An Integrative Approach to Improve Students' Cognitive Ability Through Online Learning in The Covid-19 Pandemic

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Abstract: This research has revealed the decline in students' cognitive abilities in online learning during the Covid-19 pandemic. The decline in students' cognitive abilities in studying independently at home by completing various tasks without classmates. This study aims to determine how integrated learning can improve students' cognitive abilities happened in the Qur'an and hadith learning. The research method used in this study is experimental quantitative approach. It was carried out to measure students' cognitive abilities through integrated learning, in the class XI State Madrasah Aliyah Padang Japang Payakumbuh with a research sample of 17 students. The experimental group was treated with the connected type of integrated learning treated. It applied pre-test post-test control group design. Before giving the treatment of the sample group, a pre-test was carried out, and after finishing the treatment, a post-test was carried out. The results showed that there was a significant increase in students' cognitive knowledge through connected type of integrated learning in learning the Qur'an Hadith of Madrasah Aliyah Negeri Padang Japang Payakumbuh with an average pretest score of 32.17 and an average post-test score of 48.47. Thus, improving students' cognitive abilities can be done through integrated learning.

Abstrak: *Penelitian ini telah mengungkap tentang kemampuan kognitif siswa yang menurun dalam pembelajaran daring pada masa pandemic covid 19. Menurunnya kemampuan kognitif siswa dalam belajar secara mandiri di rumah terkait dengan penyelesaiannya pada berbagai tugas. Penelitian ini bertujuan untuk mengetahui bagaimana pembelajaran terpadu dalam meningkatkan kemampuan kognitif siswa dalam pembelajaran Al-Qur an hadits. Metode penelitian dengan pendekatan kuantitatif eksperimen dilakukan untuk mengukur kemampuan kognitif siswa melalui pembelajaran terpadu, terhadap kelompok siswa Madrasyah Aliyah Negeri Padang Japang Payakumbuh kelas XI dengan sampel penelitian berjumlah 17 siswa. Eksperimen dilakukan dengan pendekatan pembelajaran integrated tipe connected*

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yang mana berupa eksperimen pretest dan postes. Sebelum eksperimen dilakukan terhadap sampel penelitian, siswa diberikan pre-tes dan setelah eksperimen dilaksanakan, siswa mengikuti post-tes. Hasil penelitian menunjukkan bahwa terdapat peningkatan pengetahuan kognitif siswa secara signifikan melalui pembelajaran terpadu tipe connected dalam pembelajaran Alquran Hadis siswa Madrasyah Aliyah Negeri Padang Japang Payakumbuh dengan nilai pretest rata-rata 32. 17 dan nilai postes dengan rata-rata 48.47. Dengan demikian untuk meningkatkan kemampuan cognitive siswa dapat dilakukan melalui pembelajaran terpadu.

INTRODUCTION

Students' cognitive abilities during the pandemic dropped drastically (Reffiane et al., 2021), fear of covid-19, lack of direction from teacher made students feel lazy and stressed to study (Salas-Rueda et al., 2021; Fitriani et al., 2022), decreased level of general knowledge, understanding, and the ability to solve problems, analyze and describe learning in synthesis and evaluate an event that occurs also decreases (Munir et al., 2021, Sholahuddin et al., 2020). These learning problems can be solved through an integrated approach to reduce boredom for students studying at home. The Covid-19 pandemic has changed the joints in the learning process in general (Hong & Quoc, 2021), the readiness of students and teachers to carry out online learning is ready or not ready to run well and optimally with all existing limitations. Learning runs in a monotonous, one-way manner through the assignment method and an integrated approach through the connected type method, which this method will make students more active in learning and think critically so that students' cognitive abilities increase and learning objectives are achieved optimally (Aldossary, 2021). Lack of use of Information Technology (IT), students' inactivity, and their lack of interest in learning in class. That there was a significant difference between the PBL learning model and the information technology intervention on the communication skills of students with

an average score of 64.27% in the experimental class and 57.70% in the control class and a significant value of 0.00. (Lufri, et all, 2021). Data on the development process were collected using tools validated by materiel experts, design experts, student response questionnaires(Kamid, et all, 2021)

According to Ellis et al., (2021) writing the phenomenon of students not getting direct experience and solving the subject matter they learn on their own. Students find it increasingly difficult to understand concepts because of the use of inadequate learning tools. This has an impact on student learning outcomes such as not achieving the Minimum Completeness Criteria (KKM). The reasons given by the teacher were limited time, facilities, and learning environment (Baloran et al., 2021; de Oliveira et al., 2021; Ucar et al., 2021; Ugur et al., 2021). Motivation to learn during the pandemic has also decreased both at school and in college (Fitri, 2020) not having enough learning tools is also the reason learning during the pandemic does not work properly.

