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Practicality of Hypothetical Learning Trajectory on Straight-Line Equations Concept

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Abstrak

Pembelajaran matematika masih belum sepenuhnya terintegrasi dengan Nilai-Nilai Keislaman. Padahal Matematika dan Islam memliki keterkaitan yang erat, sebagaimana terdapat dalam ayat-ayat Al-Qur'an. Penelitian ini bertujuan untuk menganalisis praktikalitas Hipotetical Learning Trajectory (HLT) berbasis Ayat-Ayat Al-Qur'an pada pembelajaran konsep persamaan garis lurus. Penelitian ini menggunakan metode desain research yang terdiri dari tiga tahap: desain pendahuluan, percobaan desain, dan analisis retrospektif. Partisipan penelitian adalah 18 mahasiswa semester kedua Jurusan Tadris Matematika IAIN Kerinci. Instrumen penelitian meliputi angket, observasi, dan wawancara, yang telah divalidasi untuk memastikan kelayakannya dalam penelitian ini. Analisis data dilakukan dengan pendekatan kualitatif dan kuantitatif. Hasil penelitian menunjukkan bahwa desain HLT berbasis Ayat-Ayat Al-Qur'an dinyatakan praktis dengan skor 81% dengan kategori sangat praktis. Hal ini menunjukkan bahwa integrasi Nilai-Nilai Keislam dalam pembelajaran matematika dapat meningkatkan pemahaman mahasiswa serta mendukung pengembangan model pembelajaran yang kontekstual.
Kata Kunci: Al-Qur'an; HLT; Nilai Keislaman; Persamaan Garis Lurus; Praktikalitas.

Abstract

Mathematics learning is still not fully integrated with Islamic values. However, mathematics and Islam are inherently connected, as in Al-Qur'an verses. This research aims to analyze the practicality of Hypothetical Learning Trajectory (HLT) based on Al-Qur'an verses in teaching the concept of straight-line equations. This study is a design research type consisting of three stages: preliminary design, design experiment, and retrospective analysis. The research participants were 18 second-semester students of the Mathematics Education at IAIN Kerinci. Research instruments included questionnaires, observations, and interviews, which were validated to ensure their feasibility for this study. Data analysis combined qualitative and quantitative approaches. Results show that the HLT design based on Al-Qur'an verses on the concept of straight-line equations was declared practical by students at 81% in the very practical category. This implies that integrating Islamic values in mathematics learning can enhance students' understanding and support the development of contextually relevant learning models.
Keywords: Al-Qur'an; HLT; Islamic Values; Practicality; Straight-line Equations.

I. INTRODUCTION

Islamic Religious Colleges are higher education institutions that offer not only programs focused on Islamic studies but also general study programs (Nasution & Yulia, 2024). One of the general majors available in these institutions is mathematics. A distinctive characteristic of Islamic Religious Colleges is the integration of Islamic values into every academic program (Yulia & Nasution, 2024[a]). This integration is reflected in each course offered. Therefore, in the Mathematics Education major, which deals with abstract mathematical concepts, greater effort is required to incorporate Islamic values into the curriculum. This poses a challenge for some lecturers in the Mathematics Education Department at IAIN Kerinci. According to Putri et al. (2020), the ability of mathematics to convey Islamic values is somewhat limited, which further complicates this integration.

The challenge of integrating Islamic values into mathematics courses does not imply that Islamic knowledge cannot be incorporated into mathematical learning (Yulia & Nasution, 2024[b]). Musthofa (2024) successfully developed an applicative integration-interconnection model between Mathematics and Islamic Sciences. Amin (2014) proposed the concept of scientific integration-interconnection with Islamic teachings. Mathematics, as a universal discipline, is widely applied across various fields, including in the Qur'an. Several mathematical concepts found in the Qur'an include numbers, GCD and LCM, sets, geometry, sequences, logic, statistics, and linear equations (Noperta, 2024). Nasution (2017) also highlighted that many Quranic verses are directly related to mathematics. Specifically, mathematical concepts related to linear equations can be found in Surah Al-Anfal, verses 65 and 66.

Lines play a fundamental role in mathematics, particularly in geometry (Amadeo, 2018; Harel, 2014; Nasution et al., 2021; Pereira et al., 2021). Among the various types of lines, the straight line is one of the most significant. A straight line is defined as the shortest connection between two points (Prastiwi, 2022). The equation of a straight line represents the ratio of the difference between the y-coordinates and the x-coordinates of any two points on the line (Maričić & Stamatović, 2018). A key aspect of straight-line discussions is the slope, commonly referred to as the gradient (Steward et al., 2008). The gradient is determined by the ratio of the vertical change to the horizontal change between two points on the line (Shi & Lu, 2022). When plotted on a Cartesian coordinate system, calculating the gradient becomes more straightforward (Jumbantoruan, 2020).

