Appendix

Appendix A

Experts directory

Appendix A 1

Experts in measurement and evaluation directory

Experts in measurement and evaluation

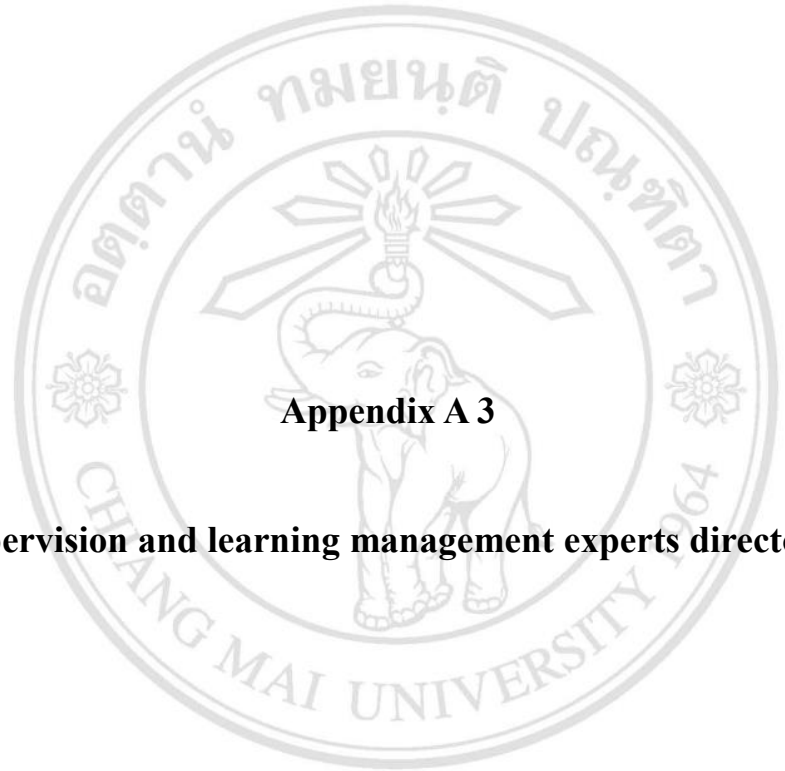
1.	Dr. Kittipong Luenarm	Master of Education Program in Educational Research and Evaluation Nakhonratchasima Rajabhat University
2.	Mr. Somwang Kantharos	Formal evaluation experts supervisor
3.	Mr. Samarn Siri	Evaluation experts supervisor of Chiangmai Primary Educational Service Area Office 3

Appendix A 2

Empowerment experts directory

Empowerment experts directory

1. Prof. Prawit Erawan Faculty of Education, Mahasarakham University
2. Dr. Tawee Boontoem Khonkaen University
3. Dr. Yuwathida Chaphanya Roi - et Ratchabhat University
4. Dr. Om-aree Suwannasri Director of Om-aree school, Lampang Province



Appendix A 3

Supervision and learning management experts directory

Supervision and mathematic learning management experts directory

1.	Miss Wongduan Pothipan	Formal supervisor in mathematic learning management supervision
2.	Dr. Jettana Muengmoon	Formal supervisor in mathematic learning management supervision
3.	Mrs. Ratchanee Sombut	Formal supervisor in mathematic learning managementsupervision
4.	Mr. Samarn Siri	Expert supervisor in mathematic learning management supervision
5.	Mrs. Pranee Meelarb	Mathematic learning management expert teacher

Appendix A 4

Learning management supervision and model creation experts directory

Learning management supervision and model creation experts directory

1.	Miss Wongduan Pothipan	Formal supervisor in mathematic learning management supervision
2.	Mr. Somwang Kantharos	Formal supervisor in mathematic learning management supervision
3.	Dr. Jettana Muengmoon	Formal supervisor in mathematic learning management supervision
4.	Mrs. Ratchanee Sombut	Formal supervisor in mathematic learning management supervision
5.	Asst. Prof. Phichsinee Chompookham	School of mathematics and Statistics Faculty of science and Technology, Chiangmai Rajabhat University
6.	Dr. Sriprapai Inchaitep	Boromarajonani College of Nursing Nakhon Lampang
7.	Dr. Siripong Nuolkaew	Professional Supervisor Chiangmai Primary Educational Service Area office 1

Appendixes B

Research instrument and quality finding

Appendixes B 1

The synthesis record form of factors and indicators of educational supervision.

The synthesis record form of factors and indicators of educational supervision.

Explanation : This record form is used for recording data from studies and research papers, by writing data from studies and research papers in the space or on the table.

Study title ……

Name of Author / Writer ……

Date/Month/Year of Education……

Content	Name of document / data source	Published year	Page	Publisher	Province

Appendixes B 2

The synthesis record form of factors and indicators of empowerment.

The synthesis record form of factors and indicators of empowerment.

