

The influence of *fiqh* insights and science literacy on student ability in developing Quran-based science

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ABSTRACT

Islamic education institutions are responsible for the process of integration of knowledge which aims to encourage the mastery and improvement of general science and religious knowledge in harmony. This study aimed to see the extent of the influence of the ability of *fiqh* (Islamic jurisprudence) and scientific literacy on the ability of physics students in developing integrated learning Quran-based science. Through a quantitative approach with a survey model of physics education students involving 150 students, it was found that the correlation value $R_{cal} (0.943) > R_{table} (0.1339)$ with a sig. value (2-tailed) $0.000 < 0.05$. Furthermore, it is also known that the correlation between scientific literacy and integration ability is $R_{cal} (0.512) > R_{table} (0.1339)$ with a sig. (2-tailed) $0.000 < 0.05$. ANOVA test results (F test) showed the value of $F_{cal} (632.126) > F_{table} 3.91$ with a probability of 0.05. Thus, it can be understood that simultaneously the independent variables (*fiqh* insights and scientific literacy) affect the dependent variable (the ability to develop integrated learning Quran-based science as tools of learning). These results are also supported by a sig. $0.00 < 0.05$, which means that the independent variables simultaneously influence the dependent variable significantly.

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1. INTRODUCTION

Islam as a perfect religion does not differentiate between religious knowledge and general knowledge (world). In Islam, seeking useful knowledge is obligatory. This is in line with the opinion of Rahman [1] that in Islam, learning is not limited by space, time, and material, because of the commandment to study Islam in general. Besides, Al-Faruqi [2] and Daneshgar [3] also stated that the concept of science in Islam is an integral part of the Islamic world view. Science in Islam includes not only theology and law, but also a range of other sciences such as physics, biology, and others subject that need to be studied. Previous researchers [4], [5] mentioned that the search for knowledge in any aspect will ultimately lead to the affirmation of *tauhid* (confession to God). It can also be understood why Islam obliges its adherents to take this knowledge seriously, both religious knowledge and general sciences. This is because the two sciences are equivalent and both are very important for human life. Tamrin [6] stated that science is an urgent matter in human life in the world so that human improve their quality and abilities and elevate their existence.

However, in general, the understanding of Muslim towards the unity of knowledge and equality is still relatively low. Fathul [7] and Dakir *et al.* [8] stated that the dichotomous mindset is still the majority of

Muslim today. This fact is in line with the previous studies [9], [10] that Islamic education in Indonesia and others country is still a dichotomy, where the general subject matter is separated from religious material. Another indication that the science of religion and general science has not been integrated is also seen from Bisryi [11]. He found that religious knowledge and general science must be in the congregation, not just labeling Islam as the science, but making religion the value that underlies every science. This situation arises because there is still an assumption that science studied from the Quran and Hadith is understood as Islamic knowledge. On the other hand, the knowledge that is studied/sourced from nature is understood as general science [12]. This could have an impact on the obstruction and delay of the development of modern science in Islam. Therefore, there must be real efforts to end the scientific dichotomy and accelerate the development of science and technology among Muslim.

One of the real efforts to end the dichotomy of education is the unification or integration of religious knowledge with general science. This scientific integration is also intended to provide moral values to science, so that science can continue to develop without contradicting human values and norms. This is in line with the previous researchers [2], [13] [14] revealed that science is not value-free, but value-laden. Previous studies [15], [16] also mentioned that the integration of science with Islamic values is very important in every process of learning science in schools.

Various attempts have been made to integrate religious and scientific values that can be seen from various researches. For example, Mahfudzoh [17] has researched integration of Islamic religious values into mathematics learning. The similar study was conducted by Muspiroh [15] who has made efforts to integrate Islamic values into science learning in schools. Furthermore, Rusdiana [18] has also investigated about the urgency of integration between religion and science and technology. Likewise, Arifudin [19] also studied the integration of science and religious values and their implications for Islamic education. Besides, integration is also carried out not only about learning in schools, but also involves scientific interpretation [20]. Likewise, Othman *et al.* [21] proposed a spiritual education (spiritual) based on Quran science.