Surah Al-Anfal, verses 65, describes the ratio between Muslims and disbelievers in battle. In these verses, Allah SWT states, "If there are twenty patient believers among you, they will surely overcome two hundred enemies. And if there are one hundred patient believers among you, they will surely overcome one thousand disbelievers." In the concept of a straight-line equation, the number of Muslims can be represented as the variable *x*, while the number of disbelievers is represented as *y*. Thus, the first coordinate can be written as *(20, 200)*, while the second coordinate is

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(100, 1000). Based on these two points, a straight line can be formed, allowing us to determine the equation of the line and calculate its gradient.

Learning Straight-Line Equations using the Al-Qur'an verse approach in Surah Al-Anfal verses 65 and 66, will make learning meaningful for students, no longer just playing with formulas and graphs. However, students will form a perception that straight-line equations are not only limited to calculations, formulas, and graphs but learning straight-line equations can introduce them to the implied meaning of the Al-Qur'an.

Integrating mathematics with the Al-Qur'an requires a well-structured learning design to ensure that the intended learning objectives are effectively achieved. One approach to structuring this process is through the Hypothetical Learning Trajectory (HLT). The concept of HLT was first introduced by Simon in the field of education. According to Simon, HLT represents a teacher's or educational researcher's prediction of the learning process. This learning trajectory consists of three key components: expected learning outcomes, planned learning activities, and anticipated student engagement throughout the learning process (Adhli, 2021; Sari et al., 2022; Mutaqin et al., 2023).

The design of HLT is essential in the learning process because lecturers, as educators, are not only responsible for preparing learning materials but must also anticipate and analyze students' potential reactions (Afriansyah & Arwadi, 2021). This enables them to develop appropriate strategies and activities that align with students' responses. This aligns with Adhli (2021), who emphasized in his research that teachers should prepare alternative hypotheses as methods students can use to address learning challenges. These alternative hypotheses help educators design suitable solutions for students' predicted difficulties. Additionally, Adhli (2021) highlighted that HLT facilitates the development of a structured plan that allows teachers to anticipate student learning activities, ensuring that both the learning material and students' comprehension during the process are considered.

Several previous studies have focused on developing HLT designs. Sukirwan et al. (2022) explored the development of set learning designs using HLT with a realistic mathematics approach. Similarly, Rezky & Jais (2020) examined the application of HLT in problem-solving activities, particularly addressing students' challenges in understanding systems of linear equations with two variables. Meanwhile, Juliani et al. (2023) designed an HLT framework for set theory material based on a Problem-Based Learning approach.

Considering the various previous studies on HLT design, it is evident that research integrating religion-based learning approaches with mathematics remains limited. Several studies have explored the possibility of integrating Islamic values into mathematics education, (Al Ayyubi et al., 2024; Azzuhro & Salminawati, 2023; Imamuddin & Isnaniah, 2024) but did not provide a well-organized pedagogical framework to integrate Islamic values into

teaching mathematics. Moreover, previous research has primarily focused on general Islamic perspectives in education rather than developing specific mathematical learning trajectories grounded in Qur'anic principles.

Additionally, no existing studies have explored the combination of HLT with the integration of Islamic values or the Qur'anic integration in mathematics learning. No research has specifically focused on straight-line equations within an HLT framework. This study bridges that gap by developing an HLT model that incorporates Qur'anic verses into the teaching of straight-line equations. This research offers a novel perspective on connecting mathematical concepts with religious values by integrating Qur'anic verses, thereby enriching pedagogical approaches and enhancing students' understanding.

Based on the description above, this study aims to explore the design of a Hypothetical Learning Trajectory (HLT) based on Qur'anic verses in the context of straight-line equations. This research offers several benefits, particularly in integrating Islamic values specifically, verses from the Al-Qur'an into mathematics learning. By using Qur'anic verses as a foundation for instructional design, students may gain a deeper understanding of mathematical concepts from an Islamic perspective. Additionally, the proposed learning design can serve as a starting point for innovation in more inclusive mathematics education. It may also inspire curriculum developers and educators to adopt diverse and engaging approaches to teaching mathematics.

