Journal of Science Education Research
Journal homepage: https://journal.uny.ac.id/index.php/jser/index

ISSN: 2597-9701

Identification of Science Laboratory Service Quality from the Perspective of Junior High School Students in Majene Regency Using the Importance Performance Analysis Method

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Abstract

This study aims to obtain comprehensive and detailed information regarding the quality and priority of science laboratory services for improving the quality of science laboratory services at the junior high school level in Majene Regency. This research used a quantitative method with a descriptive approach. The population of this study was all junior high school students in Majene Regency. The sample size was 184 students, obtained through purposive sampling. The data collection technique used was a questionnaire. The instruments used consisted of a validation sheet and a questionnaire, both of which had undergone content validation by two experts. The instrument validation stage yielded an internal consistency coefficient (content validity) of 0.83 > 0.75, indicating that the questionnaire is valid and can be used in the research activities. The data were analyzed using Importance Performance Analysis. This involved two calculations: a conformity level calculation using Microsoft Excel and a priority dimension calculation using Simple Scatter in SPSS version 26. The results of the study indicate that the quality of science laboratory services at the junior high school level in Majene Regency, from the students' perspective, is generally of high quality, as 93% of the items fall into the category of alignment between the service experienced and the expected service. Furthermore, five items were prioritized for improvement in the quality of science laboratory services at the junior high school level in Majene Regency, spread across the dimensions of reliability, responsiveness, assurance, and empathy.

History
Received: September 29, 2025
Revised: December 16, 2025
Accepted: April 24, 2026

Keywords:
Quality of Education; Service Quality; Science Laboratory; Student Perspective; Importance Performance Analysis

How to cite:
Taslim, A.M., Adam, W., & Aziza, N. (2026). Identification of Science Laboratory Service Quality from the Perspective of Junior High School Students in Majene Regency Using the Importance Performance Analysis Method. *Journal of Science Education Research*, 10(1), 178-188. https://doi.org/10.21831/jser.v10i1.90072.

1. INTRODUCTION

The quality of education in Majene Regency, as a City of Education in West Sulawesi, is still in the moderate category. It is based on the 2024 education report, particularly in the learning quality indicator.

The learning process is not only theoretical but also practical, especially in subjects that require significant practice, such as science. One of the factors of the low quality of education in Indonesia is the lack of supporting educational facilities (Wahyudi et al., 2022), one of which is laboratories.

Table 1: Majene Regency Education Report (Source: Elementary and Secondary Education Data**)**

Province	Regency/City	Type of Educational Unit	Educational Unit Status	Learning Quality	
				Achievement Label in 2024	Change in Achievement Score from Last Year
West Sulawesi	Majene Regency	Public Senior High School	All schools (Public and Private)	Moderate	Decrease
		Public Junior High Schools		Moderate	Increase
		Public Elementary Schools		Moderate	Decrease

Majene Regency has 35 junior high schools that should be equipped with science laboratories to support learning, as stipulated in Government Regulation Number 13 of 2015 concerning national education standards. However, based on information from the *Sekolah Kita* website, there are still five schools that do not have science laboratories. Meanwhile, other schools have science laboratories in varying conditions, as shown in the following table.

Table 2: Condition of Science Laboratories at Majene Middle School (Source: *Sekolah Kita* Website)

Good	Minor Damage	Moderate Damage	Severe Damage
18 units	6 units	7 units	3 units

Based on the table above, 47% of science laboratories at Majene Middle School are still in disrepair. Differences in the condition of science laboratories naturally lead to differences in learning services in each school.

One effort that can be taken is to equalize school facilities, specifically science laboratories, according to established standards (Wahyudi et al., 2022). Minister of National Education Regulation Number 24 of 2007 outlines the standards of school laboratories. However, science laboratory services at each school still vary significantly, both in terms of management and facilities. Based on preliminary information obtained through interviews with several teachers and students at junior high schools in Majene, it was found that not all schools fully optimize laboratory-based learning activities, and the frequency of practical activities in each class varies depending on the science subject teacher. It was also found that there are no laboratory guides available in the laboratories, so teachers use textbooks or create their own guidelines, resulting in a lack of uniformity in the laboratory process for the same theory. Moreover, some schools still lack laboratory assistants and technicians, requiring laboratory heads or science teachers to fill these roles.