Explanation: This record is used for recording data from studies and research papers by writing data from studies and research papers in the space or on the table.

Study title ……..……..

Name of Author / Writer ……..……

Date/Month/Year of Education.....

Content	Name of document / data source	Published year	Page	Publisher	Province

Appendixes B 3

Interview form
The synthesis of factors and indicators of the supervisors performance to empower on Learning management of mathematics teachers

Interview form

The synthesis of factors and indicators of the supervisors performance to empower on Learning management of mathematics teachers

1. Interviewer Name .....
2. Date/Month/Year to interview.....
   Time.....Place.....
3. Interviewee
   Name .....
   Position.....
   Specialization.....
4. Interview Issued
   "How do supervisors perform to empower learning management of mathematics teachers?"
   .....
   .....
   .....
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Signed.....Interviewer Signed.....Interviewee

(.....) (.....)

Appendixes B 4

Evaluation form of the content validity of the supervisors empowerment performance learning management of mathematics teachers

Evaluation form of the content validity of the supervisors empowerment performance learning management of mathematics teachers

Explanation: Please consider in each items that the performance of supervisors to empower the learning management of mathematics teacher or if it has not. When onsidering, please mark / into space to the right. Make a comment in the comments box and at the end of this evaluation form. Use the following criteria:

Evaluation Criteria:

+1 mean Ensure about that item is a performance of supervisors to empower learning management of mathematics teachers.

0 mean Not sure about if that items is a performance of supervisors to empower learning management of mathematics teachers.

-1 mean Ensure about that items is not the performance of supervisors to empower learning management of mathematics teachers.

Appendixes B 5

The questionnaire for the opinion of mathematics teachers on the performance of supervisors to develop the learning management of mathematics teachers.

The questionnaire for the opinion of mathematics teachers on the performance of supervisors to develop the learning management of mathematics teachers.

Explanation: 1. The data from this questionnaire will use for educational only.

2. The information will be kept confidential, with no effect to the respondents what so ever.

3. This questionnaire has a total of 122 items, the question about the comments on the performance of supervisors to develop the capacity to learning management of mathematics teachers in 5 levels as follows:

5 means that; The performance can develop the capacity of learning management at the highest level.

4 means that; The performance can develop the capacity of learning management at a high level.

3 means that; The performance can develop the capacity of learning management at a medium level.

2 means that; The performance can develop the capacity of learning management at a low level.

1 means that; The performance can develop the capacity of learning management at the lowest level

Additional comment : For writing the comments or more suggestions of you.

Example:

No.	Items	Comments level				
		1	2	3	4	5
0	Asking about a personal daily life of mathematics teachers regularly.	/				

From example

The respondents wrote the mark / into the space in level 1, it shows that the supervisors asked about the personal daily life of mathematics teachers regularly. It can develop the capacity of learning management of mathematics teachers in the lowest level.

The reliability of questionnaire for the opinion of mathematics teachers on the performance of supervisors to develop the learning management of mathematics teachers

****** Method 1 (space saver) will be used for this analysis ******

_

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

Statistics for	Mean	Variance	StdDev	N of Variables
SCALE	406.9333	1695.7195	41.1791	122

Reliability Coefficients

N of Cases = 30.0 N of Items =122

Alpha = .9574

Appendixes B 6

The consistency evaluation form of the factors and indicators of empowerment-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region

The consistency evaluation form of the factors and indicators of empowermen-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region

Explanation: The consistency evaluation form of the factors and indicators of empowerment-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region. There are two parts.

Part 1: Please consider in each items what indicator or the performance of supervisors that is consistent with the factors of each factors or is not. When considered already, please mark / into the space to the right. Make a comment in the comments box at the end of the evaluation form.

Part 2: Please consider the user guide draft empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region. Make comments and suggestions of the supervision model on various issues in order to make the model more complete.

Part 1 : The consistency evaluation of factors and indicators of empowerment–based Supervision**.**

Factor 1 : Clear common establishing for working acceptance

No	Indicators / Performance	Comments		Notes
		consistent	Not consistent	
1	Follow and inquiries the progress in mathematics learning management of mathematics teacher regularly.			
2	.			
3	.			

Part 2 : The Record form to consider for recommendation about improvements to the model and applying the model.

No	Issues to consider	Suggestion
1	Structure of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.	
2	.	
3	.	
4	.	

Appendixes B 7

The Questionnaire opinion on accuracy, propriety, utility, and feasibility to apply the empowerment based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

The Questionnaire opinion on accuracy, propriety, utility, and feasibility to apply the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

Explanation

1. The evaluation form has the objective to evaluate the quality of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region. Asking the opinion about the feasibility standards, utility standards, propriety standards, and accuracy standards, and other suggestions additional to make the model more complete.

2. The evaluation forms have 2 parts as follows:

Part 1: Questionnaire about the accuracy standards, the propriety standards, the utility standards, and the feasibility standards of empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

Part 2: Other additional suggestions.