The objectives of the research are (1) to experiment with an integrated approach model of the connection type in the Al-Qur'an and Hadith subjects. (2) to measure students' cognitive abilities through an integrated approach and (3) to determine the relationship between the integrated approach and students' cognitive abilities. The research aims to determine students' cognitive

abilities through an integrated approach of the connected type carried out through group action research to conduct experiments. This is done because students study at home during the covid-19 pandemic (Abbas, 2022; Jafar et al., 2022; Tuhtasinovich & Ubaydullaevna, 2022). Through an integrated approach, it is expected that students learn meaningfully and connect with other subjects so that students are not bored studying at home during covid-19 (Akhmedovna, 2022; Alghazo & Alkhazaleh, 2021; AlKhaza'leh & Obeidat, 2021; Verulava et al., 2022). The research hypothesis is an overview of the results of the connected type integrated approach research. The connected-type integrated approach can improve student learning activities through discussion and presenting the results of discussions and connecting with other topics and other subjects. Students can develop a realistic and contextual way of thinking and learning that is meaningful for their lives. Al-Quran Hadith subjects in Islamic religious education learning in Madrasas are the basis for students in discussing to develop insight.

An integrated approach is learning that prioritizes meaning in learning. Students with critical thinking and analysis can connect learning topics with other subjects, connecting with students' daily lives (Halida, 2016) stating that the integrated approach has characteristics such as being student-centered, the learning process prioritizes students' direct experience and the separation between fields of study is not clearly visible (Putra et al., 2014). The integrated approach model consists of a fragmented model, a connected model, a nested model, a sequenced model, a shared model, a webbed model, and a threaded model), the integrated model, the immersed model, and the networked model (Resmini, 2010). Of the ten models of the integrated approach in this study, the researcher uses and implements an integrated approach of the connection type.

The integrated approach according to Demina, (2016), Haidir et al., (2012) explains that an integrated approach is an approach that combines two or more elements in a learning activity in the form of concepts with processes, concepts from one subject with other subjects or combining methods with other methods for more meaningful learning (Melisa Rezi, Adam Mudinillah, 2022). This integrated approach is a link between one element and another, so it is hoped that there will be a more meaningful increase in understanding and an increase in insight because one lesson involves more than one point of view. The integrated approach prioritizes how students learn naturally in the learning process in developing thinking process skills according to curriculum instructions to improve children's thinking and understanding (Amrina, Iswantir et al., 2022). Authentic, naturally able to explore student-centered events in the learning process (Deswila et al., 2020), Fogarty has conducted various integrated learning experiments through various learning approaches and meanings that are broken down from various concepts and learning experiences directly linking various concepts and work and students' quality of life (Olin, 2005). The focus of meaningful learning starts from what is known and experienced by students according to Ausabel learning takes place in the human organism through a meaningful process of relating new events or items to already existing cognitive concepts or propositions.

The connection type according to Andiyan & Rachmat, (2021), Haidir et al., (2012) describe an integrated approach of connection type as learning that connects one subject or sub-subject associated with concepts, skills, or abilities on the subject in one field of study. (inter- field of study) (Apriantoro, 2017). The connected model does not connect existing disciplines but connects aspects of subjects in student-centered learning (student center/student-oriented) teachers package material and encourage students in learning to find connections between aspects that exist in

learning activities (Andiyan & Rachmat, 2021). The connected type of integrated learning step consists of six phases, namely the preliminary phase which consists of apperception, student motivation, providing information, questioning and answering, and learning objectives (El Said, 2021). The second phase is the presentation of the subject matter (Muhammad Yusuf Salam, Adam Mudinillah, 2022). The third phase is a group discussion, activity reports, guidance, and group work. The fourth phase is the feedback on the learning process. The fifth phase concludes the learning material and gives homework. And the sixth phase is the evaluation of the learning process (Partini et al., 2013).

