments for elementary linear algebra courses based on HOTS charged with Islamic character have good quality of different power.

Based on the test results at the field test stage, in addition to obtaining the quality of the test instruments developed, the results of students' high-level thinking abilities were also obtained. The test instruments for the HOTS-based elementary linear algebra course charged with Islamic characters that have been developed have the following characteristics: (1) the test instrument is a story question in the form of a description for the elementary linear algebra course, (2) the test instrument uses the basic Higher Order Thinking Skill (HOTS) so that it can make it easier for lecturers to measure students' high-level thinking ability in elementary linear algebra courses and encourage students to high-level thinking, and (3) the test instrument contains islamic characters in it. Based on the results of data analysis, it was obtained that the average percentage of the number of learners who obtained a score above 60 was 54.55% and those who obtained a score below or equal to 60 was 45.45%. Then, the average student score is 69.49%. This means that the high-level thinking skills of PMAT B class students are in the category of moderate ability, so further efforts are needed by the lecturer to provide questions that can spur the student's high-level thinking ability.

Based on the foregoing, the developed test instrument meets valid and reliable criteria. Then when viewed from the level of difficulty, some of the question items have an easy difficulty level and others are moderate. When viewed from the level of difficulty, the question item has a good difference. Therefore, the development of a HOTS-based elementary linear algebra course test instrument charged with Islamic characters reached the final prototype.

Limitation

The questions developed have several limitations, including 1) the questions developed are limited to one course, namely elementary linear algebra. 2) The Islamic characters developed in this question are only honest, independent, tolerant, curiosity and responsibility. 3) the number of students used in this study was only 33 or one class only. 4) the cognitive abilities measured are only higher order thinking skills (HOTS).

Implication

The implication of this research on the development of HOTS-based question instruments and Islamic characters is that it can be used as an example in the preparation of HOTS questions for mathematics subjects or mathematics courses, especially for schools or universities that will integrate Islamic teachings with other subjects in general. Then the results of this study can be used as practice questions for lecturers to train and improve students' higher-level thinking skills and improve Islamic attitudes and behavior.

CONCLUSSION

The test results obtained from the HOTS-based test instruments charged with Islamic character, as seen from the results of the validation analysis of the question content, obtained an average CVI value of 1 meeting the valid criteria. The results of the reliability test of HOTS-based test instruments charged with Islamic character obtained an average of Croncbach's alpha 0.968 meeting the reliabel criteria. Meanwhile, the difficulty level of the questions obtained an average score of 0.69. The score indicates that the HOTS-based test instruments charged with Islamic character meet the medium criteria. The test results of the different power test of the test instrument obtained an average score of 0.46 which showed that the differentiation of the test instrument was of good quality. The practicality of the test instrument is seen from the analysis of student and lecturer responses of potent students and lecturers respectively by 87.40% and 92%, this means that students and lecturers give a very positive response to the test instruments of elementary linear algebra courses based on HOTS charged with Islamic characters. The effectiveness of the test instrument is seen based on the analysis of student test results and observation sheets of student Islamic character activities. Based on the results of the analysis of test results, the final average test score was obtained of 69.49 which is included in the category of capable keep. Meanwhile, based on the results of the analysis of observation sheets on Islamic character activities, students are expected to have an average percentage of Student Islamic activities of 80.64% with good categories, so that the test instrument can meet the effective criteria.