Part 1: Questionnaire about the accuracy standards, the propriety standards, the utility standards, and the feasibility standards of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

Explanation

Please consider "the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region." And then evaluate the quality of the model according to the items that are specified in the evaluation form by checking / in each comments level as follows:

Accuracy standards considers a supervision format and how much it is reliable, and content comprehensive as to demand truthful, accurate assessment

Items	Comments				
	Most	**Much**	**Medium**	**Little**	**Least**
1. The factors of supervision model have accurate technical basis.					
2. Development of the model having accurate technical basis.					
3……..					
4……..					

Part 2: Comments and suggestions additional to the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

2.1 Problem and obstacles to use the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

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2.2 General recommendation to complete the model.

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The reliability of the quality evaluation form of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region

****** Method 1 (space saver) will be used for this analysis ******

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R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

N of

Statistics for Mean Variance StdDev Variables

SCALE 153.4286 17.2169 4.1493 32

Reliability Coefficients

N of Cases = 28.0 N of Items = 32

Alpha = .7441

Appendixes B 8

The reliability of questionnaire of the mathematics teachers supervisory

Questionnaire of the mathematics teachers supervisory

Explanation

1. The data from the questionnaire utilization for analysis the conditions of supervisory and needs. Not affect the respondents individually.

2. The questionnaire is divided into 2 parts as follow:

First Part: General data, please mark / into ☐ and write a message into space according to the actual state of your information.

Second Part: Data of mathematics learning management supervision. Please consider the items of supervisors performance, then, mark / into the box space level of supervisory and the needs as follows:

1 mean The supervisory and needs at the least level.
2 mean The supervisory and needs as little level.
3 mean The supervisory and needs as medium level.
4 mean The supervisory and needs as much level.
5 mean The supervisory and needs as the most level.

Example

Levels have been supervised					Items to performance supervision	The demand has been supervised				
1	2	3	4	5		1	2	3	4	5
			/		Inquiriesabout the academic achievement of students.	/				

From the example, Respondents wrote the mark / into the box number 4 on left hands. **It shows that getting the asking about the academic achievement from supervisors as much levels**. And marking / into the box number 1 on the right hand. **It shows that they need the asking about the academic achievement from supervisors as little level**.

Part 1 General Information

1. Gender
   - ☐ Male
   - ☐ Female

2. Age
   - ☐ Under 25 yrs.
   - ☐ 25 - 34 yrs.
   - ☐ 35 – 44 yrs.More than 45 yrs.

3. Education
   - ☐ Graduated of the major/field of mathematics
   - ☐ Graduated of major/other field (not mathematics)

4. Position/Academic Rank
   - ☐ Assistant teachers
   - ☐ Teacher
   - ☐ Expert teachers
   - ☐ Special expertise teachers
   - ☐ Specialist teachers

5. Mathematics Learning Management Experience
   - ☐ Under 5 yrs.
   - ☐ 5 – 10 yrs.
   - ☐ More than10yrs.

The reliability of questionnaire of the mathematics teachers supervisory

****** Method 1 (space saver) will be used for this analysis ******

_

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

Statistics for	Mean	Variance	StdDev	N of Variables
SCALE	123.9281	8681.8649	93.1765	75

Reliability Coefficients

N of Cases = 27.0 N of Items = 75

Alpha = .9942

Appendixes B 9

The capacity evaluation form of learning management.

The capacity evaluation form of learning management

Explanation: This capacity evaluation form of learning management is the observation form of learning management of mathematics teachers by record data from the literature review and observation in the space and mark ✓ in terms of evaluation.

Part 1: General information

1.1 Teacher name.....Day/month/Assessment years.....

1.2 Assessor name.....

Part 2: Evaluation results capable of learning management

No.	List	Learning Management		
		Non-compliance (0)	Practice	
			Improper (1)	Proper (2)
Learning management planning				
1	Analysis of the students before learning management.			
2	Analysis of the mathematics curriculum.			
3	Preparation of mathematics learning management plans.			
4	Preparation of assessment tools of basic knowledge in mathematics.			
5	Preparing of media learning.			
6	Preparation of worksheet.			
7	Preparation of exercises.			
8	Preparation of activities for learning skills such as: games, music.			
9	Preparing of measurement learning tools according to content.			
10	Preparing of measurement tools about skills of mathematical processes.			
11	Preparing of measurement tools to the desired characteristics.			

No.	List	Learning Management		
		Non-compliance (0)	Practice	
			Improper (1)	Proper (2)
12	Preparation of the assessment criteria for learning purposes.			
13	Preparation of learning resources for in the classroom or outside the classroom.			

comments about the benefits of supervision and gave other suggestions

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.....

.....

.....

.....

Signed.....Evaluator

(.....)