According to previous researchers [19], [22], [23], the process of integrating science and religion have implications for the form and structure of the curriculum, the teaching and learning process, in the aspect of socio-religious education. Therefore, the ability in the process of integrating science and religion should be possessed by teachers and prospective science teachers (physics, biology, chemistry, computers, and so on) as well as teachers and prospective Islamic teachers. In the context of learning, this integration should begin at the time of planning, implementation, and assessment. This means that during the learning planning process, the implementation of learning and assessment of student learning outcomes always involves Islamic values (for learning science) and scientific values (for learning Islam). In this way, the universality and scientific integration of students will be easier to build from the start, so that later the dichotomy of education that is still happening will disappear by itself.

To carry out integrated learning (starting from the lesson planning, learning process and learning assessment) teachers who master in sciences and religion are required. Mastery of the both fields of science is intended to ensure the success of the quality of the integration. For this reason, related research is needed to continue to explore and create the best strategy to integrate them.

The process of integrating science and Islamic religious values is mostly carried out by teachers in educational institutions. This proves that students and other Islamic scientists have a high role and responsibility for the process of scientific integration. Through Islamic scientists (teachers and prospective teachers) the integration of science and religious values begins to be developed. It also means that the *tadris* (education) students of Physics at the Tarbiyah Faculty and teachers at the State Islamic University of Sulthan Thaha Saifuddin Jambi have a big role and responsibility for the integration process. Therefore, the ability to integrate science and Islamic values must be socialized, taught to students, especially student teacher candidates, so that later they can develop this integration in the education process in schools.

Students majoring in Physics Education, Tarbiyah, and Teacher Training Faculty are students who are educated and trained to become reliable and professional science (physics), teacher candidates. Some of the abilities that a physics *tadris* student must have before being declared graduated as a bachelor is the ability to master science (physics) as the main content, mastering pedagogical competencies as teaching skills, and mastering Islamic values in general (read Quran, *fiqh*, sharia). Thus, it is clear that all alumni of Physics *Tadris* are expected to be able to teach science (physics) well and have an Islamic personality. Besides, it is implied that all alumni are also expected to be able to integrate the values of science (physics) in the learning process at school as a manifestation of this Islamic personality.

The integration of science and religious values is a must to eliminate dichotomous perceptions. To build integration of science and religion requires spiritual intelligence (one of the sources is *fiqh*) and scientific literacy. Therefore, the focus of this research is to find out how the influence of *fiqh* insight and scientific literacy on the ability to integrate learning Quran-based science.

2. LITERATURE REVIEW

One important factor in being able to implement and succeed in the process of integrating science and religious values (Islam) is that the integrator must have spiritual intelligence. Due to spiritual intelligence (divinity) towards one's mindset and lifestyle in life. This can be seen from previous studies [24]–[26] that spiritual intelligence affects employee performance, employees with good spiritual intelligence will tend to have good performance too. Besides, previous studies [27], [28] also found that spiritual and emotional intelligence has a strong influence on leadership, job satisfaction, and performance of bank managers. The ability to manage assets (finance) according to Sina and Noya [29] is also influenced by the level of one's spiritual intelligence. Therefore, it is natural that Hijriah [30] stated that there is a strong correlation or relationship between spiritual intelligence and success in entrepreneurship. In the field of education, spiritual intelligence also affects the learning outcomes (mathematics) [31] and accounting [32] of students. Puluhulawa [33] also stated that spiritual and emotional intelligence also affects the social competence of teachers and nurses [34].

