Pegem Journal of Education and Instruction, Vol. 14, No. 1 , 2024 (pp. 296-302)

RESEARCH ARTICLE WWW.PEGEGOG.NET

Student Perceptions of Science Learning at Tahfidz Boarding School

Yuniar Fahmi Lathif[1]*, Putut Marwoto[2], Endang Susilaningsih[3], Winarto[4], Sarwi[5]

[1-3,5]Semarang State University, Postgraduate of Science Education, Indonesia

[4]Peradaban State University, Brebes, Central Java, Indonesia

Abstract

This research aimed to investigate science learning in Tanfidz Boarding School. The focus of this research are: (1) Factors affecting students of a religious boarding school toward science learning, (2) Islamic boarding school students' perception and attitude toward science learning (value of science learning to religious boarding school students), (3) students' perception toward pleasant science learning. This was qualitative research. Method used in this research was phenomenology. Data collecting technique was an interview. Data analysis techniques applied were: collecting data, presenting data, and drawing conclusions. The results of this study were the school's vision and mission, parents, science teachers and religion teachers caused students to like or dislike science. Students assessed science as important because it was a provision to continue higher education, it was useful for carrying out daily activities, and it had historical considerations to restore the glory of Islam through science. Pleasant learning, creative packaging, being able to motivate, to connect science and religion, investigative activities, being humorous, being able to connect science with everyday life and to explain well were students' perceptions of a good teacher. The reasons students selected Tahfidz boarding school were the attitudes of science teachers, religion teachers, its school vision and mission, and attitudes of parents. Pleasant learning by a professional teacher was conducted by presenting creative learning, and having good emotional control. The implication of the results of this research is that the management of science learning in religious-based Islamic boarding schools needs to pay attention to the desires and needs of students in learning

Keywords: perception, students, science learning, Islamic boarding school

Introduction

Data from the Pew Research Center (2015) showed that Indonesia was a country with the largest Moslem population in the world with 209.12 people identifying themselves as Moslems or 87% of the total population. As a result, Islamic cultural values have a strong influence in the education sector. The development process of tahfidz boarding schools have increased sharply in terms of quantity, but they have not been matched with the expected quality such as creating graduates who are faithful and pious, and mastering science and technology. Efforts by Islamic scholars to integrate religion, science and technology is implemented by opening Islamic boarding schools or a pesantren. The developing process of pesantren-based junior high schools and Madrasah Tsanawiyah, religious schools managed by the Ministry of Religion, has increased tremendously in terms of quantity. However, it has not been matched with quality in accordance with the main objective of establishing a pesantren-based schools, namely creating graduates having strong faith and piety, and mastering science and technology. A strategy to eliminate the stigma that science and religion are incompatible is to integrate science with religion. Sarwi (2018) explains that the integration of Islamic science education means uniting Islamic values into science or other subjects so that they are perceived as an integrated part by students. The idea of Islamization of science emerging in the Islamic world has received serious attentions from the Indonesian government by developing a concept religion and science integration in Islamic universities, for examples are: a model of integration-interconnection of science (Abdullah, 2004), and an integration in the the "tree of knowledge" (Suprayogo, 2004). 2016). Nonetheless, the current integration discourse is still limited at the normative-philosophical level and it has not touched the empirical-implementation areas (Hanifah, 2020).

Science has a crucial role in the life of the 21st century, human beings activities are almost always related to the use and application of scientific concepts. Critical thinking skills are an important component of the XXI century (Kereluik et al., 2013). It makes critical thinking skills as one of the main goals in science education to face challenges in everyday life (Saido et al., 2015), and they have been considered as an

Corresponding Author e-mail: sarwi_dosen@mail.unnes.ac.id

http: //orcid.org/0000-0001-8772-2062.

How to cite this article: Lathif YF, Marwoto P, Susilaningsih E, Winarto (2024). Student Perceptions of Science Learning at Tahfidz Boarding School. Pegem Journal of Education and Instruction, Vol. 14, No. 1, 2024, 29 6-302

Source of support: Nil

Conflict of interest: None.

