ISLĀMIYYĀT 45(1) 2023: 253 - 262
(https://doi.org/10.17576/islamiyyat-2023-4501-21)

Science Teachers' Perspectives on the Integration of the Quran in Science Learning

Perspektif Guru Sains terhadap Pengintegrasian Al-Quran dalam Pembelajaran Sains

Fawarni Hj Ahmad[1] & Zanaton H. Iksan[1,*]

[1]Faculty of Education, Universiti Kebangsaan Malaysia, 43000 UKM Bangi Selangor

[*]Corresponding Author; email: zanaton.iksan@ukm.edu.my

Received: 9 March 2022 /Accepted: 9 June 2022

ABSTRACT

The integration of the knowledge in Quran and Science is significant and timely. The truth of Quran contents is proven by the phenomenon of Science. However, Science education in Malaysia which is too similar to Western learning style, focuses more on student achievement in examinations. Therefore, efforts to integrate Science and the Quran do not occur in formal teaching and learning activities in the classroom. Thus, this article discusses secondary school science teachers' perspectives on the Quran-integrated Science learning approach. This study uses qualitative design methodology by conducting interviews with four Science teachers at Sekolah Menengah Kebangsaan Agama (Tahfiz Model Ulul Albab) in Negeri Sembilan. Data analysis was performed using Atlas.ti software version 9. Thematic analysis method is used to analyze the data based on a fixed comparison of each study findings. The results of the interviews showed that apart from the Islamic vision of Science teachers who are excited to implement Al-Quran Integrated Science learning, there are 4 main factors that need to be examined namely (i) existing problems in the educational environment, (ii) lack of adequate knowledge and skills , (iii) suggestions on the need for tools to implement the integration of science with the Qur'an and (iv) the expectations of Science teachers on the integration of this revelation knowledge in the teaching of Science subjects. This study is expected to be a source of information to the drafters of the Science and revelation knowledge integrated curriculum which is believed to be able to produce generation of ulul albab students who are balanced in academic and spiritual aspects, especially for use in religious schools and Tahfiz Science.

Keywords: Science Integration; Tahfiz Ulul Albab Model; Science teacher perspective; Science problem integrated al-Quran

ABSTRAK

Pengintegrasian ilmu dalam al-Quran dan Sains adalah penting dan tepat pada masanya. Kebenaran kandungan al-Quran terbukti dengan fenomena Sains yang berlaku. Namun begitu, pendidikan Sains di Malaysia yang terlalu mirip dengan gaya pembelajaran Barat, lebih menumpukan pencapaian pelajar dalam peperiksaan menyebabkan usaha mengintegrasikan Sains dan al-Quran tidak berlaku dalam aktiviti pengajaran dan pembelajaran formal di dalam bilik darjah. Justeru, artikel ini membincangkan perspektif guru sains di sekolah menengah terhadap pendekatan pembelajaran Sains bersepadu al-Quran. Kajian ini menggunakan reka bentuk kualitatif sebagai metodologi dengan menjalankan temu bual dengan empat orang guru Sains di Sekolah Menengah Kebangsaan Agama (Tahfiz Model Ulul Albab) di Negeri Sembilan. Analisis data dilakukan menggunakan perisian Atlas.ti versi 9. Cara penganalisisan data adalah menggunakan kaedah analisis tematik berasaskan perbandingan tetap setiap dapatan kajian yang diperoleh. Hasil dapatan temubual menunjukkan selain daripada wawasan keislaman guru Sains yang teruja untuk melaksanakan pembelajaran Sains Bersepadu Al-Quran, terdapat 4 faktor utama yang perlu diteliti iaitu (i) masalah sedia ada yang berlaku dalam persekitaran pendidikan, (ii) kekurangan pengetahuan dan kemahiran yang mencukupi, (iii) cadangan tentang keperluan alat melaksanakan kesepaduan sains dengan al-Quran dan (iv) harapan guru Sains terhadap kesepaduan ilmu wahyu ini dalam pengajaran mata pelajaran Sains. Kajian ini diharapkan dapat menjadi

sumber maklumat kepada penggubal kurikulum Sains tentang kesepaduannya dengan ilmu wahyu yang diyakini mampu melahirkan generasi pelajar ulul albab yang seimbang dalam aspek akademik dan kerohanian khususnya bagi digunakan di sekolah agama dan Sains Tahfiz.

Kata kunci: Integrasi Sains; Model Tahfiz Ulul Albab; Perspektif guru Sains; Masalah sains bersepadu al-Quran

INTRODUCTION

Pelan Pembangunan Pendidikan Malaysia (2013-2025) contains six Student Aspirations: Knowledge, Thinking Skills, Leadership Skills, Bilingual Skills, Ethics and Spirituality and National Identity is formulated in coherence with the National Education Philosophy. The National Education Philosophy which was formally enacted and announced in 1988 is a consistent and continuous effort to build a nation-state that always lays the foundation for education starting with a strong belief in God. Through Student Aspirations it can be seen clearly that the students' learning process must be in line with the development of soft skills.