Cognitive ability is a construction process that involves the brain to think, improve, solve problems and make decisions which is the main goal in the learning process the achievement/ability of individuals/groups that can be observed as a result or process of gaining knowledge through learning experiences. Cognitive abilities are also related to the process of assessing, and considering an event or events. The development of thinking skills gradually in accordance with the physical development and nerves developed by Piaget as for cognitive development at the age of 12 years with learning activities to think, learn, remember and communicate logically and continued with abstract thinking skills with the ability to express ideas, predicting events or events, thinking scientifically or scientifically proving hypotheses. Aspects of children's cognitive development in learning can be manifested in language skills, remembering, reasoning, spatial insight, numerical and using words, and observing quickly and carefully (Kai, 2022).

The cognitive abilities of students in the learning process and student learning experiences that are expected in this study are in line with the cognitive developed by Bloom, namely knowledge of concepts, principles, facts, or terms. Students' comprehensive understanding and

application in learning to put forward general ideas, methods, principles, and theories in new and concrete situations as well as analysis to describe the situation in its various elements and components, then synthesis which requires students to be able to combine various factors and evaluate them. based on specific criteria.

This paper is based on an argument that students' cognitive abilities in integrated learning have had an impact during the pandemic period with the implementation of technology-based learning. Limited online learning determines the level of student participation in the learning process. Students from poor families are unable to access various learning resources and are unable to actively participate in learning. Limitations in online learning have affected students' cognitive abilities.

METHOD

This research is a quasi-experimental, namely practical research in order to improve classroom learning and improve the quality of learning carried out by teachers and students in problem-solving with planned actions for each indicator. The population of the study was MAN students in the neighborhood around the researcher's residence as many as 36 students consisting of 11 students in class X, class XI = 17 students, and class XII = 8 students. The research sample was students of MAN Padang Japan class XI totaling 17 people who were in the group. or research environment. Furthermore, the sample group is a group that is given action in learning as an experimental group using an integrated approach of the connection type in improving students' cognitive abilities. Sources of data in this study were students of Madrasah Aliyah Negeri Padang Japang Payakumbuh class XI as an experimental group totaling 17 students where the sample group was students who were given action or treatment as a group of actions that were around the research location. Group

members are students of class XI Madrasyah Aliyah Negeri Padang Japang Payakumbuh.

The group is determined through a purposive sampling technique where there is a certain goal in the group to get the results of the actions taken. The data was collected through an experimental connected type integrated method after the action was carried out, tests were carried out on students in the experimental group to measure the results of increasing students' cognitive abilities in learning the Qur'an Hadith.

Data were collected by using essay tests and questionnaire techniques. Essay tests to measure the ability of students after the implementation of learning or treatment or action on students in groups. The written test in the form of an essay was designed based on the topic and learning material of the Al-Quran Hadith class XI which was carried out after the action was carried out in the form of a learning evaluation. The test was designed in advance and tested on students to get a valid instrument and high reliability so that the test can be used in research. Analysis of data in this group action research through quantitative analysis with statistical data processing. Data is collected after taking action through learning the Qur'an and Hadith with an integrated approach of the connection type. After the action was taken, the students were given a test with a research design of one Group Pretest -Post test Design (one group of pretest -post test), namely a test before the action was carried out and a test after the action was carried out. The test aims to compare the results before the action

and after the auction, the action was carried out three times (Chania et al., 2017).

The treatment in this study is in the form of the first action with the topic of healthy living and the second treatment is halal food. The data collected is in the form of a performance test. After the test, the researcher compared the test results of the two values by asking questions about whether there was a significant difference between the two scores. Testing the difference in scores was carried out on the average of both Pre- Test and post-test scores through t-test data analysis. To do this, the Wilcox on Signed Ranks Test technique was used. After obtaining the percentage of answers, the answers were classified based on students' cognitive abilities. *"Looking for the score interval, namely the distribution distance between the lowest score and the highest score."*