The definition of spiritual intelligence according to Wibowo [35], Al-Salkhi [36], and Samul [37] is the ability to give meaning to worship for every behavior and activity through steps and thoughts that are *fitriah*, towards a complete human being who has an intergalactic and principled mindset. Meanwhile, according to Tasmara [38], intelligence is centered on a deep love for Rabbul-'Alamin and all of His creation, a belief that can overcome all physical, temporary, and transitory feelings. Meanwhile, according to Nurdiansyah [39], spiritual intelligence is a mind that gets inspiration, encouragement, inspired effectiveness, and a sense of divinity that all humans are part of. Thus, it can be understood that spiritual intelligence comes from thoughts and mysticism which originates from divine belief or spirituality. This is in line with the opinion of Karimi and Mohammadi [40] that spirituality refers to the monotheistic paradigm in creating a harmonious balance between aspects of the world and the hereafter, or providing direction in life [41].

By referring to the definition of spiritual intelligence above, in the context of Islam, the science of *fiqh* can be said to be one of the sources of this intelligence. Is as stated by Bustan, Sutiasasmita, and Arief [42] that Islamic education (in the form of prayer, fasting, reading Quran and *fiqh*) is very influential in increasing the spiritual intelligence of students. This is also in line with Dianto [43] that in Islam Al-Quran is the first and foremost source of Islamic law (the main source in Islamic education) which contains all aspects of human life, including *fiqh*. Sulaiman [44] states that the science of *fiqh* is the study of worship, *muamalah*, *munakah*, and *jinayah* which is strengthened by the arguments of the Quran, hadith. This is also reinforced by Nurhayati [45] opinion that *fiqh* is a science that comes from the Quran, Sunnah, consent, and *kiyas* (measurement). Therefore, it can be understood why Syarifudin [46] states that *fiqh* is a "guide" (ethically) on the one hand and a "rule" (normatively) for the safety of the cosmos on the other. Thus, it is clear that *fiqh* is one of the most important fields of study in Islamic education, almost all scientific studies in Islamic education are inseparable from this science of *fiqh*.

In Islamic teachings, there is no known scientific dichotomy. All existing knowledge, in essence, always comes from Allah (God) and will return to Him. For that, if the science of *fiqh* comes from Allah then science also has the same source. Thus, studying science also means studying Islam, or in other words, it can be said that studying science is also a part of Islamic teachings. This is in line with the opinion of Hasyim [47] that Quran and Hadith as the main sources of Islamic law have ordered followers to study (which are general in nature) with the limitation being the usefulness of knowledge itself, meaning that if it is useful knowledge it must be studied. Here there is no distinction between religious knowledge or general science.

The main goal of studying science is for humans to be literate about science. Scientific literacy can be defined as knowledge and understanding of scientific concepts and processes required for personal decision making, participation, and economic productivity [48]. The definition of scientific literacy according to previous studies [49]–[51] is the ability to use scientific knowledge, identify questions, and draw conclusions based on evidence, to understand and make decisions regarding nature and changes made to nature through human activities. Likewise, the opinion of previous researchers [52]–[54] that literation of science is the ability to use scientific knowledge, identify questions and draw conclusions based on evidence to nature and changes made to nature through human activities. Pearson, Moje, and Greenleaf [55] stated that scientific literacy is integration between literacy and science.

Referring to the explanation above, it is clear that scientific literacy is one of the most important abilities and is directly related to human life. This is in line with the opinion of Rohmawati, Widodo, and Agustini [56] that scientific literacy is not only an understanding of knowledge, but also an understanding of various aspects of the scientific process, as well as the ability to apply knowledge and scientific processes in real situations faced by students, both personal, social, and global. This is reinforced by research conducted by Oktavianti and Hakim [57] that scientific literacy (financial) affects access to credit (economy). Even in his article, Mukti [58] stated that to overcome various problems that occur, both political, economic and social, cultural and moral and intellectual decadence, it is necessary to strengthen the character of human

resources and scientific literacy. Prasetyo [59] also stated that to face the ASEAN economic community (MEA), science needs to be introduced from an early age. Therefore, Wenning and Vieyra [60] mentioned the need to develop scientific literacy through course development. DeBoer [61] also explained that scientific literacy must continue to be developed in schools by adjusting its content and methodology.

