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Building ISO 9000 Based Quality Management Systems in Education: The Case of the Faculty of Business Management, UiTM Shah Alam

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ABSTRACT

This study examines a managerial innovation involving developing, implementing and accrediting a quality management system based on the ISO 9000 international standard. There is moderate correlation between interest in managerial innovation and perceived value. Implementation strategy/ approach shows a relatively high correlation with perceived value. Staff reaction to innovation is connected to their interest and perceived value towards personal and institutional development, and growth. The multiple regression analysis shows that the model explains 15% to 19% of the variance in innovation acceptance with interest being the only significant variable. The moderating role of implementation prior to the exercise was examined via the hierarchical regression analysis. The results indicate that implementation strategy interacts with the interest variable enhancing the explanatory power to 24%. The resulting R^2 change adds weight to the claim that the implementation strategy plays a critical role in generating acceptance of the innovation introduced. A more inclusive and participative strategy is likely to generate greater interest and engagement and induce greater acceptance of the innovation. Thus, any implementation strategy that does not incorporate involvement, consultation and consensus building among members will deepen existing chasm between managers and the managed. Nowhere is this chasm more visible than in the academia.

Introduction

Institutions of Higher Learning (IHLs) in Malaysia are facing stiffer competition due to both the increasing pressure from stakeholders and the threat of internationalization from well-established institutions of more developed countries. Another area of concern is the rapid growth of private IHLs that compete for the same pool of students. Public IHLs have to institute some form of quality management system to ensure provision of better services leading to the production of international standard quality graduates.

Problem Statement

Adoption of the ISO system is a type of innovation that will bring about change to an organization enabling it to satisfy and delight its customers. Cheng and Tummala (1998) looked at the level of participation of employees in the certification exercise and provided empirical evidence that wider participation generated positive evaluations of the outcome or value of certification. The study supports the general axiom that involvement and participation of employees help create a better understanding of the standard and certification and consequently lead to less resistance.

The present study looks at the acceptance of innovation, in the form of the process-based ISO exercise, by the academic staff of the Faculty of Business Management (FBM), UiTM Shah Alam. The motivation for this research is the prevalent negative perception towards ISO which many report as time-consuming with a lot of paperwork, inflexibility, red tape and extra work (Koch and Fisher, 1998). The focus of this research is to study factors that may affect the acceptance of ISO practice at the faculty. For this purpose, we tested acceptance of innovation against factors such as interest, involvement, knowledge and perceived value.

This study addresses the following research questions:

- i. Does the acceptance of innovation (ISO 9000 practice) depend on the interest of staff in the subject matter?
- ii. Does interest affect involvement in the exercise?
- iii. How is acceptance affected by the knowledge of the ISO standard?
- iv. How does perception of the value of certification affect acceptance?

Literature Review

A quality system provides the environment needed to develop a culture of continual improvement and the framework for organizational documentation

that will fulfil the expectations of customers. Several factors contributed to the introduction of TQM principles in the education field. These included declining enrolment (Ray, 1996); increasing tuition fees; intensifying competition among institutions; employers demanding better quality graduates (Bosner, 1992; Rubach and Stratton, 1994); and students' dissatisfaction with the quality of service provided (Montano and Utter, 1999).

Matthews (1993) stated that the application of the TQM in a university environment falls under three main areas. Firstly, it could solve operational and administrative problems. Secondly, it could be used for curriculum development, and lastly it can be applied to teaching and research. A quality management system can solve operational and administrative problems like students' registration, scheduling of timetables, keeping academic records, maintenance schedule, billing, and grade submission.

Believers of TQM ignore the fact that quality initiative of any kind requires faculty members to plan and implement action plans that are time consuming. Most education institutions ignore employee time devoted in implementing the TQM processes, when in fact; academics should devote as much time possible to academic activities such as research and consultation, and curriculum development; apart from the usual teaching activities.

