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Design of total quality management information system (TQMIS) for model school on best practice

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Abstract

This research aims to 1) design the Total Quality Management Information System (TQMIS) for model school on practice, and 2) assess the Total Quality Management Information System (TQMIS) for model school on practice. The research process is divided into 3 stages: 1) study the related documents and researches as well as set up a sub-group meeting for the executives of the model schools on practice, 2) design the information system, 3) assess the appropriateness of the information system. The samples are 5 experts selected by purposive sampling. The data is analyzed by means and standardized deviations statistically. The research result shows that 1) the model of Total Quality Management Information System (TQMIS) for model school on best practice is consisted of 4 key components which are 1.1) the principle of the information system development model, 1.2) the development of the information system based on System Development Life Cycle (SDLC)'s principles, 1.3) the information report based on Total Quality Management Information System (TQMIS) for model school on practice, and 1.4) the assessment of information system using Black-Box technique, and 2) the result of the assessment of Total Quality Management Information System (TQMIS) for model school on practice is rated as absolutely appropriate in overall ($\bar{X}=4.78$).

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1. Introduction

According to Education Management section in National Education Act of B.E.2542 and its amendment (second edition) in B.E. 2545, one of the main specifications is the quality of education which is the ultimate goal of educational reforms at all levels. If basic education and tertiary education are not adequately qualified, Thailand will

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never catch up other countries' development (Office of the National Education Commission, 2545). It states in the article 48 of National Education Act of B.E.2542 amended in B.E. 2545 (second edition) that "original affiliation authorities and educational institutions must have a quality assurance system within the educational institutions and acknowledge quality assurance as a part of education management process that must be constantly continued." While in the article 49 of the same act mentions the external quality assurance in "...there must be an authority who reassures the standard and assess the quality of education. This public organization must develop standards and methodologies of external quality assurance, and assess education management's result in order to examine the quality of education" (Office for National Education Standards and Quality Assessment, 2555).

There are 6 standards for basic education standard for quality assurance within educational institutions. There are 6 standards for learners which the first to the sixth standards while the seventh to fifteenth standards are the standards for basic educational institution management. The standard for general educational institution management assigns the teachers to conduct the teaching in relevance to seventh standard. Therefore, teachers must conduct the classes of the years and subjects they are responsible according to nine indicators. (Lucas, et.al, 1988)

TQM is an organizational management system that aims to ultimately satisfy the customers by studying the "voice of customers" and apply it to the design of production and service process in order to create a product or service that best suits to the customers' need. This can be assessed by customer satisfaction. To develop educational institutions at secondary level to be model school on best practice for Total Quality Management Information System (TQMIS), there are notion, principle, and methodology and other approaches for developing quality of the whole model schools. 1. TQM notion is to ultimately satisfy the customers and the stakeholders such as students, teachers, parents, institutions, and communities. 2) TQM has 3 principles which are "customer-oriented", "continuous improvement", and "employee involvement". 3) TQM's establishment in an organization methodologies are: 3.1) leadership-development-based management, 3.2) information and analysis management, 3.3) strategic quality planning management, 3.4) human resource development and management, 3.5) management of process quality, and 3.6) Customer Relation Management. 4) There are several stages that make the TQM practical which are: 4.1) selection and appointment personnel who are responsible for organization's quality development, 4.2) objective planning, 4.3) actual operation, 4.4) follow-up, examination, revision, and 4.5) reinforcement (Pitsamai Kawcharoenphon, 2002). Moreover, there is an application of SIPPO educational management model for excellent quality process for all model schools. Stakeholder (S) refers to customers and stakeholders of the educational institutions. Input (I) refers to supporting factors for education. Process (P) refers to knowledge management and education management processes. Product (P) refers to educational outcomes such as academic results, expertise, competency of educational institution's executives, including new existing knowledge and academic services. Outcome (O) refers to satisfaction of customers and stakeholders. (Suansunandha Rajabhat University, 2554).

In terms of educational institution management, executives are responsible for management in various fields in order to operate the organization effectively and maximize the profits. (Onwalan Klongsungsarn, 2007) The executives need to decide and plan the utilization of limited resources. Therefore, the executives need related data and information about the issues that must be determined adequately. Executive information system (EIS) is used as an instrument for supporting the executives' determination. The information must include both internal and external components that are related to the targets, strategies, policies, challenges, and control for the educational institution's executives in order to make them coherent to the internal quality assurance. (Weeraporn Panurag, 2007).

Thus, the researcher had an idea to develop the Total Quality Management Information System (TQMIS) for Model School on Best Practice as a tool to support the management process so that the administrators could set up plans and make any decisions more efficiently.

2. Purpose

2.1 To design the Total Quality Management Information System (TQMIS) for model school on best practice.

2.2 To assess the appropriateness of the Total Quality Management Information System (TQMIS) for model school on best practice.

