Journal of Research in Education and Pedagogy
ISSN 3047-7131 (online) & 3047-6410 (print)
August 2025, Vol. 2, No. 3, pp. 396–404

Research Article

The Influence of Science Laboratory Management on Increasing Manager Performance at SMA IT Yarsi Mataram

Hendy Aldian[1], Dwi Wahyudiati[1], Bahtiar[2], Salman Alfarisi[3]

[1]Department of Chemistry Education, Universitas Islam Negeri Mataram, Mataram, Indonesia
[2]Department of Physics Education, Universitas Islam Negeri Mataram, Mataram, Indonesia
[3]Department of Performing Arts, Universiti Pendidikan Sultan Idris, Perak Darul Ridzuan, Malaysia

Abstract
The aims of this research include exploring the influence of laboratory management on the performance of managers (laboratories) at SMA IT Yarsi Mataram. This research uses a quantitative approach with a correlational type of research. The research method uses statistical research methods with an analytical design. The data collection technique uses observation, which consists of 1 independent variable, namely laboratory management, and 2 dependent variables, namely manager performance and science process skills. There are 2 instruments used, namely a questionnaire instrument for manager performance variables, and an assessment sheet for science process skills. The total population is 78 people, and the sample is 30 people. The research results show that, among other things, there is no influence of laboratory management on manager performance; this can be seen from the significance value obtained from the ANOVA test, namely 0.221, which is greater than the 5% significance level, namely 0.05. This means that the differences or variations in laboratory management are not strong enough to influence changes in manager performance. This could be caused by other factors outside of laboratory management that are more dominant in influencing performance, such as leadership style, organizational culture, work motivation, or the performance appraisal system used. The implication of this study is the importance of the laboratory as a place to develop students' science skills practically. So, to provide maximum implementation, laboratory management is needed with laboratory assistants who have good performance, so that the final results in science learning can achieve the intended goals.

Keywords: Laboratory Management, Manager Performance, Science Laboratory

Correspondence
Hendy Aldian
190109005.mhs@uinmataram.ac.id

Received
January 16, 2025
Accepted
June 9, 2025
Published
August 1, 2025

Citation: Aldian, H., Wahyudiati, D., Bahtiar, & Alfarisi, S. (2025). The influence of science laboratory management on increasing manager performance and science process skills of students at SMA IT Yarsi Mataram. *Journal of Research in Education and Pedagogy, 2*(3), 396–404.

DOI: 10.70232/jrep.v2i3.75

1. INTRODUCTION

Efforts to improve the quality of education in Indonesia through improving the quality of the teaching and learning process. The teaching and learning process is a process that can cause changes in behavior because of a reaction to a certain situation or because of a process that occurs internally within a person due to the influence of other people. In this case, it is between teachers and students (Babalola et al., 2025; Burchard et al., 2025; Herawati, 2018; Kotsis, 2025; Noprika et al., 2020; Nur Dhuka, 2022). The existence of a good relationship between teachers and students can support the smooth learning process. The learning process will take place more optimally if there is a place that can support it, namely the school. (Fardinal et al., 2022; Nurasiah & Zulkhairi, 2021; Wardhani & Krisnani, 2020) School is the main means of education to be able to develop all potential, creative power, and self-actualization. (Sugiarto, S., Neviyarni, S., & Firman, 2021) A school that can function well requires supporting facilities and infrastructure. However, many schools are not yet equipped with adequate facilities and infrastructure. All of this has a big impact on students' skills in improving educational achievement in general. (Sugiarto, Neviyarni, & Firman, 2021).

Education has components that support its implementation such as students, teachers, infrastructure, curriculum, funds, and environment (Hidayatulloh et al., 2023; Nugraha, 2022; Pramono, 2020; Rabbani et al., 2025). Educational facilities include all equipment and supplies that directly supports the educational process while educationalinfrastructure includes all facilities such as buildings, land and so on which indirectly support the educational process (Bararah, 2020; Candra Wijaya, Rahmat Hidayat, 2016; Farianti et al., 2020). Educational facilities and infrastructure are factors that It is mandatory because it is very important to use them to support learning activities (Hamzah et al., 2023; Sulfemi, 2018). Suggestions and infrastructure will support the learning resources used. Learning resources are also one of the determining factors for success in the learning process at school, apart from teachers, students, teaching materials, learning media, learning environment, and learning methods (Bararah, 2020; Fachrurazi, 2022). One of the things is infrastructure and resources An important learning area for students is the laboratory.

