

ANALYSIS OF VALIDITY AND RELIABILITY IN STUDENT COLLABORATION SKILLS RESEARCH ON FIQH SUBJECTS AT MAN 1 PEKANBARU

Vina Novita¹, Nurul Habibah Arfizeah², Risnawati³, Miftahir Rizqa⁴

^{1,2,3,4}Postgraduate UIN Suska Riau

¹22590124117@students.uin-suska.ac.id, ²22590124660@students.uin-suska.ac.id, ³risnawati@uin-suska.ac.id, ⁴miftahir.rizqa@uin-suska.ac.id

ABSTRACT

*This study aims to analyze the validity and reliability of the questionnaire instrument developed to measure students' collaboration skills in Islamic Religious Education (PAI) subjects, especially in Fiqh learning. Collaboration skills are one of the key competencies of 21st century education, so valid and reliable instruments are indispensable to produce accurate and accountable measurements. This study used a quantitative survey method involving 20 grade 10 students of MAN 1 Pekanbaru City who were selected through random sampling techniques. Data analysis was carried out through a validity test using Corrected Item-Total Correlation and a reliability test using Cronbach's Alpha. The results showed that 8 out of 11 statements were declared valid because they had a correlation value higher than the *r* table (0.443). Meanwhile, the reliability test yielded a Cronbach's Alpha value of 0.777 which is in the acceptable category. Thus, the instrument is declared valid and reliable so that it is suitable to be used to measure students' collaboration skills in Fiqh learning. This study provides empirical evidence on the psychometric quality of collaborative skill assessment instruments in the context of PAI education.*

Keywords: *Validity, Reliability, PAI, Collaboration*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis validitas dan reliabilitas instrumen angket yang dikembangkan untuk mengukur keterampilan kolaborasi siswa dalam mata pelajaran Pendidikan Agama Islam (PAI), khususnya pada pembelajaran Fiqh. Keterampilan kolaborasi merupakan salah satu kompetensi kunci pendidikan abad ke-21, sehingga instrumen yang valid dan reliabel sangat diperlukan untuk menghasilkan pengukuran yang akurat dan dapat dipertanggungjawabkan. Penelitian ini menggunakan metode survei kuantitatif dengan melibatkan 20 siswa kelas 10 MAN 1 Kota Pekanbaru yang dipilih melalui teknik random sampling. Analisis data dilakukan melalui uji validitas menggunakan Corrected Item-Total Correlation dan uji reliabilitas menggunakan Cronbach's Alpha. Hasil penelitian menunjukkan bahwa 8 dari 11 butir pernyataan dinyatakan valid karena memiliki

nilai korelasi lebih tinggi dari r tabel (0,443). Sementara itu, uji reliabilitas menghasilkan nilai Cronbach's Alpha sebesar 0,777 yang termasuk kategori acceptable. Dengan demikian, instrumen dinyatakan valid dan reliabel sehingga layak digunakan untuk mengukur keterampilan kolaborasi siswa pada pembelajaran Fikih. Penelitian ini memberikan bukti empiris mengenai kualitas psikometrik instrumen penilaian keterampilan kolaborasi dalam konteks pendidikan PAI.

Kata Kunci: Validitas, Reliabilitas, PAI, Kolaborasi

A. Introduction

Evaluation of collaboration skills is one of the important aspects of 21st century education because the ability to work together, communicate, and solve problems as a team are core competencies needed by students to face global challenges (Dwi Rahma Putri et al. 2022). In the elementary to secondary school environment, including in the subject of Islamic Religious Education (PAI), the development of collaboration skills not only strengthens cognitive and affective aspects, but also forms social character and morals that are in harmony with the goals of religious education. However, the effectiveness of collaborative learning programs and instructional interventions can only be validly evaluated if the measurement instruments used meet the rules of validity and good reliability.

The need for reliable and legitimate instruments to measure a student's skill in PAI, one of which is

collaborative skills, is becoming increasingly urgent because several empirical studies show that there is a large variation in results between educational units and between instruments. In addition, the PAI learning context has very distinctive characteristics, such as moral values, social norms, and spiritual dimensions that require adaptation of the concept of collaboration skills so that it can be relevant and influential on religious content. Therefore, testing the validity and reliability of the instrument is a crucial stage before the instrument is used for research or learning evaluation purposes.

Test methods that are often used in educational research to assess the relationship between items and internal consistency of instruments are Pearson's Product Moment correlation coefficient for validity (item-total correlation) and reliability coefficients such as Cronbach's alpha for internal

consistency. The Product Moment approach provides an idea of the extent to which the items on the instrument are linearly related to the total score so that it can determine whether the item measures the same construct (Stuart 2013). Through this analysis, researchers can select, revise, or get rid of items that don't meet the criteria. However, the application of this technique must consider the sample size, the normality of the score distribution, and the characteristics of the respondents in order for the interpretation of the results to be valid.