DOI: 10.47 750/pegegog.14.01.33

Received: 03.10.2022

Accepted: 25.12.2023 **Publication:** 01.01.2024

important attention by higher education institutions and the workforce (Liu et al., 2016). Thus, it can improve one's quality and logic (Dwyer & Walsh, 2019) in analyzing, assessing and generating solutions and arguments in solving problems (Scriven & Paul, 2013). Learning in the majority of Islamic boarding schools begins with selawat and uses nadzom or a special song with lyrics containing keywords of the material to be studied. Selawat is a praise addressed to the Prophet Muhammad and its practice is considered as is a worship drawing a Moslem closer to Allah similar to practicing pray (Aeni, 2014).

Research on student perceptions of learning practices was carried out by Novianti, & Syarkowi (2021) The conclusions obtained are satisfied with physics learning that is carried out boldly or distance learning in the new normal period of covid. Research by Rhmad and Badarudin (2022) students are satisfied with what is obtained from learning science. Ottoi, Har, Sari (2020) concluded that the teacher's attitude, especially in the pedagogic aspect, was basically good enough (positive), such as mastery of the material, delivery of the material and implementation of learning. But not all aspects are applied by science teachers. Arrafat, Ardiasnyah, and Atmojo (2021) students find it difficult with science learning that is carried out online. Science learning through online only using the whatsapp group to submit assignments and the youtube link makes it difficult for students to understand science learning online. Research on students' perceptions of science learning practices conducted by teachers is very important. The contribution of the results of this study provides important findings on the needs and desires of students in learning science in Islamic boarding schools. This research provides novelty, namely the needs and desires of students in learning science in the Islamic boarding school environment.

The condition of a learning environment greatly influences the success of the expected learning objectives (Aunurrahman, 2009). The stigma of science that has no connection with religion has developed since the XIII century which embraces the concept of epistemology of education with the idea of secularism between science and religion (Abraha in Abdullah, 2004; Gould et al., 2015. This study aimed to the purpose of this research is to find out the perceptions of science learning practices by teachers in schools in Islamic boarding schools. The research results namely the integration of science and Islam could manifest a complete understanding and it could improve student achievements in studying science and religion (Purwati et al., 2018; Zain & Vebrianto, 2017), make learning more meaningful (Baba et al. , 2015), and ease learning experience (Hoel, 2016). Science learning integrating with Islamic values and selawat needs to be combined with a learning approach orienting towards XXI century skills including STEM.

Science Learning at Tahfidz Boarding School

Indonesia as a country with Muslim majority population and the patterns of education is strongly influenced by Islamic culture, especially in pesantren-based schools. Learning in most of Islamic boarding schools begins with selawat and it implements nadzom (a special song) with lyrics containing keywords for the material to be studied. Selawat is a praise addressed to the Prophet Muhammad and salawat to the Prophet is considered as a worship drawing a Moslem closer to Allah like practicing zikr (Aeni, 2014). Nadzom in Islamic boarding schools learning has three main functions, namely entertainment, education and teaching, and spiritual function (Ulfa et al., 2019). Nadzom has an entertainment function because it has high literary value and it is always sung, either with or without music. It functions as an education and teaching tool because its contents contain educational values and scientific concepts. The integration of science and Islam is able to bring a complete understanding and to improve student achievements in studying science and religion (Purwati et al., 2018 ; Zain & Vebrianto, 2017), to make learning more meaningful (Baba et al., 2015), and to ease learning experience (Hoel, 2016). Nadzom has a spiritual function because it is used as teaching material or learning media for students (Muzakka, 1994). Sabki and Hardaker (2013) suggests a spiritual strategy in science learning by including important points contained in the Qur'an and hadith or Prophet Muhammad sayings and actions. This strategy directs students to connect the science they learn with the basic concepts of Islam. It is expected that students are able to correlate scientific material they learned in real life, to feel the meaning the material studied, and to apply it in various aspects of life (Sahlan, 2013; Zubaidah, 2016).

Isnawati (2012) and Purwati *et al* (2018) state that science learning integrated with Islamic values is able to improve student learning outcomes in madrasah tsanawiyah. The Qur'an and mathematical interconnection approach in learning has a positive impact on student learning outcomes (Mauluddiana, 2015). Learning science integrated with Islamic values provides opportunities for students to connect scientific knowledge with the concepts and experiences of students as Muslims. Secondary education (junior high school level) is the right time to include character education and belief in students that science and religion are an integral unit that cannot be separated from each other. Windyariani & Haq (2017) state that there are three strategies to integrate Islamic values in science learning.

