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Strategy to Improve Student's Achievement in Science at Madrasah with Islamic Boarding School (Pesantren) whose Qur'an Memorization Program

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Abstract

The focus of learning in natural science at Madrasah has not received serious treatment by teachers and stakeholders of madrasah both in private and public madrasah, especially Madrasah with Islamic Boarding School (Pesantren) whose Qur'an Memorization Program, resulting in the scientific achievements of the students are not so satisfying. This study aims to provide an overview of the implementation of the achievement clinic strategy and its effect on the improvement of students' scientific achievements in excellent Madrasah with Islamic Boarding School (Pesantren) which has Qur'an Memorization Program in Kudus, Indonesia. The method used in this study is field research with a descriptive qualitative approach analysis. The data sources were from religion teachers, science teachers, research teachers, and science laboratory superintendents and students. Data collected include observations, interviews, and documentation. Furthermore, the data analysis technique covered six steps, such as preparing and processing data, reading the entire data, coding all the data, describing the type of data, presenting the data, and analyzing the data. The results showed that the implementation of the achievement clinic was carried out by using several steps: (1) the integration of science and religion learning; (2) the addition of research courses; (3) conducting structured and scheduled mentoring; (4) intensive deepening activity before the competition; and (5) complete learning and research infrastructure. The result shows that the achievement clinic strategy can increase the students' ability in science and lead, as well as enable several students to win science olympiads both at the national and international levels.

Keywords: *Madrasah, Islamic Boarding School, Qur'an Memorization, Mentoring, Achievement*

Abstrak

Pembelajaran IPA di Madrasah belum mendapatkan perhatian yang serius oleh para guru dan pemangku kepentingan madrasah baik di madrasah swasta maupun negeri, khususnya Madrasah Berpesantren yang menyelenggarakan Program Hafalan Al-Qur'an, sehingga prestasi akademik para siswanya kurang memuaskan. Penelitian ini bertujuan untuk memberikan gambaran tentang strategi pencapaian prestasi dan pengaruhnya terhadap peningkatan prestasi ilmiah siswa di Madrasah Berpesantren Unggul yang menyelenggarakan Program Hafalan Al-Qur'an di Kudus, Indonesia. Metode yang digunakan dalam penelitian ini adalah penelitian lapangan dengan pendekatan kualitatif deskriptif analisis. Sumber data berasal dari guru agama, guru IPA, guru peneliti, dan kepala laboratorium IPA serta siswa. Data yang dikumpulkan meliputi observasi, wawancara, dan dokumentasi. Selanjutnya, teknik analisis data meliputi enam langkah, yaitu menyiapkan dan mengolah data, membaca keseluruhan data, mengkodekan seluruh data, mendeskripsikan jenis data, menyajikan data, dan

menganalisis data. Hasil penelitian menunjukkan bahwa pelaksanaan klinik prestasi dilaksanakan dengan beberapa langkah yaitu: (1) pengintegrasian pembelajaran IPA dan agama; (2) penambahan mata kuliah penelitian; (3) melakukan pendampingan terstruktur dan terjadwal; (4) kegiatan pendalaman intensif menjelang perlombaan; dan (5) melengkapi sarana prasarana pembelajaran dan penelitian. Hasil penelitian menunjukkan bahwa strategi klinik prestasi dapat meningkatkan kemampuan siswa dalam bidang IPA dan berprestasi, serta mampu mengantarkan beberapa siswa menjuarai olimpiade IPA baik tingkat nasional maupun internasional. Kata Kunci: Madrasah, Pesantren, Hafalan Al-Qur'an, Pendampingan, dan Prestasi.

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INTRODUCTION

The 4.0 disruption era is well-known for the development of science and technology along with the digitalization in various services. Today's technology has significant implications for the digitalization of technology in all aspects of life. These conditions trigger the emergence of changes in the order and lifestyle of the younger generation who prefer to use digital technology in their life activities (Sari et al., 2020). The world of education, both at the elementary, junior high, middle, and tertiary levels, has opened up to this current progress. The use of digital technology in the digital world is the main characteristic for the educational response at this age. An educator, consequently, must always try to integrate the learning process with technology and act along with the change which is currently taking place (Krismadinata et al. 2020).

By being opened, educational institutions are able to accustomed towards the existing developments. By updating to the recent policies, adjusting to new standards on the technicalities of education policy, changing governance in the field is adapted to changes that occur. Thus, when the ability to adjust development is gained, educational institutions will lead the students to their success and achievement. For that purpose, one of the determining factors towards the success and achievement of students is the presence of a headmaster who has managerial skills, the implementation of learning supervision, the formation of school culture, and ability to increase the teacher performance (Ahmad & Ghavifekr, 2020).

