



# Diagnostic Assessment of Secondary School Students' Readiness and Achievement of Fiqh Learning Objectives Through the Jigsaw

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## Abstract

This study aims to determine student readiness and the effectiveness of achieving learning objectives in Fiqh (Islamic jurisprudence) through a Jigsaw-Type diagnostic assessments. This study employed a quantitative experimental method using a one-group pretest–posttest design, with diagnostic assessment sheets as the primary instrument. Data were primarily collected through pre-test and post-test, supported by prior observation and interviews conducted in Class VIII-C of MTs Negeri 1 Kudus. The validity test showed that three items were valid, while three others were excluded. The reliability test yielded a Cronbach's Alpha value of 0.382, indicating low internal consistency. Furthermore, the paired sample t-test revealed a significant difference between pre-test and post-test scores ( $p < 0.05$ ), indicating an improvement in students' learning outcomes. The findings indicate that diagnostic assessments play a crucial role in identifying students' initial readiness before Jigsaw learning and measuring the achievement of Fiqh learning objectives, as evidenced by a significant difference between pre-test and post-test scores ( $p = 0.0001$ ). Prior studies overlook diagnostic urgency in Jigsaw contexts, this research fills that gap by integrating pre-learning diagnostics to identify deficiencies, followed by adaptive Jigsaw interventions. Its novelty delivers not just effectiveness metrics (score improvements) but diagnostic feedback for tailored instruction, offering practical value for teachers, enhancing sustainable Fiqh learning at secondary level.

Keywords: Diagnostic; Jigsaw; Student Readiness; Fiqh

## Abstrak

Penelitian ini bertujuan untuk menentukan kesiapan siswa dan efektivitas pencapaian tujuan pembelajaran Fiqih (yurisprudensi Islam) melalui asesmen diagnostik tipe Jigsaw. Penelitian ini menggunakan metode eksperimental kuantitatif dengan desain pretest–posttest satu kelompok, dengan lembar asesmen diagnostik sebagai instrumen utama. Data terutama dikumpulkan melalui pretest dan posttest, didukung oleh observasi dan wawancara sebelumnya yang dilakukan di Kelas VIII-C MTs Negeri 1 Kudus. Uji validitas menunjukkan bahwa tiga item valid, sedangkan tiga item lainnya tidak valid. Uji reliabilitas menghasilkan

*nilai Alpha Cronbach sebesar 0,382, menunjukkan konsistensi internal yang rendah. Selanjutnya, uji t sampel berpasangan mengungkapkan perbedaan signifikan antara skor pretest dan posttest ( $p < 0,05$ ), menunjukkan peningkatan hasil belajar siswa. Temuan menunjukkan bahwa asesmen diagnostik memainkan peran penting dalam mengidentifikasi kesiapan awal siswa sebelum pembelajaran Jigsaw dan mengukur pencapaian tujuan pembelajaran Fiqih, sebagaimana dibuktikan oleh perbedaan signifikan antara skor pretest dan posttest ( $p = 0,0001$ ). Studi-studi sebelumnya mengabaikan urgensi diagnostik dalam konteks Jigsaw, penelitian ini mengisi kesenjangan tersebut dengan mengintegrasikan diagnostik pra-pembelajaran untuk mengidentifikasi kekurangan, diikuti oleh intervensi Jigsaw adaptif. Kebaruannya tidak hanya memberikan metrik efektivitas (peningkatan skor) tetapi juga umpan balik diagnostik untuk pengajaran yang disesuaikan, menawarkan nilai praktis bagi guru, dan meningkatkan pembelajaran Fiqih yang berkelanjutan di tingkat menengah.*

*Kata kunci: Diagnostik; Jigsaw; Kesiapan Siswa; Fiqh.*

## **Introduction**

Identifying students' initial readiness through diagnostic assessments is a crucial step in the learning process, as it helps teachers design appropriate strategies and enhance the effectiveness of achieving learning objectives.

To ensure the achievement of learning objectives, tools are needed to measure students' understanding of the material studied. The implementation of assessment is not only to identify which students get the highest score, but also to know and understand the learning process of students so that educators can provide appropriate feedback according to the students' achievement level. Good learning is nothing but learning that has been carefully designed since before learning begins, by adjusting the needs of students in learning. Likewise, the implementation of assessments in learning is carried out in stages starting from before learning starts, in the middle of learning, and at the end of learning. It is appropriate for educators to compile and prepare all learning administrations to support a conducive and effective learning process to achieve learning objectives.

In order to ensure the achievement of learning objectives, it is also necessary to identify students early through diagnostic assessment, which is also a very important first step for educators to take. Diagnostic assessments or assessments that are held before learning starts are carried out with the aim of identifying students' readiness for the learning that will take place, educators will identify students' initial knowledge related to basic learning

concepts, students' initial conditions, and other needs that support the learning process. This assessment helps teachers understand students' initial abilities so that the learning process can be designed appropriately. This is in line with Anderson and Krathwohl's statement that the success of learning depends heavily on the teacher's understanding of the initial condition of the learner.