The laboratory is a place for observation, experimentation, training, and testing of knowledge and technology concepts (Arnita Sari, 2019; Hidayatulloh et al., 2023; Pertiwi, 2019; Zahra et al., 2023). The laboratory is expected to support the teaching and learning process to achieve learning objectives so that efforts to improve student achievement are increasing (Zakiyawati et al., 2021). However, in reality, there are still many schools that do not use laboratories as an effective learning medium. (Ernawati & Susanti, 2022) Material that should use experimental methods is the main choice for teachers of science to explain the material so that students understand the material better. The existence of laboratories in schools can support learning activities and achieve three domains of educational goals, namely affective, cognitive, and psychomotor (Ernawati & Susanti, 2022). The existence of laboratories is very necessary as a place of learning to provide real experience to students as a supporting factor in implementing learning (Hidayatulloh et al., 2023; Muldayanti & Kurniawan, 2021). Laboratory activities are not only aimed at improving theory, but students can discover their knowledge (Hidayatulloh et al., 2023). Laboratory activities are used as a way for students to easily understand the material and be able to build knowledge by experiencing the process or experimenting on their own (Hidayat et al., 2023; Zakiyawati et al., 2021). The higher the student's involvement in practical activities, the higher the student's achievement of understanding and process skills. This statement means that laboratory activities can build their knowledge about the facts, concepts, and theories contained in the learning material, as well as enrich the experience so that it will last longer in students' memories(Zakiyawati et al., 2021). Practicum is part of teaching that aims to allow students to test and implement in real situations the results obtained from the theory. When receiving news, you must know the truth of the news or information. (Hidayat et al., 2023; Rachmawati & Nisa, 2022)

The teaching and learning process using the practical method allows students to experience for themselves, follow a process, and observe an object, situation, or process of something (Arnita Sari, 2019). Studying science will not be optimal if it is not supported by conditions in the laboratory (Farianti et al., 2020; Muis et al., 2023). The ability to carry out practical work is an ability to solve problems and be scientific which involves aspectsof intellectual, and ve bal skills, motor skills, and attitudes. (Muis et al., 2023) Practical activities in the laboratory are carried out in a way so that students can easily understand the material and build knowledge by experiencing the process or experimenting themselves. To make all this happen, good laboratory management or administration is needed and by laboratory standards (Ibrahim, Muhammad Buchori, 2023; Muis et al., 2023).

Laboratory management is an effort to manage a laboratory so that it has good governance. (Hidayat et al., 2023) Laboratory management so that it has good governance is very much determined by several factors that are interrelated with each other. (Apriyanto et al., 2019; Hidayat et al., 2023) Some sophisticated laboratory equipment may not necessarily be able to operate well if it is not supported by good management (Apriyanto et al., 2019; Putra et al., 2019). So laboratory management becomes an important part and cannot be separated from laboratory activities. Good laboratory management has a good organizational system, clear work descriptions, effective, efficient, disciplined use of facilities, and good laboratory administration. To make all this happen, you need someone who can carry out good laboratory management, namely a laboratory manager (Arnita Sari, 2019).

Laboratory managers play an important role in laboratory settings. (Ernawati & Susanti, 2022; Hidayat et al., 2023; Lestari et al., 2022) The existence of laboratory managers ensures the smooth continuity of practicums. A manager is a person who plans, organizes, implements, and carries out evaluations. (Ernawati & Susanti, 2022) Laboratory managers or laboratory assistants have responsibility for managing

and carrying out laboratory functions, laboratory administration, and controlling laboratory use. So laboratory assistants are needed who have high performance in carrying out their duties and responsibilities. (Lutfi, 2018; A. L. Putra et al., 2019) To produce quality laboratory assistants, schools must provide training or guidance to laboratory assistants or select laboratory assistants according to certain requirements. Because to produce good laboratory management, managers or laboratory assistants are needed who are experts in that field. (A. L. Putra et al., 2019) Several indicators for laboratory assistants that are expected include: 1) behaving wisely in acting and solving problems, 2) behaving honestly on all information, 3) showing independence in working in their field, 4) showing self-confidence, and 5) behaving disciplined regarding time and rules. (Hidayat et al., 2023; Pertiwi, 2019) However, many schools do not pay attention to the quality and performance of the laboratory. Several factors include: 1) rarely implementing practicum as a learning reinforcer; 2) do not put too much emphasis on learning in the laboratory. 3) unavailability of laboratories. (Ernawati & Susanti, 2022) These problems limit learning in the classroom and there is no place for students to develop skills to become laboratory assistants or laboratory managers. So for now, every school is emphasized to provide laboratory facilities, even simple ones, for the advancement of education in Indonesia. (Ernawati & Susanti, 2022)

Based on the results of initial research conducted at SMA IT Yarsi Mataram on November 28, 2023, it shows that there is a science laboratory that collaborates with STIKES Yarsi Mataram in improving students' science. Science learning, especially science, is very active in using laboratories to support learning. The practical tools and materials there are quite complete and adequate for science learning applications. However, the problem is that there is no permanent laboratory assistant who manages the laboratory, and there are no regulations based on laboratory standards. Every teacher who teaches science subjects immediately becomes a laboratory assistant in the practicum. Management or management of laboratories gives latitude to teachers in developing teacher performance related to laboratories. Apart from that, students are expected to be able to improve their science process skills with laboratory-based learning. This is because the connection with laboratory management managed by teachers is expected to improve students' science process skills. Based on theoretical and empirical studies that have been presented, laboratory management is expected to improve the performance of laboratory managers and students' science process skills.