The practice of learning Science thoughtfully (Curriculum Development Division 2018) is a learning approach that consistently links the science skills learned with daily life. Thus, the establishment of Sekolah Menengah Kebangsaan Agama Tahfiz Model Ulul Albab (SMKA TMUA) which combines the Standard Secondary School Curriculum (KSSM) and the Integrated Curriculum Tahfiz (KBT) is seen as the best alternative done by the Ministry of Education Malaysia (MOE) towards realizing the desire to produce students who excelled in academics, personality and spirituality. Ideally, opportunities for learning Science using the Quranic approach can be implemented in the context of SMKA TMUA.

In this tahfiz science religious secondary school, the teachers are Muslim science teachers. Naturally, the Quran-integrated Science learning approach will not be a big issue or problem if implemented in this type of school. However, the teacher training and educational background of Science teachers who are not exposed to Quranic learning and skills such as comprehension and interpretation limit the ability to convey scientific phenomena related to the revelation knowledge. According to Zukhrufian (2017), the Islamic vision of these teachers who take the initiative in learning or referring to scientific materials either through books on Tauhidik Science, related articles or referring to experts such as ustaz or ustazah in school alone. The eye wants to show that there is a connection between what is taught in the Science subject with what is written in the Quran.

Thus, this study aims to examine in detail the perspectives and views of Science teachers who teach in national secondary schools of the religion tahfiz Ulul Albab model on the Quran-integrated approach to Science learning. The purpose was to discuss the perspectives of Science teachers in secondary schools on the Quran-integrated Science learning approach. The teachers' views on the effect of this learning approach on students who memorize 30 verses of the Qur'an is in line with the need to produce a generation of Ulul Albab who need guidance and exposure to the relationship between the phenomenon of Science and the Qur'an.

RESEARCH BACKGORUND

When the Ulul Albab program was first introduced in the education system in Malaysia, it has succeeded in convincing parents, regardless of whether they are professionals or the middle class. The characteristics of the curriculum approach and its unique purpose have attracted the interest of the community, so the demand for admission to this school has increased (Nor Adzimah et al. 2018). The uniqueness of the Ulul Albab program is seen in the Ulul Albab Model itself, which combines three main elements in its curriculum approach, namely Quranic, Ijtihadik and Encyclopedia (Figure 1).

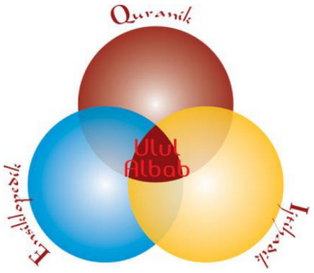

FIGURE 1. Ulul Albab Model
Source: Imtiaz Ulul Albab Melaka (2014)

According to Aini Aiziziah et al. (2018), the purpose of establishing Sekolah Menengah Kebangsaan Agama Tahfiz Model Ulul Albab (SMKA TMUA) is to produce capable students memorize 30

verses of the Quran referred to as Quranic. Skills to understand the contents of the Quran are also applied not just for memorization alone. A deep understanding of the knowledge of the Qur'an to make individuals capable of providing arguments (Hafizhah et al. 2022) and views on an issue based on the knowledge of revelation is also referred to as Ijtihadik. On the other hand, the encyclopedic is defined as an individual who has successfully mastered and practiced the knowledge and skills of the Qur'an and applied them to various other fields.

The Tahfiz Integrated Curriculum (KBT) conducted at SMKA TMUA combines the Tahfiz program with the Secondary School Standard Curriculum (KSSM). Thus, indirectly students in this type of school are no exception in following and learning other subject packages such as Language, Mathematics, Humanities, Technical and even Science. Generally, the learning process that the students in the school have to go through is twice as much as the students in the school that only runs KSSM or only one stream of Tahfiz.

Malaysia is also not left behind in providing an education system that is the best to prepare a generation of students to compete on the world stage of the Industrial Revolution 4.0 era. Science, Technology, Engineering and Mathematics (STEM) Education has been introduced to replace the Science stream starting in 2020 for the first cohort of students after the Approval of the National Curriculum Committee Meeting No.1/2019, which agreed to abolish the Science and Literature stream. This proves that students should be given equal opportunities and access to areas of knowledge or skills of interest.

Nevertheless, the advancement of various man-made technologies resulting from the STEM educational mold is seen to be an increasingly worrying phenomenon. In this regard, Mukri et al. (2019) mentioned that an Innovative disruption phenomenon when the Industrial Revolution 4.0 brought about major changes in employment. Humans are challenged by Artificial Intelligence and the creation of robots that are efficient in performing human tasks or jobs (Nur Mohd Iqzuan et al. 2021). A study conducted by Acemoglu and Restrepo (2020), stated that in theory, robots can reduce jobs and wages. The negative impact of the invention of robotics and its use is estimated to reduce the employment ratio of the population by 0.2% and wages by 0.42%, according to local industrial areas in the United States.

