



## Optimization modeling for strengthening the quality of educational institution services : POP-SDM method

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### ABSTRACT

The quality of service in higher education institutions is very important because it can affect student satisfaction, learning outcomes, and the reputation of the institution. Therefore, higher education institutions must continuously strive to improve the quality of the services they provide. This research aims to build an empirical model of service quality for educational institutions by looking for variables that influence strengthening service quality based on data and information from sources. This research uses qualitative methods through an interview and observation process with study program staff at the Indonesian Defense University Education Institute in Bogor, West Java, Indonesia. In this research, it was found that the dominant variables that influence the quality of teaching staff services are (1) organizational climate, (2) training effectiveness, (3) job satisfaction, (4) professionalism, (5) empowerment of educators, (6) motivational work, and (7) professional commitment. Therefore, improving the quality of educational institutions is important and must be a main concern for institutions.



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## INTRODUCTION

Basic services, or minimum services according to type, are: (1) citizenship services; (2) health services; (3) educational services; and (4) economic services. In the field of education, the government's efforts to create good educational services are manifested in legal regulations, including: (1) Law No. 20 of 2003 concerning the National Education System; Article 51, Paragraph 1, states that the management of early childhood education, basic education, and secondary education units is carried out based on minimum service standards with the principles of school- and madrasah-based management; and (2) Law No. 25 of 2000 concerning the National Program for 2000–2004 in Chapter VII concerning the Development Program Section. An educational institution that was established to fulfill various types of requirements in accordance with the applicable statutory and regulatory system. Several requirements must be met to be able to form an educational institution according to Law No. 20 of 2003, Article 62, Paragraph 2, among others: a. availability of curriculum; b. availability of students; c. availability of educational personnel (teachers and staff); d. availability of adequate infrastructure; e. availability of education financing; f. existence of an evaluation system.

To achieve the desired quality of educational services, an educational institution must be able to meet the national education standards set by the government. According to Republic of Indonesia Government Regulation (PP RI) No. 19 of 2005, national education standards are the minimum criteria for the education system in all jurisdictions of the Unitary State of the Republic of Indonesia. In the education industry, customer satisfaction and service quality are important concepts for higher education success, focusing on learning quality and student satisfaction as two central topics in competitive strategy discourse. The competitive strategy that needs to be developed is to position universities as a service provider industry, *namely service providers* that provide services in accordance with customer needs, desires, and expectations (customer-oriented). Customer satisfaction as a result of a comparison between product or service expectations and the reality that someone receives gives rise to two possibilities (Tukiran et al., 2021). The first is that if the seller provides excessive

information to the customer, then the customer will have expectations that are too high, which can result in dissatisfaction if the seller cannot fulfill the information (Rahman et al., 2012).

Satisfaction can be defined as a consumer's understanding and consideration regarding how a product or service is able to meet the consumer's needs or expectations. Satisfaction itself is a very complex abstract concept that needs to be defined according to the existing context (Andira et al., 2016; Cesariana et al., 2022). There is no definitive, agreed-upon definition or measuring tool for satisfaction. There are various different definitions of satisfaction put forward by experts. According to Giese & Cote (2000) in Maslowska et al. (2016), the definition of satisfaction cannot be separated from the chameleon effect, meaning that the interpretation of a definition may vary both between individuals and between situations. Giese & Cote (2000) in Maslowska et al. (2016) state that consumer satisfaction is a response, either emotional or cognitive, related to a particular focus (such as product performance expectations or consumption experience), which is determined at a specific time (for example, after consumption or choice, based on accumulated experience). Satisfaction is a person's feeling of pleasure or disappointment resulting from comparing the perceived performance (or results) of a product with expectations." From a study of various literature and previous studies, a number of factors were found that can be used to assess satisfaction. This study uses several indicator measurements from previous studies. Satisfaction and loyalty are created because of the customer's assessment of the quality of the service he or she receives. Quality is all the features and characteristics of a product or service that have the ability to satisfy consumer needs. A high level of quality will result in a high level of consumer satisfaction (Kotler & Keller, 2016). Lewis et al. (2016) stated that service quality is a measure of whether the level of service provided is in accordance with customer expectations.

