A Causal Model for the Effectiveness of Internal Quality Assurance for the Health Science Area

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The purposes of this research were 1) to study the effectiveness of Internal Quality Assurance (IQA) of the Health science area, and 2) to study the factors affecting the effectiveness of the IQA of the Health science area. A causal model has been developed by the researcher comprised of the 6 exogenous latent variables: Attitude towards quality assurance, Teamwork, Staff training, Resource sufficiency, Organizational culture, and Leadership, and the 4 endogenous latent variables, which are the effectiveness of the IQA, Student-centered approach, Decentralized administration, PDCA cycle of work (Plan-Do-Check-Act), and Staff job satisfaction.

The research sample consisted of 108 health science faculties derived by stratified random sampling technique. Data were collected by 10 questionnaires having reliability ranging from 0.79 to 0.96. Data analyses were descriptive statistics, and Linear Structure Relationship (LISREL) analysis.

The major findings were as follows:

1. The 4 dimensions of effectiveness for the IQA of the Health science areas were significantly higher at the .05 level, after the Health science faculty applied the IQA programme according to the National Education Act of 1999.

2. The causal model of the effectiveness of the IQA was valid and fitted the empirical data. The 6 predictors accounted for 83% of the variance in the effectiveness of IQA. Culture and Leadership were the predictors that significantly accounted for the effectiveness of the IQA.

Keywords: *Causal model, Effectiveness, Internal quality assurance, Health science*

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Two mechanisms of quality assurance have existed in Thailand for some time. Firstly there is the Ministry of University Affairs' inspection procedure for new curricula in both public and private sectors in all disciplines. Secondly there is the professional form of license, but this only applies to some disciplines.

Whilst these mechanisms have many positive effects, it can be seen that there is still scope for improvement in Thailand's higher education system. Sirichana (1997) & Laksana (1998) pointed out 4 issues to reconsider for the educational system and also for quality assurance in higher education in Thailand: 1) the public could not trust that the higher education system could produce graduates according to social needs, 2) inequality of the educational service and quality of graduates, 3) the decrease of competitiveness in higher education, and 4) the encouragement of higher education to improve itself continually.

The Ministry of University Affairs in 1996 declared the policy to drive the idea of quality assurance, and, because of the driving force from many divisions, it became a National Education Act in 1999. Part 4 of the act made all institutes improve their own quality assurance system. It has been about 4 years since then, but there was only a little research to find out about its effectiveness, and still these could

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not find clear answers yet. The reasons are that it is too early to study the results because most of the institutes are in the initial stage (Nakorntap, 2000; Suvejwattanakul, 2002), and the quality assurance programme had not been in place long enough to have an effect. In addition the statistics used did not permit causal inference, so it was not clear whether the result came from the quality assurance programme. To deal with this problem, Cheng (1996) suggested the study of the process outcome instead of the results. With this intention, the researcher will apply the LISREL model to study the cause and effect of the effectiveness of IQA for the Health science area.

Objectives

The purposes of this research were 1) to study the effectiveness of IQA of the Health science area, and 2) to study the factors affecting the effectiveness of the IQA of the Health science area.

Scope of the study

The International Standard Classification of Education (ISCED) mentions disciplines in the Health sciences, which are medical science, nursing science, public-health science, dental science, pharmacological science and medico-technological science, and that there are 118 faculties in Thailand.

Material and Method

Procedure

There are 2 phases in this research. The first phase is to conceptualize a causal model for the effectiveness of IQA for the Health science area by using mixed method: Quantitative and Qualitative. The second phase is to analyze, conclude, and discuss.

The first phase: to conceptualize a causal model, the researcher integrated the results from 2 parts of the studies-quantitative and qualitative study described as follows:

Quantitative study

The researcher synthesized the results from the following three parts.

The first part: The researcher synthesized 11 sources of literature about the factors related to quality. The conclusion in this part found that there are 4 factors related to quality: leadership, teamwork, staff attitude, and resource sufficiency.

The second part: 30 researches about the organizational effectiveness have been synthesized. 27 researches are about factors related to the organizational effectiveness, and 17 researches are about the organizational effectiveness's indicators. The conclusion in this part found that the 4 factors related to quality are leadership, teamwork, staff attitude, and resource sufficiency. The 4 organizational effectiveness's indicators are student centered-approach, decentralized administration, PDCA cycle of work, and staff job satisfaction.

