



Analyze the Implementation of the Curriculum 2013 in the Virtual Biology Learning Process for Teachers at a Madrasah Aliyah

Analisis Implementasi Kurikulum 2013 Dalam Proses Pembelajaran Biologi Pada Masa Pandemi Covid-19 Bagi Guru Madrasah Aliyah

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Abstract

Implementing virtual learning using technology media is changes. This is a challenge for Biology teachers, especially in implementing the curriculum 2013. This study analyzed the implementation of the curriculum 2013 in the virtual biology learning process for teachers at a Madrasah Aliyah in Labuhan Batu Regency, North Sumatra. The method used is the descriptive qualitative with subjects in this study were biology teachers who were selected by purposive sampling. Data were collected through interviews and observations. The collected data were then analyzed using the Miles and Huberman model. The results show that the implementation of the curriculum 2013 in the biology learning process during the Covid-19 pandemic has not been maximized. Teachers still experience obstacles in making and implementing RPP activities in online learning. As a result, learning activities are only centered on the teacher.

Keywords: *Biology Learning; Covid-19 Pandemic; Curriculum 2013 Implementation.*

Abstrak

Penggunaan media teknologi dalam pembelajaran berkembang dengan pesat. Hal ini menjadi tantangan bagi guru Biologi khususnya dalam mengimplementasikan kurikulum 2013. Penelitian ini menganalisis implementasi kurikulum 2013 dalam pembelajaran Biologi secara virtual di salah satu Madrasah Aliyah Swasta di Kabupaten Labuhan Batu Sumatera Utara. Metode yang digunakan adalah kualitatif deksriptif dengan subjek penelitian guru Biologi yang dipilih secara purposive sampling. Data dikumpulkan melalui wawancara dan observasi, kemudian dianalisis menggunakan model Miles dan Huberman. Hasil penelitian menunjukkan implementasi kurikulum 2013 dalam proses pembelajaran Biologi di masa pandemi Covid-19 belum maksimal. Guru masih mengalami hambatan dalam membuat dan melaksanakan kegiatan RPP secara daring. Akibatnya, kegiatan pembelajaran hanya terpusat kepada guru.

Kata Kunci: *Implementasi Kurikulum 2013; Pandemi Covid-19; Pembelajaran Biologi.*

Introduction

Education is a conscious effort carried out in a structured manner that aims to develop students' potential both cognitively and other skills. Both teachers and educators in schools realize these goals. The curriculum currently used in the learning process in Indonesia is the curriculum 2013. The curriculum 2013 is an effort to improve the quality of education in Indonesia so that it can have graduates who are productive, creative, and also innovative ¹. The curriculum 2013 focuses on developing and improving students' soft skills and hard skills so that it has three main aspects to be developed, namely the aspects of attitudes, knowledge and skills ².

In contrast to the previous curriculum which emphasizes the aspects of knowledge and skills, the curriculum 2013 has aspects that are as important as knowledge and skills, namely the attitude aspect ³. So that a renewal was carried out in the learning process where it is important to balance aspects of attitude, knowledge, and skills to be possessed by students, so that students were prepared to become individuals who have potential and have good attitudes ⁴.

The success of the curriculum also depends on the creativity and activities of teachers in realizing the curriculum. Therefore, teachers are required to be able to carry out learning in accordance with predetermined process standards ⁵. The teacher as manager of instruction, means that the teacher plays a role in being able to increase student motivation to learn. The

¹ Suci Rakhmawati et al., "Analysis of curriculum 2013 Implementation in terms of Process Standards in Class X Biology Learning at Sma Negeri 1 Krangkeng," *Scientiae Educatia: Journal of Science and Science Education* 5, no. 2 (2016): 156–64.

² As Tsaniyah Putri Aisyiyah and A Amrizal, "Application of the Scientific Approach in High School Biology Learning," *Journal of Pelita Pendidikan* 8, no. 4 (2020): 215–23, <https://doi.org/10.24114/jpp.v8i4.20856>; Hari Setiadi, "Implementation of Assessment in the curriculum 2013," *Journal of Educational Research and Evaluation* 20, no. 2 (2016): 166–78, <https://doi.org/10.21831/pep.v20i2.7173>.

