

# ***Evaluation of Academic Supervision Services of School Supervisors Based on the Satisfaction of Mathematics Teachers Using Technology at Senior High School***

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**Abstract.** This research aims to determine the quality of academic supervision services of school supervisors on the level of satisfaction of mathematics teachers using technology like handphone or laptop in pandemic Covid-19 at Senior High School (SMA) in Bone District and to determine what factors should be prioritized. This research is a descriptive-correlational using the ex post facto survey method, therefore to obtain data on this research variable the researcher does not treat the research sample but only examines the facts that have occurred, have been felt or have been done by the mathematics teacher. This descriptive-correlational research uses the ex post facto survey method, therefore to obtain data on this research variable the researcher does not treat the research sample but only examines the facts that have occurred, have been felt or have been done by the mathematics teacher. The population is SMA Mathematics teachers in Bone district. The sample was taken at random proportional stratified (stratified proportional random sampling) with a Likert model scale questionnaire. Then the respondent's answer was analyzed descriptively and with IPA analysis (Importance-Performance Analysis). The results showed that the teacher's actual satisfaction with the performance of school supervisors was in the aspects of Mathematics Curriculum Development, Mathematics Learning Process aspects, Mathematics Learning Evaluation aspects, and Mathematics Teacher Professionalism Development.

**Keywords:** *Quality of Service; Supervision; IPA Analysis; Technology.*

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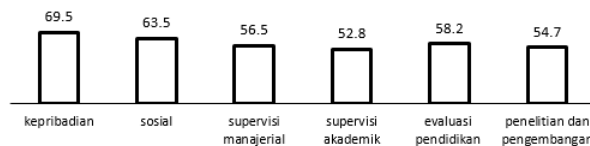
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## INTRODUCTION

In an effort to improve the quality of education, of course it cannot be separated from the role of the teacher as the main agent of the learning process, especially the readiness of the teacher in preparing students for these activities. Teachers often experience difficulties that they cannot solve on their own, so they need help or guidance from other parties. Increasing teacher professionalism can be done by providing assistance in the form of guidance or consulting services. These services can be carried out by supervisors, namely school supervisors and school principals. This has resulted in the emergence of an understanding that the level of education quality is closely related to teacher performance in carrying out learning tasks.

Academic supervision or supervision is in direct contact with teachers in schools, where academic supervision aims to help teachers develop their abilities in managing the learning process in order to achieve learning goals. Meanwhile, managerial supervision is professional assistance / expertise from supervisors to school principals and school staff so that they can improve the quality of school administration and management Sudjana (2012).

The results of the school supervisor competency test in 2010 show that of the six competencies a school supervisor must have, the academic supervision competency occupies the lowest position compared to the other five competencies, as shown in Figure 1 below.



**Figure. 1.** School Supervisor Competency Score in 2010

Source: Presentation of Surya Dharma, Director of PTK Development, Directorate General of Secondary Education, Ministry of National Education 2012

One of the supervisory competencies that most helps teachers in improving the quality of learning whose output can be seen in student learning outcomes is the competence of academic supervision. The role of a supervisor / supervisor for teachers is very large, especially in providing motivation, encouragement, assistance, in solving problems faced by teachers.

Satisfaction is a customer's response to meeting their needs. This means an assessment that a form of privilege of a good or service or the good / service itself provides a level of comfort associated with meeting a need, including meeting needs below expectations or meeting needs that exceed customer expectations. This shows that the fulfillment of a need to create a comfort and comfort is satisfaction. Satisfaction is the feeling of being happy or disappointed by someone as a result of the comparison between the perceived and expected achievement or product (Kotler,2015). Basically, the notion of satisfaction includes the difference between the level of importance and the perceived performance or result.

$$S = f(E, P)$$

$$S = \text{Satisfaction (satisfaction)}$$

*E = Expectation (hope)*

*P = Product Perceived Performance.*

Defining service quality correctly is not easy. The concept of quality is often seen as a measure of the relative goodness of a service or product which consists of design and suitability. Quality has two different concepts between the absolute concept and the relative concept. In the absolute concept, an item is said to be of quality if it meets the highest standards and is perfect, while the quality in the concept of a quality is relative if the goods or services meet predetermined specifications (Makoe,2019). The definition of quality is centered on efforts to meet customer needs and desires as well as the provision of their delivery to match customer expectations.

