



## Validity and Reliability Analysis: Measuring the Accuracy and Consistency of Instruments for the Evaluation of Islamic Religious Education Tests

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Article Info	Abstract
<b>Article History</b> Received: 2024-01-10 Revised: 2025-02-20 Published: 2025-03-03  <b>Keywords:</b> <i>Validity; Reliability; Evaluation; Test Analysis.</i>	Accurate and consistent measurement instruments are indispensable for conducting evaluations. Without adequate validity and reliability, PAI test results can be inaccurate and unreliable, thus obscuring the purpose of the evaluation. This study aims to analyze the importance of validity and reliability in the development of effective PAI tests. The method used is a literature study, by collecting and reviewing various sources such as books and relevant journal articles, which are then critically analyzed. The results of the analysis show that the fulfillment of validity, both from the content and construct aspects, as well as the consistency of results through high reliability, is very important to ensure that the test is truly accurate and reliable to be a measuring tool for the achievement of learning objectives. This study is expected to provide insight for PAI test instrument developers in creating more credible evaluation tools, in order to support a better and more meaningful religious learning process.
Artikel Info	Abstrak
<b>Sejarah Artikel</b> Diterima: 2025-01-10 Direvisi: 2025-02-20 Dipublikasi: 2025-03-03  <b>Kata kunci:</b> <i>Validitas; Reliabilitas; Evaluasi; Analisis Tes.</i>	Instrumen pengukuran yang akurat dan konsisten sangat diperlukan untuk melakukan evaluasi. Tanpa validitas dan reliabilitas yang memadai, hasil tes PAI dapat menjadi tidak akurat dan tidak dapat diandalkan, sehingga mengaburkan tujuan evaluasi. Penelitian ini bertujuan untuk menganalisis pentingnya validitas dan reliabilitas dalam pengembangan tes PAI yang efektif. Metode yang digunakan adalah studi literatur, dengan mengumpulkan dan mengkaji berbagai sumber seperti buku dan artikel jurnal yang relevan, yang kemudian dianalisis secara kritis. Hasil analisis menunjukkan bahwa pemenuhan validitas, baik dari aspek isi maupun konstruk, serta konsistensi hasil melalui reliabilitas yang tinggi, sangat penting untuk menjamin bahwa tes benar-benar akurat dan terpercaya untuk menjadi alat ukur ketercapaian tujuan pembelajaran. Penelitian ini diharapkan dapat memberikan wawasan bagi para pengembang instrumen tes PAI dalam menciptakan alat evaluasi yang lebih kredibel, guna mendukung proses pembelajaran agama yang lebih baik dan bermakna.

### I. INTRODUCTION

Validity and reliability are two key concepts that determine the quality and credibility of test results. In the context of education, measurement instruments such as tests are essential in assessing student learning achievement. For Islamic Religious Education (PAI) subjects, testing must be designed in such a way that it can accurately and consistently measure students' understanding of religious values, theological knowledge, and aspects of religious practice. This makes validity and reliability a crucial aspect in the development of PAI test instruments, in order to ensure that the results produced truly reflect the level of religious competence of students.

Validity refers to the extent to which a test or measurement instrument is able to measure what should be measured (Suharsimi Arikunto, 2013). In other words, validity indicates the level of accuracy of a test in representing the concept or construct to be measured, so that the data

produced has relevance to the purpose of the test. Without sufficient validity, the test results may not describe the actual state or characteristics of the object being measured, which can lead to inaccurate interpretations and conclusions. In this context, validity refers to the extent to which the test is able to measure relevant aspects in Islamic Religious Education, such as understanding the Quran, Hadith, morals, and Islamic history. A valid test will ensure that each item tested has a direct link to the competencies and indicators set out in the PAI curriculum. For example, the validity of the content must be guaranteed so that the test covers all the important material that the student should know, while the validity of the construct is important to ensure that the test does measure the student's religious ability, not just factual knowledge. At the stage of preparing objectives and evaluation questions, validity is not only related to the accuracy of measures and

conclusions, but also to decisions made from and against the consequences, both intentional and unintentional of conclusions (Nkwake, 2023).

Meanwhile, reliability is related to the level of consistency of measurement results when tests are performed repeatedly under similar conditions. High reliability indicates that the test can provide consistent and stable results over time and in different situations. It is important to ensure that variations in measurement results come from noticeable differences in the object being measured, not from inconsistencies in the instrument or measurement procedure. In other words, reliability emphasizes the reliability of measurement results in describing the same characteristics consistently. In this context, reliability focuses on the consistency of the results obtained from the PAI test test, so it is very important that the test results can reflect the actual condition of the student's level of religious mastery and not be affected by external factors such as mood or environmental factors. A reliable test will give stable results if applied at different times or on different but equal groups of students. This provides assurance that changes in measurement results are not the result of a weakness of the instrument, but rather a true reflection of the student's evolving understanding.

