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Effectiveness of Practicum Activities as an Effort to Improve Student Learning Outcomes at SMA Negeri 2 Tondano

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Abstract. *This research aims to determine the effectiveness of practicum activities to improve student learning outcomes at SMA Negeri 2 Tondano. This type of research is quantitative descriptive research that uses a survey method to describe and explain data based on the reality in the field. The research was carried out by distributing questionnaires to teachers and students, observation sheets, and practical activity sheets with data sources consisting of 30 students of class X Science 1, 30 students of class X Science 2, and biology teachers. Based on the research results, the level of readiness to obtain data for class X IPA 1 At the implementation stage of the practicum activities for class X Science 1 is 91%; the efforts made to improve the quality of practicum implementation are by improving practicum weaknesses such as the availability of tools and materials, good laboratory management, conducting evaluations, arranging implementation schedules and paying attention to laboratory layout in order to carry out practicum optimally. The factors that influence the quality of practicum implementation include student motivation, limited tools and materials, practicum schedule, availability of facilities and infrastructure, teacher's role in practicum activities, and students' active thinking.*

Keywords: *Effectiveness, Practicum, Learning Results, Biology*

Abstrak. Penelitian ini bertujuan untuk mengetahui efektivitas kegiatan praktikum dalam upaya peningkatan hasil belajar siswa di SMA Negeri 2 Tondano. Jenis penelitian ini adalah penelitian deskriptif kuantitatif yang menggunakan metode survey yaitu dengan menggambarkan dan menjelaskan data berdasarkan apa adanya kenyataan yang ada di lapangan. Penelitian dilakukan dengan membagikan kuesioner/angket kepada guru dan siswa, lembar observasi dan lembar kegiatan praktikum dengan sumber data terdiri dari 30 orang siswa kelas X IPA 1, 30 orang siswa kelas X IPA 2 dan guru biologi. Berdasarkan hasil penelitian yang di dapat pada tingkat kesiapan di peroleh data kelas X IPA 1, X IPA 2 tingakat kesiapan mencapai 84% dan guru biologi mencapai 94% sehingga dapat dikategorikan sangat baik. Pada tahap pelaksanaan kegiatan praktikum kelas X IPA 1 91%, X IPA 2 86% dan guru 91% sehingga dapat dikategorikan sangat baik. Adapun upaya yang dilakukan untuk meningkatkan kualitas pelaksanaan praktikum yaitu dengan memperbaiki kelemahan-kelemahan praktikum seperti ketersediaan alat dan bahan, pengelolaan laboratorium yang baik, melakukan evaluasi, mengatur jadwal pelaksanaan dan memperhatikan tata ruang laboratorium agar dapat melaksanakan praktikum dengan maksimal. Adapun faktor-faktor yang mempengaruhi kualitas pelaksanaan praktikum diantaranya motivasi siswa, keterbatasan alat dan bahan, jadwal praktikum, ketersediaan sarana dan prasarana, peran guru dalam kegiatan praktikum dan keaktifan siswa dalam berdiskusi

Kata Kunci : Efektifitas, Praktikum, Hasil Belajar, Biologi

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INTRODUCTION

The regulations governing primary and secondary education processes are outlined in Minister of Education and Culture Regulation (Permendikbud) Number 22 of 2016. This regulation stipulates that each educational institution must facilitate a learning process that is engaging, interactive, enjoyable, and stimulating, encouraging active student participation while also providing adequate physical space. The concept of fostering creativity and independence among students is emphasized in educational practices, with a focus on nurturing their talents, interests, and holistic development encompassing both physical and psychological aspects. This approach entails the formulation of learning plans, the execution of the learning process, and the evaluation of student outcomes, as highlighted by various scholars (Nuryani, 2005; Nasution & Hasairin, 2016; Mustakim, 2020).

The incorporation of the practicum activity process plays a crucial role in enhancing the quality of learning outcomes and processes. This is due to the fact that practicum activities have a greater potential to effectively enhance students' observational skills and improve their psychomotor abilities. Additionally, practicum activities serve as a valuable opportunity for students to practice utilizing laboratory tools and materials (Assidig, 2008; Damayanti & Rimbawan, 2008; Mustaji, 2009; Suprijono, 2010). Apart from that, practical activities can illustrate students' curiosity, foster activeness, an attitude of cooperation, thoroughness, tolerance, and foster scientific honesty, and provide students with experience in learning and observing an object (Hamalik, 2006; Efendy, 2013; Firmansyah, 2015 Nugraha et al., 2020). Practical activities in biology learning are used so that students are accustomed and familiar with the investigation, discovery, and problem-solving activities (Nuryani, 2005; Hidayat, 2002; Hasruddin & Salwa, 2012; Hartinawati, 2015).