In this study, it will be seen how the quality of supervisory academic supervision services on the satisfaction level of SMA mathematics teachers in Bone District and whether there is a difference between the quality of supervisory academic supervision services using technology and the quality of service expected by SMA mathematics teachers using technology in Bone district. Two things will be presented in this article.

#### **METHODOLOGY OF RESEARCH**

This research is a quantitative research using the ex post facto survey method, therefore to obtain data on the variables of this study the researcher does not treat the research sample but only examines the facts that have occurred, have been felt or have been done by the mathematics teacher. This research was conducted in SMA in Bone district with a population of all SMA mathematics teachers in Bone district. The distribution of the research population in question consists of mathematics teachers who have been civil servants from several public high schools in Bone district. In order to obtain a sample, the sampling method used was purposive random sampling technique with consensus, through the following steps: (1) By purposive determining two excellent schools, namely schools in bone district with rational considerations that the mathematics teachers of both schools should have been supervised by the main supervisor who has been a civil servant. With this determination the sample can be said to represent the population in terms of the characteristics of mathematics teachers, (2) From each school 3 mathematics teachers were taken by agreement (Agung,1990). An agreement was obtained between the researcher and the teacher who was present at the time of data collection, the arrival of the teacher at the time of data collection was considered random.

The research variables are (a) Mathematics teacher satisfaction is the score of the results of the assessment by senior teachers to determine the size of how well the mathematics teacher's activities are implemented in learning in terms of lesson planning, learning implementation, and evaluation of learning outcomes. (b) The quality of school supervisors' academic supervision services is a score that comes from the mathematics teacher's perception of the measure of how good the quality of the school supervisor's academic supervision service is in the activities of guiding mathematics teachers in planning learning, guiding mathematics teachers in

implementing learning, and guiding mathematics teachers to evaluate learning outcomes.

The data collection techniques used were: (1) The instruments used in this study were first developed to produce valid and reliable ready-to-use instruments. The validity used comes from the opinion of two experts (judgment experts) who are members of the HEPI (Himpunan Evaluasi Pendidikan Indonesia) to examine the accuracy of each item of statement in revealing the measured variables according to the variable conceptual construction and operational variables. The relevance of the two experts is the validity of the content. According to experts, Lawshe (1975) and Martuza (1977) discuss statistical methods to determine the content validity and overall reliability of a test through expert judgment. The overall relevance of the two experts is the content validity of Gregory namely the validity of the content coefficient (Gregory, 2004). The content validity coefficient can be calculated using a formula.

Two expert validators rate certain items using a scale of 1 to a scale of 4. Scale 1 means irrelevant, scale 2 means slightly relevant, scale 3 means quite relevant and scale 4 means relevant. The agreement model between validators for content validation can be seen in Figure 2.

		Expert Judge #1	
		Weak Relevance (item rated 1 or 2)	Strong Relevance (item rated 3 or 4)
Expert Judge #2	Weak Relevance (item rated 1 or 2)	A	B
	Strong Relevance (item rated 3 or 4)	C	D

Figure 2. Model of Agreement Between Validators for Content Validity

Source: Gregory [7]

Source: (Gregory, 2004)

The method of determining the overall content validity (overall) is based on the judgment of experts, namely in the form of the content validity coefficient calculated based on the formula:

$$Content\ Validity = \frac{D}{A+B+C+D} \quad (1)$$

Information:

- A = The number of items that are less relevant according to the two validators
- B = The number of items that are less relevant according to validator II and relevant according to validator I
- C = The number of items that are less relevant according to validator I and relevant according to validator II
- D = The number of relevant items according to both validators.