II. METHOD

The method used in this study is design research. Design research is defined as a strategy aimed at developing Local Instruction Theory through collaboration between researchers and educators to enhance the quality of learning (Rezky, 2019). According to Plomp (Prahmana, 2017), design research can be compared to a prototype, where researchers strive to optimize the sequence of activities and interpret students' direct experiences in ideal learning situations. Design research involves a systematic sequence of lessons, including conceptualization, refinement, and analysis of all learning-related interventions such as activities, processes, materials, outcomes, and instructional strategies. A study qualifies as design research if the learning design mechanism is a central component of the research (Rezky, 2019).

The research was conducted in the Mathematics Education Department at Institut Agama Islam Negeri Kerinci. The participants were 18 second-semester students who enrolled in the Plane Analytical Geometry course. The study was conducted in the Even Semester of the 2023/2024 Academic Year during April and May 2024, with a total of five meetings.

The designed HLT was then validated by two experts consisting of three aspects: content, media, and Islamic Values. The HLT was declared valid by the validators with a validity score of 3.9, which is considered very valid.

The research instruments used were student response questionnaires, interviews, and observations. All of these instruments have been validated to ensure

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their suitability for use in this study. During the trials, both in the pilot experiment and teaching experiment stages, students were given questionnaires to obtain information about their responses to the use of HLT in learning. The questionnaire analysis used the average score results from respondents, with percentage criteria (Riduwan, 2009) as shown in the table 1.

Table 1.
The Practicality Criteria

Percentage	Category
0 to 20%	Not Practical
21 to 40 %	Less Practical
41 to 60 %	Enough Practical
61 to 80 %	Practical
81 to 100 %	Very Practical

The interviews conducted used a semi-structured interview type. The aspects explored in the interview were outlined in the interview guidelines and would start with lighter issues when the interview began. The interview guidelines allow researchers to collect data that is not significantly different among respondents. This type of interview can shorten the time required for researchers to obtain data. It also reduces the amount of irrelevant data compared to using an unstructured interview. Researchers can design questions and select which ones will be asked later.

To design an HLT, researchers need to conduct interviews with mathematics lecturers and students at the research site. This is done to obtain initial data regarding the teaching materials used, the classroom conditions that will be the subject of the study, students' preferred learning conditions, strengths and weaknesses in learning, as well as the characteristics of students in that class.

An important point that researchers must consider is the subject being studied, namely the students themselves. The interview guidelines prepared by the researchers for the students are based on the integration of the Qur'an. Some of these interview questions aim to reveal whether the mathematics material being studied has been integrated with Qur'anic verses. This allows researchers to design a learning flow that suits the conditions of the students in the class.

The researcher conducted direct observations during the implementation of the HLT design, which were summarized in the observation sheet. The observation sheet is a tool used to reveal the processes occurring in the field. It also assesses the alignment between the developed theory and its implementation in practice. Additionally, the observation sheet helps determine whether the assumptions in the HLT align with actual learning. The observer, who is not involved in the learning process, fills out the observation sheet and monitors the learning process. The observation sheet is structured based on indicators that need to be identified and examined.

Data analysis was conducted both quantitatively and qualitatively. Quantitative data analysis was used to analyze the questionnaire responses from students to determine the practicality of the product. The obtained quantitative data was calculated using a measurement scale test. The measurement scale used in this study was the Likert scale. This method

was used to interpret the observations obtained during the learning activities. The designed Hypothetical Learning Trajectory (HLT) was compared with the results of data analysis from previous learning sessions. This was done to gain insight and information on how students construct their knowledge. Based on the results of the data analysis, the Hypothetical Learning Trajectory (HLT) was adjusted according to new hypotheses about students' thinking that developed during the learning activities.

Qualitative data analysis was used to analyze the data obtained from observations and interviews with the test subjects. The results of the qualitative data analysis served as a guide for product improvement. The obtained data was then analyzed using descriptive methods, transcript methods, and classification methods.

The teaching experiment phase was conducted with all ten students enrolled in the Plane Analytical Geometry course for semester IIA. These students were taught using the revised Hypothetical Learning Trajectory (HLT), which had been improved based on the results of the pilot experiment phase.

During the Preliminary Design stage, the researcher began by conducting a literature review on the concept of straight-line equations and related verses from the Qur'an. Various relevant studies, articles, and literature were gathered to build a foundational understanding of the topic. Additionally, an analysis of student characteristics was performed to determine the most suitable design based on their learning tendencies and common practices observed among both students and lecturers during lectures. Initial observations were also conducted to identify activities that could potentially enhance students' thinking skills. These activities could include those previously highlighted by other researchers or new ones that emerged during the study.