Based on this background, this study conducted a validity and reliability analysis of the instrument for measuring students' collaboration skills in PAI subjects using the Product Moment technique. The results of the analysis are expected to provide empirical evidence about the psychometric quality of instruments in the context of PAI learning and become a reference for educators and researchers in compiling or using similar instruments.

See the importance of validity and reliability processes in research. Thus, the researcher will try to describe the validity and reliability

process using the theoretical moment product analysis method Spearman Brown.

1. Validation Definition

Validity is a measure that shows the reliability or validity of a measuring instrument. Less valid measuring instruments show low validity (Machali 2021). Validity in the context of educational research is defined as the extent to which an instrument is able to measure what should be measured accurately and correctly. According to Matondang validity is a measure of the accuracy of an instrument in describing the concept to be measured without being influenced by irrelevant external factors (Matondang 2009). In line with that, Sappaile explained that validity shows the extent to which the measurement results are in accordance with the purpose of the measurement, both through the validity of the content, constructs, and criteria (Intang Sappaile 2019). Furthermore, Budiastuti emphasized that validity is not only related to the accuracy of the instrument, but also to the suitability of the theory and the social context in which the measurement is carried out (Intang Sappaile 2019). In educational

research, validity is a fundamental aspect that determines the credibility of research results because a valid instrument guarantees that the data obtained truly reflects the variables being measured. Thus, validity plays a key role as a benchmark in ensuring the integrity and reliability of scientific research results.

On the other hand, it is almost the same as the definition of validity. The validity of the instrument is an important aspect of the research methodology because it determines the extent to which the measuring instrument or instrument is able to measure what is actually to be measured precisely and consistently (Haq 2022). According to Matondang the validity of the instrument shows the level of accuracy of the measuring instrument in describing the research variables without any deviations from the theoretical concept being tested (Matondang 2009). Meanwhile, Novikasari emphasized that an instrument is said to be valid if the measurement results have a strong correlation with the relevant theoretical constructs or empirical indicators (Novikasari 2016). In line with that, in the research conducted by Zayrin, Nupus, & Maizia explained that

the validity of the instrument must be tested through a series of processes such as content validity, constructs, and empirical by involving experts and using appropriate statistical analysis (Zayrin et al. 2025). In addition, Anam stated that a valid instrument will provide accurate and reliable measurement results under various research conditions (Anam 2018). Thus, the validity of the instrument serves as a guarantee that the data obtained truly reflects the reality to be studied, as well as strengthening the validity of the research results.

The category of instrument validation levels is categorized into several levels as stated by Guilford (Haq 2022) as follows:

- a) $0.80 < r_{xy} 1.00$ Very high validity
- b) $0.60 < r_{xy} 0.80$ High validity
- c) $0.40 < r_{xy} 0.60$ Medium validity
- d) $0.20 < r_{xy} 0.40$ Low validity
- e) $0.00 < r_{xy} 0.20$ Very low validity
- f) $r_{xy} 0.00$ Invalid validity

2. Definition of Reliability

Reliability in the context of educational research is defined as the

level of consistency or stability of measurement results when research instruments are used repeatedly under similar conditions (Machali 2021). According to Ida & Musyarofah, reliability shows the extent to which a measuring instrument can give the same results if repeated at different times, assuming that the condition of the research subject remains (Musyarofah 2021). Meanwhile, Wicaksono explained that reliability is the main indicator of the consistency of the data produced by the research instrument and is the basis for the validity of the interpretation of measurement results. In Ndiung & Jediut's view, reliability is also closely related to validity, because a reliable instrument is not necessarily valid, but a valid instrument is definitely reliable (Ndiung et al. 2020). Therefore, the reliability test is good with the *Cronbach Alpha* as well as techniques *split-half*. It is an important step to ensure that the measurement tools used in the research are truly capable of producing stable, accurate, and scientifically reliable data.

The purpose of this study is to test the feasibility and reliability of the questionnaire instrument used in measuring students' collaboration

skills in Fiqh subjects. Meanwhile, the focus of this research is an effort to analyze the extent to which the statements in the questionnaire are valid in representing aspects of PAI learning interests, and reliable in providing consistent results. This research also aims to ensure that the instruments used are really suitable as accurate and reliable measuring tools, so that the results of measuring students' collaborative skills in Fiqh subjects can reflect the actual conditions in the learning context.

B. Methods

This study uses a quantitative approach with a survey method, which is research used for the collection of extensive and abundant data. This research was conducted on large and small populations, but the data analyzed came from samples taken from these populations (Machali 2021). The purpose of this study is to test the validity and reliability of the questionnaire instrument developed to measure students' collaboration skills in Fiqh subjects. The population in this study is all 10th grade students of MAN 1 Pekanbaru City. The sampling technique was carried out by *random sampling* method, this was adjusted to

the existing population and assessed to focus more on the research objectives and not too much irrelevant data was taken in the study with a sample of 20 respondents.