The criteria for an instrument are suitable if the results of the content validity coefficient have strong relevance. "Instruments that have a content validity

coefficient of more than 75%, it can be stated that the measurement or intervention is valid" (Gregory, 2004).

However, if this is not the case, it is necessary to revise it based on the suggestions given by the validator or by looking back at the aspects that are judged to be deficient. Then re-validated and then analyzed again. And so on until it can be declared valid. Internal (Reliable) consistency is often called The intervention is "Logically" designed. A product is considered to have internal consistency if two or more evaluators use the instrument to assess the same product will provide the same assessment conclusion and can also argue that internal consistency is one way. shows reliability.

To answer the questions in the formulation of research problems and test the hypotheses that have been proposed, the data collected is then analyzed using two kinds of analysis techniques, namely 1) Descriptive Analysis, 2) Natural Science Analysis (Importance Performance Analysis). Descriptive analysis as a first step towards quadrant analysis which is used to explain how the level of conformity of the quality of supervisory Academic supervision services based on the dimensions of reliability, responsiveness, assurance, empathy, and physical evidence; along with the hopes of high school math teachers in Bone district. to test the hypothesis about the level of significance of the difference between the ratings quality of service Academic supervision of supervisors with the quality of service expected by high school math teacher in Bone district which is symbolically written:

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 \neq \mu_2$$

Where  $\mu_1$  is the average parameter of service quality experienced and  $\mu_2$  is the average parameter of expected service quality. The test criterion is accept  $H_0$  if the significance value  $p \geq \alpha$  is certain which means that it is not exist differences between the quality of staffing services experienced and those expected by high school math teachers in Bone District. Reject  $H_0$  if the significance value is  $p < \alpha$  which means that exist difference between service quality Academic supervision of supervisors experienced with what is expected by the high school math teacher in Bone District, South Sulawesi.

The data obtained from the survey were processed using statistical application programs with descriptive analysis, factor analysis, and IPA (Importance Performance Analysis) analysis. In science, the importance level represents the average expectation of the teacher and the performance represents the average quality of academic supervision services for school supervisors. Natural Science consists of two components, namely gap analysis and quadrant analysis.

Descriptive analysis and factor analysis as a first step towards quadrant analysis are used to explain how the level of student satisfaction. Meanwhile, the IPA (*Importance Performance Analysis*) analysis is used to determine what factors should be prioritized for the quality of academic supervision services for school supervisors on the satisfaction of public high school math teachers in Bone district.

Importance is ranked on a four-point scale, such as; very important, important, less important, and not important. Meanwhile, performance is also rated on a four-point scale, such as: very good, good, not good, and not good. In conducting the

research, this method is used to descriptively analyze the quality of service, seen by the level of conformity between the expected service quality (teacher expectations) and the quality of service experienced (the quality of supervisory academic supervision services). The level of conformity referred to in conducting research is the result of the comparison of the expected service quality score (teacher expectations) with the service quality score experienced (the quality of the supervisor's academic supervision service). The formula used for the conformity assessment is:

$$TK_i = \frac{X_i}{Y_i} \times 100\%$$

$TK_i$  = Conformity Level i

$X_i$  = Service quality assessment score experienced

$Y_i$  = The expected service quality assessment score

If the percentage is in the range 0 - 44%, it means not appropriate. Range (45 – 64%), means less suitable. The range (65 – 84%) means that it is quite appropriate, and if it is in the range (85 – 100%), it means that the quality of service experienced (quality of supervisory academic supervision services) and the expected service quality (teacher expectations) is matched. (James,2014)

The horizontal axis (X) is the score for the quality of service experienced, while for the vertical axis (Y) is the score for the expected service quality. The assessment scores will be simplified to obtain the average value for each dimension. Simplify each of the assessment dimensions by using the following formula:

$$\bar{X} = \frac{\sum X_i}{n} \quad \text{dan} \quad \bar{Y} = \frac{\sum Y_i}{n}$$

Information:

$X_i$  = Service quality assessment score experienced

$Y_i$  = The expected service quality assessment score

$\bar{X}_i$  = The average score of experienced service quality assessment

$\bar{Y}_i$  = The average score of the expected service quality assessment

N = Number of samples.