3. RESEARCH METHOD

The research aimed to answer the question of how the influence of *fiqh* and scientific literacy on the ability to integrate science and Islamic values among students of Tadris Physics Department. To answer this question, this study uses a quantitative approach, as suggested by Hodge [62]. The data collection method used was a survey. According to previous researchers [63], [64], the survey method can be used to provide evidence of practice, attitudes, and knowledge. Respondents who were involved in this study as subjects were students majoring in Physics Education who had been in fourth semester or more. This is done with the consideration that they have followed prerequisite courses in this research, namely science content courses (Basic physics I and II, Basic chemistry, General biology, Modern physics, Earth sciences and space science), teaching skills courses (Educational psychology, Educational administration, Learning methods and strategies), and Islamic subjects (Study of Quran hadith, Islamic law, Islamic thought, and Philosophy). With these considerations, it is intended that each respondent has the ability to know *fiqh* and literacy, and the ability to integrate science and Islamic values is considered sufficient. The respondent was 150 students.

The instrument of this study was a questionnaire containing 25 statements with five scale (strongly agree=4, agree=3, disagree=2, strongly disagree=1, and do not answer=0). It measured the students' *fiqh* skills and scientific literacy skills. The scientific literacy instrument used in this study was adapted from the research of Chen *et al.* [65] which includes scientific knowledge, scientific awareness, and scientific ability.

The instrument used to measure the ability to integrate science and Islamic values are product-based in the form of a learning implementation plan. This means that each respondent developed an integrated learning plan. The assessment or scoring of the product in question is to use an assessment rubric. The assessment rubric in question consists of 25 assessment aspects with the scoring system used is the Likert scale as with other variable measurement instruments. Thus, the final result of the three variables is a score with a score range of 0-100.

Data analysis in the study was carried out in several stages. The first stage is categorization, which is classifying the respondent based on the score obtained. In this case, the data is classified into three categories, namely high (61-100), medium (31-60), and low (0-30) abilities. The second stage of analysis is to determine the correlation between variables. It was carried out by using SPSS version 16 software to answer research questions. The data analysis in question includes correlation analysis (Pearson Product Moment) to determine the degree of correlation between variables. Furthermore, F test (ANOVA) is carried out to find out whether the two variables (*fiqh* insights and scientific literacy) have an effect on the ability to integrate or they have an effect separately. This test is done by comparing the F table and the F count, which is technically carried out with the help of SPSS 16 software. Furthermore, after the tests in question have been carried out, the data and test results are described systematically so that they are easier to understand. This classification is intended to determine the percentage of each group so that in the future terabit steps can be taken based on these data.

4. RESULTS AND DISCUSSION

Based on the measurement of the ability of *fiqh*, scientific literacy, and the ability to develop integrated learning Quran-based science using previously developed instruments, the data were obtained as presented in Table 1. The table shows that the physics *tadris* students' *fiqh* ability is in the medium category as much as 38%, low ability as much as 36%, and the high category as much as 26%. Apart from that, these data also show that in general the jurisprudence abilities of physics students still need to be continuously developed. This is intended as an effort to improve religious scholarship which is mandatory for all students in Islamic educational institutions to ensure that the development of integrated learning can run better.

Table 1. Classification of *fiqh* insights of physics *tadris* students

No.	Category	Range of score	Number of students	Percentage (%)
1	High	61-100	39	26
2	Moderate	31-60	57	38
3	Low	0-30	54	36
	Total		150	100

The literacy abilities of physics *tadris* students at the Tarbiyah and Teacher Training faculties are shown in Table 2. It can be seen that in general the scientific literacy skills are dominated by students with moderate category of scientific literacy skills (45%). Students with high abilities were 28% and the rest (low category) was 26%. Thus, it can be understood that in general, the science literacy skills of physics *tadris* students are middle and above. From this data, it can be understood considering that physics is part of science, so it is natural that they have good scientific literacy skills. However, scientific literacy tests are not only in the context of physics, but also in the context of Biology, Chemistry, and the Environment in general, so it is only natural that there are still (26%) who have low scores.