Data was collected by distributing questionnaires to 20 respondents, from which validity and reliability tests will be carried out to maintain the quality of the research conducted. The test begins with input of data into the Excel application to perform a basic recapitulation of the values to obtain the values to be used or entered into the formula used. Then, the data obtained will be tested for validation, followed by a reliability test using product moment correlation. The internal reliability procedure to be used is the split-half method, the split-half coefficient allows the researcher to divide the questionnaire data into two parts and correlate individual scores into the two parts (Fadli et al. 2023).

C. Results and Discussion

This research instrument is in the form of a Likert scale questionnaire consisting of 11 statements, each using a score range of 1–5 (Strongly Disagree – Strongly Agree) as follows:

Table 1. Scoring Questionnaire

Symbol	Length	Score
SS	Strongly agree	5
S	Agree	4
N	Neutral	3
TS	Disagree	2
STS	Strongly Disagree	1

Table 2. Instrument Details

NO	Statement	S	S	N	T	S
		S			S	T
						S
1	I carry out all learning activities seriously					
2	I have a positive influence on the group					
3	I respond with an open mind to differences in ideas and values					
4	I give others the opportunity to speak or express their opinion					
5	I create a friendly atmosphere of cooperation between fellow friends					
6	I use mutual agreement in making decisions together					
7	I answered the teacher's questions during the lesson and gave a conclusion together					
8	I try to take responsibility for what I do					
9	I completed the task by the specified deadline					
10	I appreciate teammates by behaving politely and kindly to					

-
- friends during teamwork
- 11 I listen to and appreciate the opinions of my teammates in finding ideas, ideas, opinions and suggestions in teamwork
-

The instrument has been distributed to 20 students who are the sample in this study. The sample was selected through a random sampling method which was then carried out a data recapitulation process to obtain structured data to facilitate the analysis process which can be seen in the following table:

Table 3. Recapitulation of Questionnaire Results

RPS	1	2	3	4	5	6	7	8	9	10	11	TOTAL
R1	5	5	5	5	5	5	5	5	5	5	3	53
R2	4	5	5	4	4	4	5	5	3	5	3	47
R3	5	2	4	4	4	4	3	4	5	3	1	39
R4	3	5	4	5	4	4	5	4	3	5	3	45
R5	4	4	4	5	4	3	4	3	4	5	5	45
R6	5	5	5	5	5	5	5	5	5	5	5	55
R7	4	3	5	3	5	5	5	3	2	2	5	42
R8	5	5	5	5	5	5	5	5	5	5	5	55
R9	5	4	4	4	4	5	5	5	5	4	3	48
R10	5	3	4	5	5	5	5	5	5	5	5	52
R11	5	5	5	5	5	5	5	5	3	5	5	53
R12	5	3	4	5	4	4	4	5	4	4	2	44
R13	5	4	4	5	4	4	5	5	5	3	4	48
R14	5	5	5	5	5	5	5	5	5	5	5	55
R15	4	5	5	5	5	5	5	5	5	5	5	54
R16	5	3	4	4	5	4	5	4	5	5	5	49
R17	4	5	5	5	5	4	5	4	5	4	4	50
R18	5	3	4	5	5	4	5	5	5	5	4	50
R19	5	5	5	5	5	5	5	5	5	5	5	55
R20	5	3	4	4	4	4	5	5	5	5	5	49

Validity Test

Next, the researcher will conduct a validity test. There are two types of validity tests, namely: (1) Instrument Validity Test with the

Bivariate Correlate Method , which is correlating the statement of each item with the total items of each variable by paying attention to the scale used, namely whether the scale is in the form of ordinals, intervals, or ratings. (2) Instrument Validity Test with the Corrected-Total Item Correlation Method , which is to compare the score on the "Corrected Item-Total Correlation" which is the correlation between the item score and the total item score (calculated value) compared to the table value. In this study, the researcher used the Instrument Validity Test with the Corrected-Total Item Correlation Method because the risk of bias is more accurate because the items tested are not in the form of scores and this study uses a Likert scale instrument validity test (questionnaire). The following are the results of the SPSS output that has been carried out:

Table 5. Item-Total Statistics

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item1	44,7500	20,618	,222	,780
Item2	45,3000	16,958	,493	,754
Item3	44,9000	19,779	,461	,761
Item4	44,7500	19,355	,474	,758
Item5	44,8000	19,221	,607	,750
Item6	44,9500	19,103	,507	,755
Item7	44,6000	19,200	,583	,751
Item8	44,8000	18,589	,527	,751
Item9	44,9500	18,997	,274	,783
Item10	44,9000	17,463	,524	,748
Item11	45,3000	16,537	,422	,773