1. Integrating subjects with religion through mapping (classification) of the Quran verses and hadith by selecting verses of the Qur'an and hadith in accordance with the learning materials. Then the teachers convey them to students about the relationship between the verses of the Qur'an and the hadith with the materials being studied.

For an example is a science teacher is going to explain heat material. He shows a verse from the Qur'an or a hadith that discusses heat.

2. Connecting each with Islamic values (Islamization). For an example is in the opening, a teacher says greetings, invites prayer, and always teaches to start each activity by reading basmalah.
3. Find the value contained in the Qur'an and hadith as further scientific evidence of scientific investigations. For an example is a teacher explains verses of the Qur'an and hadith about the dangers of environmental pollution. From these verses, students are invited to think, to reflect, and to make scientific works on environmental pollution materials. It can be in the form of writings about efforts to prevent pollution or making tools to overcome environmental pollution.

The Role of a Teacher in Science Learning

Science learning helps students to understand and to have investigating skills (making and answering scientific questions), to be able to communicate and to confirm scientific findings, the products needed to improve the wellbeing of productive citizens (Davies, 2011). Science learning requires a teacher able to conduct investigative learning by asking questions, building hypotheses, predicting results, designing an experiment, analyzing the data, and drawing conclusions (NRC, 1996). The teacher needs to be taught inquiry learning strategy by involving in an investigation and by broadening his or her understanding about scientific concepts they teach (McBride et al., 2004). The teacher has to be skillful in conducting inquiry-based learning and to understand scientific core concepts (Abd-El-Khalick et al., 2004). How science is taught depends on the teacher's understanding of the connection of those concepts with daily life (Kasandaa et al., 2005). An experimental activity in science learning based on daily activities supports students' mastery of scientific concepts (Hofstein & Kesner, 2006).

Lamb *et al.* (2011) argues that a teacher is one among many factors determining students' success in learning science. A teacher determines the success of a learning by creating a challenging and pleasant learning environment for students (Ambusaidi & Al-Balushi, 2012). The teacher also faces challenges, for examples: the lack of sufficient learning sources and ineffective application of a learning strategy. Difficulties faced by a teacher trigger students' learning failure and it brings out a view that science is a difficult subject (Unesco, 2010). Lukum (2015) argues that in general science teachers do not design science learning according to its main purposes resulting in failure of students' understanding of its concepts, and they do not pay enough attention to their psychological condition from the start until the end of a lesson. Thus, those make science learning not meaningful. Raharja and Retnowati (2013) reported low teachers' ability in implementing various approaches, media and learning sources; lack of teachers' ability to facilitate interactions between students and they could not maximize their students' involvement in learning. Science learning standards consist of: (1) inquiry-based learning, (2) guiding and facilitating learning activities, (3) assessment, (4) environmental development for learning, (5) creating a learning community, (6) planning and improving learning at school (NSES, 1996).

Method

This was qualitative research. Research method implemented was phenomenology. Creswell (2016) mentions that it is a type of research to explore and to understand meanings of individuals or a group of people's social problems. Moleong (2007) argues that phenomenology is a thinking view emphasizing on the focus of subjective human beings experiences and world interpretations. This research revealed students' perception toward science learning in an Islamic boarding school. Data collecting technique in this research was an interview Research instrument was in the form of a list of questions given to students as follows:

1) Why do you study at this boarding school?
2) What is your purpose for studying at this pesantren?
3) What are your future goals after finishing your study at this pesantren?
4) Do you agree with an opinion to separate religion and science? Please explain your answer!
5) What is your opinion on science learning?
6) Why do you study science?
7) How important is science to you? Please explain your answer!
8) What do make you like or dislike about science?
9) What is your favorite subject teacher? How does she or he teach?
10) How do a teacher explain science learning in a classroom?
11) Are science teachers in this pesantren pleasing?
12) How is a pleasing science teacher in your opinion?
13) Do teachers connect religion with science? How do they do that?
14) Do teachers conduct practicum in science learning? If yes, what is the material?
15) What do you feel about science learning in a classroom?

