

The Implementation of ISO 9001 Certification to Improve the Competitive Advantage of Private Higher Education

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Abstract. At the 2005 World Trade Organization meeting, a General Agreement on Trade in Services was signed. The education sector was included as a part of the service business sector and Foreign Higher Education was allowed to be established in Indonesia, which raised the question: "Is the National Higher Education ready to compete with Foreign Higher Education?". This research investigated the level of improvement of the Quality Management System (QMS) implemented in a Private Higher Education that has ISO 9001 Certification. This research employed a survey method and descriptive analysis of three independent variables, namely the level of motivation of the study program to achieve ISO 9001 certification, the level of implementation of ISO 9001 Certification and the improved performance of the QMS. The findings revealed that the achievement of study program motivation and the level of implementation of ISO 9001 certification fell into "good" category (applied but not fully implemented). It indicated that the study program image, the growth of student interest (market share), the assurance quality of the academic process and the competitive advantage of the graduates could be achieved well. In addition, the performance improvement of the Study program QMS was at a high level.

1. Introduction

In the era of the global market, business competition (products and services) is getting tighter. At the 2005 World Trade Organization meeting, a General Agreement on Trade in Services was signed. The education sector was included as part of the service business sector and Foreign Higher Education was allowed to be established in Indonesia, which raised the question: "Is the National Higher education ready to compete with Foreign Higher Education?". This question was based on the assumption that the quality of the national higher education was still low, although there was a significant increase in the number of the institution. According to [1], quality is one of the important factors considered by customers in selecting goods and services. Therefore, the National Higher Education should provide excellent academic services to give higher satisfaction to stakeholders.

The Indonesian Government had reformed the management of Higher Education by stipulating a policy to guarantee the quality assurance of Higher Education where every Higher Education must conduct an external audit process by the National Accreditation Agency for Higher Education (BAN-PT, *Badan Akreditasi Nasional Perguruan Tinggi*). Quality assurance ensures that each activity is carried out based on the standards [2]. This can be achieved if there is supervision of the quality of its implementation. According to [3], supervision is conducted to reduce errors, maintain and improve the quality standards, reduce consumer complaints, enable grading output, comply with regulations, and maintain and improve the company image. However, there is another alternative, obtaining one of the International Organization for Standardization Certifications (ISO 9001). It can improve the image, market share growth, quality assurance, and competitive advantage. ISO 9001 is a Quality Management System for measuring the quality of an organization including the educational institutions ranging from elementary, secondary to tertiary level. [4] argues that ISO is a fully integrated system to improve the quality of the organization. In addition, his research found that there was a significant improvement in the quality of service systems of several educational institutions in Nepal after implementing ISO 9001:2008. This standard is essential to achieve the quality objectives

aimed at facing the challenges of globalization [5]. An excellent quality will result in a good image, high growth of student interest (market share), better quality assurance of academic processes, and higher competitive advantage of the graduates.

This research was conducted in two study programs in one of the faculties in Private Higher Education in Bandung that passed the external audit process and held the ISO 9001:2008 Certification. According to [5], the acquisition of this certification indicated that the organization had conducted an internationally recognized QMS. The certification provided an academic service quality goal policy that was oriented towards students (customers), preventing nonconformities, and continuous improvement. A survey assessment was needed to find out the level of improvement of the QMS at Private Higher Education that hold ISO 9001 certification. There were previous studies conducting ISO 9001 implementation assessments in an organization. A journal from [6] presented a summary of literature studies from various sources that investigated the benefits of ISO 9001. [7] states that the implementation of ISO QMS could improve internal business performance. In addition, [8] investigated the effectiveness of organizations that adopted ISO. Boiral & Roy (2007) and Jang & Lin (2008) measured the motivation of organizations that adopted ISO.

This research was mainly based on the theory from [4], [9], [10], and [11]. The measurement of the effectiveness of the ISO 9001:2008 was adapted from the research journal conducted by [4] and [9]. In addition, the system quality measurement model was adapted from [10] and [11] research on the improvement of QMS. This research employed a survey method and descriptive analysis of three independent variables, namely the achievement of the study program's motivation to obtain ISO 9001 certification, the level of implementation of the ISO 9001 QMS, and the performance of the QMS improvement. The output of this research is expected to practically contribute to study programs to improve the quality of ongoing academic services so as to create a competitive Higher Education level.

2. Method

2.1 Target Population and Sample

The population in this research were employees, lecturers, and heads of the study programs and faculties. There were 49 respondents chosen randomly. The minimum sample size was determined based on the theory from [12], which stated that the minimum sample of descriptive research was 10% of the population.