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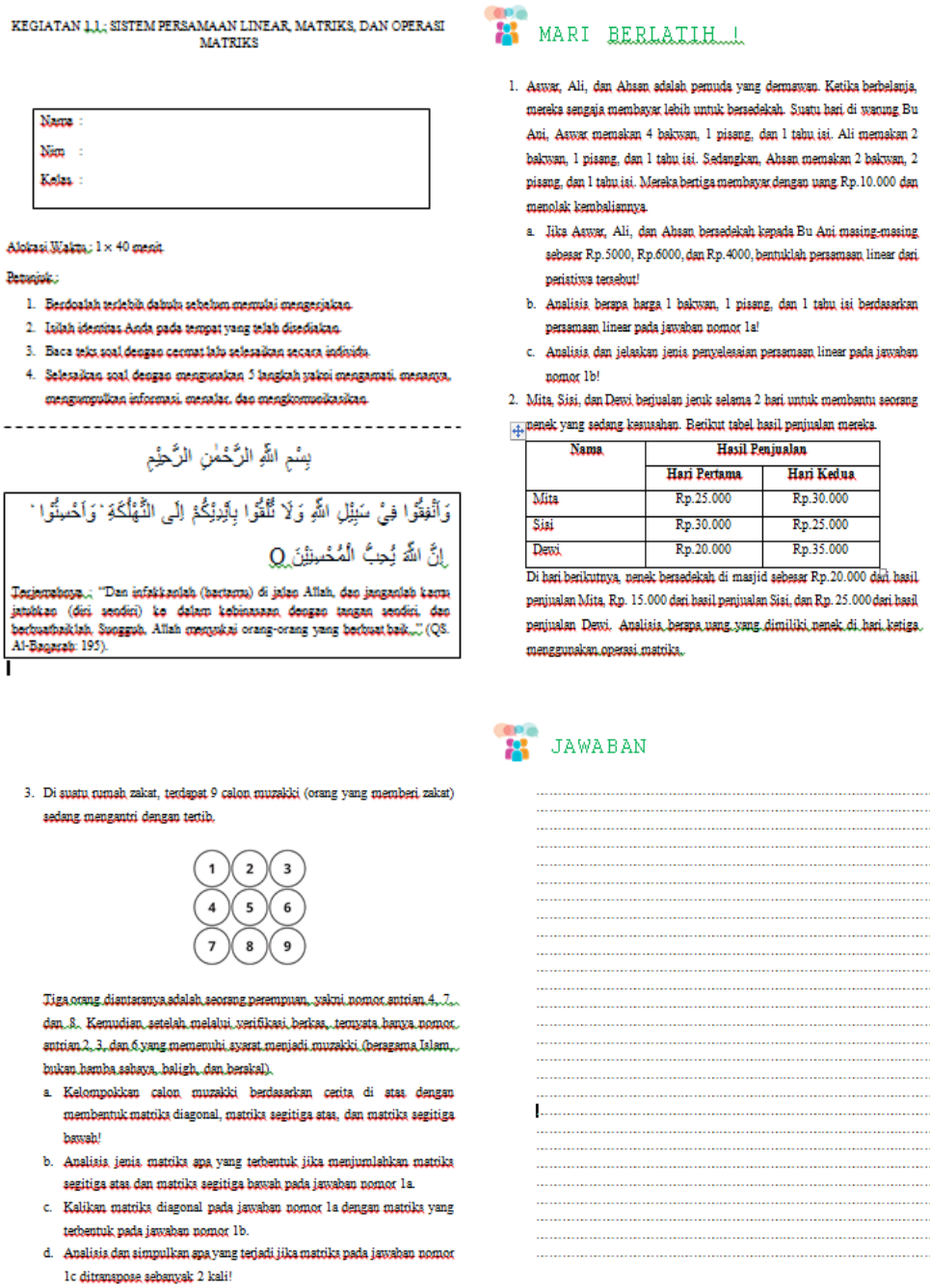
Appendix A.



KEGIATAN 1.1: SISTEM PERSAMAAN LINEAR, MATRIKS, DAN OPERASI MATRIKS

Nama :
Nim :
Kelas :

Alokasi Waktu: 1 × 40 menit

Petunjuk:

1. Berdoalah terlebih dahulu sebelum memulai mengerjakan.
2. Isilah identitas Anda pada tempat yang telah disediakan.
3. Baca teks soal dengan cermat lalu selesaikan secara individu.
4. Selesaikan soal dengan menggunakan 5 langkah yakni mengamati, menanya, mengumpulkan informasi, menalar, dan mengkomunikasikan.

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

وَأَنفِقُوا فِي سَبِيلِ اللَّهِ وَلَا تُلْقُوا بِأَيْدِيكُمْ إِلَى التَّهْلُكَةِ ۛ وَأَحْسِنُوا ۛ إِنَّ اللَّهَ يُحِبُّ الْمُحْسِنِينَ ۝

Terjemahnya: "Dan infakkanlah (bertarma) di jalan Allah, dan janganlah kamu jatuhkan (diri sendiri) ke dalam kebinasaan dengan tangan sendiri, dan berbuatbaiklah. Sungguh, Allah menyukai orang-orang yang berbuat baik." (QS. Al-Baqarah: 195).