3. Scope of the study

3.1 Population:

Population is the experts in the field of total quality management, executive information system, and quality assurance

3.2. Samples Groups:

Samples are 5 experts in the field of total quality management, executive information system, and quality assurance chosen by purposive sampling. They are highly-experienced experts in these fields for at least 5 years.

3.3. Variables of the study:

3.3.1 Independent variable is the Total Quality Management Information System (TQMIS) for model school on best practice.

3.3.2 Dependent variable is the appropriateness of the Total Quality Management Information System (TQMIS) for model school on best practice.

4. Methodology

4.1 Phase 1 Content Analysis

4.1.1 Study and analyze the relevant documents and researches on models of total quality management for education, executive information system, and quality assurance.

4.1.2 Conduct a sub-group meeting for the executives of the model schools on best practice in order to identify the needs of the Total Quality Management Information System (TQMIS) for model school on best practice

4.2 Phase 2 System Design

4.2.1 Design the Total Quality Management Information System (TQMIS) for model school on best practice.

4.2.2 Propose the Total Quality Management Information System (TQMIS) for model school on best practice to the advisor for further examination and revision

4.2.3 Create an instrument for assessing the appropriateness of the Total Quality Management Information System (TQMIS) for model school on best practice

4.3 Phase 3 Assessment of the appropriateness of the Total Quality Management Information System (TQMIS) for model school on best practice as the following:-

4.3.1 Propose the designed Total Quality Management Information System (TQMIS) for model school on best practice to the 5 experts for assessing the appropriateness

4.3.2 Analyze the output data by using appropriateness measurement scale based on 5-point Likert Scale as well as means (\bar{X}) statistics

1.00-1.49 means the assessment topic is absolutely inappropriate

1.50-2.49 means the assessment topic is inappropriate

2.50-3.49 means the assessment topic is neutral

3.50-4.49 means the assessment topic is appropriate

4.50-5.00 means the assessment topic is absolutely appropriate.

5. Result

Stage 1 The model of Total Quality Management Information System (TQMIS) for model school on best practice is composed of 4 key components which are:

5.1 the principle of the information system development model

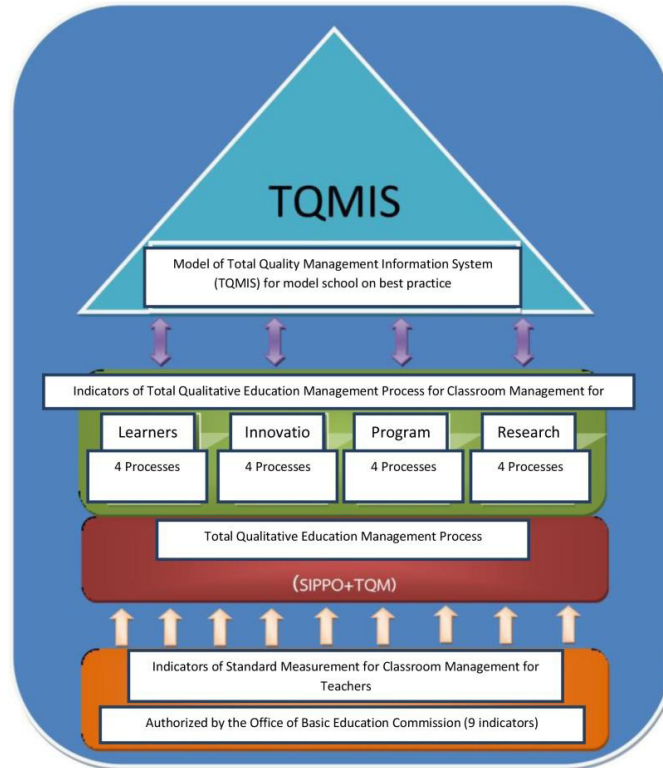


Fig. 1. The model of Total Quality Management Information System (TQMIS) for Model School on Best Practice

5.1.1. Indicators of Standard Measurement for Classroom Management for Teachers are 1.1) teachers identify the goals for learners' quality in terms of knowledge, skills, competency, and desirable qualifications, 1.2) teachers analyze students each by each and use the data to plan the educational management for developing the learners' competency, 1.3) teachers design and manage the education in regard to the differences between individuals and differences in intellectual development levels, 1.4) teachers integrate suitable media and technology suitable to the concept and indigenous knowledge, 1.5) teachers measure and assess with various methods in order to maximize the educational development of the learners, 1.6) teachers advise and solve learners' problems both in terms of academics and quality of life with fairness, 1.7) teachers study, research, and develop knowledge management for their responsible subjects and apply them to teaching, 1.8) teachers behave as good role models and good members of educational institutions, and 1.9) teachers manage their assigned classes full-time to the best of their ability.

