

Pareto Analysis on the Academic Service as an Effort to Improve Total Quality Management at Higher Education

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Abstract: The concept of TQM is really needed by educational institutions, considering the needs and user satisfaction are the main goals of services in an educational institution. The synergy of student expectations and campus interests will be achieved if academic services are carried out by prioritizing aspects of quality, adequate facilities, and professional management. Therefore, service provided to the students must be improved in terms of its quality. This study used descriptive quantitative method to find out which aspect(s) of higher education academic service that most likely needs an improvement. Although numerous studies on students' satisfaction with academic service have been conducted, a study involving the Pareto analysis method has not been clear yet. Based on the results of the study, the academic service quality that is highly expected from higher education is a domain related to information on service procedures, information on service requirements, and the responsiveness of service officers in responding to complaints.

Keywords: Pareto Analysis, Academic Service, Total Quality Management

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Introduction

Higher education as educational institutions will not operate in isolation from global competition. As a result, improving the quality of education is the major objective in order to be successful in the global era. TQM (Total Quality Management) is a management concept that emphasizes integrated quality improvement and is relatively new in the field of education. The concept of TQM is very much needed by educational institutions, considering the needs and user satisfaction are the main goals of services in an educational institution.

There is no question that TQM has enormous promise in education, although it should not be assumed that there

are no difficulties or hurdles in applying TQM in education. Higher education and other academic institutions are substantially diverse, with distinct ethos and qualities that make implementing the TQM concept handed down from industry difficult (Brinbaum, 2000; Massy, 2003; Moore, 2021; Oustous et al., 2021). Otherwise, in the education field, TQM is a method that can be used to improve the quality of education and achieve goals most effectively. The education improvement should also pay attention to the quality of service. Educational activities are focused not only on the outcome of the educational process but also on good proof of accountability, such as quality assurance and quality improvement (Peraturan Badan Akreditasi Nasional Perguruan Tinggi Nomor 5 Tahun 2019 Tentang Instrumen Akreditasi Program Studi, 2019).

Quality issues in education are not only related to inputs, processes, and outputs, but also outcomes. The involvement and synergy of the entire academic community, including employees, lecturers, students, alumni, and the private sector, is very important for higher education success. Today's interest and attention to factors of educational service quality may be attributed to the recent decade. The success of educational services is judged by delivering quality services to those who utilize them (students and the community). Students are one of the main players influencing the operation of institutions in the administration of higher education. Academic services that prioritize quality, proper facilities, and competent administration will establish a synergy of student expectations and campus interests. Therefore, service to the students must be improved in terms of its quality.

The degree of service quality cannot be measured from the perspective of the firm but must be considered from the perspective of the client (Nugraha et al., 2016). Customer satisfaction is positive if it satisfies their expectations; alternatively, the service is seen as poor if it does not satisfy their expectation (Kotler, 2000). The satisfaction level is a function of the difference between perceived performance and expectations. Likewise with students who are customers of higher education. To achieve a high level of satisfaction, it is necessary to have an understanding of what consumers want, by developing a commitment that everyone in the institution strives to meet consumer needs (Cravens & Piercy, 2009; Saritaş, Börekci, & Demirel, 2022).

Since the aim of this study is to find out aspect(s) of higher education academic service that most likely needs an improvement, the researcher refers to the study conducted by Marthalina, (2018) under the title "Analisis Kualitas Pelayanan Akademik dan Kepuasan Mahasiswa di IPDN Kampus Jakarta." According to this study, the academic services of the S-1 Human Resource Management Study Program have been going very well. However, it also needs to identify several weaknesses that exist in the academic service process of the S-1 Human Resource Management Study Program, especially on the dimensions of reliability and responsiveness. Similar findings were also revealed by Miati & Setiawan, (2022) who indicated that E-service quality had an impact on students' satisfaction levels. It emphasized that service quality, indeed, is important to improve institutions' quality especially when it comes to customer satisfaction.