Looking at the above mentioned increasingly challenging scenario, an education system based on original and authentic resources is needed, especially to teach people about the limitations of Science. Tauhidic science education with electives is the best alternative in providing unique learning opportunities and an understanding of the nurturing of science, the limitations of science, the uniqueness of scientific thinking and the contribution of Muslims in the formation of modern science disciplines (Zainun et al. 2019). Through the integration of Science learning and knowledge of revelation will be able to guide human beings towards the greatness of Allah SWT as God. These also allowed human beings to learn and explore towards developing a modern but shariah-compliant technological life (Norain et al. 2020).

But the question is, are Science teachers in Malaysia, especially at SMKA TMUA, ready to take on another challenge in facing the current 4.0 industry revolution. Educating towards humanizing Science education and humanizing human beings is not an easy task and mounts its challenges. Sidek (2006) indicated that teachers' lack of the ability to rediscover an integrative knowledge system does not occur in a directed manner. This opinion has also been proven in previous studies that teachers are the key and determinant to the success of a curriculum. In Malaysia, Science teachers have followed the training and education phase in knowledge, scientific skills and pedagogy either in teacher education institutions (IPG), Public Institutes of Higher Learning (IPTA) or Private Institutes of Higher Learning (IPTS) but have not been exposed to the teaching of Science with the concept of Tauhidic Science.

The workload of science teachers is already evident and much discussed in related studies, especially in ensuring the performance of student achievement in examinations which is the main determinant of student achievement and development. As a result, teachers are motivated to emphasize on the goal of completing the syllabus of subjects that contain too much and burdensome learning content (Siti Suhaila et al. 2018). The skill factors of teachers especially teachers who are not religious and Quranic education options for example,–Science teachers greatly affect not only the intellectual development of students but also on the formation of their moral values and personality (Zurina & Ashraf 2022). The role as a communicator of facts related to natural phenomena and all related matters about human beings and life is among the essential duties of Science teachers. Many things learned in Science cannot be analyzed using sensory reasoning (Syafitri & Darmana 2018), which has to be explained through theories of Science, the

laws of Physics or illustrations that are all from the views and contributions of Western Scientists alone.

Thus, this study is a documentation that considers the personal views of Science teachers on the idea of a Quran-integrated Science learning approach. The perspective of Science teachers is very important based on their capacity as implementers and key leaders in the success of an integrated education system that integrates aqli and naqli knowledge specifically in achieving the target of producing a generation of Ulul Albab professionals and technocrats who think Scientifically, critically and innovatively based on the Quran that is valid and accurate.

METHODS

RESEARCH DESIGN

The design of this study used a descriptive qualitative study. According to Patton (1990), the design of this study can help researchers identify and obtain in-depth information in detail but can maintain its originality holistically. Yin (1994) also suggested that this qualitative approach allows researchers to see real situations of the activities that occurred, seen and experienced in a real atmosphere in the study area environment. Thus, this support the selection of semi structured interview techniques conducted in this study involving teachers who have taught science in religious secondary school. Referring to Ginsburg and Rhett (2003), qualitative research is useful for explaining what and how an issue occurs, adding to the researcher's knowledge of the issue under study, helping the researcher to develop and analyze findings from sources believed to be rich in data sources related to the field of study. In fact, by interviewing teachers on the issue of the separation Science knowledge and Quran has opened up opportunities for the teacher to give personal views based on meaningful experience. Repetition of the same study at different places using similar protocols aids validation and replication (Ginsburg & Rhett 2003).

PARTICIPANTS

In this study, participants were referred to as those who were asked to focus on facts based on interview questions that required a person to actively reconstruct the experience in the context in which they were (Seidman 1998). In a qualitative study, the number of participants is small, so to understand the phenomenon under study, participants must be purposeful and appropriate to be selected as study participants (Merriam, 2008). Purposive Sampling Methods or *purposive sampling* have been made based on the recommendations of Gay and Airasian (1996) that the study sample was selected for a specific purpose. Purposeful selection of study participants is also based on participant ability to convey information about a phenomenon holistically and meaningfully (Creswell, 1998; Mill & Airasian 2003; Seidman 1988). According to Fatimah et al. (2008), qualitative research samples differ from quantitative research because qualitative samples are purposefully selected. Based on that, the research subjects in this study were selected according to the criteria appropriate to the problems of this study. Among the criteria that have been set are as follows:

1. Involve Science teachers who teach at SMKA Tahfiz Model Ulul Albab who use the Integrated Curriculum (KBT) and adopt the program at Tahfiz Model Ulul Albab.
2. Form 3, 4 and 5 Science teachers who also have extensive experience in teaching Pure Science subjects such as Physics, Chemistry and Biology and have taught in two different curriculum settings, namely teaching students in regular schools and religious schools only.
3. Willingness to be a study participant and permission from the school management were also considerations.
4. Willingness to be a study participant.
5. The name of the Science teacher used in writing the findings of the study is a synonymous name of the study participants.