MARI BERLATIH 1

1. Aswar, Ali, dan Ahsan adalah pemuda yang dermawan. Ketika berbelanja, mereka sengaja membayar lebih untuk bersedekah. Suatu hari di warung Bu Ani, Aswar membeli 4 bakwan, 1 pisang, dan 1 tahu isi. Ali membeli 2 bakwan, 1 pisang, dan 1 tahu isi. Sedangkan, Ahsan membeli 2 bakwan, 2 pisang, dan 1 tahu isi. Mereka bertiga membayar dengan uang Rp.10.000 dan menolak kembalianya.
   a. Jika Aswar, Ali, dan Ahsan bersedekah kepada Bu Ani masing-masing sebesar Rp.5000, Rp.6000, dan Rp.4000, bentuklah persamaan linear dari peristiwa tersebut!
   b. Analisis berapa harga 1 bakwan, 1 pisang, dan 1 tahu isi berdasarkan persamaan linear pada jawaban nomor 1a!
   c. Analisis dan jelaskan jenis penyelesaian persamaan linear pada jawaban nomor 1b!
2. Mita, Sisi, dan Dewi berjualan jeruk selama 2 hari untuk membantu seorang nenek yang sedang kesusahan. Berikut tabel hasil penjualan mereka.

Nama	Hasil Penjualan	
	Hari Pertama	Hari Kedua
Mita	Rp.25.000	Rp.30.000
Sisi	Rp.30.000	Rp.25.000
Dewi	Rp.20.000	Rp.35.000

Di hari berikutnya, nenek bersedekah di masjid sebesar Rp.20.000 dari hasil penjualan Mita, Rp. 15.000 dari hasil penjualan Sisi, dan Rp. 25.000 dari hasil penjualan Dewi. Analisis berapa uang yang dimiliki nenek di hari ketiga menggunakan operasi matriks.

JAWABAN

3. Di suatu rumah zakat, terdapat 9 calon muzakki (orang yang memberi zakat) sedang mengantri dengan tertib.

Tiga orang diantaranya adalah seorang perempuan, yakni nomor antrian 4, 7, dan 8. Kemudian, setelah melalui verifikasi berkas, ternyata hanya nomor antrian 2, 3, dan 6 yang memenuhi syarat menjadi muzakki (beragama Islam, bukan hamba sahaya, baligh, dan berakal).

a. Kelompokkan calon muzakki berdasarkan cerita di atas dengan membentuk matriks diagonal, matriks segitiga atas, dan matriks segitiga bawah!
b. Analisis jenis matriks apa yang terbentuk jika menjumlahkan matriks segitiga atas dan matriks segitiga bawah pada jawaban nomor 1a.
c. Kalikan matriks diagonal pada jawaban nomor 1a dengan matriks yang terbentuk pada jawaban nomor 1b.
d. Analisis dan simpulkan apa yang terjadi jika matriks pada jawaban nomor 1c ditranspose sebanyak 2 kali!

Appendix A2

Table A2. Results of CVR and CVI Validation After Revision

Item Question	Expert 1	Expert 2	CVR	CVI	Information
			SPL and Matrix		
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1		Item support