Linking service quality and customer satisfaction have been widely discussed by several studies. Nevertheless, there is a limited study that shows aspects of academic services that require more improvement. This current study is seen to be noteworthy since the findings should be advantageous to the institution in improving the

quality of their academic service. In addition, although numerous studies on students' satisfaction with academic service have been conducted, a study involving the Pareto analysis method has not been clear yet. According to the previous studies referred by the researcher, those studies only revealed students' satisfaction levels according to the survey. Therefore, this current study helps to identify the top aspect(s) that need to be addressed to improve the implementation of TQM in academic services. Moreover, the researcher used various levels of higher education students as respondents who were thought to be capable of understanding something more sophisticated.

Total Quality Management

TQM is planning and controlling the quality of products and services within a company explicitly and systematically (Prasojo, 2016) TQM is implemented as a tool to improve quality by taking into account the needs and satisfaction of customers or stakeholders. When adopting TQM in educational institutions, there are five factors that must be considered as follows: internal and external customer focus, entire engagement, quality standards, commitment, and continual quality improvement (Huriyah, 2016). According to Goetsch & Davis, (2016), the total quality approach is distinguished by the following characteristics: strategic focus, employee involvement and empowerment, obsession with quality, scientific approach, customer focus, long-term commitment, teamwork, bottom-up education and training, freedom through control, continuous process improvement, unity of purpose, and peak performance.

TQM requires that everyone and everything in the organization participate in the enterprise of continuous improvement (Sallis, 2002). Furthermore, Hardjosoedarmo, (2014) stated that TQM is the use of quantitative methodologies and human understanding to enhance materials and services, all organizational processes, and attempts to fulfill the demands of current and future product and service consumers.

In education, quality management can lead to a successful learning process that is fun and provides enjoyment. The implementation of TQM in education needs to consider the existence of continuous improvement, quality standards as the basis for quality development, cultural and organizational changes, and the effort of maintaining good relationships with customers (Haudi, 2020).

Academic Service Quality

Quality is the characteristics of a good or service, which demonstrates its ability to satisfy specified or implied needs. According to Sallis, (2002), educational institutions must build quality systems to demonstrate to the public that they can deliver quality services. Types of services to higher education, according to Kotler & Fox, (1995) are divided into six main dimensions namely: academic advising, extracurricular activity, resources, quality of instruction, library, opportunities to talk with faculty members job, placement services. Service quality is the extent to which the company's services meet the requirements and expectations of customers, or how large the gap between reality and consumer expectations of the services they receive (Juhana & Mulyawan,

2015; Sallis, 2002). The quality of services is centered on efforts to meet the needs and desires of the user community and the accuracy of its delivery to compensate for what the user community expects (Susanto, 2012). Quality of services depends on the ability of service providers to meet the expectations of the user community consistently and end up in the perception of the user community.

Academic services are university-related educational services that comprise syllabus, curriculum, lecture quality design, material presentation, serving material units, practicum, guidance, and evaluation (Anastasia & Tjiptono, 2001). Academic service quality is a measure of how good the overall service level provided by the higher education institution is so that it can meet customer needs or desires (main external and internal).

In the assessment of public service performance of the minister of the utilization of the state apparatus number: Kep/25/M.PAN/2/2004, community satisfaction index requires that the minimum service must meet these aspects of service which include: service procedures, service requirements, service officers' clarity, discipline, responsibility, ability, speed of service, service equity, courtesy and sociability of officers, realistic and the certainty of service costs, the certainty of service schedules, and the convenience of the service environment.

Pareto Analysis

Pareto diagrams are used as a proposal for improvement to see the order of repair variables that are top priorities (Arifianto & Dwiyanto, 2013). Furthermore, this analysis led to the statement that 80 percent of problems stem from 20 percent of processes (Sallis, 2002). The Pareto Rule, sometimes known as the 80/20 Rule, is an important concept. The Pareto diagram is useful for identifying some vital issues by applying the 80:20 comparison rule, meaning that an 80% increase can be achieved by solving 20% of the most important problems faced (Yamit, 2010).