Biology laboratories are a source of biology learning necessary to provide an authentic experience to students and as a supporting factor in implementing learning (Rustaman et al., 2003; Rustaman, 2006; Sanjaya, 2011; Rusman, 2014). Therefore, it is necessary to provide good laboratories so that the implementation of learning that requires a biology laboratory can run optimally and competence is achieved so that students can apply the theoretical knowledge they have acquired (Koesmadji et al., 2004; Kurniawan, 2005; Saleh et al., 2007; Khamida & Aprilia, 2014).

The successful implementation of practicum activities is influenced by various factors, including teacher-related factors such as their proficiency in the subject matter, mastery of teaching techniques, and ability to manage practicum activities (Lidgren, 1995; Lazarowitz & Tamir, 1994; Sudjana & Rivai, 2011; Saraswati, 2015; Yemen, 2016; Lestari, 2017). Practicum

implementation was not carried out well due to several factors, such as research conducted by Nasution and Hasairin (2016), which showed several obstacles experienced, such as the unavailability of biology practicum guides, practicum worksheets were still very limited, there was no appropriate practicum schedule, limited time. Existing learning and practicums are also less empowered in the field because many teachers who carry out practicums are considered to take up time and energy (Mulyasa, 2008; Mustaji, 2009; Sumardjo, 2013; Mastika et al., 2014). This can result in less than optimal-practicum implementation (Winataputra et al., 2008; Supardi, 2013; Wahyudiati, 2016; Wulandari & Anggraini, 2021).

The results of initial observations conducted by interviewing one of the teachers, Mr. Drs. Essau Masialu, as a biology teacher at SMA Negeri 2 Tondano, showed that practical activities were still being carried out. However, the practicum activity schedule had not been implemented optimally at the school, practicum activities also needed to be implemented more, and practicum guidebooks and student worksheets (LKS)) still need to be improved and depend on the biology teacher or student handbook. Some teachers still need help adjusting or carrying out practical activities. "Therefore, this research was carried out with the title Effectiveness of Practicum Activities as an Effort to Improve Student Learning Outcomes at SMA Negeri 2 Tondano.

METHOD

This research is descriptive research with a quantitative approach using survey methods. The survey method describes and explains data based on reality in the field. The population in this study were all students in class X Science, namely X Science 1 and X Science 2 at SMA Negeri 2 Tondano. Meanwhile, the sample used was 60 students from the population and one biology teacher. Sampling used a random sampling technique.

The data collection technique in this research uses several instruments, namely:

1. Questionnaire: The questionnaire used is a closed questionnaire using an ordinal scale given to students and teachers
2. Interviews were conducted with biology teachers to complete explanations of observations and questionnaires. The type of interview carried out is an open interview.
3. The observation sheet is used to observe the frequency of practicum implementation and conditions of the biology laboratory, the availability of equipment, tools, and materials needed in terms of quantity and condition to support practicum activities in the even semester.

4. Photo documentation is facts and data stored in various materials that are formed in documents during the process of carrying out practical activities.

The research stages include three stages, namely the preparation stage, implementation stage, and data processing.

1. Preparation phase:

   Carrying out initial observations at the school, the researcher identified the problems that occurred, and the research instruments in the form of questionnaires, interviews, and observation sheets would be validated.

2. Implementation stage:

   The research provided questionnaires to students, conducted interviews with biology teachers regarding the implementation of practicum activities and obstacles to implementing practicum activities, and completed observation sheets regarding the frequency of implementation of practicum activities.

3. Data processing stage:

   The data that has been collected will be processed using a formula (Data Analysis Technique) to obtain quantitative results from the practical implementation at SMA Negeri 2 Tondano. Then, describe the results of the research that has been carried out.