6	Yes	Yes	1		Item support
7	Yes	Yes	1		Item support
8	Yes	Yes	1		Item support
9	Yes	Yes	1		Item support
10	Yes	Yes	1		Item support
11	Yes	Yes	1	1	Item support
12	Yes	Yes	1		Item support
13	Yes	Yes	1		Item support
14	Yes	Yes	1		Item support
15	Yes	Yes	1		Item support
16	Yes	Yes	1		Item support
17	Yes	Yes	1		Item support
			Determinant		
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1		Item support
6	Yes	Yes	1	1	Item support
7	Yes	Yes	1		Item support
8	Yes	Yes	1		Item support
9	Yes	Yes	1		Item support
10	Yes	Yes	1		Item support
11	Yes	Yes	1		Item support
12	Yes	Yes	1		Item support
			Vector Space Dimensions		
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1	1	Item support
6	Yes	Yes	1		Item support
7	Yes	Yes	1		Item support
8	Yes	Yes	1		Item support
9	Yes	Yes	1		Item support
			Vector Space Euclides		
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1	1	Item support
5	Yes	Yes	1		Item support
6	Yes	Yes	1		Item support
7	Yes	Yes	1		Item support
			Vector Space General		
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1	1	Item support
6	Yes	Yes	1		Item support
7	Yes	Yes	1		Item support
8	Yes	Yes	1		Item support
9	Yes	Yes	1		Item support
10	Yes	Yes	1		Item support
11	Yes	Yes	1		Item support
			Inner Product Space		
1	Yes	Yes	1		Item support

2	Yes	Yes	1		Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1		Item support
6	Yes	Yes	1	1	Item support
7	Yes	Yes	1		Item support
8	Yes	Yes	1		Item support
9	Yes	Yes	1		Item support
		Eigenvalues and Eigenvectors			
1	Yes	Yes	1		Item support
2	Yes	Yes	1		Item support
3	Yes	Yes	1	1	Item support
4	Yes	Yes	1		Item support
5	Yes	Yes	1		Item support
		Linear Transform			
1	Yes	Yes	1		Item support
2	Yes	Yes	1	1	Item support
3	Yes	Yes	1		Item support
4	Yes	Yes	1		Item support

Appendix A3

Table A3. Analysis of the Observation Sheet Activity Character Islamic Student

Activity Student	Meeting to -													Average Rating
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Active discuss with friend group	79.1	79.1	80	80.3	80.3	80.3	83	84	84.2	84.2	84.5	84.8	84.8	82.17%
Work Duty with independent and honest without cheat	71.6	71.9	76.1	77.3	74	74.6	77	77	74.3	75.5	76.4	76.4	76.4	75.25%
Submit question related questions that haven't been understood	74.6	76.1	71.2	75.2	77.9	76.7	78.8	80	83.9	83.9	84.8	84.8	85.5	79.49%
Gather Duty appropriate time	76.7	77	78.2	75.2	80.3	79.7	79.7	80	83.9	83.9	83.6	84.2	84.2	80.48%
act polite polite	71.8	72.8	77.6	80.6	79.4	87.9	90.6	89	89.1	89.7	96.7	95.2	95.5	85.84%
Final Average														80.64 %

Table A4. Analysis of Test Results Student

Theory	Amount Mhs	Amount Mhs> 60	Percentage	Amount Mhs< 60	Percentage	Average value
SPL and Matrix	33	19	57.58	14	42.42	72.01
Determinant	33	19	57.58	14	42.42	70.33
Vector Space Dimensions	33	16	48.48	17	51.52	68.6

Vector Space Euclides	33	16	48.48	17	51.52	69.81
Vector Space General	33	18	54.55	15	45.45	69.76
Inner Product Space	33	17	51.52	16	48.48	69.61
Values and Eigenvectors	33	18	54.55	15	45.45	67.27
Linear Transform	33	21	63.64	12	36.36	68.56
Final Average	33	18	54.55	15	45.45	69.49