RESULTS AND DISCUSSION
Results

Based on the findings that occurred in the field, in the implementation of the treatment using an integrated approach model of the connection type, students' cognitive abilities began to increase, and the way of learning became active and fun compared to before the treatment, this was seen based on the results of the evaluation. In the connected type of integrated approach, students can connect one concept to another, one material to another in one field of study (inter-field of study). The improvement of student learning outcomes before and after treatment is as follows.
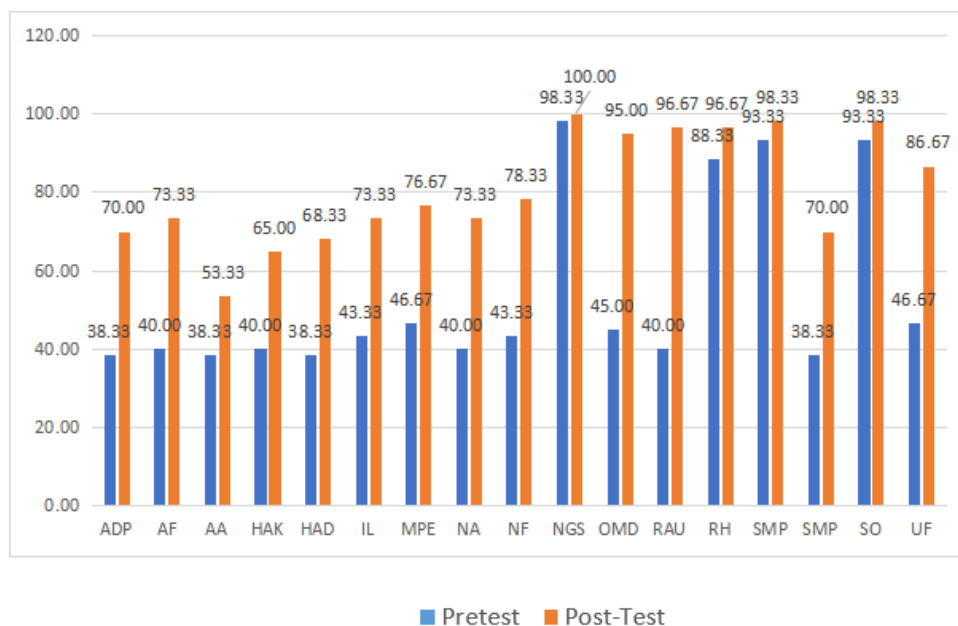
Figure 1. Students' Pretest and Post -Test Post -test Scores

Based on Figure 1, it can be seen that all students' scores have increased after the application of learning using the connected type integrated method. The difference between the increases varied; most of the increases ranged from 15% to 56%. While the slight increase between 1.67% to 8.33% was valid because, from the beginning (pretest), the student's score was already high compared to other friends. Between 98.33 to 100, 88.33 to 96.67, 93.33 to 98.33, and 93.33 to 98.33. This means that the connection type method can effectively improve student learning outcomes. The data outlined in the following table is presented based on the descriptive statistical analysis.

Table 2. Analysis with Descriptive Statistics

No	Description	Results Pretest	Results Post-test	Difference
1	Lowest value	38.33	53.33	15
2	The highest score	98.33	100.00	1.67
3	mean	53.63	80.78	27.16
4	Standard Deviation	22.25	13.93	8.31

Based on table 2, it is known that the lowest post-test post-test value is higher than the lowest pretest value. The highest post-test post-test score is higher than the highest score, in terms of the average and the difference in 27.16. Then the standard deviation of the post-test post-test is smaller than the standard deviation of the pretest, meaning that before applying the connected type method, the students' abilities are heterogeneous. After using the related type method, the students' abilities are more homogeneous. For complete information obtained, the differences in student learning outcomes based on the level of mastery categories proposed by (Mardapi, 2008) are shown in the following table.

Table 3 Student Learning Outcomes by Category

No	Interval	Results Pretest	Results Post- test	Description

		Frequency	Presents	Frequency	Presents	
1	90-100	3	17.65	6	35.29	Very well
2	80-89	1	5.88	1	5.88	Good
3	70-79	0	0.00	7	41.18	Enough
4	<70	13	76.47	3	17.65	Not enough
	Amount	17	100	17	100	