The reliability of capacity evaluation form of learning management

The data of capacity learning management of mathematics teachers

Assessor	1st person	2nd person	3rd person	P
1	45	47	45	137
2	42	41	44	127
3	49	48	50	147
4	44	42	42	128
r	180	178	181	539

The formula for reliability by the method of inference.(Generalizability Coefficient : ρ^2) as follows:

$$\rho^2 = \frac{\sigma_p^2}{\sigma_p^2 + \sigma_i^2 + \sigma_e^2}$$

When ρ^2 represent reliability coefficients or Generalizability Coefficient.

σ_p^2 represent The estimate the variance of the auditor.

σ_i^2 represent The estimate the variability of the user rating.

σ_e^2 represent The estimate of the error variance.

Represent $\rho^2 = \frac{9.07}{9.07 - 0.29 + 1.78}$

$= 0.85$

Summary, The reliability of capacity evaluation form of learning management is 0.85

Appendixes B 10

Supervision records form

Supervision records form

Explanation: Supervisors recorded the data according to supervisory issues into space and make a copy for the recipient of supervision or relevant supervision.

1. Name-Surname of supervision recipient .....

   School.....District.....

   Province.....

2. Name – Surname, Supervisor.....

   Position..... Under office of .....

3. Supervision about.....

   The method of supervision.....

   Supervisor role.....

   Supervision recipient role…….....

   Supervision result.....

   Problem/obstacle .....

   The joint solution.....

4. The designated mission of supervision together between the supervisors and recipient supervision next time.

   4.1 Subject.....

   4.2 Date/month/year.....

   4.3 Place.....

   4.4 Preparation

      4.4.1 Supervisor .....

      4.4.2 Supervision Recipient.....

Signed.....Supervisor Signed.....Supervision recipient

(.....) (.....)

Position..... Position.....

Appendixes C

The data appropriated to use for the factors analysis monitoring, The result of needs assessment, and the result of supervision performance.

The monitoring of data appropriated to use for factors analysis

Table 25 Show the result of data appropriated to use for factors analysis

Testing	The result of testing
Kaiser – Meyer – Olkin Measure of Sampling Adequacy	.879
Bartlett's Test of Sphericity	
Approx. Chi – Square	28262.133
Df	2118
Sig	.000

Table 26 Show the result of needs index at a high level. (2.01or higher)

Items	Mathematics teacher							
	M.T. 1	**M.T. 2**	**M.T. 3**	**M.T. 4**	**M.T. 5**	**M.T. 6**	**M.T. 7**	**M.T. 8**
1. Work together with mathematics teachers to review the method of mathematics learning management.		/						
2. Analysis of the problem or what are the obstacles to mathematics learning management with mathematics teacher.		/						
3. Asking the aims of mathematics teachers that they want to get from supervision.		/	/					/
4. Explanation for teachers to understand the benefits that mathematics teacher can derive from supervision.	/	/	/			/		
5. Asking for the techniques to teach mathematics in each content that mathematics teachers make up.				/	/		/	

Table 26 (Continued)

Items	Mathematics teacher							
	M.T. 1	**M.T. 2**	**M.T. 3**	**M.T. 4**	**M.T. 5**	**M.T. 6**	**M.T. 7**	**M.T. 8**
6. Support the materials for making media of mathematics learning management to mathematics teachers according to their needs.	/	/	/	/	/	/	/	/
7…….								

Table 27 shows the supervision operating results by using the empowerment model as the base.

Supervision activities and supervision recipients	Supervision method	Supervision results	Problems and solution method
1. Work together with mathematics teachers to review the method of mathematics learning management. **: Supervision Recipient** such as: M.T. 2	Supervisors share their learning with Mathematics teachers about the method of mathematics learning management that is the usual practice.	Teachers of M.T.2 said that most times they will study from the mathematics teacher manual. Then apply something that can do it without a learning management plan.	**Problem**: Teachers do not prepared lesson plans. **The solution**: Supervisors need to motivate the teacher to provide lesson plans and manage according to the lesson plans.
2. Analysis of the problem or what are the obstacles to mathematics learning management with mathematics teacher. : **Supervision Recipient such as:** M.T. 2	Supervisors share their learning with mathematics teachers about the problems of mathematics learning management.	Teachers of M.T.2 accepted that most of them used the mathematics teacher manual or textbooks without a lesson plans because there is no time to prepare lesson plans.	
3..... . .			
6. Support the materials for making media of mathematics learning management to mathematics teachers according to their needs. : **Supervision Recipient such as:** M.T. 1-8	6.1 Supervisors enquire the kind of the material that teachers need to use in their learning management. 6.2 Preparation of material and give it according to the needs.	Can find materials to give to the teacher completely, some part will be supported by the school.	