Diagnostic assessments in pre-learning have a strategic role in detecting the initial readiness of students before starting learning, including the initial conditions, initial abilities, interests, and students' learning styles. The implementation of diagnostic assessments allows teachers to identify knowledge gaps that may be barriers as learning progresses. For example, in Fiqh learning, diagnostic assessments can help teachers understand whether students have understood the basic concepts needed for advanced material. Thus, the implementation of diagnostic assessments emphasizes that effective learning must begin with an understanding of the starting point of students. Furthermore, diagnostic assessments also allow teachers to devise different learning strategies according to the needs of each individual. Especially with the condition of students who have diverse characteristics and abilities, diagnostic assessment becomes a tool to adjust teaching approaches.

The urgency of diagnostic assessments does not only stop at mapping students' initial abilities. The implementation of this assessment also helps build a better relationship between teachers and students. A well-conducted diagnostic assessment will create an inclusive and student-centered learning atmosphere. This is in accordance with the principle of constructivist learning, namely that students are actively involved in their own learning process.

However, in reality, not all learning systems adapt to the conditions, abilities, and talents of students. As in the writings of Tasurun Amma et al. which mention that there are still a number of problematic things in the learning process, including most of the educational processes carried out in Indonesia view students not as active participants in the learning process, but rather as passive recipients of knowledge. In addition, in the learning process, there is also a discrepancy between learning methods, teaching materials, and learning strategies with students' abilities so that the development of students' abilities and potentials is quite minimal. In line with that, in a previous study conducted by Wiji Antika et al. stated that, in reality, many educators still lack an understanding of how to apply diagnostic assessment.

This includes limited knowledge of its preparation, implementation, and follow-up stages. In some cases, educators do not even utilize the results of the diagnostic assessments to inform their teaching, which leads to suboptimal measurement of students' achievement . Meanwhile, several studies have examined the Jigsaw cooperative learning method. One notable example is the research by Kumar Abhishek et al., which demonstrates that Jigsaw learning enhances students' motivation, self-confidence, and academic achievement. In their study, Kumar et al. employed pre-test and post-test comparisons within medical education in India . On the other hand, there is a study investigated the effectiveness of a cooperative learning strategy on secondary school students' biology achievement using the jigsaw learning model. A quasi-experimental, nonequivalent control group pretest-posttest design was employed, involving two secondary schools. Although the intervention showed no notable impact on gender-based post-test achievement scores among experimental group participants, the study affirmed that cooperative learning strategy, specifically employing the jigsaw model, is a valid and effective approach for secondary school biology.

However, limited research has specifically examined the role of diagnostic assessment in identifying students' initial readiness prior to Jigsaw learning and its contribution to the achievement of Fiqh learning objectives. This gap is important to address, considering that diagnostic assessment is a crucial first step in ensuring the direction of education to achieve learning objectives, and also plays an important role as a means of creating meaningful and sustainable learning . Although prior research provides valuable insights, no studies have specifically addressed the urgency of diagnostic assessment with the effectiveness of Jigsaw learning, by presenting pre-learning readiness levels through percentages of learning motivation and material mastery in Jigsaw instruction, as well as analyzing deficiencies requiring remediation based on diagnostic pre-test and post-test results. This research bridges that gap by integrating diagnostic assessment with Jigsaw instruction, highlighting the positive impacts of Jigsaw on pre-learning readiness levels while identifying deficiencies through diagnostic pre- and post-test results specifically in the subject of Fiqh at the Islamic junior high school level. The novelty of this study lies in its comprehensive approach: beyond merely quantifying Jigsaw effectiveness through percentage gains, it delivers diagnostic feedback to enable instructional adjustments, offering practical contributions for teachers.

Since diagnostic assessment plays an important role in conducting

early learning diagnoses and serves a tool to determine the extent to which learning objectives are achieved, it is essential to plan instruments, media, and conduct analyses of other diagnostic needs prior to the start of instruction. Based on this statement, the researchers are interested in exploring the implementation of diagnostic assessments in identifying students' readiness and measuring the achievement of their main learning objectives to form an objective-oriented learning process, by testing the validity and reliability of diagnostic assessment instrument, as well as measuring the effectiveness of achieving learning objectives through diagnostic assessment, with case study and field research on the implementation of diagnostic assessments in class VIII-C MTs Negeri 1 Kudus.

### **Method**

The type of this research is quantitative research, which is research that uses data in the form of numbers as a tool to analyze populations or statistical samples to test the hypothesis that has been determined, using the Pre-Experimental Design with One Group Pretest Posttest . This research was conducted at MTs Negeri 1 Kudus with the subject of a diagnostic sheet research that was tested on students in grades VIII-C. The research was carried out by comparing the results of the pretest and posttest conducted in the diagnostic assessment to determine the initial readiness of students and the level of achievement of learning objectives following an intervention using the Jigsaw learning.