Data analysis technique was data reduction, data presentation, and verification (Miles & Huberman, 2014). The stages conducted were as follows: (a) creating an interview instrument; (b) conducting an interview with students; (c) conducting data analysis; (d) drawing conclusions. The subjects of this research were 60 respondents. The detailed respondents were as follows: 20 students from Al Hamidiyah

Pati Pesantren, 20 students from Yanbu'ul Qur'an Kudus Pesantren, and 20 students from Pesantren Salafiyah Kenda. This research was conducted from August to October 2021.

Results and Discussions

Findings were classified into three main aspects in accordance to factors affecting students' attitude selected as focus on this research: (1) factors affecting students' attitude of Islamic boarding schools toward science learning, (2) perception and attitude of students from pesantren toward science learning (values of science learning to students of a pesantren), (3) students' perception toward pleasant science learning (how is an ideal science teacher in students' opinion?). Each aspect then was distributed into sub-categories based on main elements on it appearing during an interview. The research results were presented as follows:

1. Factors affecting students' interest from pesantren (an Islamic boarding school)

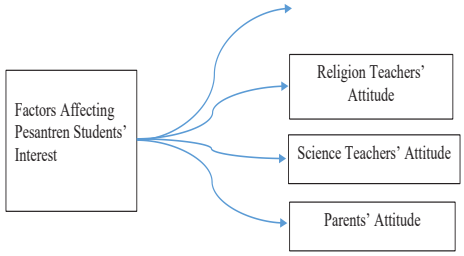


Fig.1: Factors affecting students' attitude toward science

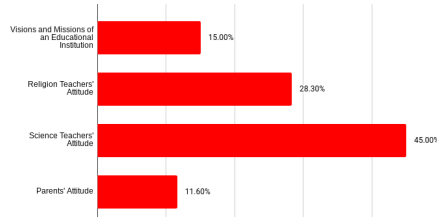


Fig. 2: Factors Affecting Pesantren Students' Attitude toward Science

2. Perception and Students' Attitude on Reasons Why Science Has to be Learned

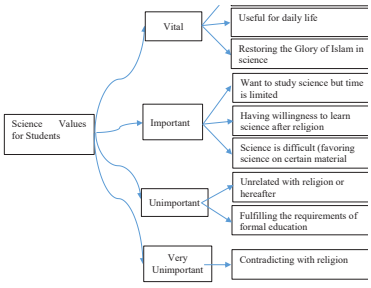


Fig .3: Perception of Pesantren Students on Reasons Why Science Needs to be Learned

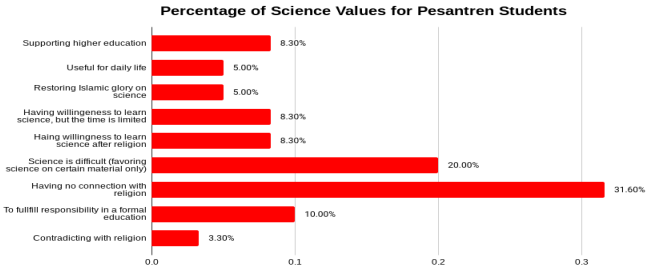


Fig. 4: Percentage of Pesantren Students' Perception on Reasons Why Science Have to be Learned