Appendixes D

User manual of empowerment-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

User Manual of Empowerment-Based Supervision model for Learning Management Capacity Development of Mathematics Teacher, School under Office of Primary Education Service Area in Upper Northern Region

DETCH SARACHAN

DOCTOR OF PHILOSOPHY
IN RESEARCH AND DEVELOPMENT IN EDUCATION
GRADUATE SCHOOL CHIANG MAI UNIVERSITY

Dr. Sunee Nguenyuang	**Advisor**
Assoc. Prof. Dr. Somsak Phuvipadawat	**Co-advisor**
Asst. Prof. Dr. Ruetinan Samuttai	**Co-advisor**

This user manual is part of thesis
Topic : Empowerment - Based Supervision model for Learning Management Capacity Development of Mathematics Teacher, School under Office of Primary Education Service Area in Upper Northern Region.

Preface

User manual of the empowerment-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region. Prepared for the efficiency of empowerment-based supervision model and for facilitating to all stakeholders who can understand the principle and guidelines for the empowerment-based supervision model. Details about the principles, theories that are involved with using the empowerment-based supervision model to develop the capacity to learning management of mathematics teachers, Supervision activities, The goal of Supervision, Supervision evaluation, and guidelines for apply the supervision model. However, the researcher thankful for all those were involved and who contributed to the supervision model and drafting the user manual of supervision model successfully. I hope that this user manual of empowerment-based supervision model will be applied to the supervision model effectively. This tool can develop the learning management for mathematics teachers, School under office of primary education service area in upper northern region, in the future.

Detch Sarachan
PhD. Student (Doctoral student), Department of Research and Development
Education Faculty, Chiang Mai University
July 26, 2015

Content

Page

Explanation

User manual of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region, containing various content to help those involved with the application process of the supervision format that the research developed up to further the capacity to learning management of mathematics teachers with accuracy and efficiency, The process is as follows:

1. Study the hold of empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

2. The respondent supervision responder should understand in detail, each step of the supervision activities for its practicality. There may be improvements in the way of appropriate implementation to the context of each school and each mathematics teacher.

3. There should be a needs assessment before practice every time. The priority supervision activities should suit with each individual teacher. Before evaluating, supervisors should clarify the benefits of the needs assessment that use the data to determine the guidelines for supervision to the mathematics teachers, that are suitable with the condition of needs of individual teachers.

4. The supervisory operations can be performed as a group or individually according to the needs index.

The user manual for the empowerment - based supervision model for learning management capacity development of mathematics teacher contains various content as follow:

Part: 1 : Principle and Rationale the concepts and theories that are involved.

Part: 2 : Applying the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region.

Part 1
Principle and rationale; Concepts and theories

Principle and rationale

Assessing the quality of education of schools, under office of basic education commission (2011 A, page 4), found that the percentage of the mathematics scores of Prathomsuksa 6, In the year 2008 were 43.76 percent, In the year 2009 was 35.88 percent, and in the year 2010 was 34.85 percent. That the lower average has had the tendency to decrease every year. This is the issue of the quality of education in Thailand overall. It is essential that all parties get involved with the learning group. The group developing the mathematics curriculum has to implement a solution, and improve the education of the students to a higher standard. To achieve the continued educational development, The Office of Primary Education Commission (2002, page 3) suggested that it is necessary to require an administrative process; So that the supervisory and teaching processes are consistent. These relate very well; Especially the supervisory process is a developmental process. Teachers could developed their capacity for effective working, Solvable, Manageable learning systems in order to improve the students' learning potential to the maximum, Consistent with the concept of Monnipaa Chutiboot (2010, pages 1-2) and the Office of the Basic Education Commission (2011B, page 26).They have the same concept that the teacher is the main factor in the development a good quality of learner. The teacher must have the knowledge and capacity to manage the learning environment effectively, Because the quality of learning depends on the quality of teachers. This is the key for the students to have a quality education; The teachers will have an important role.Teachers should have developed good qualities, Especially in understanding the curriculum and learning management. Even today, Teachers have more workload in teaching. They manage every project that they deliver, Both outside and inside their school of operation. Although the project will engage students for development, With the restrictions on the duties of teachers including the lack of teachers at the schools, This development is decreased. Although the teachers have been given training on a regular basis the effective of the quality of teaching has decreased. Moreover, Some teachers lack encouragement in their work. So the way to help teachers develop their quality of teaching is to encourage them in their

capacity (they can do it). In the meantime, They can encourage the development of the quality of the students. Consistent with Short and Greer (1997 p. 38) who say that "*teachers are the people who need to access policies and needs of the school, by being a leader who brings the policies into practice correctly and properly by linking ideas, and the principles of the curriculum to apply in teaching and learning as well as directly responsible for the development of learners*".