Science is the study of nature through experiments and observations (Rahman, 2017). Science is not merely the processing of information in the form of facts, concepts, or principles, but also a process of discovery (Agustina & Muslih, 2024); thus, laboratory work can be an effective method for achieving learning objectives (Chandra & Hidayanti, 2020). Through hands-on experiments, students will gain a deeper understanding of a theory. Theory serves as a basis for understanding learning and practicum as a psychomotor process that serves to prove theory (Makhfudi, 2018). Students can prove existing theories, experience the experimental process, and draw conclusions that can support student understanding (Muna, 2016). Scientific research activities, experiments, measurements, or scientific training can be carried out in the laboratory (Wartineli, 2024). There are several benefits of learning in the laboratory, namely training students to analyze data, compile research reports, use scientific methods, think logically and systematically, gain a scientific and critical attitude, and develop student creativity (Sani, 2018).

Students can experience the benefits mentioned above if the services provided by laboratory staff (laboratory heads, laboratory assistants, and technicians) are optimal. Ministerial Regulation No. 26 of 2008 regulates standards for school/madrasah laboratory staff. This regulation stipulates the laboratory head's duties, namely, evaluating laboratory activities. This evaluation is used for future improvements. However, the results obtained are still incomplete because the laboratory head is only responsible for assessing the performance of

technicians and laboratory assistants, assessing laboratory activities, and evaluating laboratory programs. Meanwhile, many other indicators of quality need to be determined.

Kartikasari, Ilmiyati, & Maladona (2021); Arian, Kustiawan, & Maladona (2022); and Wati, Kudadiri, & Devianty (2023) have previously identified science laboratory management using qualitative research methods through interviews, observation, and documentation. However, the results obtained are not detailed and only provide information on the effectiveness of planning, organization, implementation, and supervision. It is still insufficient to provide information for future school improvements. Whereas improvements are certainly necessary to ensure everyone has access to quality education (Ratnasari & Nugraheni, 2024).

Quantitative research using the Important Performance Analysis (Quadrant Analysis) method is more effective because it provides specific information regarding existing and excessive services, as well as services that are low and high priority for improvement. Importance Performance Analysis is more frequently used in economic research to determine service quality from a user perspective. This method has begun to be used in various fields because the results are presented in an easily interpreted quadrant, facilitating the proposal for improvement. It is similar to the researchers' previous study in analyzing the quality of educational services at Gowa Junior High School (Taslim, 2023) and analyzing the quality of learning services from a student perspective (Taslim, Yunus, Alim, 2025).

This study will determine the quality of science laboratory services at the junior high school level in Majene Regency by observing the suitability of services experienced and expected services by students in the science laboratory based on the dimensions of service quality, namely reliability (providing services according to standards and promises), responsiveness (providing services quickly and accurately), assurance (growing user trust in the services provided), empathy (a sense of concern in fulfilling the desires and needs of service users), and tangibles (tangible evidence in the form of facilities and infrastructure) (Taslim, 2023). In addition, information will also be obtained regarding services that are a priority for improvement in the science laboratory at the junior high school level in Majene Regency on these dimensions. The data obtained regarding services that are high and low priority for improvement can be used as an improvement consideration for the school.

This research aligns with the Asta Cita, namely, strengthening the development of natural resources, science, technology, education, and so on. Data-driven analysis allows schools to make targeted improvements. Therefore, this study is crucial for a comprehensive and detailed analysis of the quality of science laboratory services at the junior high school level in Majene Regency from the perspective of students as service users. It ensures that the results obtained are more authentic and meaningful, reflecting students' experiences during their studies in the science laboratory, and can be used as a basis for future improvements. Based on the above description, the researchers are interested in identifying the quality of science laboratory services from the perspective of junior high school students in Majene Regency. This study aims to determine the quality of science laboratory services at Majene Junior High Schools and to determine which services are prioritized for improving the quality of science laboratory services at Majene Junior High Schools.

2. RESEARCH METHOD

This research is quantitative with a descriptive approach. Quantitative research is used to examine populations or samples using specific statistical methods. The descriptive approach is used to systematically describe the research results. The variable in this study is the quality of science laboratory services, which is an independent variable that is not related to other variables.

This research was conducted from July to August 2025 at Majene Junior High School. The population consisted of all junior high school students in Majene Regency. The sample size was 184 students, obtained through purposive sampling. The criteria were students studying at a leading school in Majene who had used the science laboratory for two years (currently in ninth grade).