Both components (both validity and reliability) are crucial in determining the quality of a test. In the absence of strong validity, a test cannot be considered representative of the construct being measured, so the results are irrelevant for measurement purposes. On the other hand, without adequate reliability, the measurement results are unreliable, as they can change unexpectedly due to technical or methodological factors. Therefore, in order to build a credible instrument that can be widely used, testing for validity and reliability must be carried out systematically.

Thus, through this article, the author will try to analyze the concept of validity and reliability of the instrument in relation to the evaluation of the development of the PAI test. This discussion includes the essence of validity and reliability, its types, and how to measure validity and reliability. The analysis of the validity and reliability of the PAI test is expected to produce a measurement instrument that is able to provide an accurate and consistent picture of students' religious understanding, so that it can be used as a basis for credible evaluation in the educational process.

## **II. METHOD**

This study uses a literature study or literature study method, which focuses on collecting and analyzing relevant sources of information, such as academic books, scientific journal articles, and other publications related to the validity and reliability of tests in the context of education. The literature study was chosen because it allows researchers to compile a comprehensive and in-depth theoretical review (Mahanum, 2021), especially regarding the concepts of validity and reliability, especially in the development of Islamic Religious Education test instruments. The steps taken include identifying relevant literature, collecting sources, and critically analyzing theories, concepts, and findings from various previous studies. Through this approach, it is hoped that a comprehensive understanding can be obtained that can be used as a basis for analyzing the validity and reliability of measurement instruments in Islamic Religious Education subjects.

## **III. RESULT AND DISCUSSION**

Validity and reliability are the two main concepts in the development of measurement instruments. Validity refers to the extent to which a test instrument can measure what it is supposed to measure, while reliability relates to the consistency of measurement results when the instrument is used repeatedly. Based on the analysis, it can be said that valid but unreliable instruments can produce inconsistent data and will not reach the learning objectives, while reliable but invalid instruments will not provide accurate information regarding the variables studied.

By using various statistical methods to test validity and reliability, through this article the author tries to present how these two aspects can be evaluated objectively, and focuses on the nature, types and techniques/methods of testing. In the author's perspective, a good understanding of validity and reliability is essential for researchers and practitioners to ensure that the instruments used in research or educational evaluation are completely reliable and provide accurate results. Thus, systematic testing of the instrument before it is applied in a real context, in order to improve the quality of the data and decisions made based on the measurement results.

A learning outcome test is a measurement tool used to make measurements to obtain learning outcome data. Because it is a measuring tool, it

must meet the requirements. Based on the analysis of related references, a good measuring tool is one that meets 2 criteria, namely valid and reliable. Therefore, before being used, an instrument needs to be tested for its validity and reliability (Purwanto, 2021).

#### 1. Validity of Test Instruments

##### a) Definition of Validity

A test is said to be valid if it actually measures the test objective, and the validity of a test uses a numerical index that shows the extent to which the measurement results can accurately reflect a person's behavior obtained from various processes. In relation to measurement, validity has value, and the higher the value, the better the validity level. On the other hand, if it is low, it is due to systematic error. According to Sugiyono, a valid instrument means that the measuring tool used to obtain the data is valid. It is said to be valid if the instrument can be used to measure what is supposed to be measured. Valid instruments are generally reliable, but reliable instruments are not necessarily valid (Sugiyono, 2017).

According to Cronbach, test validation is a process by which test developers gather evidence to support the type of conclusions that can be drawn appropriately from test scores (Osterlind, 2002). In this definition, more emphasis is placed on the interpretation of the score produced by a test. Meanwhile, according to the AERA/APA/NCME standard, validity is defined as the most important consideration in test development; which refers to the suitability, meaning, and usefulness of the specific conclusions made from the test scores. Validity is a concept of unity that refers to the extent to which evidence supports the conclusions made by the score. Validity indicates the extent to which specific items on a tool accurately assess the concept being measured, to ensure that the questions asked allow valid conclusions to be drawn (Masuwai et al., 2024).