INTERVIEWS

Interviews are a method of data collection that involves the activity of a researcher asking questions to obtain the desired answers or responses from respondents or study participants (Robson 2002). In this study, the researcher used semi-structured interviews. The content of the interview protocol, including the explanations given, the selection and arrangement of the questions asked may change depending on the reaction and the appropriateness of the time when the interview was conducted. Although, the items in this interview protocol have gone through a qualitative expert validation process, there are times when researchers need to modify and add questions as needed (Robson 2002). Next, the researcher

transcribed the interview information, analyzed it by making interpretations, categorizing and constructing concepts. Subsequently, all the data that have been analyzed are read, reviewed and supported by two experts in the qualitative field involved in conducting the study of the integration of Science and the Quran. The researcher also emphasized validation by the study participants by giving the informants the opportunity to read and verify the transcripts of the interviews conducted to avoid any manipulative information. Researchers also used peer validity as a tool for the validity of the data that had been analyzed.

DATA ANALYSIS TECHNIQUES

The researcher requested the permission of the study participants to be interviewed and the interview was recorded. This study uses Atlas.ti version 9 program software to manage the data that has been collected by coding themes, categorizing and analyzing each data obtained. In addition, this continuous analysis can determine that the data to be collected next is not repeated. Information from the initial analysis process allows the researcher to avoid collecting the same data. This is beneficial in terms of time and energy costs. Data analysis done continuously throughout the data collection period has avoided the occurrence of data piles. Such a process allows the researcher to organize and store data systematically which will facilitate analysis after data collection.

RESULTS AND DISCUSSIONS

FINDINGS

This study identifies several problems and needs of teachers to implement integrated science learning of the Quran. These facts also lead to a discussion on the impact of the Quran-integrated Science learning approach if implemented. All Science teachers involved in this study agreed that the Quran-integrated Science learning approach is a very interesting, outstanding effort and should be carried out following with the characteristics of the Tahfiz Model Ulul Albab school. However, there are still some constraints faced by Science teachers, especially from the aspect of teaching implementation and delivery of the contents of the Qur'an related to Science facts. Each also provides views and suggestions on the needs of Science teachers to help implement Science learning integrated al-Quran. To facilitate understanding, Table 1 displays a summary of problems and suggestions based on the perspective of Science teachers in implementing integrated Science learning of the Quran.

TABLE 1. Summary of themes for views, problems and suggestion according to the perspective of science teachers to integrate Al-Quran integrated science learning

Category	Theme	Description
Perspective	Agree	Very interesting, indeed should be, very good, very important.
	Science of Quran integration	Interrelated, closely interrelated, science and religion separated,
	Understanding	Various interpretations, misinterpretation, do not refer to tafsir, can read the Quran but do not understand it
Problem	Time	Limited time
	Knowledge and Skills	No specific training for teacher, no knowledge and skills of interpreting the Qur'an, less skilled to relate the topic of Science to the Qur'an.
	Lack of confidence	Not sure right or wrong facts associated with Quranic verses.
Suggestion	Teaching and learning strategies	Module, collaborating with expert teachers in the field of al-Quran
Expectation	Impact on students	Strengthen understanding, cultivate piety, focus on goodness, excellent personality, balanced human being, preacher

Source: Science Teacher Interview

1. Perspective

The first theme begins with research findings on Science teachers 'personal views on implementing Quranic-integrated Science Learning. Among the views of the study participants on the concept of integration of Science and al-Quran are as follows;

"If *we look at the integration of Quranic verses in the study of Science, this is very good because this student when he studies Science so he can relate every event that happens or the scientific study done can be related to the Quranic verses that they have learn"* (Mrs. Amiza /TB /S1B).

"…*Regarding the approach of integrating Quranic verses in science, I think it is very good because we know that the Quran is the guide of our lives and what is contained in the Quran is all true and many scientific phenomena are described in al -Quran. So that's why when I was in the University, I really took this Science in Islam course. The reason is that I think it is very important for us to live our daily lives based on what is contained in the Quran"* (Mrs. Neisa/TB/S1C).

The results of the third and fourth Science teacher interviews also agreed that the Science learning approach of the integration of the Qur'an is very good because as a Muslim, it is necessary to know that the Qur'an was revealed to mankind through the Prophet Muhammad SAW as a guide to life. Through the Qur'an many phenomena of Science can be clearly understood because they are described in the Qur'an. Also, as a Muslim, we are convinced that the content in the Qur'an is valid and exists. Findings from the interview also stated that it is essential for people to live their daily lives based on the teachings of the Quran. Recognizing the importance, high motivation and interest can motivate an individual to take a course in Science in Islam while studying at the university level.

2. Problem

The second theme is about a problem or issue that faced by Science teachers to implement Science learning which applies the verses of the Quran to support the facts and phenomena of science that can relate to the Quran that follows the Science curriculum. Based on the analysis done, the researcher found that there are four problems that some of the main problems stated by all respondents of the study are involving issues of understanding of Quranic verses, time constraints, limited knowledge and skills of Science teachers in the Quran eventually lead to lack of confidence. Among the findings of the study that stated this lack of confidence are as follows;

"I *myself can read the Quran but we do not understand it. We have to refer to interpretation. So for those who are diligent, can know the meaning. How does he want anything to do with the Islamic phenomenon, Islamic knowledge and the world of science already exist. Only when those who do not want to refer to tafsir for example, they do not know that what they learn is actually written has been said by Allah SWT to His prophets. So that's the problem I see"* (Mr. Afif/TB/S2A).