Based on table 3, it is known that after the connected type method was applied, students with excellent mastery increased by 17.67%, moderately capable increased by 41.18%. On the other hand, this method could reduce those with poor dexterity by 58.82%. For a more precise comparison, see the following image
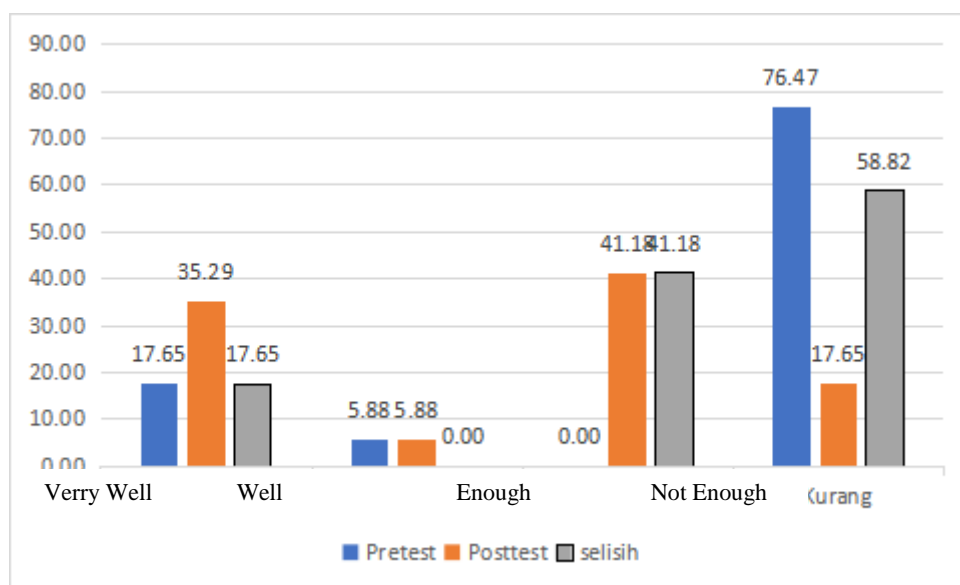
.

Figure 2. Comparison of Student Mastery by Category

Test Requirements Analysis
Normality test

Normality test using Kolmogorov-Smirnov and Shapiro-Wilk, the assumption of a normally distributed group is formulated in the following hypothesis.

H0: The sample comes from a population that is typically distributed

Ha: The sample is not taken from a population that is usually distributed.

The analysis results using the Kolmogorov-Smirnov and Shapiro-Wilk techniques are as follows.

Table 4. Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pretest	.384	17	.000	.649	17	.000

Posttest	.192	17	.098	.903	17	.075

a. Lilliefors Significance Correction

Based on table 4, it is known that the value of sig. The pretest of 0.000 is smaller than the significance value of 0.05, so it can be decided that H0 is rejected. Thus it can be concluded that the sample does not come from a normally distributed population. On the other hand, in the post-test post-test value, the sig is known. 0.098 and 0.075 are more significant than 0.05 significance, so H0 is accepted; thus, it can be concluded that the sample comes from a normally distributed population. However, because the pretest assumption of normality was not met, one of the requirements for the analysis using parametric statistics was not met.

Homogeneity Test

The homogeneity of variance test was conducted using Levene's test for = 0.05, assuming both groups had the same variance. The formulation of the hypothesis is as follows.

$H_0 : \sigma_1^2 = \sigma_2^2$ (variance 1 is equal to variance 2)

$H_a: \sigma_1^2 \neq \sigma_2^2$ (variance one is not equal to variance 2)

The results of the analysis are in the following table.

Table 5. Test of Homogeneity of Variances

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Table 6. Ranks

		N	Mean Rank	Sum of Ranks
Post-testPost-test – Pretest	Negative Ranks	0[a]	.00	.00
	Positive Ranks	17[b]	9.00	153.00
	Ties	0[c]		
	Total	17		

Levene Statistic	df1	df2	Sig.
3.325	1	32	.078

Based on table 5, the homogeneity of variance test obtained a license statistics index of 3.325 with sig. 0.078 > 0.05, so it can be decided that H0 is accepted, meaning that both groups have homogeneous variance.

Based on the calculation results of the results for the analysis requirements using parametric statistics, one of them is not fulfilled. The article does not use nonparametric statistical analysis techniques. The analytical method used in this article is the Wilcoxon Signed Ranks Test.

Hypothesis testing

$H_0 : \mu_1 = \mu_2$

$H_a: \mu_1 \neq \mu_2$

H_0: There is no significant difference in student learning outcomes before and after the connection method is applied

H_a: There is a significant difference in student learning outcomes before and after the connection method is applied.

The calculation results of the Wilcoxon Signed Ranks Test are as follows

Based on table 6, it is known that there is no post-test post-test value lower than the pretest value, nor is there a post-test post-test score that is the same as the pretest value. It means that all post-test scores are more significant than the pretest scores. Thus it can be concluded that applying the connected type method can improve all student learning outcomes. Furthermore, for hypothesis testing, the following calculations are obtained.