Cartesian diagram is a shape divided into four parts bounded by two lines that intersect at points (X, Y). For X is the average of the average service quality score experienced, and Y is the average of the average expected service quality score. For clarity the formula in question is:

$$\bar{\bar{X}} = \frac{\sum_{i=1}^n \bar{X}_i}{B} \quad \text{and} \quad \bar{\bar{Y}} = \frac{\sum_{i=1}^n \bar{Y}_i}{B}$$

Information:

$\bar{X}_i$  = The average score of experienced service quality assessment

$\bar{Y}_i$  = The average score of the expected service quality assessment

$\bar{\bar{X}}$  = The average of the average service quality rating scores experienced

$\bar{\bar{Y}}$  = The average of the expected service quality assessment scores

B = Number of items

Each of the assessment dimensions, both the average score of the experienced service quality assessment (X) and the average score of the expected service quality assessment (Y) are translated into four parts of the Cartesian Diagram.

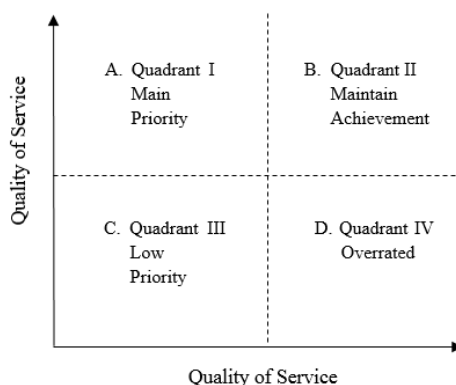


Figure 3. Cartesian diagram

## RESEARCH FINDINGS AND DISCUSSIONS

### 1. Level of Conformity of the Quality of School Supervisory Academic Supervision Service Using Technology

The level of compliance with the quality of the school supervisor's academic supervision services referred to in the implementation of this study is the result of the comparison of the weighted value of the expected service quality score (expectations of the SMA Mathematics Teachers in Bone District) with the weighted score of the service quality experienced (quality of academic supervision services). Below shows the results of the level of conformity of the quality of school supervisors' academic supervision services.

**Table 1.** The Level of Conformity of the Quality of School Supervisory Academic Supervision Services Using Technology

Quality of Service	Scale and Data (Frequency)						Weight	Level of Conformity
	1	2	3	4	5	6		
Experienced	9	103	561	692	739	206	9597	83,5466
Hope	0	4	120	550	897	739	11487	

Following are the results of the analysis of the level of conformity of the quality of school supervisors' academic supervision services based on 4 (four) dimensions of service quality that were previously obtained through each dimension weight with the formula as follows:

$$\text{Dimensions of weight} = \sum_{i=1}^6 F_i \cdot i$$

The results of these calculations can be seen in Table 2 below:

**Table 2.** Weight Calculation Results for Four Dimensions of Service Quality

Service Quality Dimensions	Experienced							wght	Hope						
	Scale and Data (Frequency)								Scale and Data (Frequency)						
	1	2	3	4	5	6	1		2	3	4	5	6		
Mathematics Curriculum Development	6	15	90	121	126	62	1792	0	0	14	96	143	167	2143	
Mathematics Learning Process	0	18	147	208	196	61	2655	0	0	27	158	244	201	3139	
Evaluation of Mathematics Learning	0	29	170	182	201	48	2589	0	0	40	147	269	174	3097	
Mathematics Teacher Professionalism Development	3	41	154	181	216	35	2561	0	4	39	149	241	197	3108	