The last part is the National Education Act's analysis results from the senate committee (2002 cited in Pitiyanuwat, 2002: 2-3). The IQA's effectiveness indicators associated with this analysis are student centered-approach, decentralized administration, stakeholder involvement in teaching-learning in the institute, and initiative to use feedback results.

The researcher synthesized the following parts: The 7 factors that influence IQA effectiveness are leadership, teamwork, attitude toward quality assurance, staff training, organizational culture, resource sufficiency, and organizational size; the 4 IQA effectiveness's indicators are student-centered approach, decentralized administration, PDCA cycle of work, and staff job satisfaction.

Qualitative study

To understand the context of the real situation, the researcher did a pilot study based upon the qualitative way of thinking. 15 faculties have been selected from 118 Health science faculties to be representative of the samples of the population concerning feasibility and approach. To create a rapport with the interviewee, the researcher telephoned the deans or heads of the QA division and began by introducing herself, describing the objective of the study, asking for collaboration, and making an appointment for an interview.

Before the interview, the researcher developed the semi-structured interview form comprised of 4 main questions: 1) what was the background in the institute before they applied the quality assurance programme, 2) how do they develop their own quality assurance system, 3) what were the changes after they applied their quality assurance programme, and 4) what were the factors related to their success. The semi-structured interview had been used with 2 faculties and the completeness of the content was reconsidered. After discussion with the advisor, the researcher adjusted some parts of the interview form. Whilst collecting the data the researcher kept checking the completeness of the interview-content. To triangulate the data, the researcher sent the

interview-content back to the interviewees to validate the content before the researcher summarized the study.

The researcher used the taxonomy of data technique, typologies, and the analytical induction technique to conclude that the results covered 4 questions, after synthesis with the IQA objectives issued in the IQA manual. There were 2 important conclusions: 6 factors that influence the IQA effectiveness are attitude towards quality assurance, teamwork, staff training, resource sufficiency, organizational culture, and leadership. The 4 IQA effectiveness's indicators are student-centered approach, decentralized administration, and PDCA cycle of work.

The researcher integral-synthesized the result from the quantitative part and the qualitative part together. There are 11 variables in the model. The 7 independent variables are attitude toward quality assurance, teamwork, staff training, resource sufficiency, organizational culture, leadership, and faculty size. 4 dependent variables are student-centered approach, decentralized administration, PDCA cycle of work and staff job satisfaction, as shown in Table 1. The conceptual framework is shown in Fig. 1.

The second phase: analyzing, concluding and discussing

Population and sample

The population in this research was 118 health-science faculties in Thailand, which are medical science, nursing science, public-Health science, dental science, pharmacological science and medico-technological science (as referenced by the International Standard Classification of Education = ISCED). The research sample is 108 health-science faculties derived by stratified random sampling technique.

Research instruments and Data collecting

The researcher used 10 questionnaires to collect the data: 6 standardized tests and 4 questionnaires that the researcher developed herself containing IOC (Item-objective congruence) ranging from 0.60 to 1.00. All questionnaires have been tried out with the Alpha Cronbach reliability ranging from 0.79 to 0.96.

Data analysis

The researcher used descriptive statistics to describe the effectiveness of the IQA, and Lisrel to prove the factors affecting the IQA effectiveness of the Health science area. The researcher excluded the organizational size from the causal model as most correlation values between the organizational size and others variables in the model are very low, and non significant. $P < 0.05$ considered to be statistically significance

Results and Discussion

1. The 4 dimensions of IQA effectiveness of the Health science areas were significantly higher at the .01 level after the faculty applied the IQA programme according to the National Education Act of 1999, as shown in Table 2.