Apart from that, in this observation activity, the researcher also looked at the initial abilities possessed by students as material for designing learning designs that suit their needs. The next activity that the researcher carried out was to formulate the learning outcomes to be achieved in the lecture. After that, the researchers created a learning plan or design that contained a series of stages of lecture activities from beginning to end. The designed lecture activities consist of lecturer activities and student activities, which are estimates of student responses to lecture activities. The lecture design design is known as the Hypothetical Learning Trajectory (HLT).

The next stage is the Design Experiment, which is the trial stage or conducting learning experiments by the HLT that was designed in the previous stage. This stage aims to explore and investigate the development of students' way of thinking in the lecture process and the lecture atmosphere formed by HLT. The experimental design consists of the pilot experiment stage and the teaching experiment stage. In the pilot experiment stage, the trial was conducted with eight second-semester students majoring in Tadris Mathematics who were enrolled in the Plane Analytical Geometry course. These students were taught based on the

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pre-designed Hypothetical Learning Trajectory (HLT). After the lessons, they completed a response questionnaire to provide feedback on the applied learning approach. In the teaching experiment stage, the trial was conducted on 10 students enrolled in the Analytic Geometry course for Semester IIA. The students were taught according to the revised HLT based on the results of the pilot experiment trial.

The lecture process is carried out by the lecturer who teaches the course, while the researcher acts as an observer, and one more observer is needed to obtain triangulation. At this stage, the researcher discusses every activity that appears in the lecture and analyzes the student's thinking process during the lecture. Another thing that is done at this stage is to observe the implementation of suspected student response activities that researchers have previously designed and included in the HLT. If there are activities that occur in lectures that the researcher has not previously predicted, then that will become a research finding.

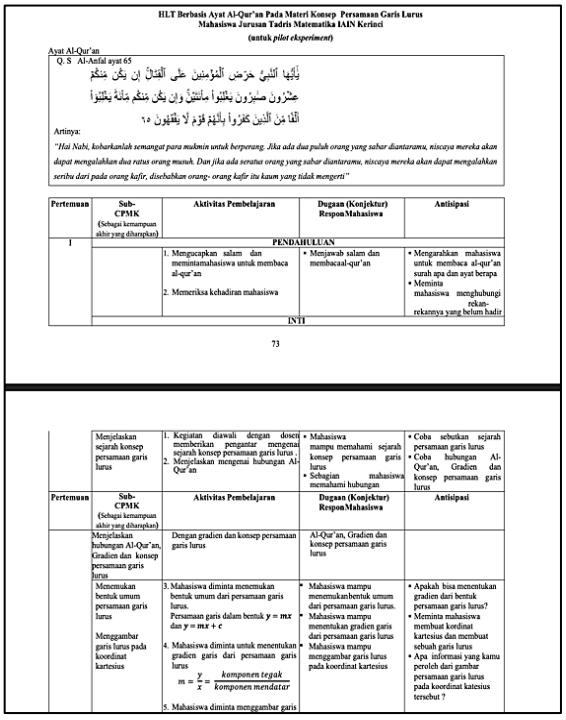
The final stage, known as the Retrospective Analysis stage, involves comparing the designed Hypothetical Learning Trajectory (HLT) with the outcomes obtained during the experimental or actual trial stage. The primary objective of this phase is to assess the effectiveness of the lecture implementation. This analysis is conducted based on the collected data, which is organized chronologically according to the sequence of activities. The evaluation focuses on addressing the predefined research questions or problem formulations.

The results of the retrospective analysis contribute to the improvement of HLT for future studies. In this stage, the researcher systematically answers the research questions by conducting a retrospective analysis with HLT serving as a guiding framework.

III. RESULT AND DISCUSSION

A. Preliminary Design

At the preliminary design stage, the researcher implements the initial idea to develop the Hypothetical Learning Trajectory (HLT) in the Plane Analytical Geometry course on the straight-line equations concept based on Al-Qur'an verses. The initial idea is obtained by observing students and reviewing the literature, then designing the Hypothetical Learning Trajectory (HLT). The designed HLT is shown in the Figure 1.