Table 2. Science literacy skills of physics *tadris* students

No.	Category	Range of score	Number of students	Percentage (%)
1	High	61-100	42	28
2	Moderate	31-60	68	45
3	Low	0-30	40	26
	Total		150	100

Obtained data regarding the ability to develop integrated learning tools using an assessment rubric as an instrument is presented in Table 3. Based on these data, it is known that 42% of physics *tadris* students have the ability to develop learning tools in the medium category. Furthermore, students with low abilities were 33.33% and students with high abilities were 24.66%. This data shows that there are still many physics students who do not yet have the ability to develop integrated learning tools, so concrete steps still need to be taken to improve this ability.

Table 3. The ability to develop an integrated learning on Quran-based science

No.	Category	Range of score	Number of students	Percentage (%)
1	High	61-100	37	24.66
2	Moderate	31-60	63	42
3	Low	0-30	50	33.33
	Total		150	100

Table 4 shows that the correlation value ($R_{\text{calculate}}$) for *fiqh* on integrated learning is $0.943 > R_{\text{table}}$, which is 0.1339. This proves that there is a significant correlation between *fiqh* variables and the ability to integrate learning. This result is also supported by the sig. value (2-tailed) $0.000 < 0.05$. Furthermore, it is also known that the correlation between scientific literacy and integration ability is $0.512 > 0.1339$. This data also proves that there is a significant correlation between scientific literacy and the ability to integrate learning Quran-based science. This result is also supported by the sig value (2-tailed) $0.000 < 0.05$.

Table 4. Correlation of the ability of *fiqh* insight, scientific literacy to the ability to develop an integrated learning on Quran-based science

<i>Fiqh</i> Science literacy Quran-based science				
<i>Fiqh</i>	Pearson correlation	1	.462**	.943**
	Sig. (2-tailed)		.000	.000
	N	150	150	150
Science literacy (SL)	Pearson correlation	.462**	1	.512**
	Sig. (2-tailed)	.000		.000
	N	150	150	150
Quran-based science	Pearson correlation	.943**	.512**	1
	Sig. (2-tailed)	.000	.000	
	N	150	150	150

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

Based on the ANOVA test (F_{test}) as shown in Table 5, it was found that the value of F_{cal} was $632.126 > F_{\text{table}} 3.91$ with a probability of 0.05. Thus, it can be understood that simultaneously the independent variables (*fiqh* and scientific literacy) affect the dependent variable (the ability to develop integrated learning, Quran-based science). These results are also supported by a sig. $0.00 < 0.05$, which means that the independent variables simultaneously influence the dependent variable significantly.

Tabel 5. ANOVA^b

Model	Sum of squares	df	Mean square	F	Sig.
1					
	Regression	54988.97	2	27494.48	632.12
	Residual	6393.80	147	43.49	
	Total	61382.77	149		

a. Predictors: (Constant), Science literacy, *fiqh*

b. Dependent Variable: Quran-based science

Table 1 shows that in general the ability of physics students of *fiqh* still needs to be developed continuously. This is intended as an effort to improve religious scholarship which is mandatory for all students in Islamic educational institutions to ensure that the development of integrated learning can run better. Besides, increasing the students' *fiqh* abilities can also encourage and improve a better understanding of Islam. This is because *fiqh* is essentially sharia in the form of rules or norms related to all aspects of a Muslim's life [66]. Besides, *fiqh* is practical (practice) in a physical form that continues to develop from time to time by human development itself so that the personality of a Muslim is often seen from his ability to apply the science of *fiqh*.

Fiqh as part of Islamic teachings must be studied by all Muslim, therefore the data above (Table 1) should be a trigger for Islamic education lecturers in Islamic education institutions to improve students' *fiqh* abilities. Several methods can be used to improve the ability of *fiqh*, for example by using certain methods. One of the methods suggested by experts in the sorongan method, with the sorongan method which can train students (santri) to be patient, diligent, skilled, and active in studying [67]. Besides, other researchers can also be used to improve students' *fiqh* skills, for example, the inquiry method. According to Efendi [68], the inquiry method can increase student motivation and achievement in learning of *fiqh*. Besides, efforts to increase the ability of *fiqh* can also be done by developing learning media that is by the characteristics of these materials. In general, learning media has a positive impact on student learning outcomes [69].