The National Education Act of 1999 provides some encouragement for institutes within the jurisdiction of the Office for National Evaluation of Education Standards and Quality Assessment (ONESQA). It is stated that all institutes must apply a QA programme and obtain evaluation at least once within five years of the National Education Act of 1999 being

Table 1. Synthesis results about the variables in the model

Independent variables	Source			Dependent variables	Source		
	1	2	3		3	4	5
1. Attitude towards quality assurance (ATTI)	✓	✓	✓	1. Student -centered approach (SC)	✓	✓	✓
2. Teamwork (TEAM)	✓	✓	✓	2. Decentralized administration (DECEN)	✓	✓	✓
3. Staff training (TRAIN)	✓	✓	✓	3. PDCA cycle of work (PDCA)	✓	✓	✓
4. Resource sufficiency (RESO)	✓	✓	✓	4. Staff job satisfaction (SATI)	-	✓	✓
5. Organizational culture (CULT)	✓	✓	✓				
6. Leadership (LEAD)	✓	✓	✓				
7. Organizational size (SIZE)	-	✓	-				

Source 1 = 11 literature reviews about the factors related to quality, 2 = 27 researches about organizational effectiveness
3 = Pilot study, 4 = The National Act's analysis results from the senate committee (2002),
5 = 17 researches about effectiveness indicators