Research population is a generic region consisting of objects or subjects with certain qualities and characteristics according to those set by the researchers to be studied and conclusions drawn . The population used in this study is students in class VIII-C at MTs Negeri 1 Kudus which totals 32 students. The sample used by the researchers was all students in class VIII-C, which amounted to 32 students. The sampling technique, by assigning all members of the population as samples, is called the sample census technique because all populations are sampled in class VIII-C .

Data collection was carried out by the researcher to conduct this research through several techniques, including observation, interview technique, and test. Observation was carried out to examine the condition of the sample population and its environmental conditions in Class VIII-C of MTs Negeri 1 Kudus on March 7, 2025. Meanwhile, interview was conducted on March 8, 2025 with Fiqh teachers and several students to obtain initial information regarding students' learning condition and classroom context. Therefore, observations and interviews were used to supplement the

quantitative data and reinforce the initial interpretation of the data prior to conducting the experiment. Test, data were collected through the intervention of the Jigsaw learning strategy, using diagnostic assessment instruments pretest and posttest to students in class VIII-C which was carried out in stages from April 10 – April 24, 2025 .

In analyzing the data, the researchers used the results of the calculation of the IBM SPSS statistical application by calculating or testing the validity and reliability of diagnostic assessment instruments, which are tools for processing, analyzing, and interpreting data from numbers into a sentence conclusion, in the form of correlation of the influence and impact of variables on other variables . The determination of the effectiveness of achieving Fiqh learning objectives is determined by comparing the results of diagnostic assessment pretest with diagnostic assessment posttest, namely by testing the correlation between the two whether there is a difference or no difference between the two diagnostic assessment results.

## **Findings and Discussion**

### **Diagnostic Assessment Instrument**

The implementation of Islamic learning media based on local wisdom through the Android application shows a significant increase in the engagement rate of generation Z students at PTKI throughout Aceh Province.

Diagnostic assessments are categorized into two, namely cognitive diagnostic assessments (to determine students' basic understanding) and non-cognitive diagnostic assessments (to determine students' initial readiness) <sup>1</sup>. The diagnostic assessment instruments prepared for class VIII-C in Fiqh subjects include diagnostics of 3 non-cognitive instruments and 6 cognitive instruments as follows.

*Table 1 Non-cognitive and Cognitive Diagnostic Assessment Instruments*

No	Instruments	Option 1	Option 2	Option 3	Option 4
1.	How I feel today	Flat	Happy	Sad	Tired
2.	I have read the material	Recent	Overnight	This morning	Not yet
3.	My passion for learning today	Ordinary	Very enthusiastic	No passion	Confused
4.	Halal (something that is permissible under sharia) while Haram (something that is not permissible under sharia)	Agree	Strongly agree	Disagree	Strongly disagree

<sup>1</sup> Lismawati, *Evaluasi Pembelajaran Teori Dan Praktik Untuk Tendik Dan Catendik*, Penerbit KBM Indonesia (Bojonegoro: KBM Indonesia, 2021).

5.	The law of halal foods, beverages, and animals can turn into haram, and vice versa	Agree	Strongly agree	Disagree	Strongly disagree
6.	Eating halal and haram food is only a form of obedience to Islamic law, it has no impact on human life	Agree	Strongly agree	Disagree	Strongly disagree
7.	Paying attention to halal labels when shopping is very important	Agree	Strongly agree	Disagree	Strongly disagree
8.	The law of all animal carcasses is haram without exception	Agree	Strongly agree	Disagree	Strongly disagree
9.	The evidence that explains the law of khamr is found in QS. Al-Maidah, verse 90	Agree	Strongly agree	Disagree	Strongly disagree

The quantity of diagnostic assessment instruments was determined based on several considerations, including maintaining classroom conduciveness within limited instructional time without disrupting the effectiveness of Jigsaw Learning. The preparation of diagnostic assessment instruments should have been planned by educators long before learning begins<sup>2</sup>. The arrangement of diagnostic assessment instruments must be adjusted to the details of the learning objectives that have been set so that later the results can be used by educators to evaluate and diagnose the achievement of learning objectives<sup>3</sup>. The preparation of diagnostic assessment instruments carried out in class VIII-C MTs Negeri 1 Kudus has been adjusted to the learning objectives of Fiqh Subjects with the following table mapping.

*Table 2 Reference for the Preparation of Diagnostic Assessment Instruments*

No.	Diagnostic Assessment Instruments	Learning Objectives Reference
1.	How I feel today	Constitutes a non-cognitive diagnostic assessment
2.	I've read today's material	Constitutes a non-cognitive diagnostic

<sup>2</sup> Wa Ode Arini Maut, "Asesmen Diagnostik Dalam Implementasi Kurikulum Merdeka (IKM) Di SD Negeri 1 Tongkuno Kecamatan Tongkuno Kabupaten Muna Sulawesi Tenggara," *Dikmas: Jurnal Pendidikan Masyarakat Dan Pengabdian* 02, no. 4 (2022): 2022; J. Paulsen and D. Valdivia, "Examining Cognitive Diagnostic Modeling in Classroom Assessment Conditions," *The Journal of Experimental Education* 90 (2021): 916–33, <https://doi.org/https://doi.org/10.1080/00220973.2021.1891008>.