The questionnaire data analysis technique used in this research is a descriptive analysis technique with percentage calculations obtained using the formula:

$$P = \frac{skorriil}{skorideal} \times 100\%$$

Information:

NP = Percentage value

real score = total score obtained

ideal score = number of respondents (max score)

The score classification is then converted into a classification in the form of a percentage and then interpreted in the form of a qualitative sentence. The assessment percentage criteria can be seen in Table 1.

Table 1. Percentage Criteria

No	Range	Criteria
1.	81% - 100%	Excellent
2.	61% - 80 %	Good
3.	41% - 60 %	Sufficient
4.	≤ 40 %	Not Good

RESULT AND DISCUSSION

A. Level of Readiness for Practicum Implementation Planning

The results of research on the level of readiness for planning the implementation of biology practicum at SMA Negeri 2 Tondano using two classes showed that class X Science 1 level of readiness reached 84% with perfect criteria, class Practical implementation by biology teachers reached 94% with perfect criteria as in Figure 1

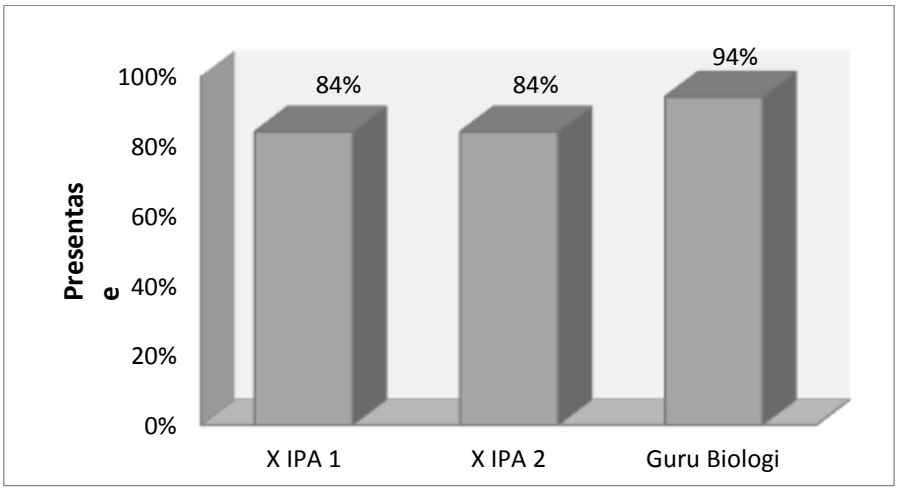

Figure 1. Diagram of readiness level for planning practicum implementation.

Based on the results from Figure 1, it shows that students in class X Science I, The average results obtained by students in class X IPA 1 and in determining the success of a practicum. The preparations made by students include: reading literature related to practicum activities, understanding the material that will be practiced, reading work procedures, preparing tools and materials that will be used, collaborating between group members so that the practicum implementation activities run well. Meanwhile, 16% of students stated that they sometimes prepare.

Planning for the implementation of practical activities from biology teachers, the readiness level reached 94% with very good criteria stating that before practical activities, biology teachers make preparations in advance, such as preparing or compiling modules/instruction books that are adapted to the material, adjusting the schedule, giving direction before carrying out practical activities, managing and arranging laboratory space so that practicum activities will be more effective, providing guidance before practicum activities by dividing groups because before carrying out practicum activities a teacher must ensure whether there are practicum tools and materials. This is in line with research by Khamidah and Aprilia (2014), the preparation of laboratory facilities and infrastructure is an important thing that supports the implementation of practicum activities.

The results of the average level of readiness for practical implementation can be seen from the level of readiness and interview results. The data is presented in descriptive percentages to describe the indicators studied, where class, the biology teacher's readiness level reached 94% and the teacher interview results reached 95% so that the average results showed 88% with very good criteria.