2. METHODS

2.1. Research Design

This research uses a quantitative approach with a correlational type of research(Budi Djatmiko, 2022; Muspawi et al., 2020). Quantitative correlational research will use statistical methods that measure the influence between two or more variables.(Candana, 2021; Sari et al., 2022) The independent variable of this research is laboratory management, while the dependent variables are the performance of laboratory managers and science process skills. The research design used is analytical. This design will further look at the correlation or relationship between the independent variable and the dependent variable in a population, where in this research, variable X will influence variables Y1 and Y2 simultaneously. This can be shown in the picture below (Fadli, 2021; Girsang, 2019).

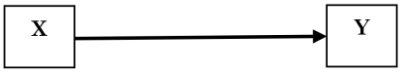

Figure 1. Research Design

2.2. Participants

The population of this study was 78 people, consisting of 1 school principal, 14 teachers, and 63 students. The samples taken referred to the random sampling technique were 30, consisting of 1 school principal, 4 teachers (laboratory users), and 25 students. This sampling is based on the representation of all existing populations.

2.3. Data Collection

Data collection techniques use observation with questionnaire instruments and assessment sheets. The questionnaire instrument was derived from 8 indicators of the Y1 variable , which were made into 16 tasks. The 8 indicators include teacher participation, user frequency, teaching effectiveness, quality of materials and resources, teacher satisfaction, professional development, creativity and innovation, and curriculum suitability. (Pertiwi, 2019) Each indicator has criteria that are used as tasks for assessing laboratory management processes. Each task will be given an assessment range of 1-5 by respondents. (Nasser et al., 2021; Rafid & Tinus, 2019) Each task will be given a rating with a range of 1-4. The assessment guidelines using these instruments include (Farianti et al., 2020; Lutfi, 2018):

Table 1. Guidelines for Internal Conversion of Presentations into Categories

No	Presentation (%)	Category
1	$80 < X \leq 100$	Very good
2	$60 < X \leq 80$	Good
3	$40 < X \leq 60$	Enough
4	$20 < X \leq 40$	Not enough
5	$0 < X \leq 20$	Very less

Based on Table 1, it can be explained that the value presentation can be seen by category by looking at the presentation of the results obtained. If the presentation obtained is in the range $80 < X \leq 100$, $60 < X \leq 80$, and $40 < X \leq 60$ then variable X can influence Y1 and Y2. However, for the range $20 < X \leq 40$ and $0 < X \leq 20$. This shows that variable X does not affect variables Y1 and Y2. (Farianti et al., 2020) For more details, a two-way ANOVA test will be carried out.

2.4. Data Analysis

The data analysis technique uses the ANOVA test. This ANOVA test will test the relationship between 1 independent variable and 2 dependent variables. (Ibrahim, Muhammad Buchori, 2023; A. L. Putra et al., 2019; Sari et al., 2022) In this research, researchers will test the prerequisites before testing the hypothesis , because it will see the effect on students' science process skills after implementing laboratory management. Data on the influence of laboratory management on laboratory assistant performance will be taken from the questionnaire, while data on the influence of laboratory management on students' science process skills will be obtained from the assessment sheet. The data to be obtained will be processed in SPSS 24* by carrying out the ANOVA test. Testing using statistical analysis will use a significance level of 5%. (Ibrahim, Muhammad Buchori, 2023) This means the confidence level is 0.05. The assumption given is that if the data obtained is below 0.05 then there is an influence of variable X on variables Y1 and Y2, so the alternative hypothesis (Ha) is accepted. Meanwhile, if the data obtained is above 0.05 then there is no influence of variable X on variables Y1 and Y2, so the null hypothesis (Ho) is accepted.

Table 2. One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			30
Normal Parameters[a,b]		Mean	.0000000
		Std. Deviation	4.20286838
Most Differences	Extreme	Absolute	.124
		Positive	.124
		Negative	-.101
Test Statistic			.124
Asymp. Sig. (2-tailed)			.200[c,d]

3. RESULTS AND DISCUSSION

Data analysis in this research used two stages, first, prerequisite testing through normality and homogeneity tests. Meanwhile, the second stage is testing the hypothesis using the ANOVA Test (Lestari

et al., 2022; Meynita et al., 2020; A. L. Putra et al., 2019). Based on the analysis that has been carried out using the SPSS application, the prerequisite tests can be explained. First, test normality using the one-sample Kolmogorov-Smirnov test. This type of test is part of the classical assumption test. This test is carried out as a requirement before carrying out a hypothesis test to see the normality of the data obtained. Based on testing via SPSS, it can be displayed, among others (see Table 2).