"… *As a science teacher, I face a problem where there is a lack of understanding of the contents of the Qur'an itself which are interrelated or which are related to the topics or matters related to science itself. So, if we ourselves do not master the relevant contents of the Qur'an, then it is very unhelpful for us to implement this integration in a comprehensive way*" (Mr. Ros/ TB/S2D).

In addition, these Science teachers also stated that time constraints due to commitment to the existing field of work also made it difficult for them to prepare a single topic or Daily Teaching Plan (RPH) covering the topic of Science with the integration of Quranic verses. Mrs. Neisa's opinion on time constraints; "For *a teacher, it takes a long time to understand or relate the contents of the Qur'an to science learning. So it may be a constraint for teachers in a short period of time*" (Mrs. Neisa/TB/S2-1C). The same is true of the opinion of the first Science teacher by saying; " *In fact, to hold each of the science topics in line with the verses of the Qur'an at the beginning stage is quite time consuming as well"* (Mrs. Amiza/TB/S3B).

Another factor that is also considered ~~as~~ one of the constraints for Science teachers to succeed in this integrative learning approach is the factor of expertise or skills in Quranic knowledge. This includes problems such as lack of exposure either in training and courses related to the integration of Science knowledge with the Quran for Science teachers. Thus, Science teachers become less confident because they clearly understand that to relate Science facts and Qur'an verses is not something that is easy and cannot be done without getting confirmation from experts. Findings from the second interview; "… *The ability of a teacher is because we have been supplied or have been trained at the university especially related to the sciences that involve approaches that involve science only. We are not exposed to how science is related to our al-Quran for example"* (Mr. Afif/TB/S3-1A). Mr. Ros also agreed with Mr. Afif on the issue of Science teachers' expertise being limited to knowledge and skills only in their field. He stated; "… *So, if we ourselves do not master the relevant contents of the Qur'an, then it is very unhelpful that we implement this integration in a comprehensive way*" (Mr. Ros/TB/S2D).

3. Suggestion

The third theme of these findings is related to the main need in helping Science teachers to implement the Quran-integrated Science learning approach by considering the suggestions by Science teachers themselves. In the Integrated Curriculum Tahfiz (KBT), which runs the Ulul Albab Program is focused on two main goals. The Tahfiz Science Secondary School targets students who finish school after completing form five, have a Sijil Peperiksaan Malaysia (SPM) and Sijil Tahfiz. All respondents or informants involved in this study have agreed that a Science learning module that integrates the Quran should be developed. Some research findings related to the proposed module construction can be seen in the following statements;

"Preferably *we need to have a special module for example when we teach about the topic of reproduction or about the reproductive organs. So we can link directly about the reproduction of this aa surah ape verse to how much and how Allah made human beings or any application when we enter a topic based on science topics, he will come out the verses of the Qur'an related to each topic- the topic of science"* (Mrs. Amiza /TB /S3B).

"*… We develop a module, for example, just now, it will be easier than if we want to find it ourselves, it is really difficult. Because we each have our own expertise. So the field of science, his expertise is science. And the field of religion or tafsir al-quran is with its field. So, we sit at a table for us to discuss so that we can produce a reference module that teachers can use and also the use of our students*" (Mr. Afif/TB/S4A).

Among the findings of the study related to the collaborative proposal are;

"*… Gather those who understand the sciences of revelation together with possible scientists for the production of scientific reference materials related to the relationship or explanation of the Qur'an related to Science where this will be able to help us teachers- teachers, especially science teachers, as reference material in delivering pdpc to link between science and revelation"* (Mr. Ros/TB/S3D).

4. Expectation

The last theme is the personal expectation of Science teachers if this approach to learning Science integrated with the knowledge of revelation is implemented especially from the intended impact on students. Although the four Science teachers involved in this study gave views from quite different perspectives from each other, the findings of their interviews can be summarized to this approach can help in strengthening understanding, cultivating piety, encouraging good deeds, personality excellent and balanced human capital of achievement in academic and spiritual.

"*…The building of excellent personalities must actually be in line with their academic excellence. So when they become a leader of caliber one day so that he will all balance them between their personal formation with personality in line with their outstanding academic achievements"* (Mrs. Amiza/TB/S5B).

"*… We want to make sure that these students excel, not only excel in terms of education but also must excel in terms of personality, physical and mental as well"* (Mrs. Neisa/TB/S5C).

"*…Apart from working as professionals, maybe they can also play a role as a ustaz tahfiz, maybe they can also play a role other than the professional field, maybe they can also play a role in the field of dakwah. That is in the aspect of spreading Islam itself which we know needs arguments where these arguments especially scientific arguments may be able to help to help them carry out da'wah more effectively where these scientific arguments as mentioned in al-Quran we know is an argument or strength that can be used during preaching"* (Mr. Ros/TB/S5D).