³ Agus Purnomo et al., "Development of Applications for Attitude and Knowledge Assessment at Elementary School Levels Based on the curriculum 2013," *Symmetrical: Journal of Mechanical Engineering, Electrical and Computer Science* 10, no. 1 (2019): 47–56, <https://doi.org/10.24176/simet.v10i1.2719>; Otang Kurniaman and Eddy Noviana, "Implementation of the curriculum 2013 in Improving Skills, Attitudes, and Knowledge," *Primary: Journal of Elementary School Teacher Education* 6, no. 2 (2017): 389, <https://doi.org/10.33578/jpkip.v6i2.4520>.

⁴ Nurjannah, A. (2019). curriculum 2013-Based Attitude Assessment in Junior High Schools. *Journal of Tarbiyah Islamiyah*. 4(1), 33-42.

⁵ Komara Nur Ikhsan and Supian Hadi, "Implementation and Development of curriculum 2013," *Journal of Education (Economy, Education and Accounting)*, 2018, <https://doi.org/10.25157/je.v6i1.1682>; Rakhmawati et al., "Analysis of curriculum 2013 Implementation in terms of Process Standards in Class X Biology Learning at Sma Negeri 1 Krangkeng."

teacher also plays a role in continuously following student learning outcomes that have been achieved by students from time to time ⁶.

Education is one aspect that has had a significant impact on the Covid-19 pandemic ⁷. The quality of education is currently facing challenges, so the government has a policy issues that learning activities can still be carried out in the midst of the outbreak of the Covid-19 virus by conducting distance learning, this is in accordance with the government's policy for social distancing ⁸, so that learning that was originally done by face-to-face in schools turned into online learning ⁹.

Along with current technological developments, education is experiencing very rapid changes and developments in the use of technology during the learning process, by carrying out virtual or online learning using supportive technology. One of them are the use of smartphones or laptops ¹⁰. The application of online learning is an educational innovation in responding to the challenges of the availability of varied learning resources. Online learning is a learning process in which teachers and students interact virtually through applications such as *Google Classroom*, video conferences, *Whatsapp Groups*, *Line Groups* and other applications ¹¹.

Teachers are required to be able to provide creative and innovative to create student learning motivation, so that students can understand the material being taught and can achieve learning objectives ¹². The advantage of online learning is that it allows virtual interactions by utilizing the internet

⁶Askhabul Kirom, "The Role of Teachers and Students in the Learning Process," Al Murabbi 3, no. 1 (2017): 69–80, <http://jurnal.yudharta.ac.id/v2/index.php/pai/article/view/893>.

⁷ Fakhri Ramadhani, "Application of Project Based Learning Models to Improve Science Learning Outcomes in Online Learning in Class IX SMP," Journal of Pelita Pendidikan 8, no. 4 (2020): 237–43.

⁸ Adhetya Cahyani, Iin Diah Listiana, and Sari Puteri Deta Larasati, "Learning Motivation of High School Students in Online Learning During the Covid-19 Pandemic," IQ (Al-Qur'an Science): Journal of Islamic Education 3, no. 01 (2020): 123–40, <https://doi.org/10.37542/iq.v3i01.57>.

⁹ Edgar John Sintema, "Effect of COVID-19 on the Performance of Grade 12 Students: Implications for STEM Education," Eurasia Journal of Mathematics, Science and Technology Education 16, no. 7 (2020): 1–6, <https://doi.org/10.29333/EJMSTE/7893>; Dede Rahmat Hidayat et al., "Learning Independence of Students in Online Learning During the Covid-19 Pandemic," Educational Science Perspective 34, no. 2 (2020): 147–54, <https://doi.org/10.21009/pip.342.9>.