2.2 Research Models and Variables

The research model is illustrated in Figure 2.1. This model was adapted from the information system success model DeLone and McLean [13]. This model only used three levels and six components in accordance with the problems in the object of this research.

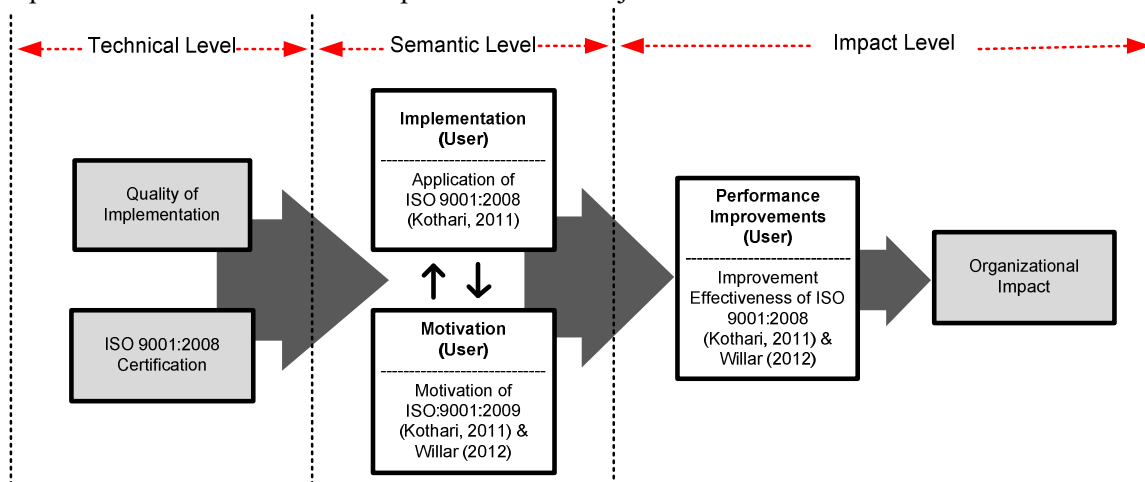


Figure 2.1 Quality Management System Improvement Research Model
Source: Modification of researchers from Jogiyanto (2014)

At the technical level, ISO 9001 Certification, as a standard of Quality Management System, was used as a reference to find out the quality of its implementation. The quality of implementation was explained in the semantic level where there were two components that were interconnected, namely the components of user motivation and user performance. Both components were used as variables to measure the success in the technical level.

At the semantic level, the first variable is the achievement of the study program's motivation to obtain ISO 9001 certification using the ISO 9001 motivational indicators from [4], which includes improvement of the organizational image, increased level of market needs (students), strengthening of QMS and integration with TQM. In addition, a number of indicators from [11] were added which included improving business performance, reducing poor quality of processes, improving markets, better QMS, fulfilling customer requirements, and company prestige. After adjustments were made, 5 variable indicators were identified (see Table 3.1). The second variable, the implementation level of ISO 9001:2008 certification, adopted 15 indicators of QMS implementation from [4] (see Table 3.1). Furthermore, the third variable, the performance improvement of the Quality Management System, used the indicators adapted from [4], including quality awareness, employee morale, team collaboration, customer satisfaction, and error level. In addition, this variable also used the indicators adapted from [11] on improving management performance, including profitability, sales growth, market share, service quality, continuous improvement, and employee satisfaction. After adjustments were made, six variable indicators were identified (see Table 3.1). Success at this last level has an impact on the total performance component (organization) of the faculty in implementing ISO 9001:2008.

2.3 Operationalization of Variables

There were three independent variables in this research presented in the following table.

Table 2.1 Operationalization of Variables, Indicators, and Instruments

Variables	Indicators	Instruments/Scale
1. Achievement of Study program Motivation to Obtain ISO 9001 Certification (User)	<ol style="list-style-type: none"> 1. Image of study program 2. Student interest 3. Academic processes/services 4. Work quality performance 5. Competitiveness of graduates 	Five items/Likert scale
2. Level of ISO 9001 Certification Implementation (User)	<ol style="list-style-type: none"> 1. Management responsibility 2. Quality Management System 3. Contract Review 4. Design Control 5. Document and Data Control 6. Purchase 7. Process Control 8. Inspection of Measurement and Testing Equipment 9. Inspection and Testing 10. Process / Service Control Is Not Appropriate 11. Corrective and Corrective Actions 12. Internal Audit 13. Quality Document Control 14. Training 15. Service 	Twenty-six items/rating scale
3. Improved QMS	<ol style="list-style-type: none"> 1. Work discipline 	Six items/Likert

Performance (User)	2. Employee morale 3. Teamwork 4. Service quality 5. Do work without error 6. Communication	scale
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Questionnaires were used for data collection. In the first part of the questionnaire, there were close-ended questions using a Likert scale, graded from extremely positive to extremely negative [14]. In the second part, there were close-ended questions using the rating scale, in the form of numbers 4, 3, 2, 1 and 0 interpreted qualitatively from extremely good to extremely poor.