Basically, an organization faces two types of customers at once, namely internally, namely employees, and externally, namely consumers or customers. So if an organization wants to provide superior service to customers, then improving service quality must be carried out both internally (*internal service quality*) and externally (*external service quality*). Improving the quality of service internally will have an impact on the job satisfaction of employees; this job satisfaction will influence the quality of external service to customers, and ultimately customers will gain satisfaction with the organization's services (Notosudjono & Suhardi, 2021; Tjiptono, 2016). The result of the quality of service provided is consumer satisfaction or dissatisfaction (Magasi et al., 2022; Permana et al., 2020). Satisfaction will make consumers return to using the services offered, but if dissatisfaction arises, consumers will be reluctant to use the service again. This is supported by Cronin & Taylor (1992) in Farooq et al. (2018), who state that "service quality influences customer satisfaction and will influence *purchasing motives*." Which means that service quality influences consumer satisfaction and will influence motivation to buy.

While studying, students, as consumers of educational services, will feel what they receive as a result of the process of using various resources provided by the campus, such as school buildings, educational facilities, and teaching staff. After using the educational services provided by the educational institution, students will bring the experiences they have had as well as a comprehensive evaluation of the services to each contact they encounter while using the services (Rinala et al., 2013; Yusof et al., 2012). Campuses are assessed from the perspective of their image. In this research, an image is a set of beliefs, ideas, impressions, or perceptions of students regarding what exists at the Indonesian Defense University based on their knowledge and experience. From studies of various literature and previous research, researchers found a number of factors that can be used as dimensions to describe *image variables*, including *reputation*, *credibility*, and *accreditation*.

After using the educational services provided by the campus, students will bring the experiences they have had as well as a comprehensive evaluation of the service company to every contact they encounter while using the services. Schools are assessed based on the image they have. The decline in the number of applicants for entrance tests at the Indonesian Defense University shows the phenomenon of decreasing student interest in studying at the Indonesian Defense University. This condition is not very good for the Indonesian Defense University, especially in the face of tight competition with other learning institutions. Many factors might cause this to happen. This could be due to the unsatisfactory quality of educational services, a lack of customer loyalty, or a poor image of the educational institution. In fact, service quality and satisfaction can influence student loyalty to continuing their education. When students have a positive response to the quality of services and feel

satisfied, they will tend to be loyal. The student will recommend his younger siblings, friends, or relatives study at the Indonesian Defense University. However, if students have a negative response to the quality of services and feel dissatisfied, then they will tend to become disloyal. They (students and students' parents) will not recommend or even send their younger siblings, friends, and relatives to Defense University.

The following initial survey was carried out from May 21 to May 25, 2022, using a questionnaire to determine that the quality of service at the Defense University was in a condition that needed to be improved. Initial survey regarding statements made to 40 alumni of S2 students from several classes. The statements submitted to the service quality variable consist of 40 questions with answers STS (strongly disagree), TS (disagree), N (neutral), S (agree) and SS (strongly agree), with indicators: 1) *reliability*, 2) dexterity (responsiveness), 3) certainty (assurance), 4) empathy (empathy), and 5) tangibles (tangibles).

The facts resulting from the preliminary survey using a questionnaire distributed using *Google Forms* can be concluded as follows:

1. There are 32% of education institutions at the Indonesian Defense University that do not meet expectations in implementing accuracy and consistency in service (reliability), as can be seen from information services, accuracy of assessment calculations, employees always on site, lecturers and officials during working hours, promises made and provided appropriately, attention to students, and fast service.
2. There are 22.5% of education at the Republic of Indonesia Defense University that has not met expectations in implementing willingness and speed of service (responsiveness), as can be seen from the responses of staff, speed of service, responsiveness of staff, presence of staff, accuracy of promises, patience of education staff, explanations from lecturers and staff, and assistance from education staff.
3. There is 30% of education at the Indonesian Defense University that has not met expectations in implementing seriousness, self-confidence, and skills in serving (assurance), which can be seen from the ease of students contacting lecturers, lecturers as surveyors, suitability of scholarship recipients, ease of finding work after graduation, library literature support, competence of lecturers and all staff, friendly and politeness to students, and all personnel can explain.
4. There are 43% of education at the Indonesian Defense University that has not met expectations in implementing deep attention to customer needs/problems ( *This* can be seen from the lecture information provided by lecturers, library service times, return of test results, opening times as needed, ease of getting in touch, good communication, attention to students, working hours the same as students, and all staff are happy to serve.
5. 15% of education at the Indonesian Defense University has not met expectations in fulfilling the quality of facilities, infrastructure, and service facilities (tangibles), as can be seen from the use of technology, facilities, IT availability, physical equipment, buildings, other physical facilities, facilities, libraries, and service-related materials.