Appendix A5

Before Revision (Prototype I)	**After Revision (Protorype II)**
Aswar, Ali, dan Ahsan adalah pemuda yang dermawan. Ketika berbelanja, mereka sengaja membayar lebih untuk bersedekah. Suatu hari di warung Bu Ani, Aswar memakan 4 bakwan, 1 pisang, dan 1 tahu isi. Ali memakan 2 bakwan, 1 pisang, dan 1 tahu isi. Sedangkan, Ahsan memakan 2 bakwan, 2 pisang, dan 1 tahu isi. Mereka bertiga membayar dengan uang Rp.10.000 dan menolak kembaliannya. 1. Jika Aswar, Ali, dan Ahsan bersedekah kepada Bu Ani masing-masing sebesar Rp.5000, Rp.6000, dan Rp.4000, bentuklah persamaan linear dari peristiwa tersebut! 2. Analisis berapa harga 1 bakwan, 1 pisang, dan 1 tahu isi berdasarkan persamaan linear pada jawaban nomor 1! 3. Analisis dan jelaskan jenis penyelesaian persamaan linear pada jawaban nomor 2!	Aswar, Ali, dan Ahsan sering berbelanja di Warung Ash-Shiddiq yang menerapkan sistem ambil sendiri, bayar sendiri, dan ambil uang kembalian sendiri. Suatu hari di Warung Ash-Shiddiq, Aswar memakan 4 bakwan, 1 pisang, dan 1 tahu isi seharga Rp5.000,00. Ali memakan 2 bakwan, 1 pisang, dan 1 tahu isi seharga Rp4.000,00. Sedangkan, Ahsan memakan 2 bakwan, 2 pisang, dan 1 tahu isi seharga Rp6.000,00. Mereka bertiga pun membayar dengan uang Rp10.000,00. Jika dalam Qs. Al-An'am: 152 Allah SWT memerintahkan kita untuk bersikap shiddiq, maka: 1. Analisis berapa uang kembalian yang seharusnya diambil oleh Aswar, Ali, dan Ahsan dengan membentuk sistem persamaan linear dari cerita di atas. 2. Analisis pula berapa uang yang harus Anda bayar jika memakan 1 bakwan, 1 pisang, dan 1 tahu isi di Warung Ash-Shiddiq! 3. Analisis dan jelaskan jenis penyelesaian persamaan linear pada jawaban nomor 2!.
7. Pak Dandi adalah seorang pedagang ikan yang tidak pernah mengeluh jika dagangannya tidak terjual, karena Ia percaya bahwa Allah Swt. telah mengatur rezeki masing-masing hamba-Nya. Pagi ini, Pak Dandi menjual 4 jenis ikan yang disusun rapi di atas meja berbentuk persegi. Ada 6 ikan bolu dan 3 ikan lele di baris pertama, serta 12 ikan cakalang dan 18 ikan mujair di baris kedua. Buktikan bahwa $(A^T)^{-1} = (A^{-1})^T$ apabila A adalah matriks yang dibentuk dari susunan ikan jualan Pak Dandi!	7. Suatu hari, Pak Dandi menjual 4 jenis ikan yang disusun rapi di atas meja berbentuk persegi. Ada 6 ikan bolu dan 3 ikan lele di baris pertama, serta 12 ikan cakalang dan 18 ikan mujair di baris kedua. Keesokan harinya, Pak Dandi meminta tolong kepada Ali untuk membantunya menyusun ikan dengan menukar posisi baris dan kolom dari posisi ikan jualan kemarin. Deskripsikan dalam bentuk matriks posisi ikan yang seharusnya disusun oleh Ali, jika Rasulullah SAW menganjurkan kita untuk bertanggung jawab ketika diberi amanah, kemudian buktikan bahwa invers dari posisi ikan yang Ali susun sama dengan transpose dari invers posisi ikan yang disusun Pak Dandi!
15.....Bentuklah sistem persamaan linear dari cerita di atas lalu analisis berapa jumlah ayat yang dihafal oleh Kaisan, As'ad, dan Aulia setiap 1 jam menggunakan eliminasi Gauss-Jordan!	15.....Jika anak yang menghafal 30 juz Al-Qur'an (6236 ayat) dapat memberi syafat kepada 10 anggota keluarganya kelak di akhirat, bentuklah sistem persamaan linear dari cerita di atas lalu analisis berapa jam yang dibutuhkan oleh Kaisan, As'ad, dan Aulia agar dapat memberi syafaat kepada 10 keluarganya (Gunakan Eliminasi Gauss-Jordan)!