3. Students' Perception on Pleasant Science Learning (How an Ideal Science Teacher is according to Pesantren Students)

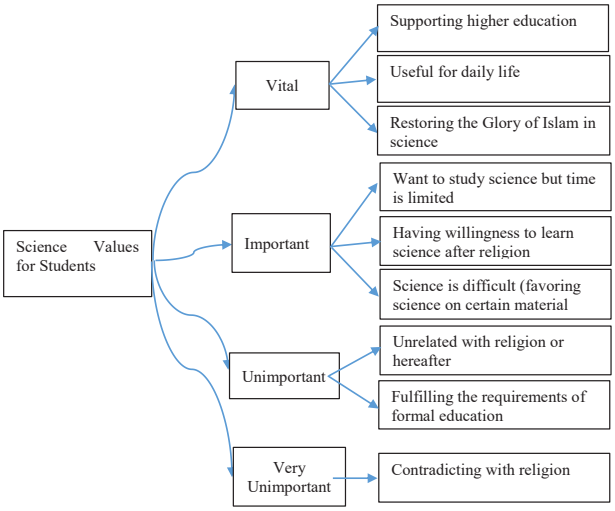
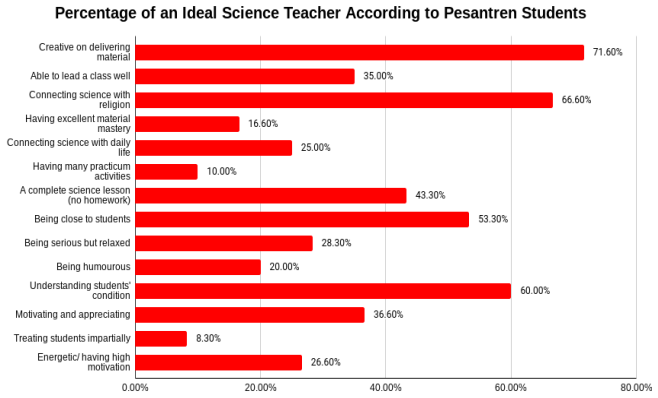


Fig. 5. Students' Perception on Pleasant Science Learning (How is an Ideal Science Teacher According to Pesantren Students)



Fig/ 6: Percentage of Students' Perception on Pleasant Science Learning (How is an Ideal Science Teacher According to Pesantren Students)

Discussions

Students' reasons for selecting tahfidz Islamic boarding schools were attitudes of science and religion teachers, schools visions and missions, and parents' attitude. Based on data collected, the role of a science teacher was crucial toward students' willingness to study in an Islamic boarding schools. The students considered learning science was important to be learned because it was a provision to pursue higher education, it was connected to daily life and Islamic religion, and they were motivated by Islamic figures inventing science concepts. However, the majority of students' responses considered that science was unrelated to religion. It was an evaluation to schools to deliver science learning and religion according to visions and missions of a religious school. Science teachers should be able to integrate science and Islam on the educational field. The results of this study are in line with the research of Novianti, & Syarkowi (2021); Badarudin (2022); Ottoi, Har, Sari (2020); . Arrafat, Ardiasnyah, and Atmojo (2021) students feel happy participating in learning if the teacher communicates well, uses experimental methods, uses multimedia, and provides examples in everyday life with what is learned, the teacher is able to motivate and there is humor in class. Novianti & Syarkowi (2021), namely success learning seen in student satisfaction in learning. Teachers are able to influence students' learning interest (Basa & Hudaidah, 2021) and have a communication style to influence student learning motivation (Fadhilah & Iqbal, 2021). Interesting, creative, fast-thinking, and precise teaching techniques carried out by the teacher are a way to increase students' interest in learning science (Fauziah et al., 2021).

Pleasant learning, being creative to deliver lessons, being able to motivate, to connect science and religion, investigative activities, be humorous, to connect science with daily life and to explain science concepts well were students' perception of an ideal teacher. Problems of science learning were from teachers' readiness. Yulaelawati (2000) mentioned problems in science education in Indonesia were incompetent science teachers, they were not able to scientific process in a classroom. Raharja and Retnowati (2013) reported that some of teachers' competency were low in conducting a lesson using various approaches, media and learning sources; lack of teachers' ability to facilitate interactions among students and it was not optimum to actively involve students in learning activities including their participation to explore broad information about material or topics being taught.

Regarding the understanding of science content and pedagogy based on the results of the initial competency test conducted by the Ministry of Education and Culture (2011), it was known that there were still many science teachers who did not meet the standards with low scores. Lamb et al. (2011) mentioned that many factors determine students' success in learning science, including the teacher. Learning that tends to convey informational knowledge only will produce students who can only know scientific information (Silk et al., 2009). Teachers as key figures in the classroom must be able to create a challenging and pleasant learning environment for students (Ambusaidi & Al-Balushi, 2012). Teachers also face various obstacles such as the availability of learning resources that are less supportive or the application of learning strategies that have not been effective. The difficulty experienced by teachers is the trigger for unsuccessful learning in students and it raises the view that science is a difficult subject (Unesco, 2010). Lukum (2015) argues that science teachers generally design science learning not in accordance with its nature resulting in misconceptions in students, and the teachers do not pay enough attention to the psychological state of the students from the opening to evaluation stage at the end of learning. As a result, science learning becomes less meaningful. Raharja and Retnowati (2013) reported that some teachers' abilities were still lacking in the implementation of learning, namely using various approaches, media and learning resources; the lack of teacher ability in facilitating interaction between students and less optimal of students active involvement in learning activities including students' participation in seeking extensive information about the material or topic being taught. Syamsuri (2010) mentioned that efforts to improve the quality of teachers by the Government were by providing services for examples: upgrading, training, workshops for teachers in some weeks. However, after they had finished the workshops and returned to schools, the teachers did not implement the knowledge to make learning effective. The results of this study have implications for the importance of teachers digging up information on students' needs and expectations when learning science. Islamic boarding schools have the advantage of increasing student motivation by connecting religion with science. On the other hand, the teacher's challenge is to increase student motivation because the learning load of students is more than that of other schools. Therefore, teachers must pay attention to the needs and expectations of students so that the learning they participate in is enjoyable.