DISCUSSIONS

The study of Mohamed Akhiruddin et al. (2017) showed that the integration of ilmu naqli and ilmu aqli allows students to relate the concepts learned in Chemistry with the Quran and Hadith. The finding coincides with the view of the study participants who stated that the learning of Science and the Quran are interrelated and should not be conducted separately. This further strengthens the views of Science teachers related to the Quran-integrated Science learning approach who agreed that its implementation is significant and brings many benefits. The whole process of learning and development of knowledge should not be separated from beliefs, whether spiritual, physical or mental (Norain et al. 2020).

According to (Aini Aziziah & Nor Hasniza 2018), Science teachers are almost unable to implement STEM Education and appreciation of the Quran due to the low level of knowledge of teachers in STEM itself and lack of knowledge in the field of the Quran who are unable to translate verses al -Quran to be associated with the facts of Science. This study also supports the view (Sayyidah et al. 2020) that teachers are not able to integrate knowledge due to a lack of experience in implementing it. In this study also found that Science teachers face major problems in terms of understanding the verses of the Qur'an to be associated with the Science topic to be taught. However, it cannot be considered as a weakness of Science teachers because it is apparent that the educational background of Science teachers is more focused on the field of Science and the lack

of exposure and pedagogical training on the concept of Tauhidic Science.

Apart from performing essential tasks, teachers are also burdened with other tasks that are more challenging and demand high commitment, especially in terms of time. Science teachers do not just impart knowledge of Science in lectures, but have to carry out science practical according to the syllabus. Numerous procedures such as marking each student's practical report, filling out assessment forms, and scoring also require a relatively long time constraining the preparation of Science teachers to plan or provide Quran-integrated teaching. This teacher workload is not only faced by Science teachers alone but also experienced by teachers of other subjects. Previous researchers have extensively studied issues related to the workload of teachers that already exist in the teaching profession. This study also supports the opinion (Manak & Farhana 2020) which states that the burden of teachers is increasing according to changes in standards made by the ministry from time to time. Thus proving that the workload of science teachers does not provide an opportunity for them to deliver Quranic-integrated science teaching in an organized and effectively. Not to mention the task of humanizing education in today's challenging era (Adlina et al. 2020). Teachers face the most difficult task when responsible for teaching basic knowledge and humanities skills especially those related to religious and spiritual practices together in harmonious and effective teaching of Science (Nik & Rabi'atul 2022).

The problems or constraints presented by the study participants can be considered as factors that have caused Science teachers to feel less motivated in implementing the Quran-integrated Science learning approach. Issues such as understanding the content of the Qur'an to be linked to the topic of teaching in Science cause teachers to be less confident for fear of translation distortion or inaccurate correlation. The findings of this study can be evidenced through studies conducted by (Nur Amelia & Lilia 2019) even in different contexts. Their analysis clearly shows that among the factors causing the implementation of STEM in education at a less encouraging level is because the teachers themselves are less confident to implement STEM elements due to lack of exposure in engineering for Science and Mathematics teachers. The same thing experienced by Science teachers to integrate the knowledge of revelation and the Quran in the teaching of Science also stems from the lack of specific exposure and educational background that is not from the field of the Quran.

In line with the findings of this study, one solution in addressing the issue of competence, workload, and time constraints of Science teachers in implementing this Quran-integrated Science learning approach is through the use of teaching and learning modules. According to Sidek (2019), the use of structured modules helps teachers plan the teaching of a topic through various activities to achieve several learning objectives. Russel (1974) also argues that a module is a teaching package related to a unit of subject concept. Thus, the focus on developing human beings through accurate and beneficial knowledge requires the cooperation of experts in the field of Quranic skills. A collaborative teaching and module construction process need to be done between Science teachers and teachers in the field of the Quran. This is evidenced through the agreement of all Science teachers regarding this collaboration. To realize the construction of this integrated module, cooperation between Science teachers and teachers who are experts in the field of the Quran is crucial. This coincides with the encouragement of cultivating the collaborative practice of "*Lesson Study"* which has long been introduced in the education system in Malaysia. (Zanaton et al. 2014) in their study found that teachers working together in developing lesson plans is a step to improve teachers' skills in terms of pedagogical skills and knowledge.

The culture and environment of religious secondary schools tahfiz model ulul albab such as the practice of reciting the Quran every morning, congregational Dhuha prayers, recitation of Yassin en masse, recitation of prayers and salawat either in the classroom or morning assembly are features of Islamic learning that have been implemented for so long (Norshariani et al. 2020). The idea to combine the learning of Science with the Qur'an is also acknowledged by (Harahap & Darmana 2020) that is through a spiritual approach in Chemistry/Science will not change the value of scientific knowledge but fill the gap in the aspect of increasing faith and piety. This study also found that the need for an integrative learning approach is one of the best initiatives in realizing the MOE's desire to develop the students' potential holistically. Learning that focuses on academic excellence in examinations alone cannot

guarantee a balanced student from the physical, mental, emotional and spiritual aspects. Sidek (2020) stressed that it is time to stop the education of dualism in the education of Muslims.