Before data analysis, instrument validity and reliability tests were conducted. According to [14], valid and reliable instruments provided valid and reliable research results. Validity test was conducted using Product-Moment Formula:

$$r_{xy} = \frac{N\sum XY - \sum X \sum Y}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}$$

Where :

- r = correlation coefficient
- X = instrument score
- Y = total item score
- N = number of respondents

Each question item in the questionnaire was considered valid if the correlation coefficient was higher than or equal to 0.3 [14]. The reliability test was conducted using Alpha Chronbach's formula:

$$r_{11} = \frac{k}{k-1} \left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right]$$

Where:

- r₁₁ = instrument reliability
- k = number of items
- ∑σ_b² = amount of variance item
- σ_t² = total variance

The question was considered reliable if the correlation coefficient was higher or equal to 0.7 [4]. After the instrument was declared valid and reliable, each variable was processed and analyzed. The respondent's score and ideal score (criterium) were used as the reference for the data analysis. A score of the respondent's answer for each indicator of the three variables was obtained by summing the results of the multiplication of the answer scale (4, 3, 2, 1) with the frequency of the answer. Furthermore, a score of each indicator was analyzed by determining the sum of ideal scores (criterium) for all items obtained by multiplying a score of the answer by the number of respondents. Each choice of answers, ranging from strongly agree scale (4) to strongly disagree scale (1), was multiplied by each number of respondents, to determine the score interval.

3 Finding and Discussion

3.1 Validity and Reliability Test

The results of the validity test of the three variables using Pearson product-moment are as follow:

1. The variable of level of motivation to obtain ISO 9001 certification: The results of the correlation calculation of the five items in the questionnaire indicated that the four items were included in good criteria and the lowest value was obtained by item 2 at 0.451 (≥0.3) included in acceptable criteria. Thus, it can be concluded that all items were valid.
2. The variable of level of implementation of ISO 9001 certification: The results of the correlation calculation of the 26 items in the questionnaire indicated that 23 items were included in good criteria and the lowest value was obtained by item 25 at 0.345 (≥0.3) included in acceptable criteria. Thus, it can be concluded that all items were valid

3. The variable of performance improvement of ISO 9001 Quality Management System: The results of the correlation calculation of the six items in the questionnaire indicated that all items were included in good criteria . Thus, it can be concluded that all items were valid

The result of the reliability test of the three variables using Cronbach Alpha are as follow:

1. The variable of level of motivation to obtain ISO 9001 certification: the result of correlation calculation obtained a value of 0.702 (≥ 0.7) included in acceptable criteria, thus the first variable was reliable.
2. The variable of level of implementation of ISO 9001 certification: the results of the correlation calculation obtained a value of 0.941 (≥ 0.7) included in good criteria. Thus, the second variable was reliable.
3. The variable of performance improvement of ISO 9001 Quality Management System: the results of the correlation calculation obtained a value of 0.0.918 (≥ 0.7) included in good criteria. Thus, the third variable was reliable.

3.2 Motivation to Obtain an ISO 9001 Certification

A score of the respondent's answer (Likert scale) and criterium for each indicator of the variable is presented in Table 3.1 and Figure 3.1.

Table 3.1 Achievement Scores of ISO 9001 Certification

No.	Indicators of Achievement of Motivation	Strongly Agree	Agree	Disagree	Strongly Disagree	Score	Proportion	Interpretation
1	Image of study program	6	32	8	3	139	70,91%	Strongly Agree
2	Student interest	10	33	4	2	149	76.02%	Strongly Agree
3	Academic processes/services	3	24	19	3	125	63.78%	Agree
4	Work quality performance	6	25	17	1	134	68.37%	Agree
5	Competitiveness of graduates	9	34	4	2	148	75.51%	Strongly Agree
	Mean					139	70.92%	Agree

The majority of the respondents answered strongly agree on indicator-2 (student interest) with a score of 149 (76.02%), indicator-5 (competitive advantage) with a score of 148 (75.51%), and indicator-1 (study program image) with a score of 139 (70.91%). Some of the respondents answered agree on indicator-4 (work quality performance) with a score of 134 (68.37%), and indicator-3 (academic service process) with a score of 125 (63.78%). The mean score was 139 (70.92%).