Several standards are used to institute required quality specifications. One such standard is the ISO 9000 series based on procedures that maintain certain required quality specifications. Its purpose is to improve operating efficiency, productivity, organization image, and internal organization. Hazman (2000) reviewed the manner in which ISO 9000 was received in the Malaysian higher educational institutions. He concluded that ignorance of the standards among academics was high and this coupled with the general anxiety about changes did not garner support of the ISO 9000. The benefits of the ISO certification seem to be more internal than external and academics were not enthusiastic supporters of such exercise (Jasni and Hazman, 2003). Extensive empirical assessment of the ISO 9000 certification has produced mixed results. The internal benefits include better process understanding, greater process clarity, cost saving, time saving and productivity. It is postulated that these benefits will be higher if there is greater interest in, and commitment to the certification decision and process.

Research Framework and Methodology

The underlying proposition of this research is that the acceptance of the faculty staffs' to some form of innovation (ISO 9000 - new way of managing things) is influenced by their interest in the subject matter, involvement in the certification exercise, knowledge of the standard and its requirements and perceived value of the certification. These relationships are moderated by the implementation

strategy undertaken by the faculty. The research framework is depicted in the schematic diagram below:

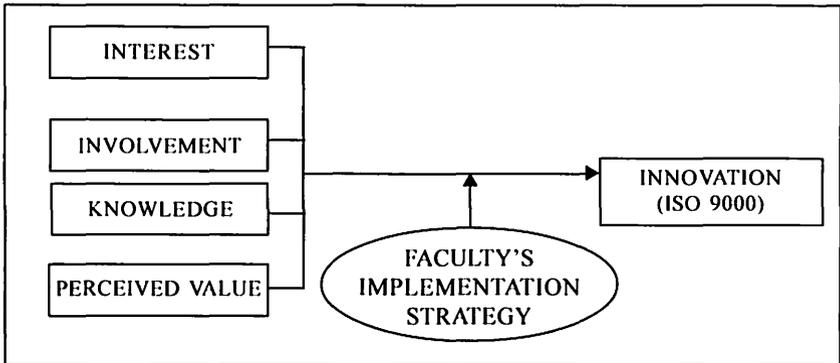


Figure 1: The Research Framework

A cross sectional survey using a structured questionnaire was personally administered to 150 staff of the faculty in the month of February to April 2004. Ninety-seven responded and all were deemed usable giving a response rate of 65%. The same process was repeated in December 2004 to February 2005, eight months after the award of ISO9001:2000 certification. This time however, only 70 responses were obtainable. The pre- and post-certification instruments used were basically the same except for additional open-ended questions added to the post-certification questionnaire.

The Hypotheses tested are as follows:

- H1: Interest, knowledge, involvement and perceived value are positively correlated
- H2a: There is a relationship between interest and innovation
- H2b: There is a relationship between knowledge and innovation
- H2c: There is a relationship between involvement and innovation
- H2d: There is a relationship between perceived value and innovation
- H3a: The relationship between interest and innovation is moderated by the implementation strategy
- H3b: The relationship between knowledge and innovation is moderated by the implementation strategy
- H3c: The relationship between involvement and innovation is moderated by the implementation strategy
- H3d: The relationship between perceived value and innovation is moderated by the implementation strategy

Findings and Analysis

The reliability measures before and after the ISO 9001:2000 certification did not illustrate a major difference of responses amongst the FBM lecturers. All six dimensions (involvement, interest, knowledge, perceived value, innovation and implementation) indicated measures of Cronbach alpha greater than 0.6 which was considered acceptable. The staff were generally positively disposed to accepting organisational or administrative innovations based on the ISO 9001:2000 standards.

Table 1: Variable Means and Standard Deviation: Pre- and Post-Certification Survey

Variables	Pre (N = 97)		Post (N =70)	
	Mean	SD	Mean	SD
Involvement	3.4313	1.82919	3.1905	1.62168
Interest	5.4175	1.21517	5.1429	1.17844
Knowledge	3.2010	1.01159	3.0881	.80694
Perceived value	4.4477	.60372	4.3911	.62660
Innovation	5.4108	.82718	5.2571	.88671
Implementation	4.6496	.95368	4.5054	.84120

Note: T-test did not produce any significant difference in means on the 6 variables between the Pre- and Post-Certification stages.