Furthermore, to see the validity of the item (Validity Test), it can be seen in the correlation results contained in the column *Corrected Item-Total Correlation*, the value is (the value of r_{count}). Then the value of the correlation (*Corrected Item-Total Correlation*) compared to the value of the table with the following decision rules:

Valid : If the value of r_{Count} greater than the value of r_{table} or the value of $r_{\text{count}} > \text{value of } r_{\text{table}}$

Invalid: If the value of r_{count} less than the value of r_{table} or the value of $r_{\text{count}} < \text{value of } r_{\text{table}}$

Using the distribution (table r) for $\alpha = 0.05$ with degrees of freedom/degree of freedom ($df = n-2$ or $20-2 = 18$) as follows: By looking at the value product moment So that a value = 0.443 is obtained, then compared with the value Corrected Item-Total Correlation as follows:

Table 6. Validity Test Results

No	Statement	R Count	R Table = 0.443	Information
1.	Item 1	0,222	0,443	Invalid
2.	Item 2	0,493	0,443	Valid
3.	Item 3	0,461	0,443	Valid
4.	Item 4	0,474	0,443	Valid
5.	Item 5	0,607	0,443	Valid
6.	Item 6	0,507	0,443	Valid
7.	Item 7	0,583	0,443	Valid
8.	Item 8	0,527	0,443	Valid
9.	Item 9	0,274	0,443	Invalid
10.	Item 10	0,524	0,443	Valid
11.	Item 11	0,422	0,443	Invalid

It can be seen from table 6 above, the statement that if R calculates $> R$ tables, it is declared valid, on the contrary it is said to be invalid if R calculates $< R$ tables or it is concluded that it cannot be used for further research. As for the questions that the researcher made amounted to 11 questions, the results above show that there are 8 valid questions. So the questions used are 8.

Reliability Test

To test the reliability of the instrument can be done with the help of SPSS (Statistical Product and Service Solution). The following are the criteria and how to conduct instrument reliability tests using SPSS through the Cronbach's Alpha:

Table 7. Reliability Assessment

Categories

Nilai Cronbach's Alpha	Category
More than or equal to 0.900	Excellent
0,800 – 0,899	Good
0,700 – 0,799	Acceptable
0,600 – 0,699	Questionable
0,500 – 0,599	Poor
Less than 0.500	Unacceptable

Based on table 7 above, the general decision of the reliability of the instrument can be known from the Cronbach's alpha value in the output reliability statistics compared to the following criteria:

When the value *cronbach's alpha* < 0.7, it is declared less reliable.

When the value *cronbach's alpha* > 0.7, it is declared reliable.

The following are the results of the SPSS output that has been carried out:

Table 8. Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
,777	11

In Table 8 (Reliability Statistics) shows the results of the data reliability calculation using the Cronbach's

Alpha with a score of 0.777. This value is in the range of 0.700 – 0.799 so that it is included in the category Acceptable and the value is more than 0.7. Therefore, all items in the learning interest variable are declared reliable. So that instruments that have been tested can be used as research instruments. Number 11 informs that the items of questions/statements processed are 11.

Table 9. Item-Total Statistics

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item1	44,7500	20,618	,222	,780
Item2	45,3000	16,958	,493	,754
Item3	44,9000	19,779	,461	,761
Item4	44,7500	19,355	,474	,758
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Item8	44,8000	18,589	,527	,751
Item9	44,9500	18,997	,274	,783
Item10	44,9000	17,463	,524	,748
Item11	45,3000	16,537	,422	,773

In the column Cronbach's Alpha if item Deleted inform about the value Cronbach's Alpha If the item is deleted, for example when item 1 is deleted, Cronbach's alpha value is 0.780.

So this column is useful for getting the cronbach's alpha as high as possible by deleting items that have a low calculation value. For example, from the table above, the calculated value of item 4 is 0.474. If this 4 item

is omitted/discarded then the value of cronbach's alphanya will rise to 0.758.

D. Conclusion

Based on the results of the validity and reliability analysis that has been carried out, it can be concluded that the student collaboration skills questionnaire instrument in Fiqh subjects has good psychometric quality. Of the 11 statements, 8 items were declared valid based on the Corrected Item-Total Correlation value that exceeded the table r value (0.443). Meanwhile, the reliability test with Cronbach's Alpha showed a score of 0.777 which was in the acceptable category, so the instrument was declared consistent and trustworthy. This finding confirms that the developed instrument is suitable for use as a tool to measure students' collaboration skills in PAI learning, and can be used as a reference for further learning research and evaluation. Overall, this instrument is able to provide an accurate picture of students' collaborative abilities in accordance with the context of Islamic religious learning, norms, and learning characteristics.

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