HLT Berbasis Ayat Al-Qur'an Pada Materi Konsep Persamaan Garis Lurus
Mahasiswa Jurusan Tadris Matematika IAIN Kerinci
(untuk *pilot eksperiment*)

Ayat Al-Qur'an
Q. S Al-Anfal ayat 65

يَٰٓأَيُّهَا ٱلنَّبِيُّ حَرِّضِ ٱلْمُؤْمِنِينَ عَلَى ٱلْقِتَالِ ۚ إِن يَكُن مِّنكُمْ
عِشْرُونَ صَٰبِرُونَ يَغْلِبُوا۟ مِا۟ئَتَيْنِ ۚ وَإِن يَكُن مِّنكُم مِّا۟ئَةٌ يَغْلِبُوٓا۟
أَلْفًا مِّنَ ٱلَّذِينَ كَفَرُوا۟ بِأَنَّهُمْ قَوْمٌ لَّا يَفْقَهُونَ ٦٥

Artinya:
"Hai Nabi, kobarkanlah semangat para mukmin untuk berperang. Jika ada dua puluh orang yang sabar diantaramu, niscaya mereka akan dapat mengalahkan dua ratus orang musuh. Dan jika ada seratus orang yang sabar diantaramu, niscaya mereka akan dapat mengalahkan seribu dari pada orang kafir, disebabkan orang- orang kafir itu kaum yang tidak mengerti"

Pertemuan	Sub-CPMK (Sebagai kemampuan akhir yang diharapkan)	Aktivitas Pembelajaran	Dugaan (Konjektur) ResponMahasiswa	Antisipasi
1	PENDAHULUAN			
		1. Mengucapkan salam dan memintamahasiswa untuk membaca al-qur'an 2. Memeriksa kehadiran mahasiswa	• Menjawab salam dan membacaal-qur'an	• Mengarahkan mahasiswa untuk membaca al-qur'an surah apa dan ayat berapa • Meminta mahasiswa menghubungi rekan-rekannya yang belum hadir
	INTI			

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	Menjelaskan sejarah konsep persamaan garis lurus	1. Kegiatan dawali dengan dosen memberikan pengantar mengenai sejarah konsep persamaan garis lurus . 2. Menjelakan mengenai hubungan Al-Qur'an	• Mahasiswa mampu memahami sejarah konsep persamaan garis lurus • Sebagian mahasiswa memahami hubungan	• Coba sebutkan sejarah persamaan garis lurus • Coba hubungan Al-Qur'an, Gradien dan konsep persamaan garis lurus
Pertemuan	Sub-CPMK (Sebagai kemampuan akhir yang diharapkan)	Aktivitas Pembelajaran	Dugaan (Konjektur) ResponMahasiswa	Antisipasi
	Menjelaskan hubungan Al-Qur'an, Gradien dan konsep persamaan garis lurus	Dengan gradien dan konsep persamaan garis lurus	Al-Qur'an, Gradien dan konsep persamaan garis lurus	
	Menemukan bentuk umum persamaan garis lurus Menggambar garis lurus pada koordinat kartesius	3. Mahasiswa diminta menemukan bentuk umum dari persamaan garis lurus. Persamaan garis dalam bentuk $y = mx$ dan $y = mx + c$ 4. Mahasiswa diminta untuk menentukan gradien garis dari persamaan garis lurus $m = \frac{y}{x} = \frac{komponen\ tegak}{komponen\ mendatar}$ 5. Mahasiswa diminta menggambar garis	• Mahasiswa mampu menemukanbentuk umum dari persamaan garis lurus. • Mahasiswa mampu menentukan gradien garis dari persamaan garis lurus • Mahasiswa mampu menggambar garis lurus pada koordinat kartesius	• Apakah bisa menentukan gradien dari bentuk persamaan garis lurus? • Meminta mahasiswa membuat kordinat kartesius dan membuat sebuah garis lurus • Apa informasi yang kamu peroleh dari gambar persamaan garis lurus pada koordinat katesius tersebut ?

Figure 1. The Designed HLT

B. Design Experiment

At the pilot experiment stage, a trial of the designed Hypothetical Learning Trajectory (HLT) is conducted before its full implementation. The purpose of this pilot experiment is to enhance the quality of the designed HLT after being validated by experts. This process helps to gather feedback, suggestions, and necessary improvements from direct users, namely students in the trial class.

The pilot experiment was conducted in Class II B of the Analytic Geometry course, which consists of eight students. During this stage, two learning sessions are carried out in accordance with the designed HLT, covering two sub-learning outcomes (sub-CPMK). In this phase, the researcher takes on the role of the instructor, teaching the Analytic Geometry course specifically on the topic of straight-line equations.