Based on the results of the preliminary research above, it shows the phenomenon that the quality of service expected by students in an effort to fulfill students' needs and desires for education, as well as the accuracy of delivery to match expectations, still needs to be improved. From what has been explained above, this research aims to produce ways and strategies to improve service quality by exploring other variables that have a positive and dominant influence on service quality. The strategies and methods found then become recommendations for related parties, namely educators, educational institutions, and the Indonesian Ministry of Defense.

## RESEARCH METHODS

The research was qualitative and carried out for three months, starting from October to December 2022, in stages starting from preparing the research proposal to establishing the research hypothesis findings. In 2019, Setyaningsih & Hardhienata developed the POP-SDM (Modeling and Optimization of Strengthening Management Resources) approach. In this method, the research begins by conducting qualitative research to explore factors that are thought to influence positive and dominant attitudes towards the resource to be strengthened. Based on the factors or variables found, a

configuration of the influence of these variables on the resources that will be strengthened will be prepared to produce a research hypothesis.

The research hypothesis at the qualitative research stage was then tested using path analysis at the quantitative research stage. Using the results of the path analysis, the SITOREM method is then used to do an indicator analysis to figure out the best way to deal with weak indicators and let the user know which indicators are good to keep or improve. These findings are then used as recommendations to related parties. In the POP-SDM method, the quantitative research stage is the model test stage, which is then analyzed using data from the quantitative research results in the form of statistical hypothesis testing and proving the research hypothesis (Suryana, 2015).

Determining the number of research samples in this quantitative stage used proportional random sampling techniques based on the Taro Yamane Formula. The term sample refers to the quantity and characteristics that the population owns and represents. In this study, the error rate and confidence level used were 5%. Based on this formula, the number of samples in this study is:  $n = 401 / 1 + 401 (0.05)^2 = 201$  (rounding), while the unit of analysis in this study is teaching staff, and the sampling technique was carried out based on the proportional random sampling technique.

The research began with a simple qualitative study to explore factors that were considered to have a dominant influence on the resources to be strengthened. The theory of creative behavior is based on the concepts of input, process, and output. Input contains independent (exogenous) variables that influence the process and output. Meanwhile, at the process level, it contains intervening or mediating variables, and at the output level, it contains dependent variables, which are the research themes that will be strengthened. Based on the factors or variables found in the field as well as expert considerations, a constellation model of the influence of these variables on the resources under study is prepared to produce a research hypothesis. The following are the stages of qualitative research until a research hypothesis is obtained: The informants in qualitative research were 15 (fifteen) Study Program Secretaries, who were the samples and sources of research data. The appointment of the study program secretary as an informant is based on the assumption that the study program secretary is the person who knows best about the condition of service quality at the university and the factors that influence it. Research data was collected through interviews with informants until the researcher felt that the data obtained was saturated, so the collection process was stopped and continued with the data processing process. From the collected data, data reduction, data codification, and data display were then carried out, the results of which were the recapitulation of variables obtained from the results of data reduction and processing from qualitative data with the theme of service quality using the *Tally Mark method*. The framework for thinking in this research is derived from findings in qualitative research in the form of a constellation of influences between research variables that have been verified by at least two (two) experts who are competent in the field of research.