A data or information can be said to be valid if it is in accordance with the actual situation. If the data produced by the instrument is correct and valid, according to reality, then the instrument used is also valid (Suharsimi Arikunto, 2013). An example of an "invalid" condition, for example, measures the amount of student

participation in learning but through daily test scores, of course this is not appropriate. Furthermore, Lewis stated that validity (*sahihan*) is limited as the level of ability of an instrument to reveal something that is the subject of measurement. In other words, validity can be interpreted as the extent to which the measurement results can be interpreted as a reflection of the measurement target in the form of abilities, characteristics, or behaviors measured through the right measuring tools (Budi Susetyo, 2015). Validity is the degree to which a 'test' can measure 'what it wants to measure' precisely, so that if it is used to measure something that is not right, it becomes invalid. For example, written tests are not a valid measure of swimming or archery skills; Then the type of test to measure learning outcomes is certainly not appropriate to measure interest in learning, and so on.

Validity is related to the accuracy of the assessment tool against the concept being assessed so that it really assesses what should be assessed. For example, assessing students' abilities in subject X, but given questions with long and convoluted sentences so that the meaning is difficult for students to grasp and finally not answered because they do not understand the question, then this can be said to be an "invalid instrument". Another example will assess the ability to speak, but what is asked about grammatical or literary structure, then this is not appropriate (invalid). In principle, validity is not universal, as it adjusts to the situation and the purpose of the assessment. Simply put, assessment tools that have been valid for one purpose are not automatically valid for another.

##### b) Validity Type

Broadly speaking, there are 2 types of validity, namely: logical validity and empirical validity.

###### 1) Logical Validity

Logical is a representation of "logic", so it means "reasoning". That is, an instrument meets valid standards based on the results of reasoning, namely when the instrument has been well designed, and follows existing theories

and provisions. In essence, instruments that have been prepared according to the theory of instrument preparation are logically "valid", because the achievement of logical validity follows the existing provisions. Thus, logical validity does not need to be tested for its condition, because it is obtained immediately after the instrument has been compiled.

Logical validity can be classified into 2, namely: content validity and construct validity. In this concept, the validity of the content refers to the condition of the instrument that is arranged based on the content of the subject matter being evaluated, while the validity of the construct refers to the condition of the instrument that is prepared based on the construct of the aspects evaluated (Suharsimi Arikunto, 2013).

## 2) Empirical Validity

Next is empirical validity. "Empirical" means "experience". An instrument is said to have empirical validity if it has been tested from experience. For example, if a person is called "creative", this statement can be said to be valid if it has been proven based on experience that he produces many new ideas that are recognized by the public differently from the existing ones. So, even if according to reasoning it is considered valid, if there is no proof from experience, then it is not valid.

As with logical validity, empirical validity is also reclassified into 2, namely "there is now" validity and prediction validity.

The following is an explanation of the four types of validity that have been mentioned earlier:

### 1) Content Validity

The validity of the content is owned by a test if it measures a specific purpose that is parallel to the material or content of the lesson given. Because the teaching material is listed in the curriculum, the validity of the content is often referred to as curricular validity. This validity can be achieved since the preparation, namely by detailing the curriculum material (teaching material).

### 2) Construct Validity

The validity of a construct is owned by a test if the question item that constructs the test measures every aspect of thinking (as well as a specific instructional purpose/indicator). For example, if the indicator is "Students can compare commendable and reprehensible attitudes", then the appropriate question item is an order so that students can mention or distinguish examples of the two attitudes.

### 3) Concurrent Validity

The validity of "there is" refers to the empirical validity that is based on experience. Example: the teacher wants to know whether the summative test prepared is valid or not, then reviews the past criteria that the data now (currently) already has, for example the UH value or last year's summative value.

### 4) Predictive Validity

The validity of a prediction is the validity of a prediction. A test is said to have predictive validity if it is able to predict what will happen in the future. For example: *a college entrance test that is expected to predict the success of test takers in attending lectures in the future. Participants who are screened for selection based on test results are expected to reflect the high and low ability to attend lectures. So that when the value is high, it is expected to guarantee its success in the future. On the other hand, if it is low, it is estimated that they will not be able to attend lectures in the future.* In this context, the comparison of the validity of predictions is the values obtained after attending lessons in college. If X who has a higher test score fails the 1st semester exam compared to Y whose test score used to be lower, then the test conducted can be said to have no prediction validity.