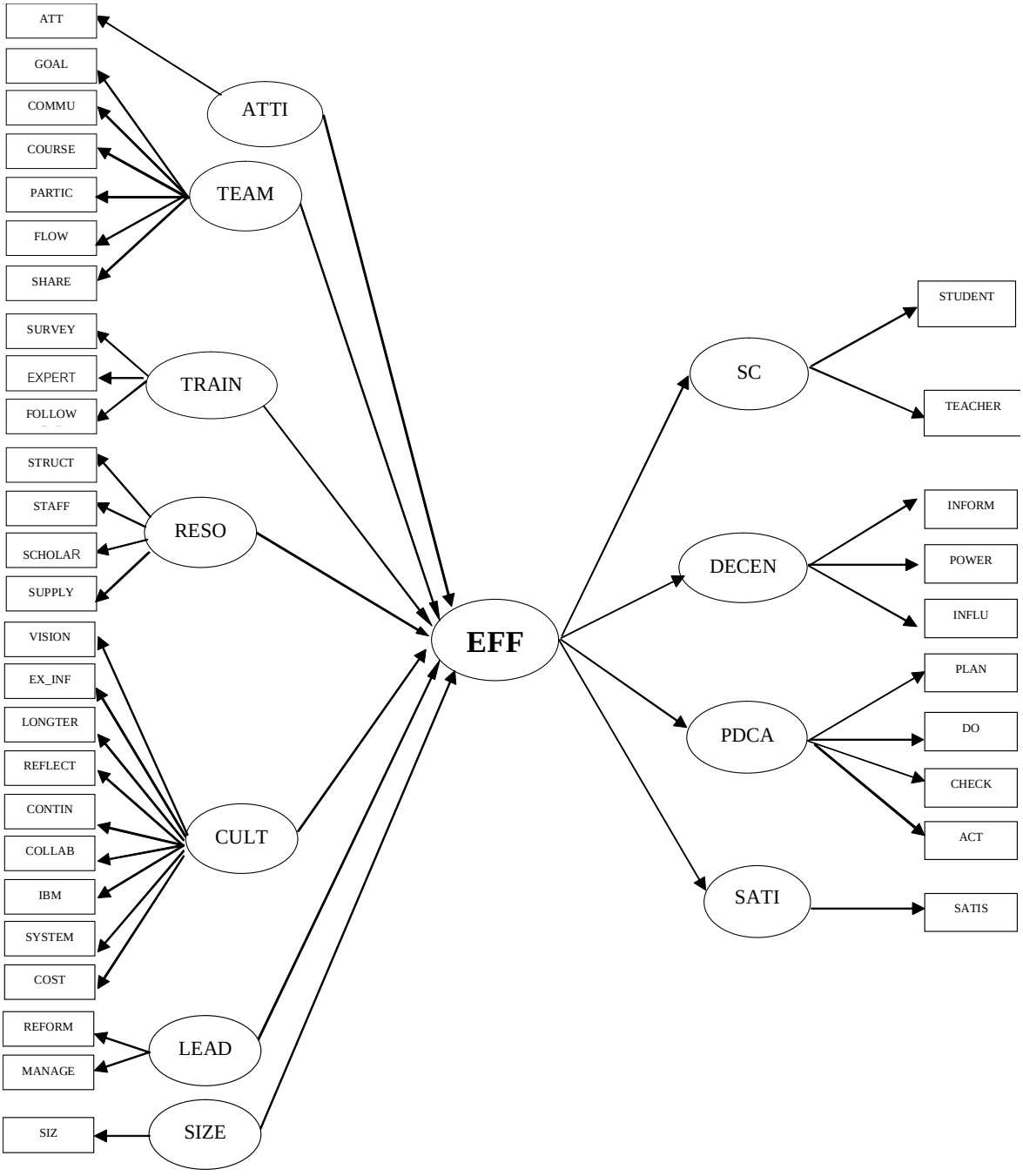

Fig. 1 A causal model for the effectiveness of IQA for the Health science area

enforced. The researcher also found in the IQA manual, and from the interviews, that the faculties were focused on following the enforcements strictly.

The 6 predictors accounted for 83% of the variance in the effectiveness of IQA. Therefore the faculties should try to find the way to improve all those independent variables, which could make the consequence of the IQA more effective.

2. The causal models of the effectiveness of the IQA were valid and fitted the empirical data. The 6

Table 2. Means and standard deviation of IQA effectiveness

Statistics variables	Mean			SD		CV (%)		Min		Max		Sk		Ku	
	Pre	Post	dif	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SC	3.27	3.68	0.41*	0.37	0.32	11.25	8.72	1.91	2.67	4.16	4.48	-0.36	-0.23	1.07	0.20
DECEN	3.03	3.48	0.45*	0.42	0.36	13.72	10.39	2.07	2.49	4.29	4.43	0.19	0.20	0.48	0.15
PDCA	3.86	4.46	0.60*	0.52	0.45	13.45	10.17	2.56	3.17	5.39	5.74	0.17	-0.12	0.05	0.23
SATIS	3.06	3.43	0.37*	0.34	0.31	11.25	8.98	2.21	2.80	4.13	4.39	0.33	0.51	0.95	0.40

* $p < 0.01$, SD = Standard deviation, CV = Coefficient of variation, Sk = Skewness, Ku = Kurtosis

predictors accounted for 83% of the variance in the effectiveness of the IQA. Culture and leardership were the predictors that significantly accounted for the effectiveness of the IQA, as shown in Table 3.

2.1 It is reasonable that the 4 dimensions of effectiveness for the IQA of the Health science areas are satisfied ($\overline{X}$ =3.03 to 3.86) before the faculty applies the QA programme according to the National Educational Act of 1999, as there is QA in a form of the licence from the professional council, which has been applied since the year 1923. This result is according to Jongseuppan et al (2002), which found from their study that the Health science area discipline is more progressive in IQA than the others.

The other disciplines should find out how to develop their own professional council in a way that might affect their effectiveness later on.

2.2 Attitude was the variable that did not significantly contribute to effectiveness of the IQA. As a theory of Planned Behavior, Ajzen (1988) stated clearly that good attitude cannot guarantee that the person will act the way they intend to because the way the person will act also depends on subjective norm and perceived behavioral control. Likewise the research found that the staff may have had a good attitude, but they did not act the way they intended to because they percieved that they did not have enough resource, and they were not capable of doing it (Pilot study, Jongseuppan et al, 2002). Ajzen (1988) said that whenever staff had these perceptions, their intention will be weak. Moreover the researcher found that in general the Health sciences do not give any incentive to persuade their staff to reach their goals. Odden & Bush (1998 cited in Briggs & Wohlstetter, 2003) stated that successful school based management in Australia uses both monetary and non-monetary rewards to acknowledge individual and group progress toward school goals.

The policy maker should find out the way to apply this reward mechanism in the school properly.

Teamwork was the variable that did not significantly contribute to effectiveness of the IQA. As the staff perceive that they are less competent, and lack knowledge about QA (Pilot study; Jongseuppan et al, 2002), the team could become ineffective.

The Health science faculty should support their staff to get an in-service training course, which could make the team becomes effective later on.