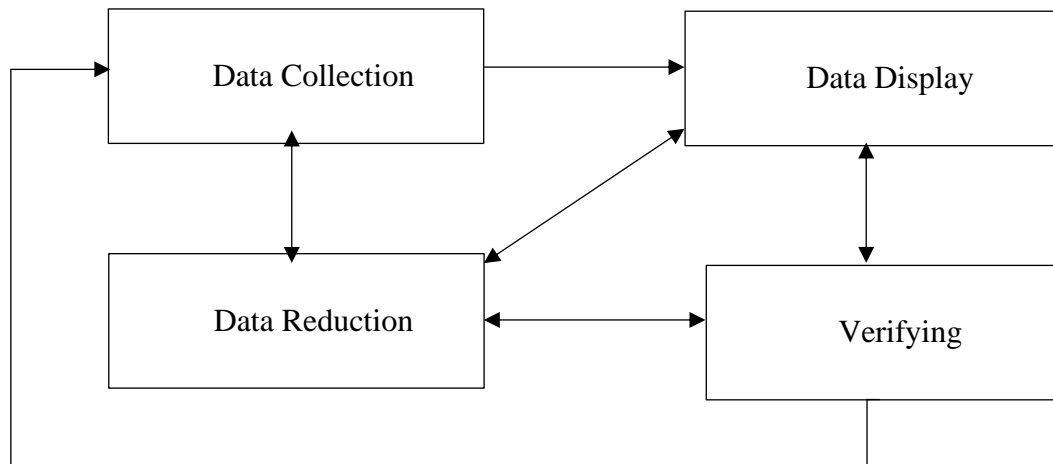
## RESULTS AND DISCUSSION

Based on the research background, factors that have a positive and dominant influence on service quality can be identified as the dependent variables. Data mining was carried out through interviews with informants who were competent in the field of service quality. The number of informants is not limited; if the researcher finds saturated answers from the informants, then the interview findings are considered sufficient. The identification of problems mentioned by the informants can be presented based on the background description above. Problems were found in the service quality aspect, which can be identified as follows: The identification of the problem in this research was found after carrying out simple qualitative research, namely by exploring factors that are thought to have a relationship and influence on the resources that will be strengthened. Theories of service quality are based on the input-process-output concept. Input contains independent (exogenous) variables that influence the process and output. Meanwhile, at the process level, it contains *intervening* variables or mediating variables, and at the output level, it contains dependent variables, which are the research themes that will be strengthened.

In the qualitative research process, the researcher is the instrument, and the sources are called informants. The requirements for the qualitative research interview process must be carried out as purely as possible without interfering with the informant's answers. Qualitative research is constructivist in nature and aims to build or develop a theory. The number of informants is not

specified, and the research process will be stopped if the researcher feels that the answers from the informants are saturated or no longer finds significant differences in the informants' answers.

Simple qualitative data analysis Data analysis was carried out in parallel with ongoing data collection. At the time of the interview, the researcher had analyzed the informant's answers. If the interviewee's answers are not satisfactory, the interview is continued again until a certain stage. Data analysis refers to the Miles and Huberman Model, as in Figure 1.



**Figure 1. Miles and Huberman model**

Based on the picture above, it is explained that: 1) Data reduction is an activity of summarizing and selecting things. main, focusing on important things, looking for themes and patterns; 2) Data display is the activity of presenting data in the form of narrative text, graphics, matrices, networks, and charts. 3) Verification or monitoring of allegations, namely the activity of making assumptions based on the information found.

In this research, the application of the Interactive Analysis Model from Miles and Huberman is carried out in the following activities:

- a. The researcher summarizes, selects the main things, and focuses on the important things from the interview data.
- b. The researcher categorized the data from the interviews by categorizing them based on the factors or indicators put forward by the informants that influence the school principal's serving leadership.
- c. Researchers confirmed the findings with informants and completed the data according to the needs of each school that was the data source sample.
- d. Researchers create tables, charts, or diagrams of the results of categorizing interview data to help understand and interpret the data.
- e. Develop a combined matrix of factors thought to influence school principals' servant leadership.
- f. Examining the dominant factors that have a positive influence on the serving leadership of school principals
- g. Determine the dominant factors that are thought to have a positive influence on the school principal's serving leadership and the configuration between factors or variables.