The data collection technique was a questionnaire with a validation sheet and a questionnaire as the research instruments. The questionnaire was constructed using a Likert scale of 1-6. Students were required to fill in two columns for each statement item: the "experienced" column, which corresponds to the services they experienced while using the science laboratory, and the "expected" column, which corresponds to the services they expected from the science laboratory. The criteria in the "experienced" column ranged from 1-6, from very poor to very good, and the criteria in the "expected" column ranged from very undesirable to highly desirable.

This research instrument was valid to be used in the study after each item was validated through content validity by two experts. Based on the content validity of Gregory's model, an instrument is considered valid if the result is > 0.75 (Gregory, 2015). In the instrument validation stage, an internal consistency coefficient (content validity) of 0.83 > 0.75 was obtained; thus, the questionnaire is declared valid and can be used in this research.

The data obtained were then analyzed using Importance Performance Analysis through two calculations: a conformity level calculation using Microsoft Excel and a priority dimension calculation using Simple Scatter in

SPSS version 26. The conformity level calculation is used to determine the level of conformity between the service experienced and the expected service using the following formula (Martilla & James, 1977):

$$TK_i = \frac{X_I}{Y_I} \times 100\%$$

Where:
TK_i = Conformity level (quality) i.
X_i = Experienced service quality score.
Y_i = Expected service quality score.

If the result is in the interval 0-49%, it is considered inappropriate (low quality); 50-59% is considered inappropriate (low quality); 60-79% is considered quite appropriate (sufficient quality), and 80-100% is considered appropriate (high quality). The priority dimension calculation was obtained using Simple Scatter in SPSS version 26. The results can be presented in the following quadrants.

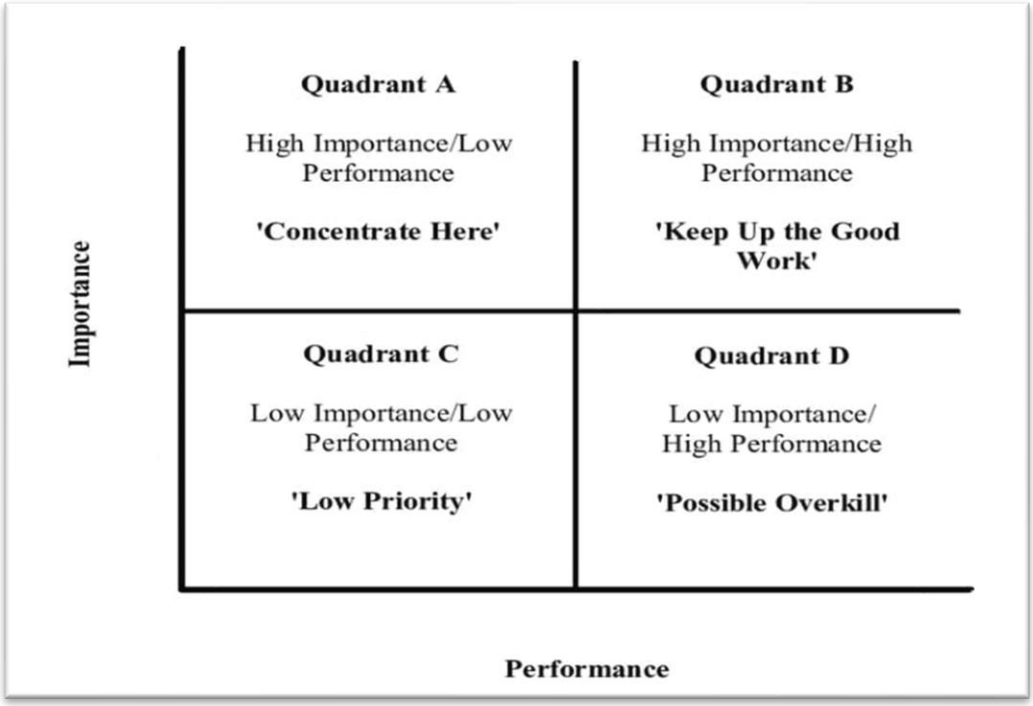

Figure 1: Importance Performance Analysis Diagram

Items in Quadrant A are the highest priority for improvement because the service experienced was lower than the expected service. Items in Quadrant B are items that need to be maintained because the service experienced and the expected service are both at high levels. Items in Quadrant C are a low priority for improvement because the service experienced and the expected service are both at low levels. Thus, items in Quadrant D are redundant because the service experienced was higher than the expected service.