Developing teachers to have the capabilities for learning management is a key objective of educational supervision. As Charee Maneesri (1999, page 22), and Watchara Lawriendee (2011, pages 7-8) said, "the purpose of educational supervision were; A rescue operation, Guide, To give knowledge and practice developing curriculum, to develop new teaching techniques, use media, create media, and to do research in the classroom. Aiming to help teachers with an awareness, and an understanding of the importance of things. To understand the purpose of education can help oneself, and understand learners. It encourages teacher to be a person of learning, to be academic leaders, To strengthen and encourage their mind to be strong. It encourages teachers to serve as a group, committed to improving the developing the lives of their learners. In all areas of their lives including the intellectual, Emotional, Physical, Social, Aesthetic, Imagination and creative abilities. So that they will have the capacity to apply the knowledge in everyday life. Meanwhile, the supervisor can help to manage the administration of a school more efficiently.

For supervision to be effective, according to the research of Somkid Chaiyaa (2002),Wichet Chanakeaw (2002), Namyen Leangprasert(2003), Thatsanee Jaihaaw (2005), and Phakin Samutwaanich (2006); For educational supervision to be effective, It should be in an atmosphere of goodwill. All parties have learned to understand their role in the mission; Regularly work together collaboratively, have a goal of interoperability, use a plan to work together, run the program, and measure of results together. Performance characteristics above mentioned; Kinlaw (1995),Robert (2001), and Nitthaya Saengwong(2002) said that the practitioners empowered to each other because empowerment means to increase knowledge, skills, self-confidence, and recognize the capacities of them. It Creates a conducive environment for all parties involved in the decision, specifies a target together, builds the vision, specifies the mission, specifies the plans and projects, and brings a sense of belonging together, to develop the

organization to be successful, while maintaining the benefits of personal interest and the common interest of the organization.

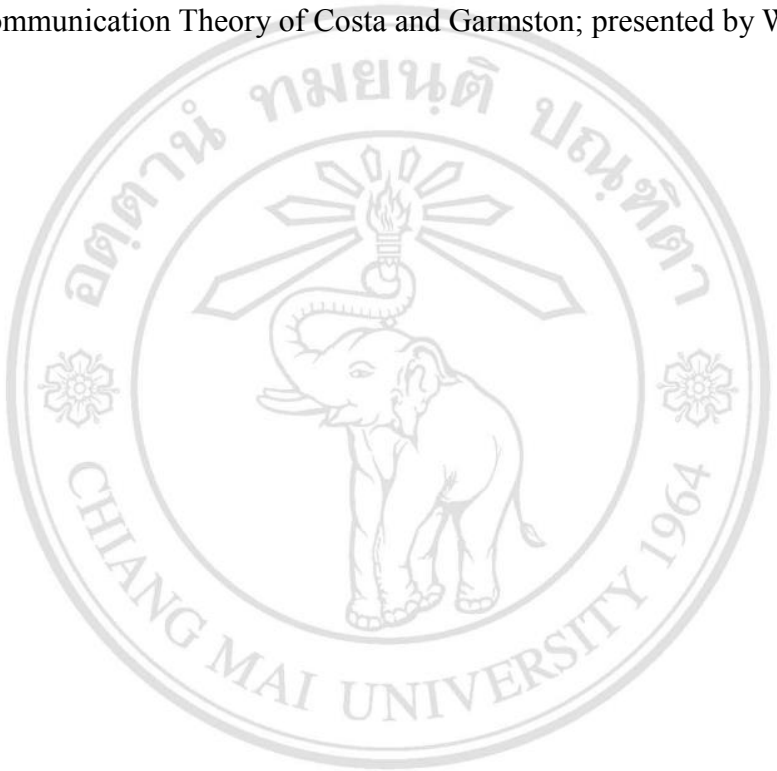
Meanwhile, David (2011 p. 14) and Suwat Ngeuncham (2010, interview) have concluded that all teachers need to be empowered. The reason is not only for teachers but for students that the teachers will be teaching. Therefore, Supervisors should be organized for teachers to work happily, participate in decision-making, and create a working environment for teachers to feel that they are asked for advise, and don't merely serve as baby sitters only teaching in their duties. Because the teachers who are empowered will have confidence and can apply philosophy, theory and programs to use in the classroom better, and will have the capacity to increase the performance of their work schedule. There is an incentive to work even more, and they will have a positive attitude towards the organization, participating in decision making and reducing conflict in the organization. There is a sense of ownership workload. Empowerment fosters organizational commitment and helps with teacher job satisfaction. Both have high affinity. That is, if a teacher has a commitment to the organization, They will be satisfied in the job, also. When the teachers were satisfied with the teaching profession, They will desire to continue to teach. Everything that happens within the teacher will directly have an effect on their work. This means, It helps teacher productivity increase, and high achievement for the learner, including the effect that impact has on the achievement of students so far.

Concepts and theories

The creation of the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region**.** Researcher set the supervision performance based on concept and theories as follow :

1. Self-control theory of Kouzes& Posner
2. Self-determination theory of Borich & Tobari
3. Goal Setting Theory of Hoy &Miskel.
4. Equity Theory of J.Stacy Adams that was developed in 1965, presented by Hoy & Miskel.