Based on the normality test, the significance value obtained was 0.200. Referring to the basis for decision making, if the significance value is greater than 0.05, then the data is normally distributed, but if the significance value is smaller than 0.05 then the data is not normally distributed. Based on this test, the significance value is 0.200 > 0.05. This shows that the residual values are normally distributed. This means that the data obtained before testing the hypothesis is normally distributed and can be continued with the next test. In previous research, the normality prerequisite test was the opening test for conducting hypothesis testing. (Aldian & Wahyudiati, 2023; Mulyana et al., 2021) The basis for making decisions on this normality test in most previous research was that the significance level was 5%, if the data was normally distributed must be above 5%. If using a significance level of 1%, then the data must be above 0.01 to be normally distributed. (Hartini, 2012; Rahayuningsih et al., 2023) Next, carry out a homogeneity prerequisite test. This test is carried out to determine whether the data is homogeneous or not. The data will be homogeneous if the value obtained is greater than 0.05 if the significance level is 5%, but if the significance level is 1%, then the data is sufficient to be greater than 0.01 for homogeneity. Based on the tests carried out, it was obtained, among others (see table 3).

Table 3. Test of Homogeneity of Variances

Test of Homogeneity of Variances					
		Levene Statistic	**df 1**	**df2**	**Sig.**
Independent	Based on Mean	4.180	1	28	.050
	Based on Median	3.090	1	28	.090
	Based on Median and with adjusted df	3.090	1	26.365	.090
	Based on trimmed mean	4.149	1	28	.051

Based on test result data, the significant value obtained was 0.051. Decision making is assumed, if the significance value is greater than 0.05 then the data is homogeneous, but conversely, if the significance value is smaller than 0.05 then the data is not normal. (Aldian & Wahyudiati, 2023; Lestari et al., 2022) Based on the test, the result obtained is 0.051 > 0.05, which shows that the data is homogeneous. Referring to previous research, this homogeneity test is important to do to make the data homogeneous. The purpose of having homogeneous data is to ensure consistency, reliability and validity of the analysis or interpretation that will be carried out. The term "homogeneous" refers to the uniformity or consistency of data in a set or group of data. (Lestari et al., 2022) Apart from that, homogeneous data also aims, among other things. (Meynita et al., 2020) :

1. Better Quality of Analysis: Homogeneous data allows for more accurate and relevant analysis. With consistent data, we can avoid distortion or bias in the analysis results, thereby providing greater confidence in the interpretation.
2. Uniformity in Interpretation: Homogeneous data ensures that the interpretations made are consistent across the dataset. This helps avoid errors or ambiguity in understanding and interpreting the results.
3. Good Comparability: Homogeneous data facilitates easier comparison between different groups or categories in the dataset. This is important to make valid generalizations or to understand significant differences between groups.
4. Accuracy in Decision Making: Homogeneous data enables more precise and informed decision-making. By ensuring that the data used to make decisions is homogeneous, we can increase confidence in the decisions made.
5. Increased Confidence in Results: Homogeneous data helps increase confidence in the results of analysis or research. By having consistent and valid data, we can have greater confidence in the results produced.

After getting normal and homogeneous data. So the next researcher carried out data analysis using the ANOVA test. The ANOVA test was carried out to see the effect of X on Y and X to Y makes the teacher or laboratory assistant the research sample. The ANOVA test results include:

Table 4. ANOVA

ANOVA[a]						
	Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	77.813	1	77.813	2.38	.221[b]
	Residual	98.043	3	32.681		
	Total	175.856	4			
a. Dependent Variable: Labor						
b. Predictors: (Constant), Laboratory Management						

Based on data on the influence of laboratory management on manager performance, the significance value was found to be 0.221. Based on the ANOVA assumption test and the basis for decision making, it shows that the significance value is greater than the 0.05 significance level. From this, researchers can see that there is no influence of laboratory management on laboratory performance. This is because the number of laboratory samples used was too small, namely 5 laboratory assistants. This was done because the number of laboratory assistants at SMA IT Yarsi Mataram was very limited. From there, to see clear results, the influence of laboratory management on laboratory performance is not effective. (Muslimin & Nursasongko, 2019) With a small sample to see the influence of a wide range of variables, the results have no effect. (Muslimin & Nursasongko, 2019) Based on previous research, there are variations in data obtained in various studies. Some are influential because the sample data is more than 20 laboratory assistants, and there are those that are not influential because the sample data is less than 10 people. (Jahari, 2016; Muslimin & Nursasongko, 2019) A review that researchers can carry out is to increase the number of samples, because the more research samples there are, the more research samples there will be. the more likely it is to have an effect. In a previous study regarding whether or not a study had an influence or not, it did not invalidate the research, meaning that in this study there were 2 research hypotheses, namely the alternative hypothesis (Ha) and the null hypothesis (Ho). So in the research what is accepted is the null hypothesis (Ho) and what is rejected is the alternative hypothesis (Ha).