3. RESULT AND DISCUSSION

3.1. Quality of Science Laboratory Services

The level of conformity between the service experienced and the expected service indicates service quality. The higher the level of conformity between the service experienced and the expected service, the higher the quality of the service. Therefore, it can be stated that the main factor influencing service quality is the fulfillment of expectations (Taslim, Yunus, & Alim, 2025). Based on the calculation of the level of service conformity between the service experienced and the expected service using Microsoft Excel, the science laboratory services from the perspective of junior high school students in Majene Regency are of good quality, as 28 out of 30 items (93%) obtained a conformity percentage within the 80%–100% interval, categorized as appropriate. There are only two items that still fall within the 60%–79% conformity interval, categorized as moderately appropriate, namely item (7), the technician's skills in repairing damaged laboratory equipment, and item (28), the availability of fire extinguishers. The school, therefore, needs to improve the quality of services that remain inadequate while maintaining the quality of services that are already deemed appropriate.

3.2. Priorities in Improving the Quality of Science Laboratory Services

Referring to the results of the conformity level calculation conducted previously, the quality of science laboratory services from the perspective of junior high school students in Majene Regency shows that only 93% of the services meet the conformity between the service experienced and the expected service. Therefore, a more in-depth analysis is required to examine the relationship between the service experienced and the expected service using the Simple Scatter in SPSS version 26, to obtain the distribution of each item in a two-dimensional scatter plot. This allows for more detailed information to be identified regarding the items categorized as top priority (Quadrant A), those that need to be maintained (Quadrant B), those considered low priority (Quadrant C), and those regarded as excessive (Quadrant D).

Based on the priority dimension analysis, there are no service quality dimensions identified as top priority for improvement (Quadrant A). However, the dimensions of reliability, responsiveness, and assurance are categorized as low priority for improvement (Quadrant C). This is illustrated in the following figure.

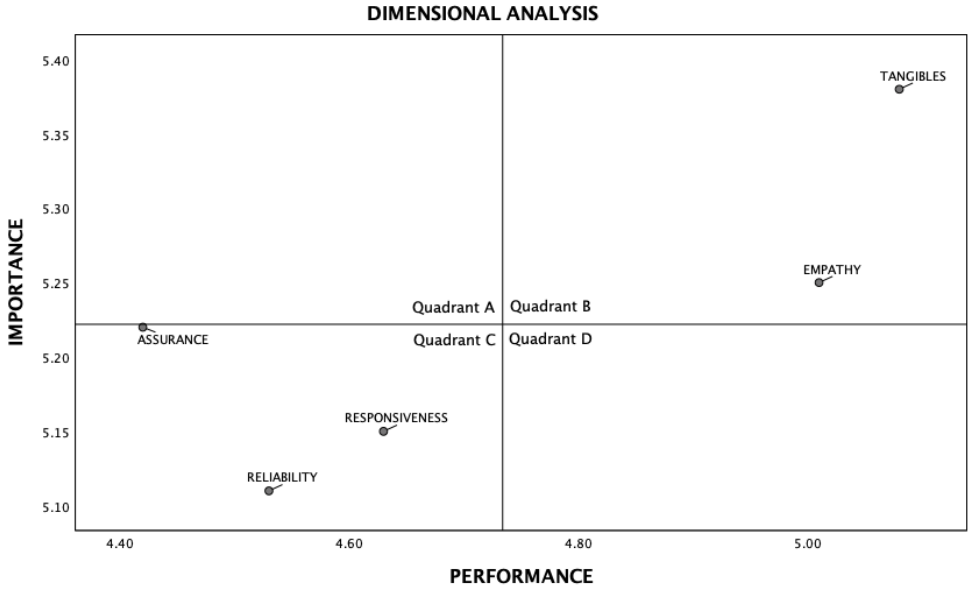

Figure 2: Cartesian Quadrant Analysis of Laboratory Service Quality Dimensions

Priority-dimension analysis should be performed for each service quality dimension, namely reliability, responsiveness, assurance, empathy, and tangibles, to provide more detailed information. Each dimension must be examined in greater depth to identify which specific items should be prioritized for improvement.