The results of the pilot experiment stage provided insights into the learning process of the Analytic Geometry course, specifically on the topic of straight-line equations using the designed Hypothetical Learning Trajectory (HLT). One key finding from this stage is that before starting the lesson, it is beneficial for the researcher to introduce students to the connection between mathematics and Islam, rather than immediately presenting the verses that contain the concept of straight-line equations. This approach aims to enhance students' enthusiasm and interest in the subject matter. This was evident from students' responses, as they inquired whether there were other connections between Islam and mathematics.

Based on the pilot experiment, it was found that the instructor needs to prepare more anticipatory measures due to the high number of student responses that were not fully accounted for in the planned HLT. Therefore, the anticipatory steps included in the designed HLT during this pilot experiment were still insufficient in addressing students' reactions to the learning activities provided.

After completing the learning process in the pilot experiment class, the researcher conducted direct interviews to assess students' responses to the learning process using the developed HLT. Based on the interviews, students expressed that the learning experience with HLT was highly engaging, easy to understand, and enjoyable. They particularly appreciated how it helped them better understand the connection between Islam and mathematics, especially concerning the concept of straight-line equations.

Students showed great enthusiasm for the lessons as they gained deeper insights into the historical background of straight-line equations and the relationship between the Qur'anic verses in Surah Al-Anfal (verses 65-66) and the concept of straight-line equations.

During the teaching experiment stage, the researcher presented verse 65 of Surah Al-Anfal as Figure 2.

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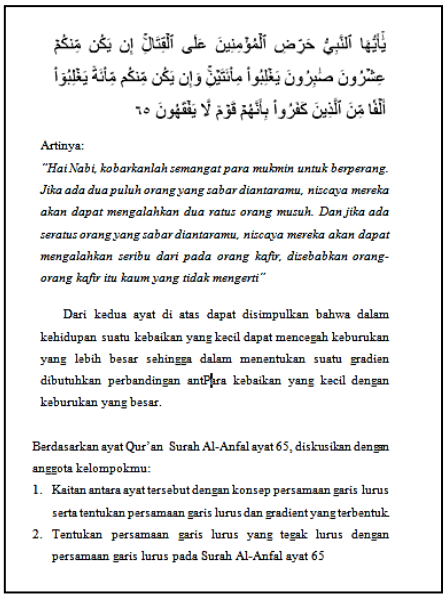

يَٰٓأَيُّهَا ٱلنَّبِيُّ حَرِّضِ ٱلْمُؤْمِنِينَ عَلَى ٱلْقِتَالِۚ إِن يَكُن مِّنكُمْ عِشْرُونَ صَٰبِرُونَ يَغْلِبُواْ مِاْئَتَيْنِۚ وَإِن يَكُن مِّنكُم مِّاْئَةٌ يَغْلِبُوٓاْ أَلْفًا مِّنَ ٱلَّذِينَ كَفَرُواْ بِأَنَّهُمْ قَوْمٌ لَّا يَفْقَهُونَ ٦٥

Artinya:

"Hai Nabi, kobarkanlah semangat para mukmin untuk berperang. Jika ada dua puluh orang yang sabar diantaramu, niscaya mereka akan dapat mengalahkan dua ratus orang musuh. Dan jika ada seratus orang yang sabar diantaramu, niscaya mereka akan dapat mengalahkan seribu dari pada orang kafir, disebabkan orang-orang kafir itu kaum yang tidak mengerti"

Dari kedua ayat di atas dapat disimpulkan bahwa dalam kehidupan suatu kebaikan yang kecil dapat mencegah keburukan yang lebih besar sehingga dalam menentukan suatu gradien dibutuhkan perbandingan antPara kebaikan yang kecil dengan keburukan yang besar.

Berdasarkan ayat Qur'an Surah Al-Anfal ayat 65, diskusikan dengan anggota kelompokmu:

1. Kaitan antara ayat tersebut dengan konsep persamaan garis lurus serta tentukan persamaan garis lurus dan gradient yang terbentuk.
2. Tentukan persamaan garis lurus yang tegak lurus dengan persamaan garis lurus pada Surah Al-Anfal ayat 65

Figure 2. The Islamic Values in HLT

Students responded in various ways. Some students were unable to identify the relevant mathematical concept in the verse and responded with uncertainty. Others associated the verse with the concept of proportionality, as they observed a direct comparison between the number of disbelievers and believers. However, this response was inaccurate because the current course focused on the concept of straight-line equations in the Plane Analytical Geometry course, which does not cover proportionality.