Regarding the scientific literacy abilities of physics education students, it can be seen that in general, scientific literacy skills are dominated by students with moderate scientific literacy skills, namely 45%. Students with high abilities were 28% and the rest (low category) was 26%. Thus, it can be understood that in general, the science literacy skills of physics *tadris* students are middle and above. However, scientific literacy tests are not only in the context of physics, but also in the context of biology, chemistry, and the environment in general, so it is only natural that there are still (26%) who have low scores. Thus, there is still a need for the development of scientific literacy skills for physics education students, especially for subjects related to science outside of physics, for example, Chemistry, Biology, and Mathematics.

According to some education experts, there are several strategies to improve scientific literacy skills. Krajcik and Sutherland [70] stated that students' scientific literacy can be developed by improving reading, writing, and oral communication skills. Science literacy, according to Holbrook and Rannikmae [71], and Turiman, *et al.* [72] can be developed, nurtured, and enhanced through natural science learning in schools. According to Dichev and Dicheva [73], data-based learning can also be used to improve scientific literacy skills. Some of the learning methods above need to be adapted by teachers and lecturers to improve student and student scientific literacy skills.

The data from the measurement of the ability to develop integrated learning tools, namely between science-physics and Islamic/*fiqh* values (Table 3) are not satisfactory. Table 3 shows that students with high abilities are 24.66% and 42% have moderate abilities and 33.33% are still low abilities. This data shows that there are still many physics students who do not yet have the ability to develop well-integrated learning tools, so concrete steps still need to be taken to improve these abilities. These data also show that efforts to remove the dichotomy of education still require a relatively long struggle. It is stated by experts in Islamic education from year to year. Hanifah [74] mentioned that the need for the Islamization of science. Chaeruddin [12], Hanifah [75], Istikomah [76] revealed that scientific integration is one way to remove the impression of a dichotomy. Even, Istikomah [77] stated that integration is an ideal concept in the Islamic education system.

Table 4 informs a significant correlation between the *fiqh* variable and the ability to integrate learning with the sig. value (2-tailed) $0.000 < 0.05$. The table shows that the correlation between scientific literacy and integration ability with the sig. value (2-tailed) $0.00 < 0.05$, which means that there is a significant correlation between scientific literacy and the ability to integrate learning tools. Besides, Table 5 describes that the value of F_{cal} was $632.126 > F_{table}$ 3.91 with a probability of 0.05. It means that simultaneously the independent variables (*fiqh* and scientific literacy) affect the dependent variable (the ability to develop integrated learning tools). Thus, it can also be understood that the three variables are closely related and influence each other. To increase the ability for developing integrated learning tools, it is necessary to have harmony between understandings Islamic values (*fiqh*) and science-physics in the form of scientific literacy.

Strategic steps are needed for improving the ability to integrate science for physics education students. Lecturers and students need to understand the ways and steps in integrating knowledge well and

systematically. According to Chaeruddin [12], integration efforts between science and religious values can be carried out by Islamization of science, Islamic science (adhering Quran and Sunnah as primary reference), and integrative-connective. Amin [78] stated that the relationship between Islamic sciences and the natural as well as social and cultural sciences requires an integrated-interconnected pattern of relationships and dialogue. For this reason, lecturers and students need to modify the lecture process in such a way as a real effort to improve students' abilities in developing integrated learning. The learning modification strategy has the opportunity to improve the scientific integration process [79].

5. CONCLUSION

This study concluded that there is a significant correlation between the ability of *fiqh* science, scientific literacy, and the ability to develop integrated learning Quran-based science physics students. Simultaneously, the independent variables (*fiqh* and scientific literacy) affect the dependent variable (the ability to develop integrated learning tools). Therefore, Islamic education lecturers in Islamic education institutions (including UIN STS Jambi) need to improve students' *fiqh* skills and scientific literacy. It is a real effort in increasing the ability to develop integrated learning.

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