a. Results of Quadrant Analysis of the Reliability Dimension

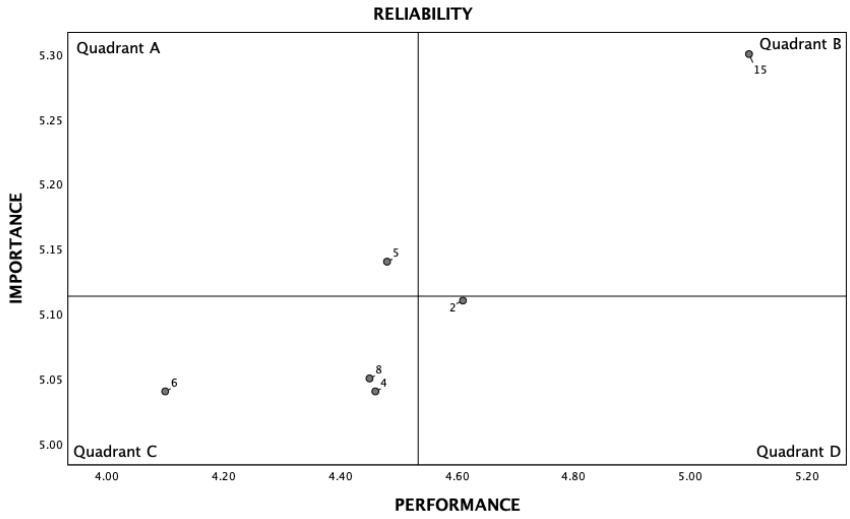

Figure 3. Cartesian Quadrant of Reliability Dimension Analysis

Students' assessment of the science laboratory service items within the reliability dimension indicates that there is one item identified as a top priority for improvement, namely item (5), the technician's ability to prepare instructions for the use of equipment. In addition, several items are

categorized as low priority for improvement, namely item (4), the technician's ability to organize the storage of tools and materials, item (6), the technician's skills in repairing damaged laboratory equipment, and item (8), the laboratory assistant's skills in reporting the tools and materials used in practicum activities.

In this dimension, the priority for improvement is focused on the services provided by technicians and laboratory assistants. It is due to the fact that among the four model schools where the data were collected, only one school has a technician, and only two schools have a laboratory assistant. Yet, the roles of technicians and laboratory assistants are highly important in ensuring the quality of practicum implementation. As stated by Azis et al. (2022), in order to ensure the quality of practicum implementation, the availability of laboratory facilities needs to be supported by skilled technicians and laboratory assistants who are capable of managing the laboratory in accordance with standards, so that practicum activities can be properly conducted and well facilitated.

Minister of National Education Regulation (Permendiknas) Number 26 of 2008 stipulates the standards for school/madrasah laboratory staff, including the qualifications and competencies that laboratory staff must possess. Therefore, each school should have technicians and laboratory assistants appointed by the local government, in this case through the Department of Education.

However, field findings indicate that some schools only have a head of the laboratory who concurrently serves as both technician and laboratory assistant. The lack of laboratory staff has led to hampered and less effective practicum activities (Batubara, Chastanti, & Harahap, 2024). To avoid overlapping responsibilities, it is necessary to establish a clear division of tasks and to develop the competencies of laboratory staff (Muhlis, Kholifah, & Nuha, 2025). This is in accordance with the 2017 guidelines for school laboratory staff issued by the Directorate General of Teachers and Education Personnel (GTK), which state that laboratory staff, including the head of the laboratory, technicians, and laboratory assistants, have their own specific duties, thereby contributing to the effectiveness of laboratory services.