After the researcher reminded the students about the learning objectives, they began to understand the connection between the verse and the straight-line equation by interpreting the ratio of disbelievers and believers as coordinate points that could be used to form a straight line on the Cartesian plane. Once students successfully identified the general form of the straight-line equation and plotted it on a Cartesian coordinate system, the researcher then explained the relationship between the Qur'an, gradients, and straight-line equations.

At first, students appeared confused while working on the worksheet. Occasionally, they asked the researcher about the meaning of the question regarding the connection between the verse and the concept of the straight-line equation, as well as how to determine the equation of the straight line and the gradient derived from Surah Al-Anfal, verse 65.

The researcher guided the students to first determine the coordinates of the points formed from the verse. Then, the researcher asked them to identify the points obtained from the verse and recall how to determine the equation of a straight line when two points are known. Once the students understood the purpose of the question, they became enthusiastic about solving the problems in the worksheet.

The Islamic values in HLT include Al-Qur'an Surah al-Anfal verses 65 and 66. The verses 65 said: "*O Prophet (Muhammad), inspire the believers to fight. If there are twenty patients among you, they will overcome two hundred; and if there are a hundred of you, they will overcome a thousand of the disbelievers, because they are a people who do not understand*." In the concept of a straight-line equation, the number of Muslims can be represented as the variable *x*, while the number of disbelievers is represented as *y*. Based on these two variables, a straight line can be formed, allowing us to calculate its gradient and determine the line equation in Figure 3.

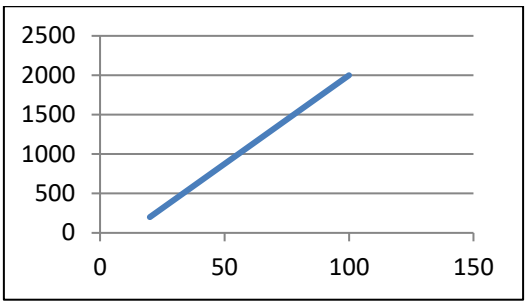

Figure 3. Straight-Line Graph in Al-Anfal Verse 65

From the comparison described in Surah Al-Anfal verse 65, it can be concluded that the first coordinate point is $(x_1, y_2) = (20, 200)$, and the second coordinate point is $(x_2, y_2) = (100, 1000)$. Using these points, the equation of the straight line can be determined as: $y = 10x$. The gradient (slope) of this equation is *10*.

Surah Al-Anfal verse 66 said: "*Now (at the time this verse was revealed), Allah has lightened your burden because He knows that there is weakness in you. If there are a hundred patients among you, they will overcome two hundred, and if there are a thousand of you, they will overcome two thousand by Allah's permission. And Allah is with those who are patient.*" In the concept of a straight-line equation, the number of patient Muslims can be represented as the variable *x*, while the number of disbelievers is represented as *y*. it can be concluded the first coordinate point is $(x_1, y_2) = (100, 200)$, and the second coordinate point is $(x_2, y_2) = (1000, 2000)$. Based on these two points, a straight line can be formed, allowing us to calculate its gradient and determine the line equation in Figure 4.

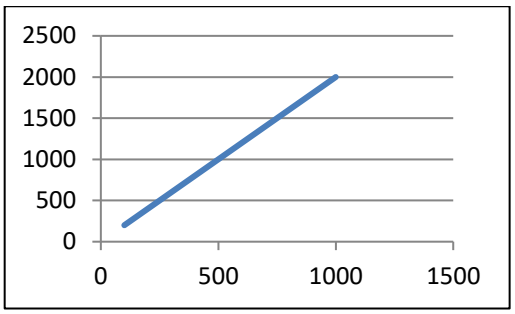

Figure 4. Straight-Line Graph in Al-Anfal Verse 66

From the comparison described in Surah Al-Anfal verse 66, the equation of the straight line can be determined as: $y = 2x$. The gradient (slope) of this equation is *2*.

After the learning activities in the teaching experiment stage were carried out, students were given a questionnaire to observe the implementation of the predicted student response activities that had been previously designed by the researcher and included in the HLT.

During this experimental stage, the researcher collected various data, including lecture video recordings, observation sheets, field notes, student worksheets, student interview audio recordings, and photographic documentation of the lecture activities. All these data were arranged chronologically to facilitate the subsequent analysis phase.

The results of the student response questionnaire are presented in Table 2.