<sup>3</sup> E. Bara and G. Bara, "The Connection between Assessment and Learning Outcomes," *Balkan Journal of Interdisciplinary Research* 9 (2023): 51–58, <https://doi.org/https://doi.org/10.2478/bjir-2023-0006>; Susanti Sufyadi et al., *Panduan Pembelajaran Dan Asesmen Jenjang Pendidikan Dasar Dan Menengah (SD/MI, SMP/MTs, SMA/SMK/MA)* (Jakarta: Pusat Asesmen dan Pembelajaran Badan Penelitian dan Pengembangan dan Perbukuan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, 2021).

		assessment
3.	My passion for learning today	Constitutes a non-cognitive diagnostic assessment
4.	Halal (something that is permissible under sharia) while Haram (something that is not permissible under sharia)	Referring to the second Learning Objective "Understanding the provisions of halal and haram food" with the criteria of completeness of the first point, namely "Mention the provisions and laws of halal or haram food and beverages"
5.	The law of halal foods, beverages, and animals can turn into haram, and vice versa	Referring to the third Learning Objective "Analyzing the Causes of Halal and Haram Food and Beverages" with the first point of completeness criteria, namely "Stating the provisions and laws of halal or haram food and beverages"
6.	Eating halal and haram food is only a form of obedience to Islamic law, it has no impact on human life	Referring to the first Learning Objective "Showing a cautious attitude and healthy and clean living behavior" with the third point of completeness criteria, namely "Showing an attitude of obedience to Allah by consuming Halal food and beverages"
7.	Paying attention to halal labels when shopping is very important	Referring to the first Learning Objective "Showing a cautious attitude and healthy and clean living behavior" with the third point of completeness criteria, namely "Showing an attitude of obedience to Allah by consuming Halal food and beverages"
8.	The law of all animal carcasses is haram without exception	Referring to the second Learning Objective "Understanding the provisions of halal and haram food" with the criteria of completeness of the second point, namely "Understanding the provisions of halal and haram animals"
9.	The evidence that explains the law of khamr is found in QS. Al-Maidah, verse 90	Referring to the second Learning Objective "Understanding the provisions of halal and haram food" with the criteria of completeness in the second point, namely "Mention the provisions and laws of halal or haram food and beverages"

After being tested on students in class VIII-C MTs Negeri 1 Kudus, the following *pretest* data was obtained.

*Table 3 Diagnostic Assessment Pretest Result*

No.	1	2	3	4	5	6	7	8	9	Final result	TOTAL SCORE
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1	1	4	1	1	1	3	2	2	3	50	18
2	2	4	2	1	1	4	1	3	2	56	20
3	1	4	1	1	2	3	1	2	1	44	16
4	1	4	1	2	2	3	1	2	1	47	17
5	1	4	1	1	2	3	1	3	2	50	18
6	2	4	1	1	1	1	1	1	1	36	13
7	1	4	2	1	2	1	1	1	2	42	15
8	2	4	2	1	1	3	1	2	2	50	18
9	1	4	1	1	1	3	1	1	2	42	15
10	4	4	1	1	2	4	1	3	1	58	21
11	2	4	1	1	2	3	2	3	2	56	20
12	1	4	1	1	2	3	1	3	2	50	18
13	2	4	2	1	1	3	1	2	1	47	17
14	2	4	1	1	2	4	1	3	1	53	19
15	1	4	1	1	2	3	1	1	1	42	15
16	2	4	1	1	2	1	1	3	2	47	17
17	2	4	1	1	1	2	1	2	1	42	15
18	2	4	1	1	2	4	1	3	2	56	20
19	1	2	2	1	1	4	2	3	2	50	18
20	2	1	1	1	1	3	1	3	1	39	14
21	2	4	1	1	1	3	1	3	1	47	17
22	1	4	1	1	1	4	1	2	1	44	16
23	1	2	1	1	2	3	1	2	1	39	14
24	1	4	1	1	1	4	1	2	4	53	19
25	1	4	1	1	2	4	1	3	1	50	18
26	2	4	1	1	2	4	1	3	1	53	19
27	1	4	1	1	2	3	2	3	2	53	19
28	2	4	2	1	3	4	1	2	1	56	20
29	2	4	1	1	2	3	1	3	2	53	19
30	2	4	1	1	2	3	2	3	1	53	19
31	1	1	1	1	2	2	1	2	2	36	13
32	2	1	1	2	2	3	1	3	1	44	16

Based on the results of the *pretest* above, it can be concluded that the condition of students' readiness before learning starts can be concluded with the following percentage.