However, there are several studies showing there is no effect. (Meynita et al., 2020; Mulyana et al., 2021; Muspawi et al., 2020) This is because laboratory management and laboratory assistant performance are two different aspects of laboratory operations. Laboratory management is more related to the planning, organization, and management of laboratory operations as a whole, including policies, procedures, and resource allocation. (Rachmawati & Nisa, 2022) Meanwhile, laboratory performance is more related to individual performance in carrying out specific tasks in the laboratory (Pertiwi, 2019; Putra et al., 2023). Laboratory performance does not always depend entirely on laboratory management. There are external factors such as individual motivation, technical expertise, availability of resources, and working conditions that can also influence laboratory performance. Sometimes, laboratory assistants' performance may be less than optimal due to a lack of training or development of the necessary skills. (Ernawati & Susanti, 2022) This can happen regardless of good laboratory management. The level of motivation and job satisfaction of laboratory assistants can influence their performance, and these factors may not be completely related to laboratory management. Factors such as fairness, recognition, and opportunities for development also play an important role in individual performance. (Hidayat et al., 2023; Muldayanti & Kurniawan, 2021).

5. CONCLUSION

Based on the discussion that has been presented, it can be concluded that: (1) Based on the results of research and discussion, there is no influence of laboratory management on the performance of laboratory assistants (laboratory users). This means that Ho is accepted and Ha is rejected. (2) Based on the results and discussion, there is an influence of laboratory management on students' science process skills. This means Ha is accepted and Ho is rejected.

Acknowledgment. I thank UIN Mataram for providing the necessary facilities and resources to conduct my research.

Research Ethics. This study received UIN Mataram ethics approval on 10 June 2024.

Data Availability Statement. All data can be obtained from the corresponding author.

Conflicts of Interest. The author declares no conflicts of interest.

Funding. This research received no external funding.

REFERENCES

Aldian, H., & Wahyudiati, D. (2023). Analisis Pengaruh Bahan Ajar Kimia Berbasis IT Terhadap Keterampilan Kolaborasi dan Komunikasi Siswa. *Jurnal Paedagogy*, *10*(1), 207. https://doi.org/10.33394/jp.v10i1.5484

Apriyanto, C., Yusnelti, Y., & Asrial, A. (2019). Pengembangan E-Lkpd Berpendekatan Saintifik Larutan Elektrolit Dan Non Elektrolit. *Journal of The Indonesian Society of Integrated Chemistry*, *11*(1), 38–42. https://doi.org/10.22437/jisic.v11i1.6843

Arnita Sari, Y. (2019). Penerapan Pembelajaran Berbasis Praktikum Untuk Meningkatkan Keterampilan Proses Sains Dan Sikap Ilmiah Siswa Smk Pada Materi Bakteri. *SINAU : Jurnal Ilmu Pendidikan Dan Humaniora*, *5*(2), 60–77. https://doi.org/10.37842/sinau.v5i2.55

Babalola, V. T., Umar, A., & Sani Tafida, H. (2025). Patterns of Teacher-Student Interaction in Relation to Chemistry Achievement in Science Secondary Schools of Kano-Nigeria. *Journal of Research in Environmental and Science Education, 2*(1), 18-28. https://doi.org/10.70232/jrese.v2i1.5

Bararah, I. (2020). Pengelolaan Sarana Dan Prasarana Pendidikan Dalam Meningkatkan Kualitas Pembelajaran. *Jurnal MUDARRUSUNA*, *10*(2), 351–370. http://dx.doi.org/10.22373/jm.v10i2.7842

Bariyah, L. L. N., & Sugandi, M. K. (2022). Project Based Learning Untuk Meningkatkan Keterampilan Proses Sains Siswa Pada Konsep Ekosistem. *Seminar Nasional Pendidikan*, 135–144.

Budi Djatmiko, M. K. A. (2022). KINERJA KEPALA SEKOLAH (Peningkatan Mutu Pendidik di Lingkungan SMK Negeri 1 Sukapura). *Jurnal Edukasi*, *9*(2023), 23–34.