Conclusions

Students' perceptions of science learning should be fun with lots of experimental activities, active teachers communicating, and connecting science and religion. In addition, students like it when there is humor in class.Pleasant and creative packaging of learning, being able to motivate, to connect science and religion, having investigative activities, being humorous, being able to connect science with everyday life and to explain learning material excellently were students' perceptions of ideal teachers. The reasons students selected Tahfidz boarding schools were the attitudes of science teachers, religion teachers,

the school's vision and mission, and the attitudes of parents. Based on the data collected, the role of science teachers was crucial for the willingness of students to attend Tahfidz boarding schools. The students consider science important to learn because it was necessary pursue higher education, it related to daily life and Islam, and they are motivated by Islamic scholars inventing the concepts of science.

Limitations and Future Research Suggestions

This research was conducted on 20 male students. If the number of research subjects is more, the information obtained will reveal more fully about students' perceptions of learning science at Islamic boarding schools. Suggestions for further research, increase the number of research subjects and female students.

Acknowledgment

Thank you to the principal of the Salafiyah Kendal junior high school, Al Muayyad Surakarta, and Tahfidz Yanbuul The Holy Quran which gives permission for data collection so that researchers can conduct research.

References

Abd-El-Khalick, F., Boujaoude, S., Duschl, R., Lederman, N. G., Mamlok-NaamanR., Hofstein, A., Niaz, M., Treagust, D., & Tuan, H. L. (2004). Inquiry in science education: International perspectives. Science Education, 88(3), 397–419. https://doi.org/10.1002/sce.10118

Abdullah, M. A. (2004). Integrasi Sains-Islam: Mempertemukan Epistemologi Islam dan Sains. Yogyakarta: Pilar Religia.

Aeni, A. N. (2014). Pendidikan Karakter Untuk Siswa SD dalam Perspektif Islam. Mimbar Sekolah Dasar.

Ambusaidi, A. K., & Al-Balushi, S. M. (2012). A Longitudinal Study to Identify Prospective Science Teachers' Beliefs about Science Teaching Using the Drawa-Science-Teacher-Test Checklist. International Journal of Environmental 68 JIPTEK, 15(1). doi: https://dx.doi.org/10.20961/jiptek.v15i1.65187 and Science Education,

Arrafat,R.A.N, Atmojo, I.R.W, Ardiansyah,W. 2021. Persepsi Peserta Didik Kelas IV SD Terhadap Pembelajaran IPA Daring Selama Masa Pandemi. Jurnal Pendidikan Ilmiah, 7(1):52-57

Aunurrahman. (2009). Belajar dan Pembelajaran. Bandung: Alfabeta.

Baba, S. B., Salleh, M. J., Zayed, T. M., & Harris, R. (2015). A Qur'anic Methodology for Integrating Knowledge and Education: Implications for Malaysia's Islamic Education Strategy. The American Journal of Islamic Social Sciences, 32(2), 1–27.

Basa, Z. A., & Hudaidah, H. (2021). Perkembangan Pembelajaran Daring terhadap Minat Belajar Matematika Siswa SMP pada Masa Pandemi COVID19. EDUKATIF: Jurnal Ilmu Pendidikan, 3(3), 943– 950.

Creswell, J. W. (2016). Research Design pendekatan kualitatif, kuantitatif, dan mixed. Terjemahan Achmad Fuwaid. Yogyakarta : Pustaka Pelajar.