According to Nana Sudjana, validity can be grouped into four types, namely the validity of content, the validity of building understanding, the validity of predictions, and the validity of similarity (Nana Sudjana, 2014). According to him, the validity analysis aims to examine the validity of measuring tools or questions in assessing what should be measured or to assess the

accuracy of test questions as a measuring tool. Meanwhile, based on the agreement of the joint committee of The American Psychological Association, The American Education Research Association, and The National Council on Measurement Used in Education, validity testing methods can be classified into three types, namely: content validity, criterion validity and construct validity.

### c) Content Validity

Content validity is a validity test to ensure that the test item accurately measures the state to be measured, so that it represents a sample from the population. This test was carried out to ensure that although the data collection was in the form of a sample, it was sufficiently representative of the population. Content validity testing can be carried out using one of three methods, namely (Purwanto, 2021):

#### 1) Examining the instrument items

In order to be representative, the development of the test must be based on grid planning. The item review process is carried out by observing the suitability of the content of the items written with the planning outlined in the grid. In other words, the underlying criterion of testing is the grid. The purpose of this study is to ensure and maintain that the test material developed does not deviate from the grid. If there is a conformity, then it is valid.

#### 2) Asking for expert consideration

Testing the validity of the content can be done by requesting expert judgement. In this context, an "expert" is a person who has competence in a field. An expert may be asked for his opinion to assess the accuracy of the content of the test items. Considerations can also be submitted to professionals. "Professional" in this context is a person who pursues a field in accordance with the area of study of the test, for example teachers, mechanics, doctors, advocates, and so on. In addition, consideration can also be made to several competent people to provide an assessment (interrater judgement). If it has been agreed by an expert, then it is valid. Example:

A content validity test was conducted on 10 test questions to 2 experts. Therefore, the researcher/compiler of the question needs to create assessment criteria, such as "appropriate", "doubtful", and "not suitable", so that experts can choose options that replicate the suitability of the test. The next stage is scoring, which is by giving a score of +1, 0, or -1 to the criteria that have been selected to then be tabulated.

### 3) Correlation analysis of question items

Next is to test the validity of the content by looking at the correlation of the question items with the total. In principle, an item is declared valid if it is highly correlated with the total. The test of the validity of the content is carried out by looking at the correlation of the item with this total, the assessment criterion is when the  $r$  value is calculated  $> r$  table. For Example:

Correlations			
		S1	N
S1	Pearson Correlation	1	.787**
	Sig. (2-tailed)		.007
	N	10	10
N	Pearson Correlation	.787**	1
	Sig. (2-tailed)	.007	
	N	10	10

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*The value of  $r$  calculated for question-item 1= 0.787*

*The value of  $r$  of the table for N10 with  $\alpha=5\%$  is 0.632*

*So,  $r$  calculates  $> r$  table, so it correlates significantly with the total score, so it is valid.*

### d) Validity of Criteria

It is a validity test by comparing tests with certain criteria outside of the test. This validity is divided into concurrent and predictive validity, as previously explained. For example, testing the validity of the final test with a UH value as a criterion; entrance test for new students with the final score of the previous school report card; the results of the measurement of tests developed by teachers with those compiled by MGMP, etc.

e) Construct Validity

Methods that can be used for construct validity testing include:

- 1) Examining the items
- 2) Asking for expert consideration
- 3) Convergence and discrimination
- 4) Multitrait-Multimethod (MTMM)
- 5) Factor Analysis.

2. Test Instrument Validity Test

Validity testing involves the calculation of correlation statistics, and the concept of correlation is related to the relationship between variables X (free) and Y (bound). Independent variables are variables that cause the occurrence of dependent variables, while bound variables are those caused by independent variables. The degree of correlation is notated with the coefficient  $r$  (relation), so the relationship between X and Y becomes  $r_{xy}$ . The interpretation and significance level of the relationship between X and Y can be compared with the table.

Product moment correlation formula:

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{\{N \sum x^2 - (\sum x)^2\} \{N \sum y^2 - (\sum y)^2\}}}$$

Dimana:

$r$  = Correlation index number, "r" product moment

$N$  = Number of cases

$xy$  = Sum of the result of multiplying the score  $x$  by  $y$

$X$  = Total score  $x$

$Y$  = Total score  $y$

3. Test Instrument Reliability

Reliability is a concept that refers to the reliability and consistency of a measuring or measuring instrument. In this context, reliability refers to the extent to which the measurement results can be trusted and provide the same results when performed repeatedly under the same conditions (Mabruri Pudiyas Salim, n.d.) Anderson argues that validity is more important than reliability in the context of measurement and evaluation (Arikunto, 2013). Validity refers to the extent to which a test or instrument actually measures what it is meant to measure, while reliability is concerned with the consistency of measurement results. According to Anderson, while reliability is necessary to support

validity, a test can be considered reliable but invalid. Conversely, a valid test will usually also be reliable (Tentama &., 2018).