2.4 Health science faculties perceived that they had moderate resource, but resource was the variable that did not significantly contribute to effectiveness of the IQA. It might be because the Health science faculties lack good management, as the reasearcher found from the pilot study that only one faculty had changed their resource management strategy. The rest of them used the same strategy. Kennedy (1993) focused on the point that to reach the goals of the school, budget and resource allocation is needed, and school resource management is needed, otherwise it is wasting resources. As Gilbert (1993) concluded, budget and resource allocation, and school resource management is equally important. Meanwhile Grauwe (2000 cited in Simkins, Sisum, & Memon, 2003) concluded from many researches found that the quality of education depends on the means to handle the resource rather than the availability of resource.

The faculty should study more about how to use available resource most effectively.

2.5 Training was the variable that did not significantly contribute to the effectiveness of the IQA, as the researcher found that the Health science faculties process their staff training without surveying the needs and problems situations. The most issues with training came from the QA committee of the faculty, so that is why the staff perceived that they were less competent and lacked knowledge about QA. Likewise staff training without surveying the needs and problem situations could make staff training ineffective.

Table 3. Analysis result for a causal model for the effectiveness of IQA

(Latent variable) Observed variable		Effectiveness of IQA			
		b	SE_b	b_{sc}	R^2
(EFF)	SC	1.99	-	0.84	0.70
	DECEN	5.54*	0.35	0.94	0.88
	PDCA	4.37*	0.26	0.96	0.93
	SATIS	4.57*	0.34	0.87	0.77
(ATT)	ATTI	0.12*	0.01	1.00	1.00
(TEAM)	GOAL	0.41*	0.04	0.85	0.72
	COMMU	0.27*	0.03	0.76	0.57
	COURSE	0.29*	0.03	0.78	0.60
	PARTI	0.44*	0.04	0.91	0.84
	FLOW	0.32*	0.03	0.82	0.67
	SHARE	0.40*	0.03	0.90	0.81
(TRAIN)	SURVEY	0.42*	0.03	1.01	1.02
	EXPERT	0.40*	0.03	1.00	1.00
	FOLLOW	0.44*	0.03	1.00	1.00
(RESO)	STRUCT	0.38*	0.03	0.94	0.88
	STAFF	0.39*	0.03	0.94	0.88
	SCHOLAR	0.40*	0.03	0.89	0.79
	SUPPLY	0.30*	0.03	0.77	0.60
(CULT)	VISION	0.36*	0.03	0.91	0.82
	EX_INF	0.19*	0.02	0.69	0.48
	LONGTERM	0.35*	0.03	0.90	0.81
	REFLECT	0.33*	0.03	0.93	0.87
	CONTINUE	0.33*	0.02	0.95	0.90
	COLLAB	0.35*	0.03	0.93	0.86
	IBM	0.33*	0.03	0.91	0.83
	SYSTEM	0.28*	0.02	0.88	0.77
	COST	0.24*	0.03	0.75	0.56
(LEAD)	REFORM	0.46*	0.03	1.00	1.00
	MANAGER	0.29*	0.02	0.88	0.78

Statistics, effectiveness of IQA χ^2 = 318.07, df = 287, p = 0.100, AGFI = 0.74, RMR = 0.048, R^2 for Structural Equations = 0.83

Cause effect			
Dependent variable Independent variable	Effectiveness of IQA		
	Direct	Indirect	Total
ATT	0.13	-	0.13
TEAM	0.08	-	0.08
TRAIN	-0.02	-	-0.02
RESO	-0.07	-	-0.07
CULT	0.55*	-	0.55
LEAD	0.30*	-	0.30

*p < 0.05, b = factor loading, SE_b = standard error, b_{sc} = completely standardize fo factor loading, R^2 = realiability

2.6 Culture was the predictor that significantly accounted for the effectiveness of the IQA. This result concurs with many other studies that found that culture could affect school effectiveness (Wilkin & Ouchi, 1983; Purkey & Smith, 1983; Scheerens & Creemers, 1989; Cheng, 1993; Fuller & Clarke, 1994; cited in Harrison J & Kuint S, 1998).

The other faculties should provide more culture based study and encourage cultivation of it.