¹⁰ Irwandi and Lusilawat, "Effectiveness of Online Learning Through Whatsapp on Interests and Learning Outcomes of Biology," BIOEDUSAINS: Journal of Biology and Science Education 4, no. 2 (2021): 166–74.

¹¹ Wahyu Aji Fatma Dewi, "Impact of COVID-19 on the Implementation of Online Learning in Elementary Schools," Educational: Jurnal Ilmu Pendidikan 2, no. 1 (2020): 55–61, <https://doi.org/10.31004/edukatif.v2i1.89>.

¹² Mia Aina et al., "Motivation of Biology Learning of High School Students in Online Learning During the Covid-19 Pandemic," Journal of Biology Education Research 2, no. 1 (2021): 1–12.

network that can be accessed anytime and anywhere, so that students can still get learning at home ¹³.

The implementation of online learning allows students to trigger the emergence of independent learning and encourage students to be more active in accessing learning ¹⁴. The important thing is the quality of the internet network, online learning applications, communication tools used such as cellphones or laptops, and also internet quota ¹⁵.

The application of Biology learning by implementing the demands of the curriculum 2013 during the Covid-19 pandemic has become a new challenge for Biology teachers. During online learning, teachers are not prepared to implement the curriculum 2013. Based on a survey was conducted on December 3, 2021, it was found that teachers had implemented the curriculum 2013, but teachers had not implemented it optimally. Teachers in implementing the curriculum 2013 are still not as expected, especially in the problem of the online learning process which is still focused only on providing material via *WhatsApp Groups*. Moreover, this research describes how the implementation process of curriculum 2013 carried out boldly by Madrasah Aliyah teachers in teaching Biology.

Method

This research was conducted in one of the private Madrasah Aliyah in Labuhan Batu Regency, North Sumatra. This research is a descriptive qualitative research that interprets the implementation of the curriculum 2013 in Biology learning found in the field ¹⁶. The aspects assessed in this research are preliminary activities and core activities. The subjects in this study were Biology teachers which consisted of 3 people. This research was conducted from October 2021 to January 2022. The sampling technique was carried out by purposive sampling. Data were collected through interviews and observations made to research subjects to obtain information about the implementation of the curriculum 2013 in learning Biology. The data analysis technique used is the Miles and model *Huberman* consisting of (1) data reduction, as the process of selecting and transforming the implementation of the curriculum 2013 in learning Biology; (2) presentation of data in the form

¹³ Ali Sadikin and Afreni Hamidah, "Online Learning Amid the Covid-19 Outbreak," *Biodik* 6, no. 2 (2020): 109–19, <https://doi.org/10.22437/bio.v6i2.9759>.

¹⁴ Firman Firman and Sari Rahayu, "Online Learning Amid the Covid-19 Pandemic," *Indonesian Journal of Educational Science (IJES)* 2, no. 2 (2020): 81–89, <https://doi.org/10.31605/ijes.v2i2.659>.

¹⁵ Agusmanto Hutauruk and Ropinus Sidabutar, "Online Learning Constraints During a Pandemic Among Mathematics Education Students: A Descriptive Qualitative Study," *Journal of Mathematics Education and Applied* 02, no. 01 (2020): 45–51.

¹⁶ Rakhmawati et al., "Analysis of curriculum 2013 Implementation in terms of Process Standards in Class X Biology Learning at Sma Negeri 1 Krangkeng."

of a narrative based on the results obtained in the study; (3) verification, by drawing conclusions about the implementation of the curriculum 2013 in learning Biology ¹⁷.

Results and Discussion

The interview with one of the biology teachers said that the curriculum is a guide for education, especially for Madrasah Aliyah. This shows that the biology teacher has understood the importance of the curriculum in the world of education, especially in learning activities. In the world of education, the curriculum is very important because without the right curriculum, students will not be able to obtain appropriate learning targets. Without a curriculum, the educational process will not be well directed. The curriculum must be able to provide space for students to develop skills and provide assistance to special issues experienced by students ¹⁸.