How to Find the Amount of Reliability

To find out the reliability (determination of test results) can basically be seen from the alignment of test results. To find out this alignment, various approaches can be used, including:

a) Parallel (equivalent) method

The parallel forms method approach or equivalent form reliability is a technique used to measure the consistency of results from two different but equivalent versions of the test (Riadi, 2021) or in other words, a parallel test is two tests that have the same objectives, level of difficulty, and arrangement but the question items are different and tested in the same group (Arikunto, 2013). This method aims to ensure that both forms of the test measure the same construct with consistent results.

The parallel form method is the first by creating two different but equal sets of questions, with the same number of items and covering similar content and difficulty levels. For example, if you're testing math comprehension, both tests should cover the same concepts and question types. Furthermore, in the implementation of the test by giving both tests to the same group of respondents in the near future. For example, you can give Test A on Monday and Test B on Friday to the same group of students (Ramadhan et al., 2024).

The main advantage of this method is its ability to reduce the carry-over effects that often occur in test-retest methods, where respondents may recall their answers from previous tests. However, this method also has significant drawbacks. The main challenge lies in the difficulty of putting together two truly parallel instruments, which requires equality in terms of objectives, number of items, and difficulty. In addition, if both tests are presented in sequence without sufficient time lag, there is a possibility that participants will be affected by the experience from the first test while taking the second test, which may affect the results. Another disadvantage is the need for more time and resources to develop and implement these two tests compared to other methods (Wahyudi, 2017).

b) Test-retest Method

The retest method is carried out to avoid the preparation of two test series. In other words, the test-retest method, is a technique used to measure the reliability of a measuring device by giving the same test to a group of subjects at two different times by having only one test series (Gunartha, 2022), because the number of tests is only one and tested twice, this method is also called the single-test-double-trial method. Then the results of the two tests are calculated by correlation (Arikunto, 2013).

The basis of this method is that if a test has a high level of reliability, then the scores obtained from the two tests should show significant similarity. In other words, if the same individual underwent the same test at different times, the results should not show a big difference. This method assumes that the measured characteristics remain stable between the two measurements. If there is a significant change in the condition of the subject. For example, if they learn more between two tests, then the results may not reflect the reliability of the measure. Therefore, it is important to consider factors such as fatigue or the subject's motivation when conducting backtesting (Gunartha, 2022).

c) Split-half Method

The Split-Half Method is a technique used to test the reliability of an instrument by dividing the measuring instrument into two parts. This method aims to assess the consistency of measurement results from the same instrument when used at one time. In practice, the items on the test are divided into two groups, such as odd items and even items, and then the scores from each group are correlated to determine the extent to which the two sections produce consistent results. If the results of the analysis show a high reliability coefficient (generally above 0.70), then the instrument is considered reliable. A test's reliability score scale is a measure of how reliable the test is in delivering consistent results (Ramadhan et al., 2024). This reliability is usually expressed in the form of a coefficient, which ranges from 0 to 1, where a higher value indicates a better level of reliability which in the Reliability coefficient, if:

Coefficient 0.70 - 0.79: Accepted as good reliability.

Coefficient 0.80 - 0.89: Accepted as very good reliability.

Coefficients above 0.90: Accepted as outstanding reliability.

To calculate the reliability coefficient using the bifurcation method, one of the commonly used formulas is as follows: The Spearman-Brown formula; Flanagan formula; Rulon Formula; Kuder-Richardson formula; C. Hoyt formula, or Cronbach Alpha formula.

#### IV. CONCLUSION AND SUGGESTION

##### A. Conclusion

Validity and reliability are very important in the development of test instruments, including for Islamic Religious Education (PAI) subjects. Validity guarantees that the test is completely accurate to measure religious abilities relevant to learning objectives, while the reliability of the test instrument is an important aspect in measurement that shows the consistency and durability of the measurement results of a measuring instrument so that it can be trusted. Through the literature study method, this study emphasizes that the fulfillment of these two components is a basic requirement for the PAI test to provide accurate and reliable results. Without adequate validity and reliability, test results not only have the potential to lead to incorrect interpretations, but can also hinder the achievement of learning objectives.

##### B. Suggestion

Therefore, the development of PAI test instruments that focus on high validity and reliability should be a priority for educators and curriculum developers to support effective and credible evaluation of religious learning.

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