5. Guidelines for empowerment in the work of Prawat
6. The concept of empowerment in the work of Kanpol
7. The concept about the power of the teacher's work of Klecker & Loadman
8. The concept of empowerment practice as the work of teachers of Terry
9. The concept of empowerment of teachers working of Blasé & Blasé
10. Theories of adult learning of Glickman and Others
11. Motivational Theory of Herzberg; presented by Watchara Lawriendee
12. Communication Theory of Costa and Garmston; presented by Watchara Lawriendee



Part 2

Applying the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region

Concept and details of model

For the most benefits and effectively of applying the empowerment-based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region; The researcher present the details of model and model applying as follows:

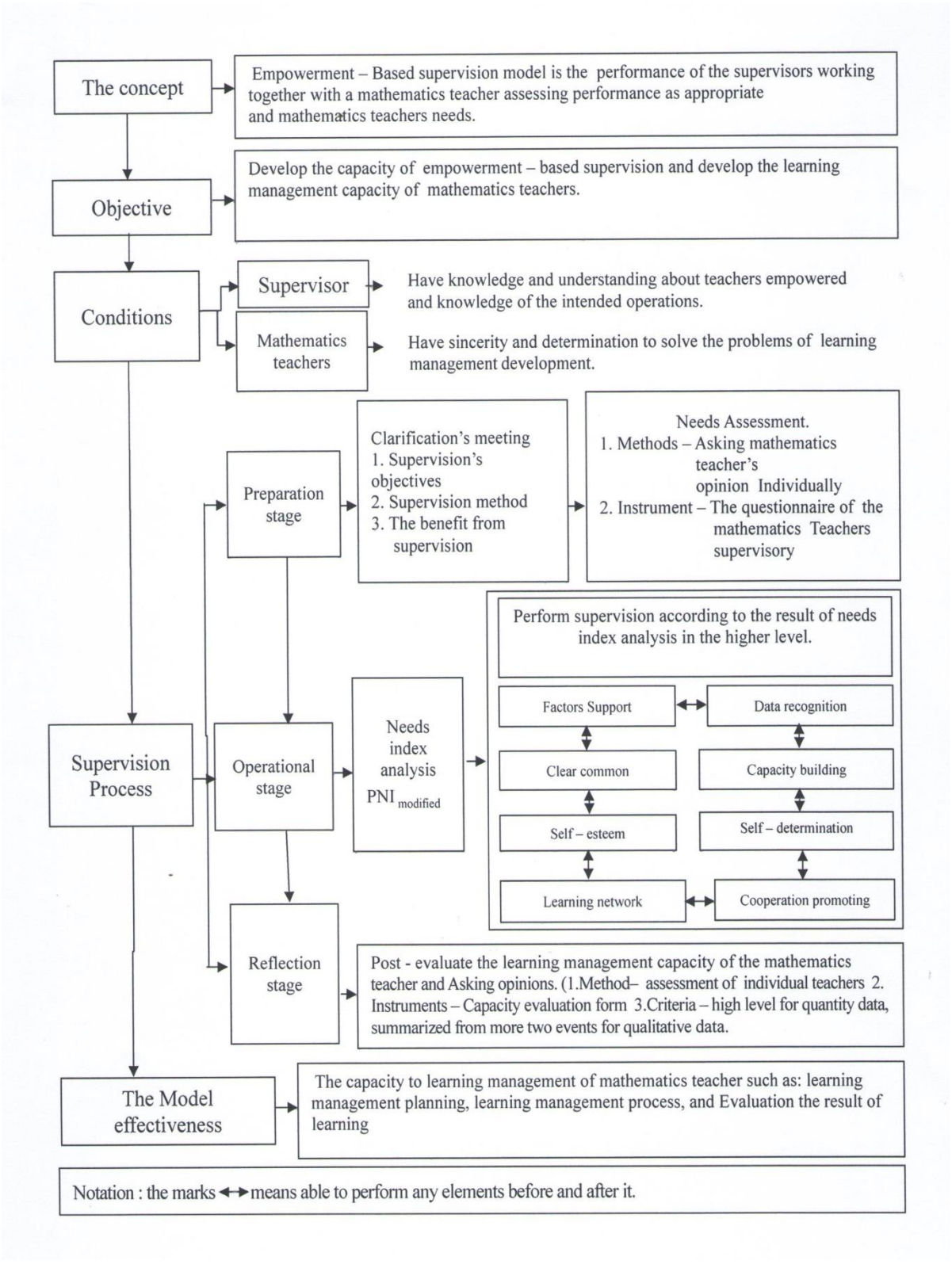


Chart 1 Empowerment–Based supervision model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region.