Based on information from the teacher, one of the Madrasah Aliyah in Labuhan Batu Regency, North Sumatra already has graduate competency standards that cover 3 aspects, called attitudes, knowledge and skills. In terms of attitudes, students are expected to have behaviors that reflect the attitudes of believers, have noble character, are confident, and are responsible for interacting effectively in the social and social environment and place themselves as a reflection of the nation in the association of the world. In terms of knowledge, students are expected to have factual, conceptual, procedural, and metacognitive knowledge in science, technology, art, and culture with insight into humanity, nationality, state, and civilization related to the causes and impacts of phenomena and events. Meanwhile, in terms of skills, students are expected to have the ability to think and act effectively and creatively in the abstract and concrete as the development of something learned in school independently. This finding is in accordance with the description in Article 35 of Law Number 20 of 2003 which states that Graduate Standards Competency are qualifications of graduate abilities which include the attitudes, knowledge and skills of students obtained from a primary and secondary education unit.

The implementation of the curriculum 2013 in Biology is still not running smoothly. This is revealed from the results of interviews with Biology teachers who stated that teachers encountered problems in preparing RPP due to the lack of supporting facilities and infrastructure for

¹⁷Wardinsen Situmorang, Ashar Hasairin, and Linda Seri Murni, "Jurnal Pelita Pendidikan," *Journal of Pelita Pendidikan* 7, no. 1 (2019): 23–27.

¹⁸ Liz Thomas, "Chapter 9 - Developing Inclusive Learning to Improve the Engagement, Belonging, Retention, and Success of Students from Diverse Groups," in *Widening Higher Education Participation*, ed. Mahsood Shah, Anna Bennett, and Erica Southgate (Chandos Publishing, 2016), 135–59, <https://doi.org/10.1016/B978-0-08-100213-1.00009-3>.

making RPP, especially books based on the curriculum 2013. As a result, teachers still use RPP from colleagues who work in other schools with the same major and from several sources on the internet. Teachers still do not understand the objectives of the curriculum 2013 and the scientific approach because of the limited education and training that is followed in this regard.

The RPP that has been made by the teacher has no information about what method is used. The formulation of learning objectives and learning indicators does not contain all the important points that will be achieved by students. The lesson plans that have been made consist of school identity, subject, class/semester, and time allocation. Basic Competencies are only written in the form of numbers. There are already materials, learning objectives, and learning steps consisting of media and tools, introduction, core, closing. The assessment written in the lesson plan consists of an assessment of attitudes, knowledge and skills. The format of the RPP made by the teacher does not refer to Permendikbud No 22 of 2016 concerning the components of the curriculum 2013 RPP which consists of 1) school identity, 2) subjects, 3) classes/semesters, 4) subject matter, 5) time allocation ¹⁹.

Furthermore, in the preliminary activities in the lesson plans used by the teacher, there is no greeting. However, in the core activities it is good, which consists of (1). Literacy activities are activities where students are given motivation and guidance to see, observe, read and rewrite them. They are given impressions and reading materials related to the material being studied. (2). Critical thinking, namely teacher activities provide opportunities for students to identify as many things as possible that have not been understood. (3). Collaboration is an activity to form students in several groups to discuss the material. (4). Communication is the activity of students presenting the results of their work. (5). Creativity is the activity of teachers and students making conclusions about the things that have been learned.

In practice, teachers still have difficulty in implementing the lesson plans that have been made. Moreover, the learning activities carried out are online learning while they still used the lesson plans when face to face in class. Teachers still rarely give appercations about the material taught to the students and at the end of the activity, the teacher does not give the assignment either individually or in groups. Teachers are also still glued to books as a learning resource, without using technology that support the learning being carried out. The curriculum 2013 requires teachers to be skilled and creative in using technology in the learning process ²⁰.