Another determining factor for students'success is also the existence of student-centered learning innovations which can lead them to higher creativity and critical thinking. Some of the things that can be done in supporting this creativity are to use student-centered learning in each subject, especially STEM subjects (Science, Technology, Engineering, and Mathematics) (Theobald et al., 2020). To pursue student's achievement in technology, it is also necessary to involve the use of technology during the

learning process. Learning that comprises technology and traditional is known as blended learning. This model consists of various forms for instance like a rotational model which includes class rotation and laboratory rotation, a flex model where some meetings are carried out online, a self-blended model where the main learning is still carried out face-to-face while online learning is carried out to deepen and add material, and the enriched-virtual model where learning is mostly carried out online while face-to-face learning is only given as part of the experiencial lecture (Krismadinata et al., 2020).

The effort for the development of student achievement is carried out by establishing science and technology. Regularly, educational institutions are not accompanied by the integration between religion knowledge and science. Although there is a discussion, this is limited to as a belief and has not interfered the learning process of students (Marin & Lindeman, 2021). Integrating the values of religion knowledge and science is very important to develop the quality of students' religion with the existence of religion-integrated science learning. It has been proven that many people who are religious experts can master natural sciences or humanities (Zabidi, Abd Rahman, and Halim 2021).

Furthermore, the development of science and technology has not concerned much of the education world in madrasah and Islamic boarding schools, especially for Islamic boarding schools integrated with Qur'an memorization program. These institutions still hold on to the old tradition which are so far left from the touch of knowledge and technology in this era. Education in Islamic boarding schools prioritizes learning in ulum al-syar'i such as fiqh, jurisprudence proposals (Usul Fiqh), interpretation and memorization of the Qur'an.

Madrasah education in Indonesia only aims to shape the character of religion, while madrasah education in Malaysia has integrated religion knowledge and general education (Mas'ud et al., 2019). This system create the situation where madrasah and Islamic boarding schools are unable to keep up with the progressive developments. As a matter of fact, the study of science and religion will be the solution towards the existing problem. Thus, it is essential to integrate science learning and Islamic learning (Zabidi et al., 2021).

The development of science and technology is still considered apathetic by most Madrasah with Islamic Boarding School (Pesantren) whose Qur'an Memorization Program in Indonesia because the institution focuses more on learning the Islamic religion education. Meanwhile, state schools have lackness in Islamic religion learning. In spite of this, state schools must complement the integration between religion and science.

Religion is seen as an inseparable part of science and culture (Sumarni et al. 2020).

Madrasah and Islamic Boarding School must have open minded and keep up with the current science and technology development by paying special attention to mentoring the learning that has been done. Mentoring is believed to have the ability to improve the quality of learning and provide solutions on learning problems (Montgomery, 2017). Madrasah and Islamic boarding schools must remove the shackles of learning by conducting research activities. The research is carried out in a pleasant environment in order to increase students' research interest and equipping the infrastructure in learning science and technology also becomes vital. Infrastructure has a positive and significant impact on improving the quality of learning (Garad et al., 2021).

The purpose of this study is to enable Madrasah with Islamic Boarding School (Pesantren) whose Qur'an memorization program to acquire not only good competence and achievements in science but also mastery in Islamic religion knowledge and memorization of the Qur'an. This research specifically seeks to answer the following research questions: 1. What is the strategy for mentoring the learning in the integration of religion and science, 2. How to assist students in learning science, 3. How to assist students' research, 4. How to achieve the strategy of winning the Olympic Games, and 5. How are the infrastructures supporting student learning and research activities? For this reason, it is very important to do this research regarding Tahfiz Al-Quran based madrasah.

RESEARCH METHOD

The type of research in this thesis is a qualitative approach, namely a research method based on post-positivism philosophy, used to research natural object conditions, where the researcher is the key instrument, data collection techniques are carried out by triangulation (combined), data analysis is inductive/qualitative and qualitative research results emphasize meaning rather than generalization (Sugiyono, 2015: 9).

This research is in the form of qualitative research that aims to describe in detail the objective conditions of science learning in madrasah based on Islamic boarding schools memorizing the Qur'an in Kudus Indonesia. Researchers also use a descriptive approach to analysis, trying to provide an overview of the object under study through data or samples that have been collected as is, then the results of the research are processed, analyzed, and constructed to obtain hypotheses or theories.

The data collection method consists of interviews, observation, and document analysis. The data collected greatly influences the quality of the results, so this study uses strategic and important steps (Rina Febrian, 2019: 48). The data sources were taken from religion teacher, chemistry teacher, physics teacher, biology teacher, research teachers, science laboratory manager, and students memorizing the Qur'an in Kudus Indonesia.

This sample was taken because the achievements of the science studied are related to natural science and efforts to integrate religion and science. The data collected involved observations on the practice of mentoring science learning, research, and madrasah infrastructure, interviews conducted with religious teachers, science teachers, research teachers, and managers of science laboratories and students, and documentation for mentoring activities in madrasah and Islamic boarding schools.

Data analysis carried out in this study used two approaches, namely qualitative and quantitative approaches. The analysis used is interactive qualitative analysis, which consists of three activity streams, namely data reduction, data presentation, and drawing conclusions (Sugiyono, 2013: 404). The validity test of the data used triangulation for the source and the methods. The data analysis technique involved six steps; preparing and processing data, reading the entire data, coding all the data, describing the type of data, presenting the data, and analyzing the data.