Level of Acceptance of Innovation (ISO 9000)

The results suggested that the staff were fairly positive towards innovation and change. The pre-and post-certification mean values were 5.41 and 5.26 respectively. The T-test failed to show significant difference in the level of acceptance of innovation between these two periods (pre- and post- test). The pre- and post-certification standard deviation (0.83 and 0.89 respectively) also showed the relatively close clustering of the observations around the mean. The certification process did not improve the attitude of the staff towards the acceptance of this innovation. Their perceptions of innovation appeared to be rather robust and stable.

Interest, Involvement and Knowledge

The level and the relationship posited between interest, involvement and knowledge showed that the interest level was fairly high (5.4 on a scale of 1 to 7) compared to the level of involvement which was below the mid-point in the

scale (3.43). This finding is in no way surprising considering that the academics are quite curious about any new developments. However, the involvement opportunity was not equally extended to all the staff. Some staff by virtue of their managerial responsibilities were mandated to be involved in the standard. The level of involvement of the rest of the staff was dictated by need. Hence, the involvement scores were lower than interest. Since the observations were carried out at two different periods, the difference in the means between the two periods was also examined. The T-test did not show any significant difference in the means.

Besides the level of the abovementioned variables, their correlation was also examined. In the pre-certification phase, the correlation between interest and involvement was low but significant (refer to Table 2). In the post-certification stage this correlation was not significant. The relationship between the involvement and knowledge was significant in both periods and was moderately strong (0.518 and 0.508 respectively). The correlations observed between the two variables were intuitive and logical. With more involvement comes the opportunity to know more about the standard and its interpretation. Hence, knowledge of the standard improves alongside involvement.

Perceived Value of ISO 9000

While the acceptance of innovation suggests a disposition towards change, the perceived value was indicative of the merits of a specific innovation. Overall, the staffs were quite neutral to the question of perceived value where the mean value was 4.4. They were not clearly dismissive or supportive of the innovation. This type of ambivalence is common as staff adopt a neutral position waiting to see the effect of the value of innovation on their work. In the pre-certification period, the perceived value was significantly correlated with interest (0.447), knowledge (0.289), acceptance of innovation (0.368) and implementation (0.499). However, in the post-certification period, the perceived value remained significantly correlated only with interest and acceptance of innovation. These results can be attributed to the experience of staff to change. Table 2 illustrates the correlations among the variables for this study.

The correlation between the variables shown in Table 2 partially supported hypothesis 1. Prior to certification, it was depicted that interest was moderately correlated with perception of value ($r = 0.447$, $p < 0.01$), involvement ($r = 0.269$, $p < 0.01$), innovation ($r = 0.296$, $p < 0.01$), strategy ($r = 0.418$, $p < 0.01$), but not with knowledge. There seemed to be no association between the variables with knowledge as knowledge was something that was obtainable through other means like courses and training but one would not obtain knowledge if one were not interested in the subject matter to begin with. However, after the exercise, hypothesis 1 was only supported by the perceived value ($r = 0.352$, $p < 0.01$) and innovation acceptance ($r = 0.361$, $p < 0.01$). The FBM lecturers are

Table 2: Correlation between Variables in the Pre (N = 97) and Post Certification Period (N =70)

		Interest	Involvemt	Knowledge	Percvalu	Innovatn	Strategy
Interest	Pearson C.		.162	.003	.352(**)	.361(**)	.165
	Sig. (2-tailed)	.	.181	.980	.003	.002	.172
	N	97	70	70	70	70	70
Involvemt	Pearson C.	.269(**)		.508(**)	-.043	-.053	.140
	Sig. (2-tailed)	.008	.	.000	.721	.661	.248
	N	97	97	70	70	70	70
Knowledge	Pearson C.	.124	.518(**)		-.030	-.129	.075
	Sig. (2-tailed)	.227	.000	.	.807	.286	.535
	N	97	97	97	70	70	70
Percvalu	Pearson C.	.447(**)	.188	.289(**)		.302(*)	.227
	Sig. (2-tailed)	.000	.065	.004	.	.011	.059
	N	97	97	97	97	70	70
Innovatn	Pearson C.	.296(**)	.055	.077	.368(**)		.378(**)
	Sig. (2-tailed)	.003	.590	.456	.000	.	.001
	N	97	97	97	97	97	70
Strategy	Pearson C.	.418(**)	.205(*)	.196	.499(**)	.154	
	Sig. (2-tailed)	.000	.043	.054	.000	.133	.
	N	97	97	97	97	97	97

** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Note: Correlation value to the left and right of diagonal is the before and after correlation matrix respectively.

predicted to be motivated by the exercise because of their interest and the perceived value such an exercise would bring.