2.7 Leadership was the predictor that significantly accounted for the effectiveness of IQA. As the European Foundation for Quality Management proposed in the EFQM Excellence Model, leadership is one of the factors that affect TQM success (Zalri, 1998 cited in the Office of Educational Reform, Thailand, 2002). Also Mohd & Aspinwall (2000) found from their survey research on 194 small and medium business companies that leadership is 1 of 11 important factors that affect the educational reform success. Recently, Guo (2002) concluded from synthesis of 12 researches, which were supported by the Office of Educational of American, that leadership is 1 of 8 important factors that affect educational reform success.

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โมเดลเชิงสาเหตุประสิทธิผลการประกันคุณภาพภายใน สำหรับกลุ่มสาขาวิทยาศาสตร์สุขภาพ

กิตติยา สีอ่อน

การวิจัยครั้งนี้มีวัตถุประสงค์ที่สำคัญสองประการ ประการแรกเพื่อศึกษาประสิทธิผลการประกันคุณภาพภายใน ระดับคณะวิชาของกลุ่มสาขาวิทยาศาสตร์สุขภาพ และประการที่สองเพื่อศึกษาปัจจัยเชิงสาเหตุของประสิทธิผลการประกันคุณภาพภายใน ระดับคณะวิชาของกลุ่มสาขาวิทยาศาสตร์สุขภาพ โมเดลเชิงสาเหตุที่ผู้วิจัยพัฒนาขึ้นประกอบด้วยตัวแปรแฝงภายนอก 6 ตัวแปร ได้แก่ ทัศนคติต่อการประกันคุณภาพภายใน การฝึกอบรมพัฒนาบุคลากร ความพร้อมด้านทรัพยากร การทำงานเป็นทีม วัฒนธรรมคุณภาพ ภาวะผู้นำของผู้บริหาร และตัวแปรแฝงภายในซึ่งเป็นตัวบ่งชี้ประสิทธิผลการประกันคุณภาพภายในประกอบด้วยสี่ตัวแปรแฝงได้แก่ การจัดการเรียนการสอนที่เน้นผู้เรียนเป็นสำคัญ การบริหารจัดการแบบกระจายอำนาจ การทำงานแบบวงจรคุณภาพ และความพึงพอใจในงานของบุคลากร

กลุ่มตัวอย่างที่ใช้ในการวิจัยคือคณะวิชาสาขาวิทยาศาสตร์สุขภาพจำนวน 108 คณะวิชา สุ่มตัวอย่างแบบแบ่งชั้น เครื่องมือที่ใช้ในการเก็บข้อมูลประกอบด้วยแบบสอบถาม ซึ่งใช้ในการวัดตัวแปรแฝงทั้ง 10 ตัวแปร เป็นแบบสอบมาตรฐาน 6 ชุด อีก 4 ชุด ผู้วิจัยพัฒนาขึ้นเองและผ่านการตรวจสอบความตรงตามเนื้อหาโดยผู้ทรงคุณวุฒิ มีค่าความสอดคล้องระหว่างความเห็นของผู้ทรงคุณวุฒิระหว่าง 0.60-1.00 โดยทุกชุดได้ผ่านการทดลองใช้ และมีค่าความเที่ยงสัมประสิทธิ์แอลฟ่าของครอนบาคตั้งแต่ 0.79-0.96 วิเคราะห์ข้อมูลด้วยสถิติเชิงบรรยาย การวิเคราะห์สหสัมพันธ์แบบเพียร์สัน การวิเคราะห์โมเดลลิสเรล ผลการวิจัยที่สำคัญสรุปได้ดังนี้

1. คณะวิชาของกลุ่มวิทยาศาสตร์สุขภาพมีประสิทธิผลการประกันคุณภาพภายในทั้งสี่ด้าน หลังจากดำเนินงานประกันคุณภาพตามแนว พ.ร.บ. การศึกษา พ.ศ. 2542 แล้วสูงขึ้น อย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2. โมเดลเชิงสาเหตุประสิทธิผลการประกันคุณภาพภายในที่ผู้วิจัยพัฒนาขึ้น เป็นโมเดลมีความสอดคล้องกับข้อมูลเชิงประจักษ์ โดยตัวแปรอิสระสามารถอธิบายความแปรปรวนของประสิทธิผลการประกันคุณภาพภายในได้ร้อยละ 83