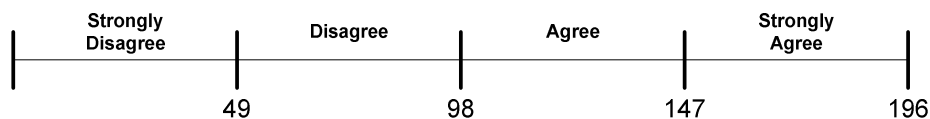


Figure 3.1 Continuum Criteria Scale (Variable-1)

Overall, the responses for the five indicators were mostly "agree" with an average score of 134.6 or 68.67%. This indicated that the level of motivation to obtain ISO 9001 certification was good.

3.3 Level of Implementation of ISO 9001 Certification

The mean score of the respondent's answer (rating scale) for each indicator is presented in Table 3.2 and interpreted qualitatively referring to Table 3.3.

Table 3.2 The Mean Score Level of Implementation of ISO 9001 Certification

No.	Implementation Level Indicator	Amount	Score	Interpretation
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		Item		
1	Management Responsibility	3	67.35	Good
2	Quality Management System	1	66.84	Good
3	Contract Review	4	66.71	Good
4	Design Control	1	76.53	Good
5	Document and Data Control	1	60.71	Good
6	Purchase	1	66.84	Good
7	Process Control	2	66.08	Good
8	Inspection of Measurement and Testing Equipment	2	66.33	Good
9	Inspection and testing	2	71.43	Good
10	Process/Service Control Not Appropriate	3	71.77	Good
11	Improvement and Corrective Actions	1	64.29	Good
12	Internal Audit	2	66.84	Good
13	Quality Document Control	1	67.35	Good
14	Training	1	72.45	Good
15	Service	1	75.00	Good
Mean			68.29	Good

Table 3.3 Interpretation of Mean Score

Score Interval	Interpretation Answers
81 – 100	Applied completely (Extremely Good)
61 – 80	Applied but not fully (Good)
41 – 60	Applied to just enough (Average)
21 – 40	Applied, but minimal (Poor)
0 – 20	Not implemented at all (Extremely Poor)

The average response for each indicator fell into 'good' category. The highest average score was indicator-4 (design control) with a score of 76.53 and the lowest average score was indicator-5 (control of documents and data) with a score of 60.71. It can be concluded that the response to 15 indicators is in 'good' category or applied but not fully implemented with an average score of 68.29.

3.4 Performance Improvement of the ISO 9001 QMS

Scores of the respondent's answer (Likert scale) and criterium for each indicator of the variable performance improvement of the ISO 9001 Quality Management System is presented in Table 3.4 and Figure 3.2.

Table 3.4 Performance Improvement Scores of ISO 9001 QMS

No	Performance Improvement Indicator	Extremely High				Extremely Low		Score
		High	Medium	Low	Extremely High	Extremely Low		
1	Work discipline	3	27	17	1	1	177	
2	Employee morale	1	31	14	2	1	176	
3	Teamwork	3	31	12	2	1	180	
4	Service quality	2	26	19	1	1	174	
5	Do work without error	1	24	16	7	1	164	
6	Communication	3	31	11	2	2	178	
	Mean						174.83	

The score for indicator-3 (improvement in teamwork) was 180 (73.47%). The score for indicator-6 (improvement in communication) was 178 (72.65%). The score for indicator-1 (improvement in work discipline) was 177 (72.24%). The score for indicator-2 (improvement in employee morale) was 176 (71.84%). The score for indicator-4 (improvement of service quality/customer satisfaction) was 174 (71.02%), and the lowest score was indicator-5 (improvement doing work without error) with a score of 164 (66.94%).

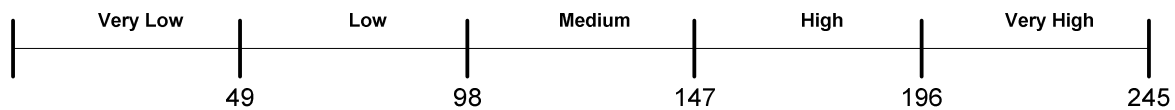


Figure 3.2 Continuum Criteria Scale (Variable-3)

The average response of the six indicators fell into the ‘high’ category with a mean score of 174.83 (71.36%). It can be concluded that the level of improvement of the Quality Management System in the study program had a high impact.

4 Conclusion

According to the findings of the research, it can be concluded that:

1. The mean score of the motivation variable indicators of the two study programs with ISO 9001 Certification was 139 (70.92%).
2. The level of implementation of ISO 9001 Certification indicators fell into the “good” category with a mean score of 68.29.
3. The impact of ISO 9001 certification on the study programs showed a high level of QMS improvement with a mean score of 174.83 (71.36%).

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