B. Level of Implementation of Practical Activities

Based on research that has been carried out using questionnaires, observations regarding the implementation of practicums in the laboratory at SMA Negeri 2 Tondano which includes laboratory layout, laboratory administration, laboratory management and storage of practicum equipment and materials, the following data were obtained:

1. Laboratory standardization data based on the results of filling out questionnaires by teachers and students

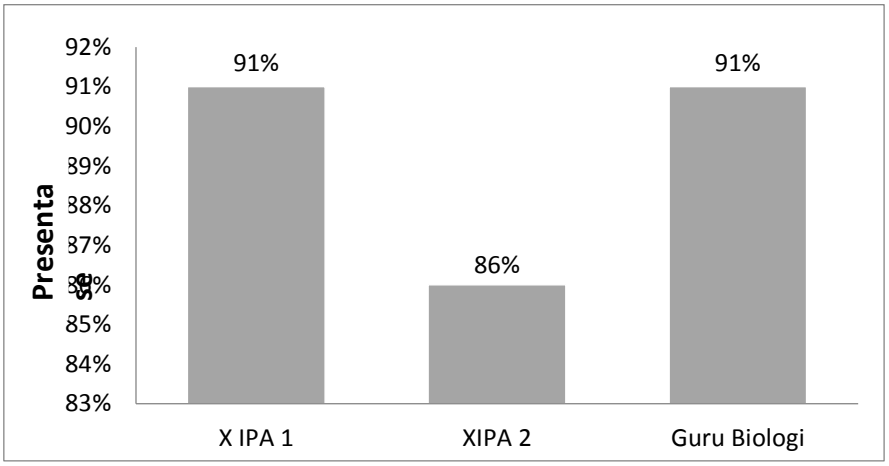

Figure 2 Diagram of practicum implementation levels

Based on Figure 2, the research results from filling out questionnaires given to teachers and students show that the implementation of practicums in the laboratory at SMA Negeri 2 Tondano received different implementation standards, where class X Science 1 reached 91% in the very good category, class X Science 2 achieved 86% in the very good category, biology teachers reached 91% in the very good category, and the results of the practicum sheets distributed reached 80% with good criteria. Judging from the indicators of practicum implementation in the laboratory of SMA Negeri 2 Tondano, which include practicum tools and materials, laboratory management, and storage of practicum tools and materials, it shows that the average score obtained from the implementation level of students in class X Science 1 and1X Science 2 reached 88% with very good category. However, 12% of students experienced difficulties in carrying out practicum activities due to a lack of practicum tools and understanding of the material, so they could have been more extensive in carrying out

practicum activities. Meanwhile, 88% said the practicum could run well because of the guidance, direction, and availability of facilities and infrastructure in the SMA Negeri 2 Tondano biology laboratory. In practical activities, implementation is an essential function because with implementation, what is planned will become a reality.