Data Credibility Testing Testing the credibility or trust of research data is carried out in various ways:

- a. Extension of interview time The researcher returned to the field to meet the data sources that had been found previously and dig up additional data to make it more complete.
- b. Member check Researchers check the data obtained from the data provider. The aim is to ensure that the data obtained has been agreed upon between the researcher and the informant.

The following are the variables obtained by the informants that are related to and influence problems in developing service quality, which are presented in tabular form after data reduction and data coding in Table 1.

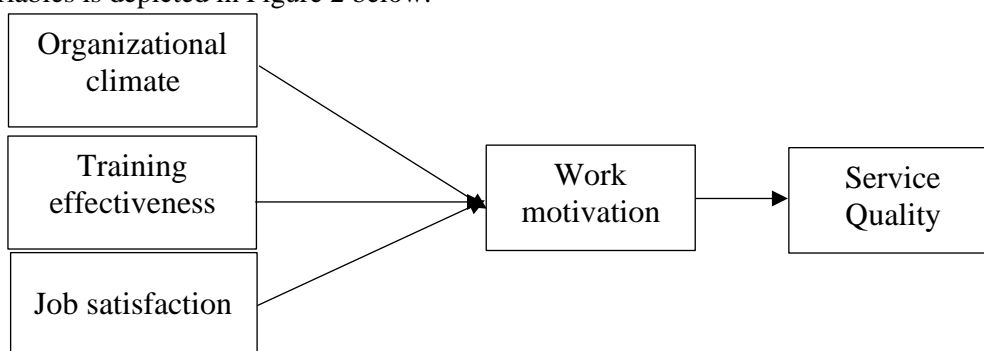
**Table 1. Recapitulation of variables obtained from data reduction and processing results**

No	Exogenous variables resulting from data reduction & processing	Tally Method Mark/Turus	Amount Information	Percentage (%)	Variable description *)
1	Job satisfaction	III	4	4%	not dominant
2	Work motivation	III III III	15	14%	Dominant
3	Work commitment	III	3	3%	not dominant
4	Organizational Climate	III III	8	7%	quite dominant
5	Training Effectiveness	III III III	15	14%	Dominant
6	Personnel Performance	III	4	4%	not dominant
7	Training	III	3	3%	not dominant
8	Leadership Commitment	III III	9	8%	quite dominant
9	Professional Commitment	III III III	15	14%	Dominant
10	Organizational Guidelines	III	4	4%	not dominant
11	Professionalism	III III	9	8%	quite dominant
12	Empowerment of Educators	III III III	15	14%	Dominant
13	ICT mastery	III	4	4%	not dominant
	Number of informants:	108	108	100.00	
	15				

\*) Variable description: 1-5 (not dominant); 6-10 (moderately dominant); 11-15 (dominant)

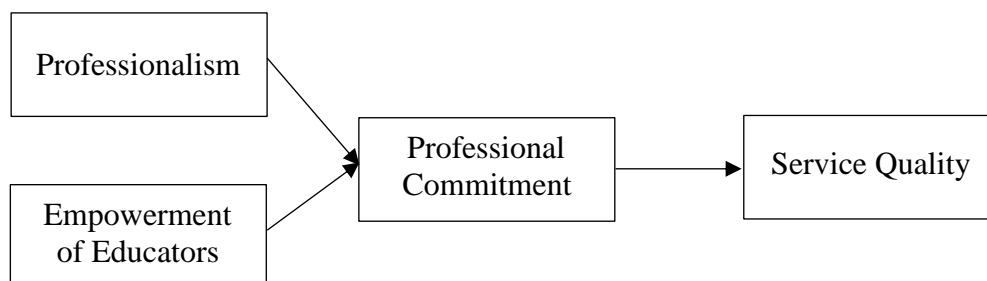
Based on the findings of the variables above, the researcher then carried out further research into the data and information with the informants who had been interviewed to look for relationships between the dominant variables found above so that the problem in this research could be narrowed down. The following are the results of in-depth data on dominant variables, which are thought to greatly influence service quality:

- a. Organizational climate variables, job satisfaction, training effectiveness, and the work motivation variable were said by the informants to be interrelated. If teaching staff have an organizational climate, effective training, good job satisfaction in carrying out their duties, and work motivation, these four elements will really encourage them to provide the best in the learning and teaching process and have an impact on improving service quality. The model of influence between these variables is depicted in Figure 2 below:



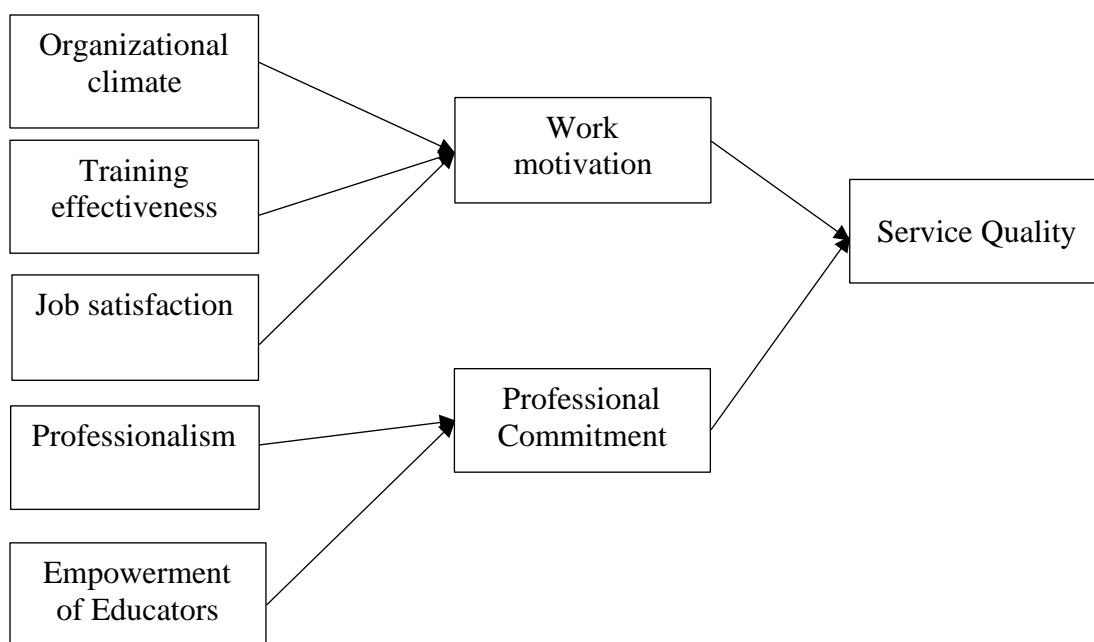
**Figure 2. Model of the Influence of Organizational Climate, Training Effectiveness, Job Satisfaction and Work Motivation on Service Quality**

- b. The next dominant variable is professionalism, empowerment of teaching staff, and professional commitment, which greatly influence the quality of services at universities. Experience during the pandemic period from 2020 until now shows that professionalism and empowerment of teaching staff are needed, especially the professional commitment of teaching staff to continue to provide special face-to-face learning processes for undergraduate student learning. The model of influence between these variables is depicted in Figure 3 below.



**Figure 3. Model of the Influence of Professionalism, Empowerment of Educators and Professional Commitment on service quality**

- c. The two dominant variable models above are combined to form a service quality constellation model in Figure 4 as follows:



**Figure 4. Dominant Variable Constellation Model Obtained From The Results Of Exploratory Research**

## CONCLUSION

The quality of service in higher education institutions is very important because it can affect student satisfaction, learning outcomes, and the reputation of the institution. Therefore, higher education institutions must continuously strive to improve the quality of the services they provide. Therefore, improving the quality of educational institutions is important and must be a main concern for institutions. Modeling and optimizing strengthening the quality of educational institutions' services using the POP HR method in an empirical study using path analysis and cytorem on teaching staff, it was found that the dominant variables that influence the quality of teaching staff's services are (1)

organizational climate, (2) training effectiveness, (3) job satisfaction, (4) professionalism, (5) empowerment of educators, (6) work motivation, and (7) professional commitment.

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