Burchard, C., Nguru, F., & Pembe, F. K. (2025). Enhancing Science Literacy in Secondary School Physics: A Systematic Review of Multimedia Integration Strategies and Resources. *Journal of Education for Sustainable Development Studies, 2*(1), 71-81. https://doi.org/10.70232/jesds.v2i1.26

Candana, D. M. (2021). Determinasi Prestasi Kerja Dan Kepuasan Kerja: Etos Kerja Dan Disiplin Kerja (Suatu Kajian Studi Literatur Manajemen Sumberdaya Manusia). *Jurnal Ilmu Manajemen Terapan*, *2*(4), 544–561. https://doi.org/10.31933/jimt.v2i4.471

Candra Wijaya, Rahmat Hidayat, ien R. (2016). *Manajemen Sumber Daya Pendidik dan Tenaga Kependidikan*.

Ernawati, T., & Susanti. (2022). Skill Manajemen Laboratorium : Sebuah Perspektif bagi Mahasiswa Pendidikan IPA. *Kegiatan Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat*, *1*(1, No. 1 (2022)), 787–799. https://seminar.ustjogja.ac.id/index.php/semnas_LP2M_UST/article/view/658

Fachrurazi, D. (2022). *Pengaruh Kompetensi Manajerial Kepala Sekolah Dan Budaya Organisasi Terhadap Kinerja Guru Pada Sekolah Dasar Islam Se-Kabupaten Malang*. 208.

Fadli, M. R. (2021). Memahami desain metode penelitian kualitatif. *Humanika*, *21*(1), 33–54. https://doi.org/10.21831/hum.v21i1.38075

Fardinal, F., Ali, H., & Anwar US, K. (2022). Mutu Pendidikan Islam: Jenis Kesisteman, Konstruksi Kesisteman Dan Berfikir Kesisteman. *Jurnal Ekonomi Manajemen Sistem Informasi*, *3*(4), 370–382. https://doi.org/10.31933/jemsi.v3i4.894

Farianti, D., Danial, M., & Aulia, A. (2020). Pengaruh Praktikum Berbasis Bahan Alam melalui Model Discovery Learning terhadap Motivasi dan Hasil Belajar Kimia Peserta Didik. *Chemistry Education Review (CER)*, *3*(2), 138. https://doi.org/10.26858/cer.v3i2.13765

Girsang, W. S. (2019). Pengaruh Budaya Organisasi dan Komitmen Terhadap Kinerja Karyawan RS Putri Hijau No. 17 Medan. *AJIE-Asian Journal of Innovation and Entrepreneurship*, *04*(2), 159–170.

Halawa, A. N., & Mulyanti, D. (2023). Faktor-Faktor Yang Mempengaruhi Peningkatan Kualitas Mutu Instansi Pendidikan Dan Pembelajaran. *Inspirasi Dunia: Jurnal Riset Pendidikan Dan Bahasa*, *2*(2), 57–64.

Hamzah, A. R., Mesra, R., Br Karo, K., Alifah, N., Hartini, A., Gita Prima Agusta, H., Maryati Yusuf, F., Endrawati Subroto, D., Lisarani, V., Ihsan Ramadhani, M., Hajar Larekeng, S., Tunnoor, S., Bayu, R. A., & Pinasti, T. (2023). *Strategi Pembelajaran Abad 21*.

Hartini, S. (2012). Pengaruh kualifikasi akademik, pengalaman kerja dan motivasi kerja terhadap kinerja kepala sekolah dasar se Kecamatan Wiradesa Kabupaten Pekalongan. *JMP, Volume 1 Nomor 3*, *1*, 331–344.

Herawati. (2018). Memahami Proses Belajar Anak. *Jurnal UIN Ar-Raniry Banda Aceh*, *4*(1), 27–48. https://jurnal.ar-raniry.ac.id/index.php/bunayya/article/view/4515

Hidayat, W., Sukri, A., & Mirawati, B. (2023). Efektivitas Penggunaan Laboratorium IPA Terhadap Pembelajaran Biologi. *Empiricism Journal*, *4*(1), 163–174. https://doi.org/10.36312/ej.v4i1.1126

Hidayatulloh, M. D., Irawan, & Priatna, T. (2023). Tata Kelola Sains di Lembaga Pendidikan Islam melalui Penataan Laboratorium. *PANDU : Jurnal Pendidikan Anak Dan Pendidikan Umum*, *1*(1), 1–8. https://doi.org/10.59966/pandu.v1i1.8

Ibrahim, Muhammad Buchori, D. (2023). *Metode Penelitian Berbagai Bidang Keilmuan (Panduan & Referensi)*. https://books.google.com/books?hl=en&lr=&id=OCW2EAAAQBAJ&oi=fnd&pg=PP1&dq=metode+penelitian+campuran&ots=XqNXCWppa8&sig=vd-PFXG63FBzf0trpLWt9FGYfbY