2. Analysis per group (Practicum) per group of classes X IPA 1 and X IPA 2 in practical activities in the laboratory

a. Class X Science Group Practicum 1

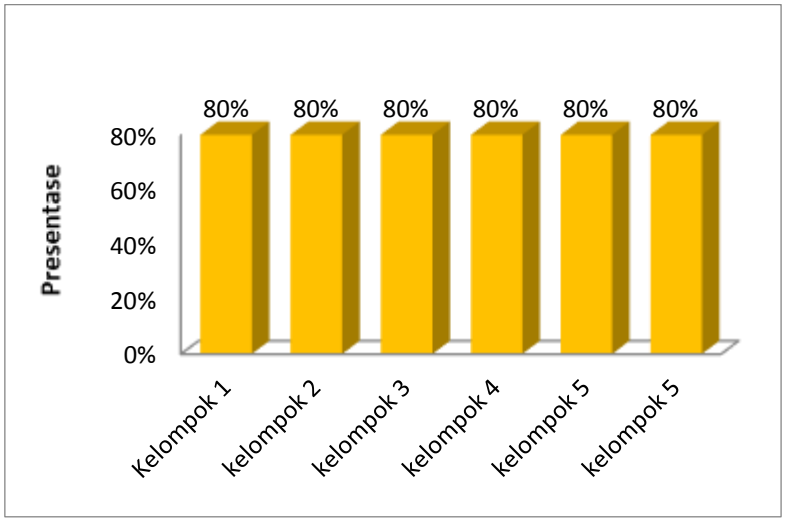

Figure 3 Diagram of LKS analysis results per class X Science 1 group

b. Class X Science Group Practicum 2

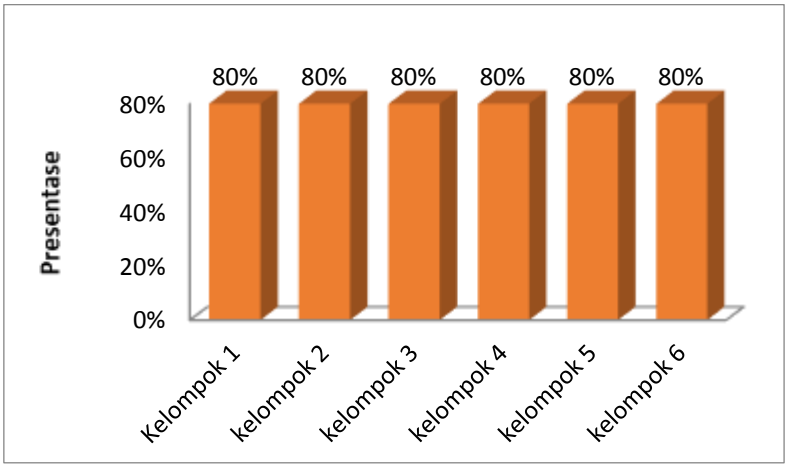

Figure 4 Diagram of LKS analysis results per class X Science 2 group.

Figure 3 and Figure 4 show the evaluation results based on filling in the LKS given to students that the group division for practicum activities at SMA Negeri 2 Tondano was achieved from the practicum activity process. They were judging from the practicum activities filled by six groups of class X Science 1, which showed 80% in the good category, and six groups of class X Science 2, which showed 80% in the good category. The average results of

each of the six groups that received the good category show that in the practical activities in the laboratory, students in classes X Science 1 and X Science 2 collaborated between groups so that the practical activities took place well and effectively.

The results of implementing practicum activities by analyzing the effectiveness of practicum activities to improve student learning outcomes at SMA Negeri 2 Tondano were taken using questionnaires, interviews, and worksheets for students and teachers. The data is presented in descriptive percentages to describe the indicators studied show that the results, an average of 87% with very good criteria, stated that they had carried out the practicum on time according to the predetermined schedule; this means that some students were able to be time disciplined and could understand that they had to prepare everything before the practicum was carried out. However, practicums are still outside school hours, even with teacher guidance. This is in line with research by Hasruddin and Rezeqi (2012) that the timing of the practicum for SMA Negeri 2 Tondano was effective because of precise practicum scheduling. Students actively participate in the practicum activities; they can discover things they have yet to learn. Besides that, students are enthusiastic about discussing with each other. There needs to be teacher motivation to increase students' understanding and interest because that is very important.

C. Efforts made to improve the quality of practicum implementation at SMA Negeri 2 Tondano

The research results are based on data related to the efforts made to improve the quality of practicum implementation. 88% of students stated that every time they carry out practicum activities, they first understand the material to be practiced and conduct assessments in the practicum implementation, such as assessing the availability of tools and materials activeness in groups. , and have discussions with the teacher. Meanwhile, 12% of students stated that they did not carry out assessments in carrying out practicums and needed help understanding the material that would be practiced. Efforts are made to improve the quality of practicum implementation, namely by improving weaknesses in practicum implementation, such as increasing cooperation between one another, carrying out assessments, increasing group activity, holding discussions before starting practicum activities, and understanding the material to be practiced in advance. The efforts to improve the quality of practicum implementation at SMA Negeri 2 Tondano include the availability of tools and materials, good laboratory management, conducting evaluations, arranging implementation schedules, and paying attention to the laboratory layout to carry out practicums optimally. This is in line with research by Wahyudianti (2014). The quality of practicum implementation is determined by

the availability of practicum tools and materials in the laboratory, completeness of facilities and infrastructure, good laboratory management, teacher participation, reports, practicums, and lab management.

D. Factors that influence the quality of practicum implementation at SMA Negeri 2 Tondano

Based on research conducted at SMA Negeri 2 Tondano, some factors influence the quality of practicum implementation, including student motivation, limited tools and materials, practicum schedule, availability of facilities and infrastructure, teacher's role in practicum activities, and students' activeness in discussions. From the data obtained, 86% of students stated they were motivated to conduct practical activities to increase their knowledge. Meanwhile, 14% of students said they needed more motivation. The role of the teacher in implementing the practicum received a good response; before carrying out the practicum activities, the teacher made a plan first, provided direction and guidance, and carried out assessments and discussions so that the practicum implementation could be carried out well to overcome existing weaknesses. 80% of students stated that the teacher always carries out assessments and discussions, but 20% of students stated that they sometimes carry out assessments and discussions because of time constraints, so teachers do not monitor the implementation of practicums. About the factors that influence the quality of practicum implementation, it show that in practicum activities, learning motivation, the role of the teacher, practicum schedule and time, tools and materials, self-readiness of teachers and students, as well as existing facilities and infrastructure must be adjusted and improved because they are very influential in carrying out practical activities.