If at least 80% of the issue areas can be identified, they should be prioritized in any quality improvement initiative. Initiative strategies should focus on the areas that provide the most issues. Pareto charts are basically specialized vertical bar charts that help with quality concerns. Pareto charts direct attention to the most pressing issues affecting a group or institution.

Method

This study is conducted by using a descriptive quantitative method to investigate academic service in higher education to improve the implementation of total quality management. This study took data from students and alumni from higher education in Indonesia that were selected by using a random sampling method.

Since the purpose of this study was to explore academic services in higher education, so the appropriate tool was a questionnaire. The questionnaire used was adapted from (*Laporan Survey Indeks Kepuasan Masyarakat*

Bidang Pelayanan Umum Kelurahan Di Surabaya Timur, 2019). The adaptation process produced a new questionnaire that consisted of four sections questioning respondents' demographic data, respondents' perceptions of their expectations and satisfaction with academic services at higher education, and related suggestions for improving academic services.

The researcher used an indirect questionnaire which means the respondents only answer the question about the characteristics. This questionnaire used Likert response scales ranging from Very Unimportant and Very Dissatisfied (*STP*) to Very Important and Very Satisfied (*SP*). Each has its numerical value for the sake of the statistical computation needed among others, *STP* had the lowest score (1) while the *SP* has the highest one (5). By using this questionnaire, the researcher gained data from the respondents regarding service requirements, service procedures, service time duration, officers' competencies, officers' behavior, supporting facility and infrastructure, handling and complaint, and service result.

Table 1. Blueprint of the Questionnaire

Domain	Indicators	Section
	Respondents' name, Respondents' alma mater,	1
Demographic Data	Respondents' student status, Higher education level	
Service requirements	Information availability, clarity, and convenience regarding service requirements	2, 3
Service procedures	Information existence, clarity, and convenience regarding service procedures	2, 3
Service time duration and costs	Accuracy and speed of service time duration, accuracy and affordability of service costs	2, 3
Officers' competencies	Officers' skills, experience, knowledge, and understanding of their work	2, 3
Officers' behaviors	Officers' attitude, attention, and professionalism	2, 3
Supporting facility and infrastructure	Availability, feasibility, and utilization of supporting facilities	2, 3
Handling and complaint	Availability of complaint facilities and follow-up on complaints	2,3
Service result	Suitability of service result	2, 3
Suggestion	Respondents' suggestions of academic service in higher education	4

The features of the questionnaire were analyzed by using the Customer Index Satisfaction method (CSI). The results of the CSI calculation then will be categorized into satisfaction level criteria as shown in Table 2.

Table 2. Criteria Scale of CSI

CSI Score	Criteria
$X > 0.81$	Very Satisfied
0.66 – 0.8	Satisfied
0.51 – 0.65	Sufficiently Satisfied
0.35 – 0.5	Not Satisfied
0.00 – 0.34	Very Dissatisfied

After the calculation result was revealed, Pareto analysis was applied to identify which academic service domain needs more improvement. To assure the study's validity and avoid bias, the researcher reviewed the questionnaire data and identified supportive ideas from past research and experts.

$$CSI = \frac{\sum_{i=1}^p WSi}{5} \times 100\%$$

p = number of importance's attributes
5 = scale total

Figure 1. CSI Formula

Results

Customer Index Satisfaction

To know customer index satisfaction, the researcher distributed the questionnaire by using Google Form to the students and alumni of higher education in Indonesia. The questionnaire was shared in March, 21st 2022 through social media and WhatsApp groups. The questionnaire used Likert Scale with five range which are Very Important/Very Satisfied, Important/Satisfied, Moderately Important/Sufficiently Satisfied, Not Important/Not Satisfied, Very Unimportant/Very Dissatisfied.

Each statement had its numerical value for the statistical computation which applied the highest score (5) to Very Important/Very Satisfied as the lowest score (1) to Very Unimportant/Very Dissatisfied. The result of the questionnaire was determined by calculating the respondents' answers and then analyzing and scoring them. There is a total of 21 questions for each important and satisfaction section regarding the service requirements, service procedures, service time duration, officers' competencies, officers' behavior, supporting facility and infrastructure, handling and complaint, and service result.