b. Results of Quadrant Analysis of the Responsiveness Dimension

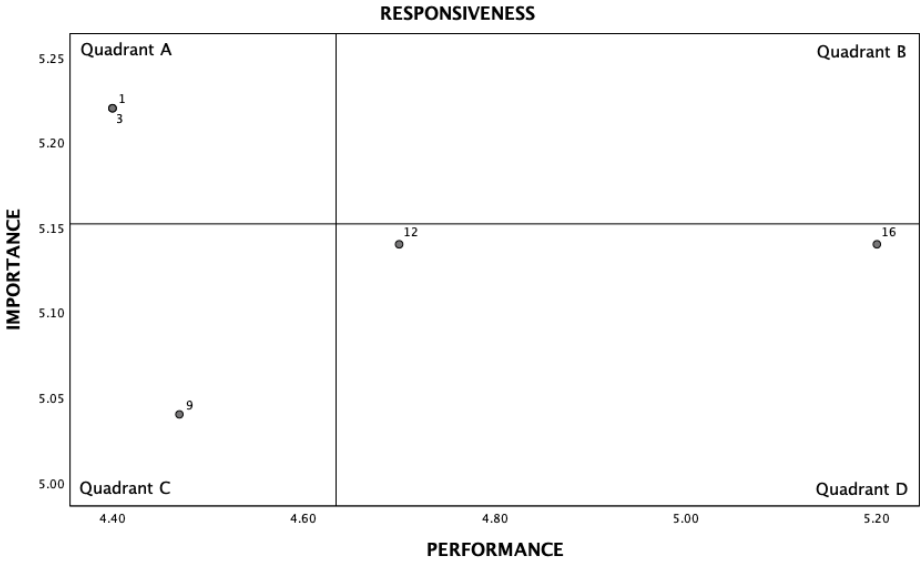

Figure 4. Cartesian Quadrant of Responsiveness Dimension Analysis

Students' assessment of the science laboratory service items within the responsiveness dimension indicates that there are items identified as top priority for improvement, namely item (1), the head of the laboratory's responsiveness in ensuring safety in the laboratory, and item (3), the technician's responsiveness in providing the necessary tools and materials for practicum activities. In addition, there is one item categorized as low priority for improvement, namely item (9), the laboratory assistant's responsiveness in identifying damaged equipment.

In this dimension, the top priority for improvement lies in the head of the laboratory's responsiveness in ensuring occupational safety within the laboratory. Efforts to ensure occupational safety include measures to prevent the possibility of accidents in the laboratory as well as handling procedures in the event of an accident (Sangi & Tanauma, 2018). Minister of National Education

Regulation (Permendiknas) No. 26 of 2008 concerning standards for school/madrasah laboratory staff stipulates that the head of the laboratory must meet four competencies: personal, social, managerial, and professional. Within the managerial competency, it is stated that the head of the laboratory is required to monitor the condition and safety of laboratory materials, equipment, and facilities. This competency is essential to ensure the safety and security of students and staff working in the laboratory (Yaman, 2016).

The next top priority for improvement is the technician's responsiveness in providing the necessary tools and materials for practicum activities. In accordance with Minister of National Education Regulation (Permendiknas) No. 26 of 2008 on standards for school/madrasah laboratory staff, one of the professional competencies of technicians is preparing material packages and equipment sets ready for use in practicum activities. This is intended to ensure that practicum activities are carried out in accordance with established procedures, thereby making the practicum more accurate and enabling the achievement of learning objectives. In addition, this can also help to increase time efficiency, as teachers and students can immediately begin the practicum activities. Therefore, laboratory staff, including the head of the laboratory, technicians, and laboratory assistants, need to have a better understanding of Minister of National Education Regulation (Permendiknas) No. 26 of 2008 and the 2017 guidelines for school laboratory staff issued by the Directorate General of Teachers and Education Personnel (GTK) in carrying out their duties.

c. Results of Quadrant Analysis of the Assurance Dimension

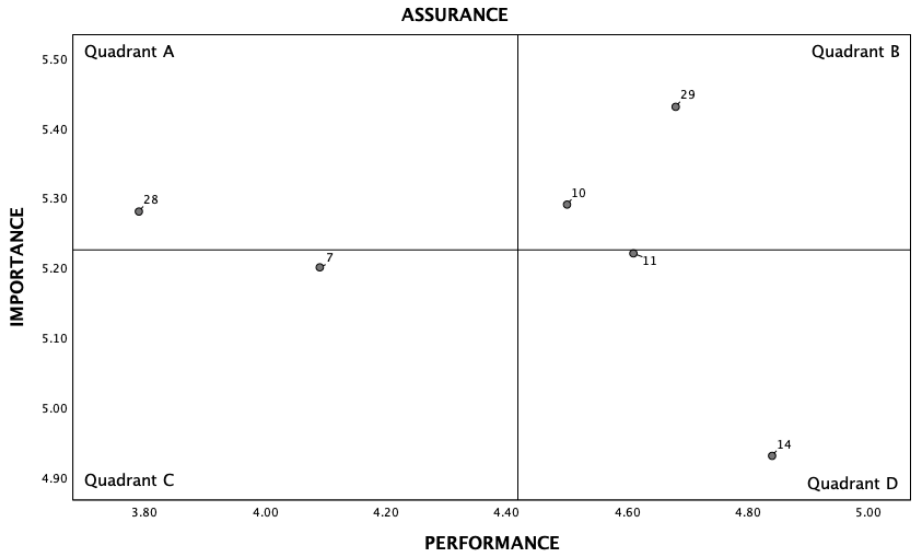

Figure 5. Cartesian Quadrant of Assurance Dimension Analysis

Students' assessment of the science laboratory service items within the assurance dimension indicates that there is one item identified as a top priority for improvement, namely item (28), the availability of fire extinguishers. In addition, there is one item categorized as low priority for improvement, namely item (7), the technician's skills in separating and labeling hazardous and toxic materials.