Jahari, J. (2016). Kinerja Kepala Sekolah Menengah Atas Berbasis Islam. *Jurnal Pendidikan Islam*, *28*(1), 1. https://doi.org/10.15575/jpi.v28i1.533

Kotsis, K. T. (2025). Inquiry-Based Learning in Science: Mathematical Reasoning's Support of Critical Thinking. *Journal of Research in Mathematics, Science, and Technology Education, 2*(1), 60-72. https://doi.org/10.70232/jrmste.v2i1.35

Lestari, A., Mahmud, H., & Munir, N. P. (2022). Pengaruh Soft Skills Dan Keterampilan Interpersonal Terhadap Kepemimpinan Kepala Sekolah. *Kelola: Journal of …*, *7*(1), 107–120. http://ejournal.iainpalopo.ac.id/index.php/kelola/article/view/2746%0Ahttps://ejournal.iainpalopo.ac.id/index.php/kelola/article/download/2746/1798

Lutfi, M. (2018). Peningkatan Kompetensi Lulusan dengan Mutu Layanan di Perguruan Tinggi Muhammadiyah (PTM) (Studi kasus di Provinsi DKI, Banten, Jawa Tengah dan Jawa Timur). *Jurnal Tahdzibi: Manajemen Pendidikan Islam*, *3*(2), 67–81. https://doi.org/10.24853/tahdzibi.3.2.67-81

Meynita, Fitria, H., & Nurkhalis. (2020). Pengaruh Kemampuan Manajerial Kepala Sekolah Dan Iklim Kerja Terhadap Kerja Guru. *Jurnal Pendidikan Tambusai*, *4*(3), 132. https://doi.org/10.31004/jptam.v4i3.866

Muis, A., Dwi, D., Ulan, P., & Patongai, S. (2023). *Analisis Keterlaksanaan Unit Praktikum Biologi Pada Kelas XI Sekolah Menengah Atas Negeri Di Kota Makassar Analysis of the Implementation of Biology Practicum Units in Grade XI Senior High Schools in Makassar*. 1–7.

Muldayanti, N., & Kurniawan, A. D. (2021). Bimbingan Teknis Managemen Laboratorium Sebagai Pendukung Kegiatan Belar Mengajar Ipa Biologi. *Jurnal Widya Laksana*, *10*(2), 189. https://doi.org/10.23887/jwl.v10i2.29895

Mulyana, Nongkeng, H., & Arifin. (2021). Pengaruh Kemampuan Manajerial Kepala Sekolah,Lingkungan Sekolah, Dan Kompetensi Pedagogik TerhadapPeningkatan Kinerja Guru Di SMK NegeriKabupaten Soppeng. *Bata Ilyas Educational Management Review*, *1*(1), 46–63.

Muslimin, A., & Nursasongko, R. (2019). Pengaruh Gaya Kepemimpinan Dan Kemampuan Manajerial Kepala Sekolah Dasar Terhadap Kinerja Guru. *Manajer Pendidikan: Jurnal Ilmiah Manajemen Pendidikan Program Pascasarjana*, *13*(2), 127–132. https://doi.org/10.33369/mapen.v13i2.9665

Muspawi, M., Setiyadi, B., & Gunawan, G. (2020). Upaya Kepala Sekolah Untuk Peningkatan Kompetensi Profesional Guru. *Jurnal Ilmiah Universitas Batanghari Jambi*, *20*(1), 95. https://doi.org/10.33087/jiubj.v20i1.864

Nasser, A. A., Arifudin, O., Barlian, U. C., & Sauri, S. (2021). Sistem Penerimaan Siswa Baru Berbasis Web Dalam Meningkatkan Mutu Siswa Di Era Pandemi. *Biormatika : Jurnal Ilmiah Fakultas Keguruan Dan Ilmu Pendidikan*, *7*(1), 100–109. https://doi.org/10.35569/biormatika.v7i1.965

Noprika, M., Yusro, N., & Sagiman, S. (2020). Strategi Kepala Sekolah Dalam Peningkatan Mutu Pendidikan. *Andragogi: Jurnal Pendidikan Islam Dan Manajemen Pendidikan Islam*, *2*(2), 224–243. https://doi.org/10.36671/andragogi.v2i2.99

Nugraha, B. (2022). *Pengembangan Uji Statistik: Implementasi Metode Regresi Linier Berganda*. Pradina Pustaka.

Nur Dhuka, M. (2022). Perencanaan Strategis Mutu Pendidikan Agama Islam. *Journal of Industrial Engineering &*

Management Research, *3*(5), 287–298.