CONCLUSION

In conclusion, this study identifies a need to construct teaching and learning modules to assist Science teachers in implementing an integrated learning approach of the Quran. Problem factors that already exist are among the reasons for the emergence of the construction of modules with the concept of Tauhidic science. Limited skills in interpret and elaborate Quranic verses to be associated with the topic of Science, lack of confidence, less accurate arguments based on diverse understandings, and unskilled are among the most frequently raised problems. There is no preparation for basic training of Science teachers regarding the integration of both branches of Aqli and Naqli Knowledge and specialization only in the field of Science. The existing curriculum system also influences the issue of separation between Science and the Quran. All schools under the Ministry of Education Malaysia (MOE) are still subject to a uniform Science syllabus and the increased workload of Science teachers when STEM education has begun to be enforced. Therefore, the implementation of the learning of Science integrated al-Quran will only be realized when all related problems are appropriately addressed. The researcher hopes that further research aims to find intervention that may apply to all types of government schools in Malaysia if it does not disregard the rights of non-Muslim students in learning Science guided by the truth of the Qur'an, which has never been outdated.

ACKNOWLEDGEMENT

We would like to thank the Universiti Kebangsaan Malaysia for the financial support via the Grant: GG-2-22-003.

AUTHORS' CONTRIBUTION

Fawarni Hj Ahmad: as a writer and master student who conducts research, conducts studies, collecting data at the school level. Fawarni Hj Ahmad has also written the original draft, formed the research concept, gathered reference sources, reviewing and editing. Zanaton Hj. Iksan: as the supervisor who guides and reviews articles, reviews the final draft and corresponding author to ensures that the articles are resubmitted to the journal for publication. Both Fawarni Hj Ahmad and Zanaton Hj. Iksan contributed in terms of validity and review of findings. All authors have read and agreed to the published version of manuscript.

REFERENCES

Acemoglu, D., & Restrepo, P. 2020. Robots and jobs: Evidence from us labor markets. *Journal of Political Economy* 128(6): 2188–2244. DOI:https://doi.org/10.1086/705716

Adlina Abdul Kadir, Mohamad Khairi Hj. Othman & Mohd Kasri Saidon. 2020. Driving education in the era of the industrial 4.0: Implementation Islamic values and innovation in teaching at the institution of higher education. *ISLĀMIYYĀT* 42(Isu Khas) 2020: 13 - 20

Aini Aziziah Ramli & Nor Hasniza Ibrahim. 2018. Q-STEM Module promotes Al-Quran appreciation in teaching STEM. Proceedings - 2017 7th World Engineering Education Forum, WEEF 2017- In Conjunction with: 7th Regional Conference on Engineering Education and Research in Higher Education 2017, RCEE and RHEd 2017, 1st International STEAM Education Conference, STEAMEC 201: 623–627.

Aini Aziziah Ramli, Farawahida Mohd Yusof, Nor Hasniza Ibrahim & Johari Surif. 2018. Critical thinking from stem education and Al-Quran perspectives. *Journal of Engineering Science and Technology* 13 (Special Issue on ICITE 2018): 35–41.

Bahagian Pembangunan Kurikulum. 2018. Dokumen Standard Kurikulum Dan Pentaksiran Kimia Tingkatan 4 Dan 5. 182.

Cresswell, JW. 198. Qualitative Inquiry and Research Design Choosing among Five Traditions. California CA: Sage Publication.

Fatimah Idris, Aishah Rohani Nahar, Rashidah Begam O. A. Rajak, Rosinah Edinin, Sarimah Hj Awang & Suria Baba. 2008. Pensampelan dan kaedah kutipan data. Retrieved from http://researchipbmm2008.blogspot.com/2008/01/pensampelan-dan-kaedah-kutipan-data-html dalam Noraini Idris, Penyelidikan dalam pendidikan, Edisi ke 2, 2013: 129-130.

Gay, LR & Airasian, P. 2003. Educational Research: Competencies for analysis and application. New Jersey: Prentice-Hall

Ginsburg, A. & Rhett, N. 2003. Building a better body of evidence: New oppurtunities to strenghten evaluation utilization. *American Journal of Evaluation* 4(23): 45-76

Hafizhah Zulkifli, AB. Halim Tamuri & Nur Syazwani Abdul Hafidz. 2022. Teacher's evaluation of student progress in Islamic education using Hikmah pedagogy. *ISLĀMIYYĀT* 44(2): 137-147.

Harahap, A. & Darmana, A. 2020. Pembelajaran PBL menggunakan bahan ajar terintegrasi nilai spiritual untuk meningkatkan hasil belajar dan sikap spiritual. *Jurnal Inovasi Pembelajaran Kimia* 2(2): 64.

Manak Ek Klai & Farhana Kamarul Bahrin. 2020. Kesedaran tentang masalah kemurungan dalam kalangan guru. *Malaysian Journal of Society and Space* 16(4): 273–284.