*Table 4 Analysis of Students' Initial Readiness*

Non-Cognitive	Criterion 1	Criterion 2	Criterion 3	Conclusion
Question 1	15 students feel flat	16 students in happy heart condition	1 student in a tired state	50% of students are happy before learning starts
Question 2	3 students have just read the material	2 students read the material yesterday	27 students have not read the material	84% of students have not read the material
Question 3	26 students have ordinary enthusiasm for learning	6 students are very enthusiastic for learning	There are no students who are not enthusiastic for learning	81% of students must be motivated so that their enthusiasm for learning increases

Furthermore, the analysis of students' basic understanding based on the results of the students' correct answers (in green) is as follows.

*Table 5 Analysis of Students' Initial Comprehension*

Cognitive	Correct amount	Conclusion
Question 4	All students answered correctly	100% of students in class VIII-C know the basic concepts of halal and haram food and beverages
Question 5	31 students answered correctly	97% of students in grades VIII-C know the provisions of changes in law of halal or haram of food and beverages
Question 6	27 students answered correctly	84% of students in class VIII-C know the impact of consuming halal or haram food and beverages
Question 7	32 students answered yes	100% of students in grades VIII-C know the urgency of being careful in choosing food
Question 8	17 students answered yes	53% of students in class VIII-C know the halal provisions of the haram of animal carcasses
Question 9	30 students answered yes	94% of students in grades VIII-C know the evidence about the law of khamr

### **Validity and Reliability Test of Diagnostic Assessment Instruments**

After knowing the data and conclusions of the *pretest* results in the diagnostic assessment, the next step is to test the validity and reliability of the cognitive diagnostic assessment instruments used to measure the effectiveness of achieving Fiqh learning objectives in class VIII-C.

Testing the validity of the data from the *pretest* results is carried out using the IBM SPSS Statistics application with the following steps.

- 1) Data input in the "Data View" sheet
- 2) Set "numeric type" to "Variable View"
- 3) Set the width at the number 8
- 4) Set the form decimals 0, with no values and missing
- 5) Set the alignment in the right position
- 6) Set the measure "Scale"
- 7) Click Analyze – correlate – bivariate – ok

After following the validity test flow using the SPSS Statistics application, the results of the validity test of the cognitive diagnostic assessment instruments tested in class VIII-C are as follows.

*Table 6 Result of the Cognitive Diagnostic Assessment Validity Test*

		Correlations						
		SOAL1	SOAL2	SOAL3	SOAL4	SOAL5	SOAL6	skortotal
SOAL1	Pearson Correlation	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)	.	.	.	.	.	.	.
	N	32	32	32	32	32	32	32
SOAL2	Pearson Correlation	. <sup>a</sup>	1	-.077	. <sup>a</sup>	,191	-.046	,285
	Sig. (2-tailed)	.	.	,674	.	,295	,801	,115
	N	32	32	32	32	32	32	32
SOAL3	Pearson Correlation	. <sup>a</sup>	-.077	1	. <sup>a</sup>	,286	-.111	,578**
	Sig. (2-tailed)	.	,674	.	.	,113	,545	,001
	N	32	32	32	32	32	32	32
SOAL4	Pearson Correlation	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>	. <sup>a</sup>
	Sig. (2-tailed)	.	.	.	.	.	.	.
	N	32	32	32	32	32	32	32
SOAL5	Pearson Correlation	. <sup>a</sup>	,191	,286	. <sup>a</sup>	1	,275	,884**
	Sig. (2-tailed)	.	,295	,113	.	.	,128	,000
	N	32	32	32	32	32	32	32
SOAL6	Pearson Correlation	. <sup>a</sup>	-.046	-.111	. <sup>a</sup>	,275	1	,409*
	Sig. (2-tailed)	.	,801	,545	.	,128	.	,020
	N	32	32	32	32	32	32	32
skortotal	Pearson Correlation	. <sup>a</sup>	,285	,578**	. <sup>a</sup>	,884**	,409*	1
	Sig. (2-tailed)	.	,115	,001	.	,000	,020	.
	N	32	32	32	32	32	32	32

N0	Pearson Correlation	r.table	Criterion
1	0,a	0,349	Invalid
2	0,285	0,349	Invalid
3	0,578	0,349	Valid
4	0,a	0,349	Invalid
5	0,884	0,349	Valid
6	0,409	0,349	Valid

r-table:  $n-2$  ( $32-2 = 30$  ; 30th r-table data)

Based on the table of validity test results above, it is known that diagnostic assessment questions are said to be valid if the value of *pearson correlation* is greater than the value r table, 0.349. The r table (Simple Correlation

Coefficient) is a statistical distribution table used in the context of statistical testing, such as to test the validity of a data.<sup>4</sup> Thus, it is concluded that:

- 1) The *Pearson correlation* in question 1 is at the value of *.a*, meaning that the correlation cannot be calculated because all respondents give identical responses or answers. So question 1 of the cognitive diagnostic assessment is *invalid* and not suitable for use.
- 2) The *Pearson correlation* in question 2 is at value of 0.285, because the *pearson correlation* value  $< r$  table 0.349, it is concluded that question 2 of the cognitive diagnostic assessment is *invalid* and not suitable for use.
- 3) The *Pearson correlation* in question 3 is at value of 0.578, because the *pearson correlation* value  $> r$  table 0.349, it is concluded that question 3 of the cognitive diagnostic assessment is *valid* and suitable for use.
- 4) The *Pearson correlation* in question 4 is at the value of *.a*, meaning that the correlation cannot be calculated because all respondents give identical responses or answers. So question 4 of the cognitive diagnostic assessment is *invalid* and not suitable for use.
- 5) The *Pearson correlation* in question 5 is at value of 0.884, because the *pearson correlation* value  $> r$  table 0.349, it is concluded that question 5 of the cognitive diagnostic assessment is *valid* and worthy of testing.
- 6) The *pearson correlation* in question 6 is at value of 0.409, because the *pearson correlation* value  $> r$  table 0.349, it is concluded that question 6 of the cognitive diagnostic assessment is *valid* and suitable for use.

Based on the results of the validity test using Pearson's correlation, it was found that an item is considered valid if the calculated  $r$  value is greater than the critical  $r$  value (0.349). The analysis results show that test items number 3 ( $r = 0.578$ ), number 5 ( $r = 0.884$ ), and number 6 ( $r = 0.409$ ) are deemed valid and suitable for use. Meanwhile, test item number 2 ( $r = 0.285$ ) is deemed invalid because the calculated  $r$  value is smaller than the table  $r$  value. Additionally, items 1 and 4 could not be analyzed because all respondents provided the same answer, resulting in no data variation. Therefore, these items were also deemed invalid and were not used in further analysis. Consequently, only the valid items were used in the subsequent reliability testing.

After knowing the validity of the data of the cognitive diagnostic assessment

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<sup>4</sup> Nadya Pradiva Fibra and Junaidi Indrawadi, "Kendala-Kendala Dalam Penyusunan Dan Pelaksanaan Rencana Pelaksanaan Pembelajaran Program Merdeka Belajar (Studi Pada Guru PPKn Di SMA Negeri 1 Gunung Talang)," *Journal of Education, Cultural and Politics* 1, no. 2 (2021): 70–76.

instrument tested in class VIII-C, the researchers then tested the reliability level of the valid cognitive diagnostic assessment instrument using the IBM SPSS Statistics application with the following steps.

- 1) Valid data input in the "Data View" sheet
- 2) Set "numeric type" to "Variable View"
- 3) Set the width at the number 8
- 4) Set the form decimals 0, with no values and missing
- 5) Set the alignment in the right position
- 6) Set the measure "Scale"
- 7) Klik Analyze – scale - reliability analysis - ok

After following the reliability test flow using the SPSS Statistics application, the results of the reliability test on the cognitive diagnostic assessment instruments tested in class VIII-C are as follows.

*Table 7 Result of Cognitive Diagnostic Assessment Reliability Test*

Reliability Statistics		on the table, the reliability test results show a Cronbach's Alpha of 0.382, indicating a low level of internal consistency. This condition may be influenced by the limited number of test items and the homogeneity of students' responses. Nevertheless, in educational research with a limited number of items, such reliability is still tolerable, provided that the research findings are supported by relevant statistical analyses and interpreted with caution. Therefore, a paired-sample t-test was conducted to determine the significance of the difference between pretest and posttest scores.
Cronbach's Alpha	N of Items	
,382	3	

**Hypothesis test comparison of two paired correlation samples between pretest and posttest results diagnostic assessment**

To determine the level of achievement of learning objectives in the educational process, the implementation of diagnostic assessments needs to be carried out continuously in two stages, namely tested before learning begins and after learning is completed with the same assessment instruments

<sup>5</sup>. To find out the level of achievement of learning objectives, it is necessary to test the level of correlation comparison or test the comparison of outcome *pretest* and *posttest* data next.

*Table 8 Pretest and Posttest Result Data*

No	Pretest	Posttest
1.	62	93
2.	93	93
3.	77	93
4.	77	93
5.	93	93
6.	62	93
7.	62	93
8.	77	77
9.	77	93
10.	93	93
11.	93	93
12.	93	93
13.	77	77
14.	93	93
15.	77	93
16.	77	93
17.	62	93
18.	93	93
19.	93	93
20.	93	93
21.	93	93
22.	77	93
23.	77	93
24.	62	77
25.	93	77
26.	93	93
27.	93	93
28.	62	93
29.	93	77
30.	93	93
31.	62	93
32.	93	93

After obtaining a comparison of the *pretest* (with an average score of 82) and *posttest* (with an average score of 90), the next step is to determine the hypothesis of the data on the achievement of learning objectives through a comparison test of two pair-correlated samples whether there is a difference in the average results of the Fiqh diagnostic assessment before and after receiving the *jigsaw learning* strategy in cooperative learning with the

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<sup>5</sup> S. Pan and F. Sana, "Pretesting Versus Posttesting: Comparing the Pedagogical Benefits of Errorful Generation and Retrieval Practice," *Journal of Experimental Psychology: Applied* 27, no. 2 (2021): 237–257, <https://doi.org/https://doi.org/10.1037/xap0000345>; Kementerian Pendidikan dan Kebudayaan, *Asesmen Diagnostik (Unit Modul Asesmen)* (Jakarta: Repostori Kemendikbud, 2020).

following conditions.