Nurasiah, N., & Zulkhairi, Z. (2021). Efektivitas Komunikasi Interpersonal Kepala Sekolah dalam Meningkatkan Kinerja Guru. *Jurnal MUDARRISUNA: Media Kajian Pendidikan Agama Islam*, *11*(4), 658. https://doi.org/10.22373/jm.v11i4.5403

Pertiwi, F. N. (2019). Sistem Pengelolaan Laboratorium IPA 65. *Kodifikasia: Jurnal Penelitian Islam*, *13*(1), 65–76.

Pramono, J. (2020). Implementasi dan Evaluasi Kebijakan Publik. UNISRI Press.

Putra, A. L., Kasdi, A., & Subroto, W. T. (2019). Pengaruh Media Google Earth Terhadap Hasil Belajar Berdasarkan Keaktifan Siswa Kelas Iv Tema Indahnya Negeriku Di Sekolah Dasar. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan Dan Hasil Penelitian*, *5*(3), 1034–1042. https://doi.org/10.26740/jrpd.v5n3.p1034-1042

Putra, I. G. K. A. P., Dyanthi, L. M., Saravistha, D. B., & Herawati, K. M. (2023). Perkawinan Berbeda Agama Di Indonesia. *Jurnal Indragiri Penelitian Multidisiplin*, *3*(2), 63–72. https://doi.org/10.58707/jipm.v3i2.446

Rabbani, Q. S., Hidayat, P., Maharani, E. A., & Satrianawati, S. (2025). The Influence of Smartphone Use on the Cognitive Abilities and Emotional Intelligence of Students at Pogung 2 State Elementary School. *Journal of Computers for Science and Mathematics Learning, 2*(1), 1-5. https://doi.org/10.70232/jcsml.v2i1.11

Rachmawati, W., & Nisa, F. S. (2022). Sistem Informasi Pengelolaan Laboratorium Komputer Jurusan Administrasi Niaga Politeknik Negeri Malang. *Jurnal Administrasi Dan Bisnis*, *16*(1), 60–68.

Rafid, R., & Tinus, A. (2019). Kinerja Kepala Sekolah dalam Meningkatkan Mutu Tenaga Pendidik di Sekolah Menengah Atas Negeri 1 Latambaga, Kolaka. *Jurnal Akuntabilitas Manajemen Pendidikan*, *7*(2), 188–198. https://doi.org/10.21831/amp.v7i2.28012

Rahayuningsih, T., Setyaningsih, S., & Sunardi, O. (2023). Pengaruh Supervisi Pengawas dan Kepuasan Kerja terhadap Peningkatan Kinerja Kepala Sekolah. *DWIJA CENDEKIA: Jurnal Riset Pedagogik*, *7*(2). https://doi.org/10.20961/jdc.v7i2.75723

Sari, M., Rachman, H., Juli Astuti, N., Win Afgani, M., & Abdullah Siroj, R. (2022). Explanatory Survey dalam Metode Penelitian Deskriptif Kuantitatif. *Jurnal Pendidikan Sains Dan Komputer*, *3*(01), 10–16. https://doi.org/10.47709/jpsk.v3i01.1953

Sugiarto, S., Neviyarni, S., & Firman, F. (2021). Peran Penting Sarana dan Prasarana Dalam Pembelajaran Bimbingan Konseling di Sekolah. *JPT: Jurnal Pendidikan Tematik*, *2*(1), 60-66. https://www.siducat.org/index.php/jpt/article/view/223

Sulfemi, W. B. (2018). Modul Pembelajaran Program Studi Administrasi Pendidikan STKIP Muhammadiyah Bogor. *Buku Manajemen Kurikulum Di Sekolah*, *106*, 3.

Wardhani, T. Z. Y., & Krisnani, H. (2020). Optimalisasi Peran Pengawasan Orang Tua Dalam Pelaksanaan Sekolah Online Di Masa Pandemi Covid-19. *Prosiding Penelitian Dan Pengabdian Kepada Masyarakat*, *7*(1), 48. https://doi.org/10.24198/jppm.v7i1.28256

Zahra, S., Dalalah, L., Rozak, F. A., & Fauzi, A. (2023). Aktualisasi Keterampilan Interpersonal Kepala Sekolah Dalam Meningkatkan Aktivitas Kinerja Guru. *Foramadiahi: Jurnal Kajian 9*(2), 55–67. http://36.93.48.46/index.php/foramadiahi/article/view/995%0Ahttp://36.93.48.46/index.php/foramadiahi/article/download/995/738

Zakiyawati, S. W., Trihantoyo, S., Pendidikan, J. M., Pendidikan, F. I., & Surabaya, U. N. (2021). Urgensi sarana dan prasarana dalam meningkatkan prestasi belajar pada jenjang sekolah menengah kejuruan. *Jurnal Inspirasi Manajemen Pendidikan*, *9*, 200–214.