From chart 1 the details of the model are as follows:

1. Principle

The empowerment–based supervision model is the performance of the supervisors working together with a mathematics teacher assessing performance as appropriate and mathematics teachers needs.

2. Objectives

To develop the capacity of supervision by using the empowerment–based and develop the learning management capacity of mathematics teachers.

3. Conditions

3.1 Supervisor must have knowledge and understanding about teachers empowered and knowledge of the intended operations.

3.2 Mathematics teachers must have sincerity and determination to solve the problems of learning management development.

4. **The Process** has 3 stages

Stage 1: Preparation, include the activities of:

1.1 The meeting to clarify school administrators and mathematics teachers, To understanding the supervision objectives, method and benefit.

1.2 Needs assessment individually (Annex. Page 15-23); Supervisors analyzed the needs index; Supervisors should clarify the benefits of a needs assessment to apply the data to specify the supervision activities. They should answer questions on how to answer the questionnaire. Criteria determining the need for supervision operations by using the concept of John W. Best & James V. Khan (2003, P. 332).

Mean	Meaning
Lower than 0.00	Without the needs of supervisory.
0.00 – 1.00	The needs of supervisory as little level.
1.01 – 2.00	The needs of supervisory as medium level.
2.01 – 3.00	The needs of supervisory as much level
3.01 – 4.00	The needs of supervisory as the most levels.

(The details of evaluation and example of evaluation index needs. Appendix c. Pages 212).

1.3 Pre - evaluated the capacity of learning management with the capacity evaluation form of learning management. The assessors should be a supervisor, school administrators, or school academic teachers. The evaluation should proceed both the monitoring of the documents and observation of learning management. Supervisors and the supervision recipient should have the basic information about the capacity of learning management of each mathematics teachers, and use it as the results of needs index to specify the supervision activities which the supervision activities need to do first or need to do later, because the assessment results of needs index in each point may have values of equality. Using the assessment results of capacity in learning management before supervision to specify the supervision activities.(Supervisors may allow the mathematics teachers to evaluate their capacity of learning management of their own as appropriate.)

Stage 2: Operation; include the activities of:

2.1 The supervision operations according to the needs index. This is through by a group or individually. Each time of supervision may have several supervision activities or use any activity of the supervision. Depending on the results of needs index that are consistent and synchronized with the mathematics teachers. This research used the supervision operations of needs index at a high level. (2.01or higher) In the case that the results of needs index have many synonymous values, the supervisors will be consulting with school administrators, academic teachers, or mathematics teacher who get an assessment from the supervisors to determine what is appropriate to the needs to specify the sequence of supervision activities.

2.2 The record of supervision operating through a record form of supervision. (Annex C. Pages 214) Supervisors should record the supervised every time, because it will help supervisors and the supervision recipients know the results of supervision and have the information for planning the supervision for the next time.

Stage 3: Reflection; include the activities of:

3.1 Post - evaluated the capacity of learning management. and then bring the results to compared with the evaluation criteria based on the concept of John W. Best & James V. Khan (2003 P. 332).

Mean	Meaning
0.00 – 0.66	Have the capacity of learning management as little level.
0.67 – 1.33	Have the capacity of learning management as medium level.
1.34 – 2.00	Have the capacity of learning management as much level.

This research used the assessment criteria; Capacity of learning management in a high level (Mean1.34 and up).

3.2 Asking the opinion of mathematics teachers and bring the data for content

analysis. Using the conclusion criteria of events from two or more events, to bring the information to improve supervision operation or improved supervision model.

5. The model effectiveness; is the capacity of learning management development of mathematics teachers in 3 aspects such as: learning management planning, learning management process, and learning management assessment..

Additional suggestions

Supervisors can apply the empowerment - based supervision model for learning management capacity development of mathematics teacher, School under Office of Primary Education Service Area in Upper Northern Region, for supervision project management to solve problems or develop the capacity of learning management of teachers, which can implemented in the short term or long term project as follows:

1. Use the supervision process in Stage 1: Preparation, to justify the need to do the project, the target group of the project, curriculum or content, and supervision activities.

2. Use the supervision process in Stage 2: Operations, it can be implemented either as a group or individually to solve problems or develop teachers who have clear goals, for example as shown in table 28.

Table 28 Shows the performance of supervision according to the needs index.

Supervision Activities according to needs index	**Activities**
1. Support the materials for making media of mathematics learning management to mathematics teachers according to their needs.: **Supervision recipients** : M.T. 1 – M.T.8.	1. Supervisors asked about the nature of the lesson plans and measurement tools that the teachers' needs. 2. Supervisors bring the sample of lesson plans and the sample of measurement tools to give to mathematics teachers. 3. Join together to give advice about the process to apply the utilization.
2.	……

3. Use the supervision process in Stage 3: Reflection, to measure and evaluate project implementation.

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Charee Manisri.(1999). *Educational Supervision*. 4thedition. Bangkok: Sophon printing.

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