Davies, M. (2011). Concept mapping, mind mapping and argument mapping: what are the differences and do they matter? 62(3), 279–301.

Dwyer, C. P., & Walsh, A. (2019). An Exploratory quantitative case study of critical thinking development throught adult distance learning. Educational Technology Research and Development, 68, 1–19.

Fadhilah, A. N., & Iqbal, F. (2021). Gaya Komunikasi Guru dan Motivasi Belajar Siswa pada Pembelajaran Daring di Masa Pandemi COVID-19. CARAKA: Indonesian Journal of Communication, 2(1), 43–56

Fauziah, P. I. N., Mansur, R., & Mustafida, F. (2021). Efektivitas Penggunaan Aplikasi Whatsapp Dalam Pembelajaran Daring Pada Mata Pelajaran Matematika Di Sdn Sumberagung 1 Kabupaten Kediri. JPMI: Jurnal Pendidikan Madrasah Ibtidaiyah, 3(2), 101–111

Gould, K., Sadera, W., & McNary, S. (2015). Comparing Changes in Content Knowledge Between Online ProBLem Based Learning and Traditional Instruction in Undergraduate Health Professional Students. MERLOT Journal of Online Learning and Teaching, 11(1), 74–86.

Hanifah. (2020). Musik Gambus : Bentuk Musik dan Nilai Pendidikan Karakter pada Proses Pembelajaran di Sanggar Al-Mubarok Kota Palembang. Universitas Negeri Semarang.

Hoel, N. (2016). Exploring Women's Madrasahs in South Africa: Implications for the Construction of Muslim Personhood and Religious Literacy. Religious Education, 111(1), 30–48.

Hofstein, A., & Kesner, M. (2006). Industrial Chemistry and School Chemistry: Making Chemistry Studies more Relevant. International Journal of Science Education, 28(9), 1017–1039.

Isnawati, D. (2012). Intergrasi-Interkoneksi Pembelajaran Pai Dan Mata Pelajaran Umu Pada Siswa Kelas Ii Di Sdit Sunan Averroes YogyakartA. Skripsi thesis, UIN SUNAN KALIJAGA YOGYAKARTA.

Kasandaa, C., Lubben, F., Gaoseba, N., Kandjeo-Marengaa, U., Kapendaa, H., & Campbell, B. (2005). The Role of Everyday Contexts in Learner-centred Teaching: The practice in Namibian secondary schools. International Journal of Science Education, 27(15), 1805–1823.

Kereluik, K., Mishra, P., & Fahnoe, C. Terry, L. (2013). What knowledge is of most worth: Teacher knowledge for 21st century learning. Journal of Digital Learning in Teacher Education, 29(4), 127–140.

Lamb, R.L., Anneta, L., Meldrum, J. and Vallet, D. (2011). Measuring science interest; Rasch Validation of the science interest survey. International journal of Science and Mathematics Education

Liu, O. L., L. Mao, L., Frankel, & Xu, J. (2016). Assessing Critical Thinking in Higher Education: The HEIghtenTM Approach and Preliminary Validity Evidence. Assessment and Evaluation in Higher Education, 41, 677–94.

Lukum, A. (2015). J. Penelit. dan Eval. Pendidik. 19(1), 25.

Mauluddiana, N. L. (2015). Pengaruh Pembelajaran dengan Pendekatan Interkoneksi Matematika -Al-Qur'an pada Ayat -Ayat Pilihan dengan Pokok Bahasan Himpunan terhadap Hasil Belajar Matematika Siswa Kelas VII MTs Al-Umron Bendosewu Kabupaten Blitar Tahun Pelajaran 2014/2015. Skripsi. Institut Agama Islam Negeri (IAIN) Tulungagung.

McBride, J. W., Bhatti, M. I., Hannan, M. A., & Feinberg, M. (2004). Using an inkuiri approach to teach science to secondary school science teachers. Physics Education, 39(5).

Miles, M. B., & Huberman, A. (2014). Qualitative Data Analysis, A Methods Sourcebook Edition 3. USA: Sage Publications. Terjemahan Tjetjep Rohindi Rohidi, UI-Press.

Moleong, L. J. (2006). Metodologi Penelitian Kualitatif. Bandung : PT Remaja Rosdakarya.