5.1.2 The total qualitative education management process is consisted of 2.1) quality process management that uses SIPPO educational management model composed of Stakeholder (S) which refers to customers and stakeholders of the educational institutions, Input (I) which refers to supporting factors for education, Process (P) which refers to knowledge management and education management processes, Product (P) which refers to educational outcomes

such as academic results, expertise, competency of educational institution's executives, including new existing knowledge and academic services, and Outcome (O) which refers to satisfaction of customers and stakeholders, and 2.2) 3 Total Quality Management (TQM) principles which are "customer-oriented", "continuous improvement", and "employee involvement".

5.1.3 The process design that will bring about the model schools on best practice consists of 1) learners' quality discovery process, 2) innovation management in classrooms process, 3) learners' quality management process, and 4) research management in classrooms process.

5.2 the development of executive information system based on Total Quality Management Information System (TQMIS) for model school on best practice uses System Development Life Cycle (SDLC) model for designing. The cycle includes 1) problem recognition, 2) feasibility study, 3) analysis, 4) design, 5) construction of the system, 6) conversion, and 7) maintenance.

5.3 the information report based on Total Quality Management Information System (TQMIS) for model school on best practice supports the indicators of education management in terms of learners, innovation, program, and research. Each section is made of 4 processes and 12 indicators; therefore, there are 48 indicators in total.

5.4 the assessment of the designed information system uses Black-Box technique for assessing. The questions are categorized as below:-

5.4.1 Functional Requirement Test

5.4.2 Functional Test

5.4.3 Usability Test

5.4.4 Performance Test

5.4.5 Security Test

Stage 2 *The result of appropriateness measurement of the model of Total Quality Management Information System (TQMIS) for model school on best practice*

Following Table 1, the Total Quality Management Information System (TQMIS) for model school on best practice is rated as absolutely appropriate in overall ($\bar{X}=4.78$). When considering each component, it found out that the development of the information system based on System Development Life Cycle: SDLC is rated as the most absolutely appropriate ($\bar{X}=4.89$), followed by 1) the principle of the information system development model which is consisted of 3 component (1.1 the indicators of standard measurement for classroom management for teachers, 1.2 the total qualitative education management process, and 1.3 the indicators of total qualitative education management process for classroom management for teachers), and 2) the assessment of the designed information system uses Black-Box technique which is consisted of functional requirement test, functional test, usability test, performance test, and security test. These are rated as absolutely appropriate ($\bar{X}=4.78$). These are followed by the information report based on Total Quality Management Information System (TQMIS) for model school on best practice which is also rated as absolutely appropriate ($\bar{X}=4.67$).

Table 1 the Assessment Result of Total Quality Management Information System (TQMIS) for Model School on Best Practice

Assessment Topics	\bar{X}	S.D.	Assessment Result
1. Principles and Rationale as a basis of Model of Total Quality Management Information System (TQMIS) for model school on best practice	4.67	.53	Highest
2. Model's Objectives	4.32	.58	High
3. Information System Development Model	4.24	.52	High
-SIPPO Management's Development System	4.30	.53	High
-Total Quality Management's Development System	4.32	.50	High
-Executive Information's Development Systems that use System Management Life Cycle	4.10	.53	High
-Data Processing using TQMIS System	4.11	.58	High
4. Measurement and Assessment includes	4.36	.57	High
-Model Assessment using TQMIS System	4.42	.55	High
-Effectiveness Measurement using TQMIS System	4.35	.58	High
-Satisfaction Measurement using TQMIS System	4.30	.58	High
Total	4.33	.55	High

The examination by the experts shows that the design of executive information management based on the Model of Total Quality Management Information System (TQMIS) for model school on best practice is rated as absolutely appropriate. This is consistent to the findings of Pongsak Pakamas in which the development of ICT system for management in North-Eastern regional universities facilitates and simplifies the executives' management, and also consistent to the findings of Pisamai Kaewjareonpol in which the management based on total quality management in primary schools was rated as absolutely appropriate.

6. Conclusion and discussion

According to evaluation by the experts, it is found that the development of model of Total Quality Management Information System (TQMIS) for Model School on Best Practice has suitability in a good level. This is in complaint with (Onwalan Klongsungsrn, 2007) who found that the development of information system for the administration in universities around the northeast of Thailand enabled the executives to work more easily and conveniently. Also, the results are in accordance to those of (Pitsamai Kawcharoenphon, 2002) who found that the management by means of Total Quality Management in primary schools was in good level.

The schools that employ the model of Total Quality Management Information System (TQMIS) for Model School on Best Practice should be well prepared in terms of fundamental technology, network system, and basic equipment needed for internet connection.

7. Recommendations

Schools that apply the Model of Total Quality Management Information System (TQMIS) for model school on best practice as an instrument for leveling up themselves to excellence should be ready and adequate in terms of basic technology, networking system, and basic tools necessary for internet connection.

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