Table 2.
The Student Response Questionnaire Results

Average Score	Percentage	Category
51	81%	Very Practical

Based on Table 2, the percentage of the students response practicality questionnaire is 81%, which falls into the "very practical" category. This indicates that the Qur'an-based HLT on the Concept of Straight-Line Equations is considered practical in terms of student responses.

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A percentage of 81% suggests that the majority of students responded positively to the use of HLT. This demonstrates that the media is easy to use, understand, and accept by students. The "very practical" category indicates that this learning media is not only functional but also effectively supports the teaching and learning process. Students found that this media helped them better understand the concepts being taught.

C. Retrospective Analysis

This stage involves comparing the designed HLT with the results from the experiment or trial phase. The comparison reveals that during the first meeting of the pilot experiment, students faced difficulties in finding the connection between Islam and mathematics. After the researcher revised the activities, asking students to explore the contributions of Islamic scholars in mathematics and the Qur'anic verses related to mathematical concepts, students in the teaching experiment phase better understood the intended connection.

The use of Qur'anic verses in learning materials enhances the appeal and relevance for students with religious backgrounds, thereby increasing their motivation and interest in learning. These findings provide valuable input for curriculum developers and educators to consider incorporating learning media based on religious values or other local contexts to enhance student engagement and motivation.

Based on these results, further development and refinement of the learning media can focus on aspects most appreciated by students while also evaluating and addressing any existing challenges.

Thus, this study demonstrates that the developed HLT has met a high level of practicality from the student's perspective, which is a crucial indicator of the successful implementation of learning media.

The results of this study align with the study conducted by Yusnimar (2022) who has found that a Hypothetical Learning Trajectory (HLT) based on the Qur'an and Hadith can help overcome learning difficulties. Additionally, Wike (2024), in her research, designed a Hypothetical Learning Trajectory (HLT) based on Surah Yusuf, Verse 87, which was able to regulate students' mathematical dispositions.

The integration of Islamic values in mathematics learning adds a unique appeal for students. In line with the statement of Fitrah and Kusnadi (2022), the integration of Islamic values in mathematics learning can strengthen positive character in students. Relating mathematics learning to Qur'anic verses or Islamic concepts makes the material feel more relevant and meaningful for students with an Islamic background Fitriyani and Kania (2019). This approach helps them understand that knowledge, including mathematics, is not separate from religious values. The Qur'an-based HLT can assist students in realizing that religious values and scientific knowledge can coexist harmoniously, ultimately broadening their perspectives and fostering a deep appreciation for both fields.

This research contributes to the development of Islamic-integrated mathematics learning by proposing a Hypothetical Learning Trajectory (HLT) framework that explicitly incorporates Qur'anic verses into the teaching of straight-line equations. Unlike previous studies that focus solely on HLT development, this study bridges the gap between mathematical concepts and Islamic values through a structured learning trajectory.

The practicality results demonstrate that students perceive this approach as highly applicable, reinforcing its potential as a pedagogical model for integrating religious perspectives in mathematics education. Furthermore, this research provides a methodological contribution by showcasing how Qur'anic-based HLT design can be validated and assessed in classroom settings. The findings also offer insights for educators and curriculum developers to enhance students' engagement and conceptual understanding by contextualizing mathematics within their religious framework.

IV. CONCLUSION

This study designed a Hypothetical Learning Trajectory based on Al-Qur'an verse in straight-line equation concept was declared practical by students with a practicality score at 81% in the very practical category. The practical results indicate that the HLT is applicable and beneficial in real classroom settings. This research demonstrates how a Qur'anic-based HLT design can be validated and effectively implemented, providing insights for educators and curriculum developers to enhance student engagement through religiously contextualized mathematics instruction.

This results suggests that integrating Islamic values in mathematics learning can enhance student engagement and understanding. These results imply that a contextually relevant HLT can serve as a valuable pedagogical tool for integrating religious perspectives in mathematics education.

This research contributes to the development of Islamic-integrated mathematics learning by proposing a Hypothetical Learning Trajectory (HLT) framework that explicitly incorporates Qur'anic verses into the teaching of straight-line equations.

Given the positive response to integrating Qur'anic verses with the concept of straight-line equations, future research could explore applying a similar approach to other mathematical topics to determine the broader applicability of integrating religious or cultural contexts within different areas of the curriculum. Additionally, further research and development efforts can build on the current findings to optimize the HLT model, ensuring that it effectively bridges religious values with academic learning and continues to meet the evolving needs of students.

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