The maximum score of the questionnaire was 210 and the result of the questionnaire calculation is shown in Table 3.

Table 3. Result of the Questionnaire

No	Indicators	Mean Important Score	Mean Satisfaction Score	Gap
1	The existence of information about the requirements for obtaining services	4.51	4.17	0.34
2	Clarity of information about the requirements for obtaining services	4.51	4.21	0.3
3	Ease of requirements to get services	4.43	4.17	0.26
4	The existence of information about service systems/mechanisms/procedures	4.40	4.13	0.27
5	Clarity of information about service systems/mechanisms/procedures	4.51	4.24	0.27
6	Ease of information about service systems/mechanisms/procedures	4.47	4.14	0.33
7	Speed of service processes	4.56	4.29	0.27
8	Accuracy of service process	4.47	4.31	0.16
9	Accuracy and affordability of service costs	4.53	4.41	0.12
10	Officers' competence in carrying out their duties	4.54	4.30	0.24
11	Officers' knowledge and understanding of the duties and their responsibilities	4.56	4.36	0.2
12	Officer's ability to provide solutions to students/alumni	4.50	4.36	0.14
13	Friendly attitude and officers' attention to students/alumni	4.53	4.23	0.3
14	The professionalism of officers in carrying out duties	4.56	4.40	0.16
15	The ministry does not discriminate.	4.56	4.43	0.13
16	Feasibility and comfort of the service building	4.39	4.27	0.12
17	The availability of services supporting infrastructure	4.46	4.30	0.16
18	Implementation of the use of IT / Information Technology systems for service processes	4.47	4.33	0.14
19	Availability of complaint box	4.33	4.07	0.26
20	Follow-up on student/alumni complaints	4.40	4.17	0.23
21	Conformity of output/quality of service results obtained	4.51	4.30	0.21
Total Mean Score		98.66	93.81	4.85
Customer Index Satisfaction			85.30	

Based on the result of the questionnaire, the mean satisfaction score of each statement is below the important score. The indicator "follow-up on student/alumni complaints" achieved the lowest mean satisfaction score which is 4.07. Meanwhile, the highest mean satisfaction score was achieved by indicators of "officers'

knowledge and understanding of the duties and their responsibilities” and “officers’ ability to provide solutions to student/alumni” with a figure of 4.36. The highest gap is on the indicator “the existence of information about the requirements for obtaining services” with a figure of 0.34, while the lowest gap is on the indicator “accuracy and affordability of service costs” and “feasibility and comfort of the service building”.

Furthermore, the table also revealed that the total mean importance score is 98.66, while the total mean satisfaction is 93.81. It meant that respondents most likely had a positive impression of academic service in higher education. However, a gap of 4.85 between the important and satisfaction score indicates that service performance was still below customer expectations.

On the other hand, the table shows that the customer index satisfaction of academic service in higher education obtained a score of 85.30. It means that most of the users are very satisfied with the academic service, (see Table 2).