Consequently, there was a relationship between innovation and interest ($r = 0.296$ [before], $r = 0.361$ [after], $p < 0.01$), and there was a relationship between innovation and perceived value ($r = 0.368$ [before], $p < 0.01$, $r = 0.302$ [after], $p < 0.05$), thus supporting only hypotheses 2a and 2d. Obviously the academic staff's interest in the ISO exercise was attached to the perception that it could benefit them in terms of their professional and personal growth. Interestingly, the implementation strategy seemed to show positive correlations with interest ($r = 0.418$, $p < 0.01$), involvement ($r = 0.205$, $p < 0.05$) and perceived value ($r = 0.499$, $p < 0.01$) prior to the exercise, but only with innovation acceptance ($r = 0.378$, $p < 0.01$) after. Evidently, the whole exercise had to be carefully formulated and executed via implementation strategies that were accepted by all in order to reduce staff resistance and make the exercise a success. The survey showed that there was a low level of knowledge

(mean = 3.49) of the standard among FBM lecturers and this was probably a source of their reluctance or resistance and anxieties to provide or support any involvement (mean = 3.43).

The Regression analysis was carried out with all the independent variables and with innovation as dependent variable. The results are portrayed in Table 3 and Table 4. In general, the model indicated that all four independent constructs before the exercise were able to explain 15.9% variance in innovation acceptance (ISO 9000 exercise) before and 18.2% after the exercise.

The Durbin-Watson showed no major effect of autocorrelation in the error and an examination of the t-value indicated that the perceived value contributed to innovation at $\alpha = 0.01$; hence H2d can be accepted while the others (H2a, H2b, H2c) are rejected. However, after the exercise, it was found that the perceived value no longer contributed to innovation acceptance as it was replaced by interest (Table 4), thus accepting H2a.

Table 3: Regression Analysis of Interest, Knowledge, Involvement and Perceived value with Innovation BEFORE the Exercise

Constructs (1-4)	R	2 R	Std. Error estimate	Sig. F	Durbin Watson
		0.399	0.159	0.7743	0.003
<hr/>					
	Unstandardized Coefficient		Std. Coeff. Beta	t	Sig.
	Beta	Std. err			
INTEREST	0.118	0.486	0.174	1.575	0.119
INVOLVEMENT	-0.019	0.052	-0.043	-0.0373	0.710
KNOWLEDGE	-0.006	0.073	-0.010	-0.085	0.932
PERCEIVED VALUE	0.272	0.100	0.302	2.719	0.008

Dependent variable: Innovation acceptance (ISO 9000 exercise)

The Influence of Implementation Strategy as a Moderator

The moderating variable, implementation strategy, was multiplied with all the independent constructs to create four interaction variables for the purpose of determining implementation strategy as a moderating variable that would influence the relationship between the independent constructs and innovation acceptance. This interaction variables were created for both pre and post exercise in order to ascertain if there existed any differences for both periods.

Table 4: Regression Analysis of Interest, Knowledge, Involvement and Perceived value with Innovation AFTER the Exercise

Constructs (1-4)	R	2 R	Std. Error estimate	Sig. F	Durbin Watson	
		0.426	0.182	0.8264	0.010	2.06
		Unstandardized Coefficient		Std. Coeff. Beta	t	Sig.
		Beta	Std. err	Beta		
INTEREST	0.226	0.092	0.301	2.453	0.017	
INVOLVEMENT	-0.022	0.073	-0.041	-0.309	0.759	
KNOWLEDGE	-0.114	0.144	-0.104	-0.793	0.431	
PERCEIVED VALUE	0.270	0.171	0.191	1.582	0.119	

Dependent variable: Innovation acceptance (ISO 9000 exercise)

Hierarchical regression was employed and the findings are stipulated in Table 5. It showed that before the exercise, the R-square change was 7.9% and the change in F-value was significant at $\alpha = 0.1$ level ($F = 0.07$).