¹⁹Putri, V.a. (2016). Quality of curriculum 2013 Learning Implementation Plans 1-13

²⁰ Fawziah Zahrawati and Andi Nur Ramadani, "The Problems of Implementing the curriculum 2013 on the Learning Process During the Covid-19 Pandemic," *Bidayatuna Journal of Teacher Education Mandrasah Ibtidaiyah* 4, no. 1 (February 6, 2021): 75–88, <https://www.iaisyarifuddin.ac.id/ejournal/index.php/bidayatuna/article/view/901>.

The core activities that have been well designed by the teachers in the lesson plans have not been successfully implemented. The teacher provides teaching materials to students by sending photos of the material via *Whatsapp Groups*. As an exercise, the teacher invites students to make a summary of the material. The teacher has not been able to design an experiment in online learning, even though experimental activities really help students in understanding the concept of the material well. By being directly involved in experimental activities, students will be able to construct their previously owned knowledge with new knowledge gained through investigation. In the lesson plans it is written that learning is carried out by implementing a scientific approach, by observing, asking questions, gathering information, associating, and communicating, but this has not been shown to be done. Students only see and pay attention to the material that has been sent by the teacher via *Whatsapp Group*. This causes the learning process only focusing on the teacher, teachers are more likely to deliver material, students only listen, write the material presented and do assignments in the form of questions given by the teacher. In fact, even though the learning process done by online, the scientific approach to Biology learning activities should still be implemented. Students can be directed to conduct experiments at home, then make videos and ask the teacher to provide feedback or suggestions. The curriculum is designed to maximize the involvement of learners in a series of deliberate, structured, proactive, and systematic strategies that are in line with predetermined learning objectives ²¹.

In the assessment section, the teacher has assessed students' attitudes and cognitive abilities. In the attitude aspect, the teacher assesses the presence of students at each meeting, the activeness of students in responding to the teacher, and also the consistency of students in participating in learning from beginning to end. In the aspect of knowledge, the teacher assesses through the answers that students give verbally in online learning and the value of assignments collected through the whatsapp group and google classroom. One of the characteristics of the curriculum 2013 related to assessment is that teachers are required to conduct an authentic assessment that is carried out comprehensively to assess starting from the input, process, and output of learning, which includes the domains of attitudes, knowledge, and skills. Authentic assessment assesses the readiness of students, as well as the process and learning outcomes as a whole. The integrated assessment of the three components (input - process - output) will describe the capacity, style, and learning outcomes of students, even being able to produce instructional effects and nurturing effects from

²¹ Thomas, "Chapter 9 - Developing Inclusive Learning to Improve the Engagement, Belonging, Retention, and Success of Students from Diverse Groups."

learning. Authentic assessments must reflect real-world problems, not the school world. Authentic assessment does not only measure what students know, but emphasizes measuring what students can do ²².

The teacher has not made an assessment of the aspects of student skills. In fact, psychomotor assessment is very important in Biology learning because it can be used to develop students' skills in carrying out practicals correctly and accurately as a demand for the application of the biology learning process ²³. Based on the results of the research conducted, the Madrasah Aliyah in has not conducted a psychomotor assessment at all, because it does not carry out a practicum during the biology learning process which is carried out online. In fact, practicum can be done by optimizing digital-based applications ²⁴ or through structured assignments based on students' life experiences ²⁵.

Conclusion

Biology teachers at one private Madrasah Aliyah in Labuhan Batu Regency, North Sumatra, still have difficulty in making lesson plans due to the lack of supporting facilities and infrastructure, especially books based on the curriculum 2013. As a result, teachers still use lesson plans obtained from colleagues who work in other schools with the same department and also from several sources on the internet. Learning activities that have been well prepared by the teacher in the lesson plans are difficult to applied in online learning. Learning activities seem only be centered on the teacher because the instructions given by the teacher are only limited to material sent through the whatsapp group. Aspects of the assessment should include 3 things but only 2 that can be done by the teacher, which are the assessment of students' attitudes and cognitive. Psychomotor assessment of students is not carried out even though it is also important to identify students' skills in carrying out practical activities correctly and accurately. Furthermore, it is necessary to have training activities for teachers on the use of technology as a means of learning and evaluation activities during the online learning period.