7) Hipotesis

$H_0$  : there is no difference in the average Fiqh learning outcomes before and after being given the *Jigsaw Learning* model

$H_1$  : there is a difference in the average Fiqh learning outcomes before and after being given the *Jigsaw Learning* model

8) Degree of trust or level of significance

$\alpha = 5\% = 0,05$

9) Critical Region

If the sig < 0.05 then  $H_0$  is rejected and  $H_1$  is accepted

If the sig > 0.05 then  $H_0$  is accepted and  $H_1$  is rejected

Using the IBM SPSS Statistics application, these are the steps to find out the comparative hypothesis of two pair-correlated samples.

- 1) Input data from *pretest* and *posttest* result in the "Data View" sheet
- 2) Set "numeric type" to "Variable View"
- 3) Set the width at the number 8
- 4) Set the first data label as PRETEST and the second data as POSTTEST
- 5) Set the form decimals 0, with no values and missing
- 6) Set the alignment in the right position
- 7) Set the measure "Scale"
- 8) Click Analyze – Compare means – Paired Samples T Test – adjust Option Confidence 95% - continue – ok

After following the hypothesis test flow of comparing two paired correlation samples between the *pretest* and *posttest* result using the SPSS Statistika application, the results of the hypothesis test comparing two paired correlation samples between the result of the *pretest* and the *posttest* cognitive diagnostic assessment tested in class VIII-C are as follows.

*Table 9 Result of Comparative Hypothesis Test of Two Paired Correlated Samples*

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRETEST - POSTTEST	-8,781	13,711	2,424	-13,724	-3,838	-	31	,001

Based on the result of the *paired simple test*, the sig value is at 0.001, indicating

that the sig value is less than the degree of confidence or significance level ( $0.001 < 0.05$ ), then it can be known that  $H_0$  is rejected and  $H_1$  is accepted. Thus, it is concluded that there is a difference in the average results of *pretest* and *posttest* diagnostic assessments of Fiqh subjects before and after receiving intervention of the *jigsaw learning* strategy in cooperative learning. Based on the diagnostic pre-test and post-test results presented, it can be concluded that through the implementation of diagnostic assessment, teachers can identify students' readiness levels prior to instruction, as well as compare material mastery before and after the commencement of Jigsaw learning.

### **Readiness of students before participating in learning**

The analysis of students' readiness before participating in Fiqh learning in class VIII-C refers to the results of non-cognitive diagnostic assessments, namely analyzing students' circumstances or feelings before learning, initial preparation such as reading material, and analyzing learning enthusiasm before participating in learning. The determination of the level of readiness of students refers to the following provisions.

*Table 10 Pre-Learning Student Readiness Criteria and Level of Effectiveness in Achieving Learning Objectives*

No.	Percentage	Criterion
1.	0% - 49%	Less
2.	50% - 79%	Enough
3.	80% - 100%	Good

Based on *Table 4 Result of Non-Cognitive Diagnostic Assessments* It is known that:

- 1) 50% of students are happy before learning starts, so it is concluded that the students' feelings before learning starts are supportive **enough** and do not have the potential to interfere with learning. After knowing the initial condition of students, educators need to strive for a more enjoyable and meaningful learning atmosphere.
- 2) 16% of students have read the material before learning starts, the remaining 84% of students have not read the material, so it is concluded that the readiness to understand basic knowledge before learning begins is categorized **less** and has the potential to hinder learning. To minimize obstacles that may occur, educators can take several steps, including giving students the opportunity to read the

material through the available teaching materials,<sup>6</sup> or by presenting interesting learning media so that it can increase students' motivation to read.<sup>7</sup>

- 3) 19% of students are very enthusiastic about participating in learning, so it is concluded that students' enthusiasm for learning is still **less**. Thus, educators need to create a fun learning atmosphere, prepare interesting and varied learning models, by utilizing interesting electronic learning media, providing *reward and punishment*.<sup>8</sup>

### Effectiveness of achieving learning objectives

The analysis of the effectiveness of achieving learning objectives can be determined from the comparison of *pretest* and *posttest* cognitive diagnostic assessment data.

Based on *Table 8 of Pretest and Posttest Result Data*, it is known that the average score of class VIII-C pretest results is 82, while the average score of *posttest* result of class VIII-C is 90. Thus, it can be concluded that there is an increase in the results of the cognitive diagnostic assessment of class VIII-C, with the following *posttest* result.