CONCLUSION

Based on1the research that has been carried out, the effectiveness of practicum activities in improving student learning outcomes at SMA Negeri 2 Tondano, seen from the level of readiness and implementation of practicum, is categorized as very good. Therefore, it is recommended that these results be used in teaching and learning activities, practicum implementation, and a teaching and learning process.

REFERENCES

Anonim, (2007) Peraturan Menteri Pendidikan Nasional Nomor 24 Tahun 2007. Tentang Standar Sarana dan Prasarana untuk SD, SMP, SMA.

-------, (2016) Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia No. 22 Tahun 2016 Tentang Standar Proses Pendidikan Dasar dan Menengah

Assidiq, K. A., (2008), Kamus Biologi, Yogyakarta: Panji Pustaka

Bloom dalam Suprijono. (2010). Cooperative Learning. Yogyakarta: Pustaka Pelajar

Daryanto, (2018), Manajemen Laboratorium Sekolah. Penerbit Gava Media. Yogyakarta

Damayanti, E., dan Rimbawan. (2008). Penuntun Praktikum Evaluasi Nilai Gizi. IPB. Bogor

Effendy, Onong Uchjana. (2013). Ilmu Komunikasi Teori dan Praktek.Bandung : PT Remaja Rosdakarya

Firmansyah, D. 2015. "Pengaruh Strategi Pembelajaran dan Minat Belajar terhadap Hasil Belajar Matematika". Jurnal Pendidikan UNSIKA 3(1) : 24- 44.

Hamalik. O. (2006) Proses Belajar Mengajar, Bandung: Bumi Aksara.

Hasruddin dan Salwa Rezeqi. (2012). Analisis Pelaksanaan Praktikum Biologi dan Permasalahannya di SMA Negeri Sekabupaten Karo.Vol. 9 No. 1, Hal. 29-30

Hartinawati. (2015). Pengelolaan Laboratorium IPA. Tanggerang Selatan : Universitas Terbuka.

Hidayat, A.A. (2002). Pengantar dokumentasi proses keperawatan. Jakarta : EGC.

Kurniawan, A. (2005). Transformasi Pelayanan Publik. Yogyakarta. Penerbit Pembaharuan.

Khamida N. dan Aprilia N. (2014). Evaluasi Program Pelaksanaan Praktikum Biologi Kelas XI SMA Se-Kecamatan Umbulharjo Yogyakarta Semester II Tahun Ajaran 2013/2014, Program Studi Pendidikan Biologi, Universitas Ahmad Dahlan, Kampus III . Yogyakarta.

Koesmadji, Wirjosoemarto, et.al (2004) Teknik Laboratorium, (Bandung: Jurusan Pendidikan Biologi FMIPA UPI).

Lazarowitz, R. & P. Tamir. (1994). "Research on Using Laboratory Instruction in Science." Handbook of Research on Science Teaching and Learning. Edited by: D. L. Gabel. New York: Macmillan Publishing Company.

Lestari. B. Suripto, S. (2017). Penerapan Model Tari Bambu (Bamboo Dancing) Dengan Media Kartu Dalam Peningkatan Hasil Belajar Pendidikan Kewarganegaraan Tentang Organisasi Di Kelas V Sekolah Dasar. KALAM CENDEKIA, 5(June), 97–98

Lindgren, D.T. (1985). Penginderaan Jauh Untuk Perencanaan Penggunaan Lahan. Yogyakarta: Gadjah Mada University Press.

Mastika, I Nyoman; I B Putu Adnyana dan I Gusti N Agung Setiawan. (2014). Analisis Standarisasi Laboratorium Biologi Dalam Proses Pembelajaran Di Sma Negeri Kota Denpasar, e-Journal Program Pascasarjana Universitas Pendidikan Ganesha.

Mulyasa. E. (2008). Menjadi Guru Profesional Menciptakan Pembelajaran Kreatif dan Menyenangkan. Bandung : PT. Remaja Rosdakarya.