Pareto Analysis

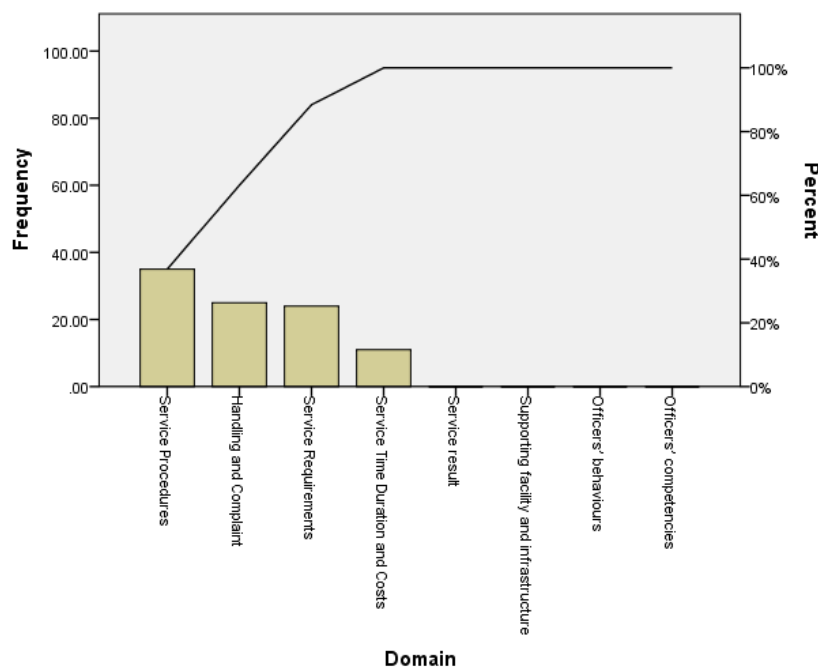


Figure 2. Pareto Chart

Based on the Pareto Chart, showed that dominant problems occur related to the service procedures then followed by the domain of handling and complaint, service requirements, and service time duration. According to the Pareto principle, if the three most dominant domains are handled, 80% of the problems will be resolved since the three types of domains are the priority that must be addressed first. These three domains are things that must be considered so that the service quality can be improved, and customer satisfaction can increase.

Discussion

The results of this study also support the findings of the study conducted by Azam, (2018) who states that students' views of service quality are connected to their satisfaction with such services. Other research results that are also relevant to this research are research conducted by Kurbani, (2017). The results of the analysis confirm the existence of a favorable and substantial relationship between academic service quality and student satisfaction with sig values 0.046. It is emphasized by Shah & Nair, (2010) who stated that student evaluations of education are based on more than just what happens in a typical classroom; they consider the entire student experience, including course design, instructor quality, relevant support services, learning infrastructure, information technology, assisted learning, and campus life.

Quality academic services are supposed to enhance student satisfaction with academic services provided by any educational institution. The quality of academic services behavior is supported by student enthusiasm to utilize them. It is similar to the result of the previous study explaining that officers' dependability in providing academic services, accuracy in information delivery, responsiveness to student complaints and requests, and harmonization of service relationships between officers and students all contribute to the quality of educational achievements desired by students in higher education institutions (Kuswanto & Anderson, 2021).

Students will engage in positive consuming behavior if they feel that the academic services they use will help them to complete their academic affairs and there are enticing offers from higher education institutions. It is in line with Malik et al., (2010), who stated that the quality of service has a significant impact on student satisfaction in a variety of ways. The basis of student satisfaction is dependent on the institution's teaching and learning environment, as well as the demand for well-qualified students, learning, and faculty experience for their academic and professional growth. Besides, Zhang et al., (2008) pointed out that since college reputation has a direct impact on student expectations, universities should first improve their educational services to enhance student satisfaction.

Student satisfaction will provide benefits for the college. Students who are satisfied with the college's services will continue their education at the same institution. Furthermore, they will advertise the college's excellent service to other potential students. This is in line with (Kotler, 2000) that many benefits will be obtained by the company with the achievement of a high level of satisfaction.

Conclusion

Based on the results of the study, the academic service quality that is highly expected from higher education is a domain related to information on service procedures, information on service requirements, and the responsiveness of service officers in responding to complaints. Indirectly, these expectations are helpful to the institutions in improving their performance, especially in academic service. This current study leads the

institution to know what aspects most likely need to be improved to implement Total Quality Management in education. It can be seen that most respondents feel less satisfied compared to their expectations.

Recommendations

The researcher made several recommendations for the academic service officers based on this study. As a service assistant, the officer should pay attention to the customers' needs. The officer should note that different customers should have different needs and characteristics. However, the researcher assumed that this study will serve as a useful reference for other researchers doing more studies on Total Quality Management in educational institutions. Since the analysis method used in the present study is Pareto Analysis Method, future researchers might analyze similar themes from another method like Root Cause Problem Analysis or else. Future researchers can explore comparable subjects and expand the scope of the study by conducting various issues, resulting in better and more valid results.

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