Merriam, SB. 2001. Qualitative Research and Case Study Applications in Education. San Francisco: Jossey-Bass Pub.

Mohamed Akhiruddin Ibrahim, Afif Arifin, Latipah Mohd Noor & Siti Rubaini Mat. 2017. Naqli and aqli elements in the teaching and learning of chemistry course: A survey on tahmidi centre, Universiti Sains Islam Malaysia. *International E-Journal of Advances in Social Sciences* (3)9: 870-879.

Mukri, M., Faisal, Anwar, S. & Asriani. 2019. Quran-integrated science in the era of industrial revolution 4.0. *Journal of Physics: Conference Series*: 0–5.

Nik Md Saiful Azizi Nik Abdullah, Alwi Lubis & Rabi'atul Athirah Muhammad Isa. 2022. Exploring Teachers' Experience with Student Character Development: A Comparative Analysis. *ISLĀMIYYĀT* 44(1): 65 – 80.

Norain Azlan, Najah Nadiah Amran & Hamdi Ishak. 2020. Amalan Service-Learning berdasarkan falsafah dan matlamat pendidikan dalam Islam. *ISLĀMIYYĀT 42(2)*: 22-23.

Norshariani Abd Rahman, Fatin Nur Marhamah Zabidi & Lilia Halim. 2020. Integration of tauhidiq elements for environmental education from the teacher's perspectives. *Religions Special Issue Reflecting on Possibilities of Religious Education Research* 11(8): 394.

Nor Adzimah Subirin, Fathiyah Mohd Fakhruddin, Nor Hayati Alwi, Siti Suria Salim & Umi Kalthom Abdul Manaf. 2018. Ulul Albab generation: Roles of Ulul Albab teachers in Malaysian selected school. *International Journal of Academic Research in Business and Social Sciences* 7(14): 190–191.

Nur Amelia Adam & Lilia Halim. 2019. Cabaran pengintegrasian pendidikan STEM dalam kurikulum Malaysia. *Seminar Wacana Pendidikan* (September): 1–10.

Nur Mohd Iqzuan Samsudin, Asma Hakimah Ab. Halim & Rasyikah Md Khalid. 2021. Adakah kecerdasan buatan boleh berfungsi sebagai penasihat syariah? Analisis peranannya dalam sektor pasaran Modal Islam. *ISLĀMIYYĀT* 43(Isu Khas) 2021: 3 - 15

Patton, MQ. 1990. Qualitative evaluation and research methods (2nd ed.). Sage Publications, Inc.

Robson, C. 2002. Real World Research: A resource for social and practitioner -researchers (2nd ed). Oxford: Blackwell Publishers Ltd.

Sayyidah Nusaibah Mohd Salehudin & Zanaton H.Iksan. 2020. The integration of tawheed in the topic of Cell Structure and Organization in the I - Bio Module. Psychology and education 2021 58(2): 2507-25043.

Sidek Baba. 2006. Pendidikan Rabbani: Mengenal Allah Melalui Ilmu Dunia. Shah Alam : Karya Bestari Sdn. Bhd.

Sidek Baba. 2020. Ke Arah Pendidikan Ulul Albab. Selangor Darul Ehsan: MZ Edu Publications, 59-68.

Seidman, I. 1998. Interviewing as a Qualitative Research. New York: Teachers College Press

Siti Suhaila Ihwani, Ab Halim Tamuri & Zetty Nurzuliana Rashed. 2018. Cabaran guru Pendidikan Islam mengintegrasikan ilmu Sains dan Al-Quran dalam pengajaran Pendidikan Islam. *The Online Journal of Islamic Education* 6(2): 27–41.

Syafitri, A. & Darmana, A. 2018. Development of chemistry module integrated with Islamic values in thermochemistry and reaction rate for senior high school student. *Jurnal Pendidikan Kimia* 10: 418–423.

Yin, RK (1994). Case Study Research: Design and Methods. 2nd Edition. Thounsand Oaks: Sage Publications, Inc.

Zainun Mustafa, Nooraida Yakob & Zolkofli Awang. 2019. Ulasan komprehensif terhadap prinsip, matlamat dan pelaksanaan konsep pendidikan sains secara tauhidik dalam program Bioda'i. *Jurnal Hadhari* 11(2): 195–212.

Zanaton H Iksan, Aidah Abdul Kamim, Fariza Khalid, Effandi Zakaria, Rosseni Din, Md Yusof Daud, & Roslinda Rosli. (2014). Lesson Study (Jogyoukenyu): Kajian Perbandingan. The 4th International Conference on Learner Diversity (ICELD 2014), 271–278.

Zukhrufian, R. I. 2017. Persepsi guru Kimia tentang integrasi Islam dan Kimia. Tesis Sarjana Pendidikan, Fakultas Ilmu Tarbiyah dan Keguruan, Universitas Islam Negeri Syarif Hidayatullah.

Zurina Zakaria & Ashraf Ismail. 2022. Personality traits of Muslim teachers: A brief overview. *ISLĀMIYYĀT* 44(2) 2022: 123 – 135.