In this dimension, the top priority for improvement lies in the availability of fire extinguishers. Laboratory activities are inherently associated with the risk of accidents, whether caused by equipment, materials, or the practices themselves (Abidin & Ramadhan, 2019). The implementation of science laboratory activities, if not carried out in compliance with safety regulations, may result in workplace accidents, health problems, and even fatalities (Setiawan et al., 2023). Moreover, science laboratories contain toxic and flammable materials. Therefore, fire extinguishers need to be provided in the laboratory as a preventive measure. Considering that workplace accidents in educational settings can affect many individuals, namely students, teachers, and laboratory staff (Hasan et al., 2017).

d. Results of Quadrant Analysis of the Empathy Dimension

Students' assessment of the science laboratory service items within the empathy dimension indicates that there is one item identified as a top priority for improvement, namely item (18), the teacher's concern for students who experience failure in practicum activities. In addition, there is

one item categorized as low-priority for improvement, namely item (13), the comfort experienced when interacting with the laboratory assistant while collecting tools and materials.

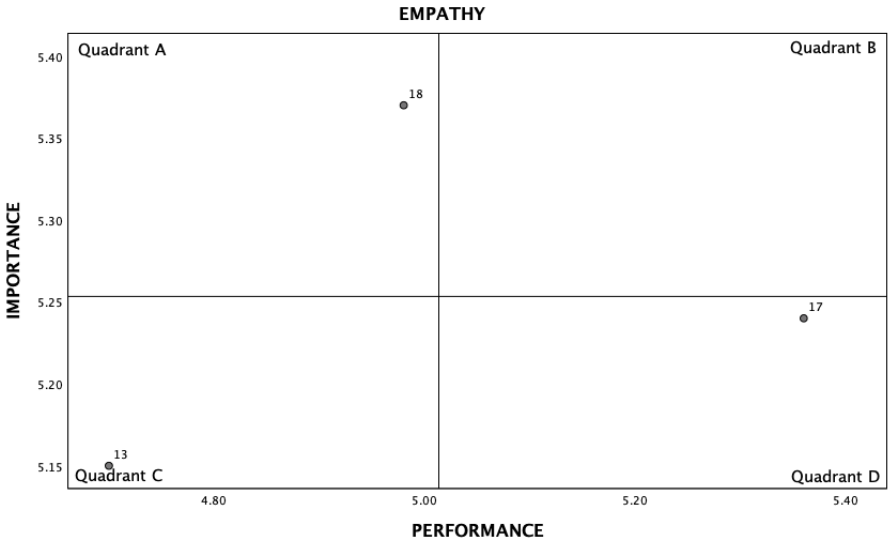

Figure 6. Cartesian Quadrant of Empathy Dimension Analysis

In this dimension, the top priority for improvement lies in the teacher's concern for students who experience failure in practicum activities. In the learning process, some students progress smoothly and succeed, while others encounter obstacles (Fhauza, Lilies, & Jamhri, 2024). The learning process in this context includes both theoretical and practical learning. Not all practicum activities conducted by students succeed on the first attempt; at times, such activities may fail due to various factors, including technical errors, a lack of conceptual understanding, or insufficient skills. Therefore, teachers should show greater concern for students during practicum activities, particularly for those who experience difficulties, by providing continuous guidance. This effort is necessary to ensure that students acquire knowledge and skills, as well as develop an attitude of perseverance in facing challenges.