*Table 11 Posttest Result of Cognitive Diagnostic Assessment*

No.	Q1	Q2	Q3	Q4	Q5	Q6	Total
1	1	2	3	2	3	2	93
2	1	1	4	1	3	2	93
3	2	2	3	1	3	1	93
4	1	2	3	2	3	2	93
5	1	1	3	2	3	2	93
6	1	1	4	1	4	1	93
7	1	1	3	1	4	1	93
8	1	1	3	1	2	1	77
9	1	2	3	1	3	2	93
10	1	2	4	1	4	1	93

<sup>6</sup> Anjas Luchiyanti and Vanda Rezanía, "Upaya Guru Dalam Meningkatkan Minat Membaca Siswa Kelas Dasar," *Tarbiyah Wa Ta'lim: Jurnal Penelitian Pendidikan Dan Pembelajaran* 9, no. 2 (2022): 84–92, <https://doi.org/10.21093/twt.v9i2.4211>.

<sup>7</sup> Kayyis Fithri Ajhuri, Elsa Nurianasari, and Riska Andalina, "Strategi Guru Dalam Menghadapi Kesulitan Belajar Membaca Pada Siswa Kelas III SDN Tambang Puduk Ponorogo," *Jurnal Pendidikan Guru Sekolah Dasar* 1, no. 4 (2024): 11, <https://doi.org/10.47134/pgsd.v1i4.873>.

<sup>8</sup> Suharni Suharni, "Upaya Guru Dalam Meningkatkan Motivasi Belajar Siswa," *G-Couns: Jurnal Bimbingan Dan Konseling* 6, no. 1 (2021): 172–84, <https://doi.org/10.31316/g.couns.v6i1.2198>.

11	2	2	3	2	3	2	93
12	2	2	3	1	3	1	93
13	1	1	4	1	1	2	77
14	1	1	4	2	3	2	93
15	1	2	4	1	3	2	93
16	1	1	4	2	4	2	93
17	1	1	4	1	3	2	93
18	1	1	3	2	3	2	93
19	2	1	4	1	3	1	93
20	1	1	4	1	3	1	93
21	1	2	4	1	3	1	93
22	1	2	4	1	3	1	93
23	2	2	3	2	3	2	93
24	1	1	4	1	1	1	77
25	1	1	2	1	3	2	77
26	1	1	4	1	3	2	93
27	2	2	3	2	3	2	93
28	1	2	4	1	3	1	93
29	1	1	4	2	2	2	77
30	2	2	3	2	3	1	93
31	1	2	3	1	3	2	93
32	1	1	4	1	4	1	93

In accordance with *Table 6 of Result of the Cognitive Diagnostic Assessment Validity Test*, it was found that there are three diagnostic assessment instruments that are valid and feasible to measure the level of achievement of students' learning objectives, namely the 6th, 8th, and 9th question diagnostic instruments. The determination of the level of effectiveness of achieving students' learning objectives refers to the provisions of *Table 10 of Pre-Learning Student Readiness Criteria and the Level of Effectiveness in Achieving Learning Objective*.

Based on *Table 11 of Postest Result of the Cognitive Diagnostic Assessment*, it was found that:

- 1) 31 students answered the 6th question correctly with a percentage of 97%, thus it can be concluded that the achievement of learning objectives by students is categorized as good and the learning process has been effective in achieving the learning objectives "Knowing the impact of halal or haram food and beverage consumption"

- 2) 28 students answered the 8th question correctly with a percentage of 88%, thus it can be concluded that the achievement of learning objectives by students is categorized as good and the learning process has effectively achieved the learning objectives "Knowing the provisions of halal and haram of animal carcasses"

All students answered the 9th question correctly with a percentage of 100%, thus it can be concluded that the achievement of learning objectives by students is categorized as good and the learning process has been effective in achieving the learning objectives "Knowing the evidence about the law of *khamr*"

### **Conclusion**

The results of the study indicate that diagnostic assessment using the Jigsaw intervention can improve the readiness and achievement of learning objectives among eighth-grade students in Class VIII-C at MTs Negeri 1 Kudus, as evidenced by the correlation test results between the pretest and posttest ( $0.001 < 0.05$ ). These findings underscore the urgency of diagnostic assessment to tailor learning interventions in Fiqh subject. Thus, the use of the Jigsaw learning strategy with a quantitative experimental approach provides insights into its correlation with students' readiness levels and the effectiveness of learning objective achievement. However, this study has limitations. First, only one class received the treatment without a control group, so it cannot yet represent variations among students in other schools at the same grade level. Second, revisions and retesting are needed to improve the validity and reliability of the instrument, as a preventive and corrective measure against confounding variables. Third, it is important to vary the difficulty levels of the items in the assessment instrument to examine the significance of the improvement from the pretest to the posttest. Future research should employ a stronger and more representative experimental method and refine the development of items in the research instrument to ensure greater reliability and sensitivity.

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