Table 7. Wilcoxon Signed Ranks Test

	Post-testPost-test − Pretest
Z	-3.625[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on hostile ranks.

Based on the calculations' results in table 7,

　　a. Posttest < Pretest

　　b. Posttest > Pretest

　　c. Posttest = Pretest

the Z index is -3.625 with a significance of 0.000. Because the significance value is < 0.05, H0 is rejected at a significance level of 0.05. Thus, it can be concluded that there is an increase in student learning outcomes after the connected type method is applied.

Discussions

Based on the facts that the researchers found in the results of the analysis, it was revealed that the effect of the Connected type integrated approach on students' cognitive abilities in the subjects of the Qur'an and Hadith was very good. The Connected-type integrated approach model can affect students' cognitive abilities because (1) learning is connected with various disciplines so that students can be actively stimulated in learning (2) with connected learning, students are more active in finding answers and describing each related verse explanation. with other sciences, (3) with an integrated approach can develop and improve students' cognitive abilities, so that learning objectives are achieved optimally (Ercan-Demİrel & Ulaş-Taraf, 2021; Yustina et al., 2022).

The Connected-type integrated approach to learning during the COVID-19 period has several advantages, including the following: (a) by integrating ideas across fields of study,

students have a broad picture of a field of study focused on a particular aspect, (b) students can develop key concepts continuously, so there is an internalization process. (c) integrating ideas in inter-fields of study allows students to examine, conceptualize, improve and assimilate ideas in solving problems and become recommendations for learning models in the state of California (Iveland et al., 2018).

Connected-type integrated approach research to improve students' cognitive results in student activities in discussing and connecting topics with other subjects can be done by clicking through the reality that exists in their environment. Through an integrated approach with learning, steps become meaningful for students.

Teachers can control student discussions easily because students can connect the material with other subjects that students have studied. The integrated approach is the mandate of the learning approach in the 2013 curriculum, where learning is student-centered and the relationship between topics and materials.

Through the integrated method, the Connected type has several advantages, including: (a) by integrating ideas across fields of study, students have a broad picture as a field of study that focuses on a particular aspect, (b) students can develop critical concepts continuously so that the internalization process occurs. (c) integrating ideas in interdisciplinary fields allows students to study, conceptualize, improve, and assimilate ideas in solving problems and strongly influence students' cognitive abilities. Cognitive problem solving and the fear of COVID-19 have become solutions in online learning in countries such as Malaysia and Pakistan (Munir et al., 2021).

CONCLUSION

The connected-type integrated approach can improve students' cognitive abilities in online learning during the covid-19 pandemic on Al-Qur'an Hadith subject. The connected type of integrated approach allows students to learn and connect in subjects from one concept to another, one topic to another, skills to other skills, and the tasks at hand. Thus, the connected-type integrated approach in student learning easily masters the material in an integrated manner with the expected knowledge of concepts, ideas, and skills. The connected-type integrated approach demands understanding and creativity of teachers and students in discussing the main ideas of learning topics. Students as learning centers (student-centered / oriented) can freely connect topics with high rationality and reasoning and students' bright ideas. Students in learning can improve attitudes, interests, and motivation and can develop and carry out deepening, reviewing, improving, and assimilation of ideas gradually. Namely financing, teachers / educators, assessment, and graduates.

In a multicultural perspective, problems in management and assessment aspects basically caused by a misunderstanding of the meaning of standards and standardization (Mazid et al., 2021). Analysis of integrated learning to improve students' cognitive abilities during a pandemic has contributed thoughts on; First, integrated learning not only improves students' cognitive abilities but also increases learning activities in the context of mental activity. Both of these studies contributed to the pandemic and online learning in relation to learning, social activities, and learning motivation. The meaning of this research can be drawn that integrated learning contributes to boredom in online learning.

This research was carried out during the covid-19 pandemic only for MAN students, not yet done for MTSN and MIN levels. The material in the research is limited to the subjects of the Qur'an Hadith with the topic

of halal food, it has not been carried out on other materials at each level of the education unit. It is highly recommended that further research be carried out for all levels of education units and subjects in MAN, MTSN, and MIN equivalent. So that the mandate of the 2013 curriculum through an integrated approach can be implemented and taught to students.

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