e. Results of Quadrant Analysis of the Tangibles Evidence Dimension

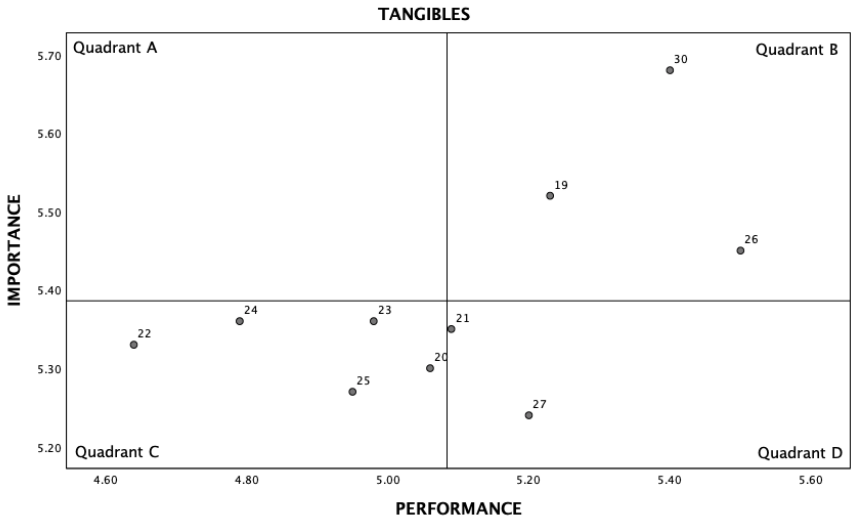

Figure 7: Cartesian Quadrant of Tangible Evidence Dimension Analysis

The students' assessment of the items of science laboratory services on the tangible evidence dimension indicated that no item was identified as a top priority for improvement. However, there were five items identified as low-priority for improvement, namely: (20) availability of equipment cabinets, (22) availability of washbasins, (23) completeness of equipment according to the

practicum material, (24) completeness of materials according to the practicum material, and (25) availability of experiment instructions (practicum guide).

Facilities and infrastructure are crucial factors that can support the success of the learning process. Therefore, the adequacy of laboratory facilities and infrastructure in accordance with the minimum standards set by the government impacts the success of science learning (Rahman, 2017). Based on field observations, the availability of washbasins and experiment instructions (practicum guides) was found to be crucial.

All schools where data were collected had washbasins; however, they often faced issues with water supply, and some were damaged, which hindered practicum activities. The school should carry out repairs for damaged laboratory facilities. In addition, to prevent damage and maintain the facilities in good condition, the school needs to perform maintenance. Maintenance includes cleaning, storage, additions, repairs, and preventive measures to avoid damage (Haffifa & Kosim, 2023).

Moreover, experiment instructions (practicum guides) were not provided by the laboratory, so science teachers either relied on the practicum guides from the textbooks or created their own, resulting in a lack of uniformity. In fact, the implementation of practicum is a crucial stage that must be carried out in accordance with the procedures and guidelines previously established (Laili et al., 2025). Therefore, practicum guides are essential and should be provided by the laboratory to prevent discrepancies in practicum procedures when conducted by different science teachers. Based on the quadrant analysis results for each service quality dimension presented above, several aspects can be considered for improving the quality of science laboratory services at junior high schools in Majene Regency, namely:

1. Junior high schools in Majene Regency need to pay attention to student satisfaction as laboratory users by providing services in accordance with the standards of facilities and infrastructure, as well as following the laboratory staff's work guidelines.
2. The local government, through the Education Office, needs to assign laboratory assistants and technicians to all junior high schools in Majene Regency.
3. Laboratory staff, including the head of the laboratory, technicians, and laboratory assistants, need to ensure they possess the required competencies in accordance with Permendiknas No. 26 of 2008 and carry out tasks following the school laboratory staff work guidelines issued by the Directorate General of Teachers and Education Personnel (Dirjen GTK) in 2017.
4. Science teachers should pay greater attention to students during practicum activities, particularly those who experience difficulty.
5. Laboratory facilities and infrastructure need to be equipped in accordance with the minimum standards set by the government in Permendiknas No. 24 of 2007 concerning Standards for Facilities and Infrastructure for Elementary Schools, Junior High Schools/MTs, and Senior High Schools/MA.

4. CONCLUSION

Based on the discussion of the research results, it can be concluded that:

1. The quality of science laboratory services at junior high schools in Majene Regency, from the students' perspective, is generally of good quality, as 93% of the items fall into the category where the experienced services align with the expected services.
2. The services that are the top priority for improving the quality of science laboratory services at junior high schools in Majene Regency are distributed across the dimensions of reliability, responsiveness, assurance, and empathy, namely: the technicians' ability to prepare equipment usage instructions, the laboratory head's promptness in ensuring laboratory safety, the technicians' readiness in providing practicum equipment and materials, the availability of fire extinguishers, and teachers' attention to students who experience difficulty during practicum activities.

ACKNOWLEDGMENTS

We would like to express our gratitude to the BIMA Program of Kemdiktisaintek, Universitas Sulawesi Barat, the schools where the research was conducted, the research team, and every party that has contributed to this study.

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