Muzakka, M. (1994). "Singiran: Sebuah Tradisi Sastra Pesantren" dalam Hayamwuruk. No. 2 Th. IX.

Novianti, R., & Syarkowi, A. (2021). Kepuasan Siswa Terhadap Pembelajaran Fisika di Era New Normal Covid-19. Journal of Natural Science and Integration, 4(2), 162–174.

NRC. (1996). National science education standard. Washington DC : National Academy Press.

Ottoi, K., Har,E., Sari, T.S. 2020. Persepsi Siswa Dalam Pembelajaran IPA Terhadap Sikap Guru Di Kelas VII SMP Negeri 2 Siberut Tengah, 8 (2): 1-12

Purwati, N., Zubaidah, S., Corebima, A. D., & Mahanal, S. (2018). Increasing Islamic junior high school students learning outcomes through integration of science learning and Islamic values. International Journal of Instruction, 11(4), 841–854.

Rachmat, Badaruddin,Z. (2022). Persepsi Siswa Terhadap Pembelajaran IPA Selama Masa Pandemik Covid-19 Di SMPN 12 Kota Kendari, Paedagoria : Jurnal Kajian, Penelitian dan Pengembangan Kependidikan, 13(1):27-34

Raharja, J. T., & Retnowati, T. H. (2013). valuasi Pelaksanan Pembelajaran Seni Budaya SMA di Kabupaten Lombok Timur, NTB. Jurnal Penelitian Dan Evaluasi Pendidikan, 17(2), 287–258.

Sabki, A. A., & Hardaker, G. (2013). The madrasah concept of Islamic pedagogy. Educational Review, 65(3), 342–356. doi: 10.1080/00131911.2012.668873

Sahlan, A. (2013). Pendidikan Karakter dalam Perspektif Islam (Kajian Penerapan Pendidikan Karakter di Lembaga Pendidikan Islam). Jurnal El-Hikmah Fakultas Tarbiyah UIN Malang Hal, 139–149.

Saido, G. M., Siraj, S., Nordin, A. B. B., & Amedy, A. (2015). Higher Order Thinking Skills Among Secondary School Students in Science Learning. The Malaysian Online Journal of Educational Science, 3(3), 13–20.

Sarwi. (2018). Integrasi sains islami bidang pendidikan membentuk karakter positif di era digital. Prosiding Seminar Nasional Pendidikan Fisika Fisika FITK UNSIQ, 1(1).

Scriven, M., & Paul, R. (2013). Defining Critical Thinking. http://www.criticalthinking.org/pages/defini ng-critical-thinking/410

Silk E M, Schunn, C D, S., & CM, T. (2009). J. Sci. Educ. Technol. 18(3), 209.

Suprayogo, I. (2006). Paradigma Pengembangan Keilmuan Islam Perspektif UIN Malang. Malang: UIN Malang Press.

Syamsuri I. (2010). Peningkatan Kompetensi Guru Untuk Meningkatkan Minat Siswa Pada Bidang MIPA.

Ulfa, S, N., & Sukmawati, I. (2019). The Effectivennes of Sociodrama Techniquea Group Settings to Improve the Prosocial Attitude of SMA Adabiah 2 Padang Students. Jurnal Neo Konseling, 1(4), 1–11.

Unesco. (2010). Current Challenges in Basic Science Education. Paris: Unesco Education Sector.

Windyariani, S., & Haq, A. M. . I. (2017). Contextual and integrated islamic values in biology learning : perspective of prespective teacher at muhammadiyah university. International Conference on Education, 1(1).

Zain, Z., & Vebrianto, R. (2017). Integrasi Keilmuan Sains dan Islam dalam Proses Pembelajaran Rumpun IPA. Seminar Nasional Teknologi Informasi, Komunikasi Dan Industri Fakultas Sains Dan Teknologi Ke 9, 703–708.

Zubaidah, S. (2016). Keterampilan abad Ke-21, Keterampilan yang diajarkan Melalui Pembelajaran. Artikel Seminar Nasional Pendidikan dengan tema"isu-isu strategis pembelajaran MIPA Abad 21, Program Studi Pendidikan BIologi STKIP Persada Khatulistiwa Sintang-Kalimantan Barat. 2.