Based on the weight of each dimension of the quality of supervisory academic supervision services, the results of the analysis of the level of conformity of the quality of supervisory academic supervision services based on 4 (four) dimensions of service quality can be seen in table 3 below:

**Table 3.** Compliance Level of Four Dimensions of Service Quality

Service Quality Dimensions	Experienced Weight	Average	% Conformity Level	Hope	
				Weight	Average
Mathematics Curriculum Development	1792	4.27	83.62 (Sufficiently Fit)	2143	5.10
Mathematics Learning Process	2655	4.21	84.58 (Sufficiently Fit)	3139	4.98
Evaluation of Mathematics Learning	2589	4.11	83,597 (Sufficiently Fit)	3097	4.92
Mathematics Teacher Professionalism Development	2561	4.07	82.40 (Sufficiently Fit)	3108	4.93

## 2. Differences in Service Quality Experienced and Hope

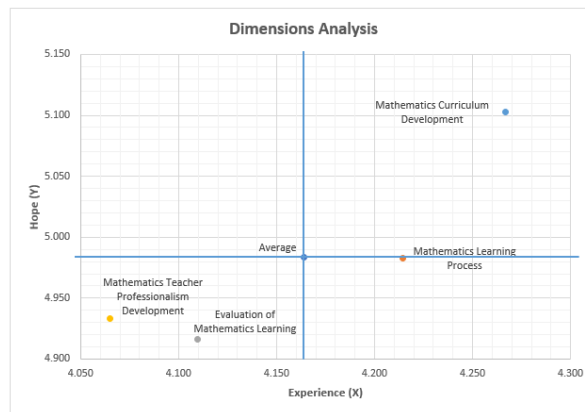
Based on the results of data analysis using the t statistic, it shows the value of  $t = -5,331$  with a value of  $p < 0.01$ , far below  $\alpha = 0.01$ . It means that the data supports the research hypothesis or the null hypothesis is rejected. Thus the hypothesis which states that there is a difference between the quality of staffing services experienced and that expected by the high school math teacher in Bone District can be accepted. Based on the results of the hypothesis testing, it can be



concluded that the quality of the Academic Supervision service is different from the service quality expected by all high school math teachers in Bone District.

### 3. Quadrant Analysis Results (Cartesian Diagram)

Based on the results of the quadrant analysis, it can be seen the dimensions of the quality of supervisory academic supervision services contained in quadrants I, II, III, and IV and the implications for these results. The interpretations and implications of the dimensions of the quality of supervisory academic supervision services on the quadrants contained in the Cartesian Diagram can be explained in Figure 4 below:



**Figure 4.** Cartesian Diagram of Service Quality for Academic Supervision of Supervisors using technology

In Figure 4 above, the Cartesian diagram shows that the location of the dimensions of the quality of services provided by the Supervisor Academic Supervision and high school math hopes in Bone District are divided into four parts or quadrants. The interpretations and implications of the quadrants contained in the Cartesian diagram can be explained one by one as follows:

Quadrant I shows that the dimensions of service quality that are in this quadrant need to be prioritized by the Academic Supervision of Supervisors, because the existence of these dimensions is considered very important by SMA Mathematics Teachers in Bone District, while the quality of services provided by Supervisor Academic Supervision is not as expected. . This illustrates that in these dimensions the quality of services provided by the Supervisor Academic Supervision is lower than the expectations of the SMA Mathematics Teachers in Bone District so that the Supervisory Academic Supervision is necessary and must improve the quality of service for these dimensions to be optimal. Based on the results of the analysis, there are no dimensions in this quadrant