²²Alimuddin, "Assessment in the curriculum 2013," National Seminar on Character Education 01, no. 1 (2014): 23–33

²³ Zukhrufatul Azizah, "Development of Psychomotor Aspect Assessment Instruments in Archaeobacteria and Eubacteria Material Biology Practicum for Class X SMA/MA Students" (Thesis, Yogyakarta, State Islamic University Sunan Kalijaga, 2015), <https://digilib.uin-suka.ac.id/eprint/18639/1/BAB%20I,%20V,%20DAFTAR%20PUSTAKA.pdf>.

²⁴ María Amor Barros-del Río, Carlos López Nozal, and Beatriz Mediavilla-Martínez, "Practicum Management and Enhancement through an Online Tool in Foreign Language Teacher Education," *Social Sciences & Humanities Open* 6, no. 1 (January 1, 2022): 100273, <https://doi.org/10.1016/j.ssaho.2022.100273>.

²⁵ Kate Jones, Liam C. Hein, and Lisa James, "A Nursing Leadership Practicum in the Time of COVID19:: A Southeastern University Experience," *Nurse Leader* 19, no. 2 (April 1, 2021): 145–49, <https://doi.org/10.1016/j.mnl.2020.06.010>.

Bibliography

- Aina, Mia, Retni S Budiarti, Gusti Ayu Muthia, and Desi Ariani Putri Br Purba. "High School Students' Biology Learning Motivation in Online Learning During the Covid-19 Pandemic." *Journal of Biology Education Research* 2, no. 1 (2021): 1–12.
- Aisyiyah, As Tsaniyah Putri, and A Amrizal. "Application of the Scientific Approach in High School Biology Learning." *Journal of Pelita Pendidikan* 8, no. 4 (2020): 215–23. <https://doi.org/10.24114/jpp.v8i4.20856>.
- Azizah, Zukhrufatul. "Development of Psychomotor Aspects of Assessment Instruments in Archaeobacteria and Eubacteria Material Biology Practicum for Class X SMA/MA Students." Thesis, Sunan Kalijaga State Islamic University, 2015. <https://digilib.uin-suka.ac.id/id/eprint/18639/1/BAB%20I,%20V,%20DAFTAR%20PUSTAKA.pdf>.
- Barros-del Río, María Amor, Carlos López Nozal, and Beatriz Mediavilla-Martínez. "Practicum Management and Enhancement through an Online Tool in Foreign Language Teacher Education." *Social Sciences & Humanities Open* 6, no. 1 (January 1, 2022): 100273. <https://doi.org/10.1016/j.ssaho.2022.100273>.
- Cahyani, Adhetya, Iin Diah Listiana, and Sari Puteri Deta Larasati. "High School Students' Learning Motivation in Online Learning During the Covid-19 Pandemic." *IQ (Science of the Qur'an): Journal of Islamic Education* 3, no. 01 (2020): 123–40. <https://doi.org/10.37542/iq.v3i01.57>.
- Dewi, Wahyu Aji Fatma. "The Impact of COVID-19 on the Implementation of Online Learning in Elementary Schools." *Educational: Journal of Education* 2, no. 1 (2020): 55–61. <https://doi.org/10.31004/edukatif.v2i1.89>.
- Firman, Firman, and Sari Rahayu. "Online Learning Amid the Covid-19 Pandemic." *Indonesian Journal of Educational Science (IJES)* 2, no. 2 (2020): 81–89. <https://doi.org/10.31605/ijes.v2i2.659>.
- Hidayat, Dede Rahmat, Ana Rohaya, Fildzah Nadine, and Hary Ramadhan. "Students' Learning Independence in Online Learning During the Covid-19 Pandemic." *Educational Science Perspective* 34, no. 2 (2020): 147–54. <https://doi.org/10.21009/pip.342.9>.
- Hutauruk, Agusmanto, and Ropinus Sidabutar. "Online Learning Constraints During a Pandemic Among Mathematics Education Students: A Descriptive Qualitative Study." *Journal of Mathematics Education and Applied* 02, no. 01 (2020): 45–51.
- Ikhsan, Komara Nur, and Supian Hadi. "Implementation and Development of the curriculum 2013." *Journal of Education (Economics, Education and Accounting)*, 2018. <https://doi.org/10.25157/je.v6i1.1682>.
- Irwandi, and Lusilawat. "The Effectiveness of Online Learning Through Whatsapp Towards Interests And Learning Outcomes Of Biology." *BIOEDUSAINS: Journal of Biology and Science Education* 4, no. 2 (2021): 166–74.