Mustaji. (2009). Laboratorium: Perspektif Teknologi Pembelajaran. Tersedia: http://www.tp.ac.id/.html. Diakses pada 03 Maret 2015.

Mustakim. 2020. Efektivitas Pembelajaran Daring Menggunakan Media Online Selama Pandemi Covid-19 pada Mata Pelajaran Matematika. Al Asma: Journal of Islamic Education Vol. 2, No. 1.

Nasution, N., & Hasairin, A. (2016). Analisis Sarana dan Pemanfaatan Laboratorium IPA (Biologi) dalam Pembelajaran Biologi Kelas XI Di SMA Swasta Nusantara Lubuk Pakam. Jurnal Pelita Pendidikan, 04(04), 31-37.

Nugraha. A. Sobron., Sudiatmi. T., Suswandari. M. (2020). Studi Pengaruh Daring Learning Terhadap Hasil Belajar Matematika Kelas IV.Jurnal Inovasi Penelitian. Vol.1

Nuryani. (2005). Strategi Belajar Mengajar Biologi. Malang: IKIP Malang Press.

Rusman, (2014) Model-Model Pembelajaran (Jakarta: PT. Rajagrafindo), 1.

Rustaman, Nuryani Y dan Dirdjosoemarto Soendjojo (2003). Strategi Belajar Mengajar Biologi: Common Textbook. Edisi Revisi. Bandung: UPI

Rustaman, N. (2006). Strategi Pembelajaran Biologi. Bandung: Jurusan Biologi FPMIPA Universitas Pendidikan Indonesia.

Sanjaya. W. (2011) Strategi Pembelajaran Berorientasi Standar Proses Pendidikan (Jakarta: Prenada Media), 112.

Saleh, M.S, Adelina E., Maemunah, Nuraeni, Idham, Sakka S., dan Alam N. 2007. Perkembangan Penelitian Teknologi Benih Aren (Arenga pinnata (Wurmb.) Merr) di Universitas Tadulako. Prosiding Seminar Nasional Hasil Penelitian. Hal 91-95.

Saraswati, F.N., (2015), Uji Aktivitas Antibakteri Ekstrak Etanol 96% Limbah Kulit Pisang Kepok Kuning (Musa balbisiana) Terhadap Bakteri Penyebab Jerawat (Staphylococcus epidermidis, Staphylococcus aureus, dan Propionibacterium acne), Skripsi, Fakultas Kedokteran dan Ilmu kesehatan Program Studi Farmasi, UIN Syarif Hidayatullah Jakarta.

Sudjana. N. dan Rivai. A. (2011) Media Pengajaran, Bandung: Sinar Baru Algensindo.

Sumardjo, A.P. (2013). Pengaruh Penggunaan Metode Praktikum dengan Model Pembelajaran Kooperatif Tipe Numbered Head Together (NHT) terhadap Keterampilan Proses Sains Siswa pada Materi Pokok Ciri-Ciri Makhluk Hidup (Kuasi Eksperimen pada Siswa Kelas VII SMP Negeri 3 Metro Semester Genap Tahun Pelajaran 2012/2013). Lampung: Fakultas Keguruan dan Ilmu Pendidikan Universitas Lampung.

Supardi. (2013). Sekolah Efektivitas Konsep Dasar dan Praktiknya. Jakarta: PT Rajawali Pers.

Wahyudiati, D. (2016). Analisis Efektivitas Kegiatan Praktikum Sebagai Upaya Peningkatan Hasil Belajar Mahasiswa. Jurnal Tatsqif, 14(2)

Winataputra U. S, Delfi.R, Pannen, P. dan D Mustafa (2008). Teori Belajar dan Pembelajaran. Jakarta: Universitas Terbuka.

Wulandari, S. S. & Anggraini, P. D. (2021). Analisis Penggunaan Model Pembelajaran Project Based Learning Dalam Peningkatan Keaktifan Siswa. Jurnal Pendidikan Administrasi Perkantoran (JPAP), 9(2), 292–299.

Yaman, E. (2016). Pengoptimalan Peran Kepala Labor dalam Menunjang Pembelajaran IPA di SMPN 7 Kubung. Jurnal Penelitian Guru Indonesia JPGI. Vol 1 No 1, ISSN: 2541-3317.