Quadrant II shows that the dimensions of service quality in this quadrant need to be maintained by the Supervisor's Academic Supervision, because generally the quality of service is in accordance with the expectations / interests of SMA Mathematics Teachers in Bone District, so as to satisfy SMA Mathematics Teachers in Bone District. This means that the Academic Supervision of Supervisors has shown the quality of service in accordance with the expectations of the SMA Mathematics Teachers in Bone District, for this reason Supervisor Academic Supervision needs to

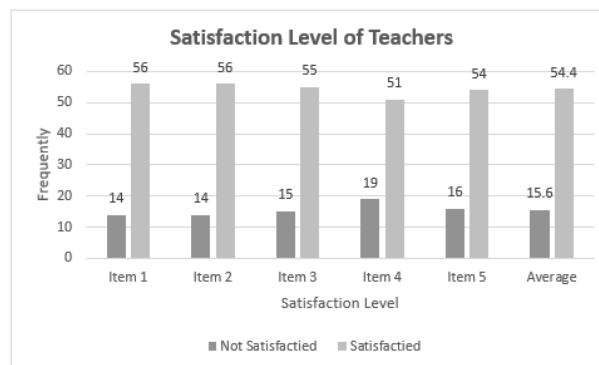
maintain service quality in this dimension. The dimensions of service quality included in this quadrant are; Mathematics Curriculum Development.

Quadrant III shows that the dimensions of service quality that are in this quadrant are considered less important for SMA Mathematics Teachers in Bone District, while the quality of implementation is normal or sufficient. This means that the quality of Supervisor Academic Supervision service and the expectations of SMA Mathematics Teachers in Bone District are at a low level, so that the Academic Supervision of Supervisors can give low priority to these dimensions. The dimensions of service quality included in this quadrant are: Mathematics Teacher Professionalism Development and Mathematics Learning Evaluation.

Quadrant IV shows that the dimensions of service quality in this quadrant are considered excessive in service, this is mainly because the SMA Mathematics Teachers in Bone District consider these dimensions not too important, but the services provided by Supervisor Academic Supervision are carried out very well, so it's very satisfying. These dimensions illustrate that the quality of the Supervisor's Academic Supervision service is at a high level, but the expectations of SMA Mathematics Teachers in Bone District for services in these dimensions are low. Based on the results of the analysis of the dimensions of service quality in this quadrant is the Mathematics Learning Process.

#### 4. Satisfaction Level High School Mathematics Teacher Using Technology in Bone District

The satisfaction level of the SMA Mathematics Teachers in Bone District with the Academic Supervision services of Supervisors can be reviewed from the items that have been filled in by the Teachers. The following is a graph of teacher satisfaction levels based on Figure 5.



**Figure 5.** Teacher Satisfaction Level Graph

Based on Figure 5, it can be seen that, in point 1, the number of respondents considered that they were not satisfied with the academic supervision services of 14 people and those who gave a satisfied score were 56 people. In point 2, the number of respondents considered that they were not satisfied with the academic supervision services of 14 people and those who gave a satisfied score were 56 people. In point 3, the number of respondents rated that they were not satisfied with the academic supervision services of the supervisors as many as 15 people and those who gave a satisfied score were as many as 55 people. In point 4, the number of

respondents assessed that they were dissatisfied with the supervisory academic supervision services as many as 19 people and those who gave a satisfied score were as many as 51 people. In point 5, the number of respondents assessed that 16 people were dissatisfied with the academic supervision services of the supervisor and those who gave a satisfied score were as many as 54 people.

## **CONCLUSION**

1. Level the suitability of the service quality of the Academic Supervision of School Supervisors based on 4 (four) dimensions of service quality, namely the dimensions of Mathematics Curriculum Development, Mathematics Learning Process, Mathematics Learning Evaluation, and Mathematics Teacher Professionalism Development are categorized as sufficient in accordance with teacher expectations, and if reviewed based on each dimension there are items that are categorized as quite appropriate and some are already appropriate.
2. Infrared it is concluded that there are differences among the quality of service Supervisor Academic Supervision experienced with what is expected by the high school math teacher in Bone District

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