Before Revision (Prototype I)	After Revision (Protorype II)
Aisyah ingin mempererat silaturrahmi dengan keluarganya. Ia berencana mengunjungi rumah nenek, rumah paman, dan rumah bibinya secara bergantian. Rumah nenek berada di blok 1. Rumah paman berada di blok 2. Sedangkan, rumah bibi berada di blok 3. 1. Bentuklah permutasi pola urutan kunjungan yang dapat Aisyah gunakan menggunakan blok rumah keluarganya! 2. Klasifikasikan inversi dan permutasi genap-ganjil dari jawaban nomor 1.	Aisyah ingin mempererat silaturrahmi dengan keluarganya. Ia berencana mengunjungi rumah nenek, paman, dan sepupunya. Rumah nenek berada di blok 1. Sedangkan rumah paman berada di blok 2 dan rumah sepupunya berada di blok 3. 1.Bentuklah permutasi pola-pola urutan kunjungan yang dapat Aisyah gunakan, kemudian permutasi manakah yang sebaiknya Aisyah gunakan jika Rasulullah menganjurkan untuk memuliakan orang yang lebih tua! 2.Klasifikasikan inversi dan permutasi genap-ganjil dari jawaban nomor 1.
5.Kaisan, As'ad, dan Aulia selalu memuroja'ah hafalan mereka. Berikut tabel daftar muroja'ah mereka.....	Mentor hafidz Qur'an di SD IT Al-Fityan mengarahkan Kaisan, As'ad, dan Aulia untuk melaporkan daftar surah yang telah mereka muroja'ah. Berikut daftar surah muroja'ah yang mereka tuliskan sebelum dilaporkan kepada mentor....
1.Pada Hari Raya Idul Fitri, Ayah, Bunda, Chairul, dan Dinda berangkat menuju lokasi sholat Ied menggunakan mobil. Bunda dan Dinda duduk di kursi belakang, sedangkan Ayah dan Chairul di depan. Jika ikhwan dimisalkan dengan angka 1 dan akhwat dimisalkan dengan angka 2, bentuklah matriks A – matriks persegi yang terbentuk dari posisi duduk Ayah, Bunda, Chairul, dan Dinda, dan matriks x – matriks 2×1 yang entri-entrinya merupakan entri kolom pertama matriks A, kemudian tunjukkan nilai eigen dan vektor eigennya!	Pada Hari Raya Idul Fitri, Nur dan adiknya berangkat menuju lokasi sholat Ied menggunakan mobil. Adik Nur duduk di sebelah Nur yang mengemudikan mobil. Selama di perjalanan, ia melihat dua orang tetangganya berangkat dengan berjalan kaki. Jika dalam Qs. Al-Maidah: 2 Allah SWT memerintahkan kita untuk saling tolong-menolong, kemudian Nur dan adiknya dimisalkan dengan angka 1 dan kedua tetangga Nur dimisalkan dengan angka 2, maka deskripsikan sikap yang seharusnya ditunjukkan Nur kepada kedua tetangganya dengan membentuk matriks A – matriks persegi yang terbentuk dari kondisi mobil Nur dan matriks x – matriks 2×1 yang entri-entrinya merupakan entri kolom pertama matriks A, kemudian tunjukkan nilai eigen dan vektor eigennya!
Empat orang siswa SMP IT Ar-Rahman duduk di pelataran masjid membentuk matriks persegi. Tiba-tiba, seorang guru matematika menghampiri dan memberikan mereka kaos. Siswa yang duduk di baris pertama memperoleh kaos bertuliskan angka 6 dan teman di sebelah kanannya memperoleh kaos bertuliskan angka 4. Sedangkan, Siswa yang duduk di baris kedua sebelah kanan memperoleh kaos bertuliskan angka 0 dan teman di sebelah kirinya memperoleh kaos bertuliskan angka -2. Jika A merupakan matriks yang terbentuk dari angka pada kaos keempat siswa tersebut,.....	Pak Nasrun berjanji akan memberikan hadiah kepada empat orang siswa yang memiliki nilai tertinggi dalam ujian matematika. Empat orang siswa tersebut diarahkan untuk duduk di pelataran masjid membentuk matriks persegi. Pak Nasrun pun mengamanahkan ketua kelas untuk memberikan kaos bertuliskan angka 6 pada siswa yang duduk di baris pertama dan kaos bertuliskan angka 4 untuk teman di sebelah kanannya. Lalu, kaos bertuliskan angka 0 akan diberikan kepada siswa yang duduk di baris kedua sebelah kanan dan kaos bertuliskan angka -2 untuk teman di sebelah kirinya. Jika Rasulullah SAW menganjurkan kita untuk bertanggung jawab ketika diberikan amanah, maka....