- Jones, Kate, Liam C. Hein, and Lisa James. "A Nursing Leadership Practicum in the Time of COVID19:: A Southeastern University Experience." *Nurse Leader* 19, no. 2 (April 1, 2021): 145-49. <https://doi.org/10.1016/j.mnl.2020.06.010>.
- Kurniaman, Otang, and Eddy Noviana. "Implementation of the curriculum 2013 in Improving Skills, Attitudes, and Knowledge." *Primary: Journal of Elementary School Teacher Education* 6, no. 2 (2017): 389. <https://doi.org/10.33578/jpkip.v6i2.4520>.
- Purnomo, Agus, Rizki Hartono Putro, Rudi Hartono, and Rusmiyanto -. "Development of Applications for Attitude and Knowledge Assessment at Elementary School Levels Based on the curriculum 2013." *Symmetrical: Journal of Mechanical Engineering, Electrical and Computer Science* 10, no. 1 (2019): 47-56. <https://doi.org/10.24176/simet.v10i1.2719>.
- Rakhmawati, Suci, Novianti Muspiroh, Nurul Azmi, SI Pd, Department of Tadris, Biology Science, Jalan Perjuangan Bypass, and Sunyaragi Cirebon. "Analysis of curriculum 2013 Implementation in terms of Process Standards in Class X Biology Learning at Sma Negeri 1 Krangkeng." *Scientiae Educatia: Journal of Science and Science Education* 5, no. 2 (2016): 156-64.
- Ramadhani, Fakhri. "Application of Project Based Learning Model to Improve Science Learning Outcomes in Online Learning in Class IX SMP." *Journal of Pelita Pendidikan* 8, no. 4 (2020): 237-43.
- Sadikin, Ali, and Afreni Hamidah. "Online Learning Amid the Covid-19 Outbreak." *Biodik* 6, no. 2 (2020): 109-19. <https://doi.org/10.22437/bio.v6i2.9759>.
- Setiadi, Hari. "Implementation of the curriculum 2013 Assessment." *Journal of Educational Research and Evaluation* 20, no. 2 (2016): 166-78. <https://doi.org/10.21831/pep.v20i2.7173>.
- Synthema, Edgar John. "Effect of COVID-19 on the Performance of Grade 12 Students: Implications for STEM Education." *Eurasia Journal of Mathematics, Science and Technology Education* 16, no. 7 (2020): 1-6. <https://doi.org/10.29333/EJMSTE/7893>.
- Thomas, Liz. "Chapter 9 - Developing Inclusive Learning to Improve the Engagement, Belonging, Retention, and Success of Students from Diverse Groups." In *Widening Higher Education Participation*, edited by Mahsood Shah, Anna Bennett, and Erica Southgate, 135-59. Chandos Publishing, 2016. <https://doi.org/10.1016/B978-0-08-100213-1.00009-3>.
- Zahrawati, Fawziah, and Andi Nur Ramadani. "The Problems of Implementing the curriculum 2013 on the Learning Process During the Covid-19 Pandemic." *Bidayatuna Journal of Teacher Education Mandrasah Ibtidaiyah* 4, no. 1 (February 6, 2021): 75-88. <https://www.iaisyarifuddin.ac.id/ejournal/index.php/bidayatuna/article/view/901>.