Table 5: Regression Analysis with Implementation Strategy as a Moderator on the Relationship between the Independent Constructs and Innovation (BEFORE)

Model	R	R ²	R ² change	Std. Err Est.	Sig. F	Durbin- Watson
1	0.399	0.159	0.159	0.7743	0.003	
2	0.405	0.164	0.005	0.7767	0.465	
3	0.493	0.243	0.079	0.7561	0.070	2.2
Model	$f\beta$	Std E	$f\beta$	t	Sig	
Model 2						
INTEREST	0.131	0.077	0.193	1.699	0.093	
PERCEIVED VALUE	0.301	0.108	0.333	2.794	0.006	
Model 3						
IXTINTER	0.225	0.081	2.399	2.778	0.007	

Dependent variable: Innovation (ISO 9000 exercise)

Both interest and perceived value influenced innovation acceptance directly at $p < 0.1$ and $p < 0.01$ respectively. Interest was seen to interact with implementation strategies at $p < 0.01$ depicting those implementation strategies enhanced the relationship between interest and innovation acceptance. The staff who had interest in the innovation exercise could facilitate the exercise further if the faculty provided them with an acceptable strategy for its innovation prior to the exercise.

Table 6: Regression Analysis with Implementation Strategy as a Moderator on the Relationship between the Independent Constructs and Innovation (AFTER)

Model	R	R ²	R ² change	Std. Err Est.	Sig. F	Durbin-Watson
1	0.426	0.182	0.182	0.8264	0.010	
2	0.528	0.279	0.097	0.7819	0.005	
3	0.570	0.324	0.046	0.7816	0.408	2.06
Model	$f\beta$	Std E	$f\beta$	t	Sig.	
Model 2						
INTEREST	0.209	0.088	0.278	2.389	0.02	
STRATEGY	0.342	0.117	0.324	2.934	0.005	
Model 3						

Dependent variable: Innovation (ISO 9000 exercise)

However, after the exercise, it could be seen from Table 6 that implementation strategies no longer interacted with the other variables but appeared as a predictor. Hence interest and implementation strategies directly influenced the innovation exercise before certification and that implementation strategies no longer existed as a moderating variable after the certification was received.

Conclusion

Overall, the staff of the faculty were positive to the innovation in the form of ISO 9000 practice even though the level of acceptance did not differ significantly after the successful completion of the exercise. The staff who were interested in the certification exercise tended to accept the innovation readily as they perceived that the benefits in terms of professional and personal growth could be derived. A major source of resistance towards the exercise is lack of knowledge of the ISO 9000 standards. Moreover, the implementation strategy served as a crucial factor in the innovation acceptance. A properly executed implementation

strategy had the effect of reducing resistance and staff would readily accept new ideas and innovations.

The findings of this study are generalizable with some risks as the study focused on one faculty only. As a result, sufficient institutional and cultural heterogeneity was not available to test the model in multiple settings. Nevertheless, the design enabled the model to be tested without the confounding influence of heterogeneous settings. More research is needed before the generalization to all academic staff in Malaysia can be made.

Suggestions for Further Research

This study was conducted on only one faculty in a public university. It is recommended that this study be further extended to other faculties and other institutions of higher learning – both public and private. Furthermore, the scope of research should include non-academic staff too. They would be more involved in executing some of the procedures especially those pertaining to administrative matters. However, this incorporation would make the sample heterogeneous and caution should be exercised in drawing conclusions to the findings. It is also recommended to incorporate additional variables that measure resistance or acceptance to an administrative innovation. Besides introducing additional variables, further refinement of the measures will raise the reliability levels and accentuate the correlations and regression results. This is just one part of the study on the acceptance of innovation, which is hoped to add some additional results to the existing knowledge. Even though this study is not exhaustive, it is hoped that this will invite further interest in this area and more research in the future.

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