RESULTS AND DISCUSSION

The data obtained in excellent madrasah which implement achievement clinical strategies as a way to guide students for scientific achievements are by conducting several steps such as integrating religion and science, assisting students in strengthening science learning, providing special strategies in science learning, providing reinforcement to student research, complementing the learning infrastructures, research activities on science and technology.

Integration of religion and science is conducted by presenting materials and theories about science and then connecting it with related verses in the Qur'an. The dialogue between science and religion will create a new model of diversity in the technological era to reconstruct methods of religion studies and scientific methodologies, (Taufiqurrahman et al., 2021). The implementation of the religion and science integration in learning can develop spiritual potential, intelligence, and morals (Fahyuni et al., 2020).

The steps taken in integrating religion and science learning in the Madrasah are carried out during the *halaqah* learning time where the Qur'an memorization is applied, and also in the class when one theory is explained, the science learning is integrated with particular verses in the Qur'an. For example when explaining the process of human creation, it is related to several verses of the Qur'an like in surah al-Mu'minun verses 12-14, surah al-Qiyamah verses 37-39, as well as in managing the environment which is associated with man's duties as khalifah (leader) on earth as explained in surah al-Baqarah verse 30. The existence of an integration strategy for learning Science and Religion can shape the character of religious students (Rahardjanto & Susilowati, 2018).

The next step is to provide mentoring in learning science materials. This assistance is executed for two hours at night time in the Islamic boarding school. The existence of mentoring on student learning can have a positive impact on improving the quality of students and help them to continue developing (Stoeger et al., 2021).

Mentoring can be done directly by the teacher or done by senior students. When mentoring is carried out by senior students, mentors and mentees experience a significant increase in competence (Opheim & Faye, 2021). Students who diligently receive a lot of mentoring will gain more experience and knowledge. In the learning process, mentoring strategies have an effect on students such as the existence of special learning motivation given by the teacher to them. By doing so, will increase the enthusiasm of students in learning and ultimately get maximum results. (Hariri et al., 2021).

Figure 1: Halaqah Tahfiz as a means of integration for religion and science at 16.00-17.00, 18.15-19.20, and 04.45-05.30 at Islamic Boarding School

Reinforcing student research activity which is conducted upon research subjects has the purpose to strengthen student science material. Madrasah is committed to strengthening the field of student research by declaring it as a research-based madrasah. Student research is very

necessary by considering several aspects, including the availability of a research-friendly environment, student research is intended for all levels of education and does not distinguish the gender of students. Student research gains a large place in madrasah based on Islamic boarding schools because of the sufficient time available (Rianawaty et al., 2021).

The implementation of research in the madrasah was carried out in six stages: 1), students look for ideas related to the material, 2), The idea with the research supervisor is consulted, 3), review of the students' ideas at the research teacher teaching team meeting, 4), is the determination of research supervisors, 5) is the implementation of research, 6), research reports. Research that is integrated with learning can improve student achievement. The combination of science and research materials adds to students' enthusiasm for researching. The habituation of research in students can create student enthusiasm for researching (Vereijken et al., 2018).

Science learning strategies before the competition is conducted. Innovation in learning strategies by integrating the structured and scheduled mentoring outside of class hours is conducted by deepening the special material on the theme for the science competition. Student-centered learning mentoring has a significant impact on student abilities and quality (Yaumi et al., 2018). Competition materials such as the Madrasah Science Competition (KSM) whichinclude Physics, Chemistry, Biology, Mathematics, Economics, and Geography. Structured mentoring strategies before the competition have a positive impact on students participating in these activities (Asyhar et al., 2021).

Completing the learning and research infrastructure based on the needsis addressed to support science learning & research activity in madrasah. One of the keys to success in learning science and producing smart and competitive students is the existence of adequate infrastructure which provides services for students' maximum achievement (Rianawaty et al., 2021).

Complete and various infrastructure facilities are highly necessary for learning needs, especially for the research process because research activities on one subject requires different tools compared to another one (Serrano, 2019). Infrastructure must be met in educational institutions which develop management like Learning Management Systems (LMSs). By using this system, all services depend on the infrastructure of information and communication technology (Aldiab et al., 2019).

CONCLUSION

After conducting the study on science learning innovations carried out in madrasahs based on the Qur'an memorization program by using the achievement clinical strategy to guide students in order to be excellent and outstanding achievers, it can be concluded that this is all done by studying the integration of religion and science through memorization of the Qur'an and providing explanations for science material integrated with verses of the Qur'an, assisting in science learning intensively, providing reinforcement in the field of scientific research, conducting special mentoring before the science olympiad, and completing the infrastructure for learning activities and researching science. By doing some of these activities, the students are led to excel in the fields of religion and science and gain great achievements both at the national and international levels.

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