Chapter 4

Research Results

Research about 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 presents the research result according to the purposes of research in order that:

Part 1: The results of the factors and indicators of the empowerment – based supervision analyzing.

Part 2: The results 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 creating.

Part 3: The results 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 implementation.

Part 1: The results of the factors and indicators of the empowerment – based supervision analyzing.

Analysis of the factors and indicators of the empowerment - based supervision, the researcher performed analysis of the factors surveyed in order such as : How much monitoring data collected that is appropriate to use for analysis the factors. by considering the KMO (Kaiser - Meyer - Olkin) and examines the relationships of the variables that are related, or are not. By considering the Bartlett's Test of Sphericity, Factor Extraction, The rotation factor, naming the factors, and ensuring the consistency of the factors and indicators of the empowerment – based supervision. Analysis of survey results as follows:

1.1 The result of Factor Extraction, For the first factors finding, By using principal component analysis. The key component to factor were number of factors, Eigen Values, percentage of variances, as shown in table 9.

Table 9 Shows the common values, Eigen Values, the percentage of variance, and the cumulative percentage of variance.

Factors	Eigen values	The percentage of variance	The cumulative percentage of variance
1	35.982	43.352	43.352
2	6.313	7.606	50.968
3	5.097	6.141	57.098
4	4.303	5.185	62.283
5	3.608	4.347	66.630
6	3.079	3.709	70.339
7	2.789	3.360	73.699
8	2.336	2.815	76.514

From Table 9, considered the factors that have Eigen Values, which is the sum of the coefficients of the common factors in each factors has the value over 1, found that there are 8 factors showing that performance of supervisors of 77 articles have 8 common factors. The cumulative percentage of variance equal to 76.514.

1.2 The result of factor rotation and factors naming.

After factor extraction of the 8 factors by the method of Orthogonal and Varimax, was performed to show the relationship with in the factors in a manner that was clear and used the criteria for consideration: 1) The indicator showing the performance of supervisors must have a factor loading from 3.0 and up. 2) Due to the principle of Orthogonal is the factor rotation, That makes perpendicular factors or can be an independent. Therefore, the indicator shows the performance should be one of the factors in the composition only. If the performance of supervisors in the presence of more than one factor, the researchers consider this as consistent with the mission to implement the appropriate factors. 3) Define the factors required for the performance of supervisors from 2 articles and up, and each factors has an indicator that shows the performance of supervisors that can describe the factors of it, and can name a suitable factors. As shown in table 10 - 17.

Table10 The indicator showing the performance of the empowerment-based supervision and factors loading in the first factors.

No	Performance	Factors Loading
75	Follow and inquiries the progress in mathematics learning management of mathematics teacher regularly.	.564
76	Advise the method of mathematics learning management of mathematics teacher.	.701
77	Advise about the preparation of lesson plan to mathematics teacher.	.557
80	Define the schedule to supervision the monitoring of the performance of mathematics teacher clearly.	.767
81	Advise the creation and use the activities of mathematical skill training to the mathematics teacher.	.739
82	Advise the method to measure the mathematical learning of mathematics teachers.	.511
83	Advise the creation and use the tools to measure the mathematical learning to mathematics teachers.	.551
84	Advise the creation of assessment criteria mathematical learning to mathematics teacher.	.569
85	Advise preparation the remedial mathematics activities to mathematics teacher.	.557
86	Advise the mathematics classroom research to mathematics teachers.	.517
98	Define the method supervision of mathematics learning management together between supervisors and mathematics teacher.	.469
99	Bring agreement about performance of the supervision of mathematics learning management as a guideline for the operation.	.683
100	Define target of supervision mathematics learning management with mathematics teacher.	.635

Table 10 (Continued)

No	Performance	Factors Loading
101	Define the method to solve the problem of mathematics learning management with mathematics teacher.	.619
102	Define supervision schedule of mathematics learning management with mathematics teacher.	.794
103	Evaluation supervision of mathematics learning management. The performance of supervisors and mathematics learning management of mathematics teacher together with mathematics teacher every time that have supervision.	.692
104	Mathematics teacher participate in the evaluation of the performance mathematics learning management on their own.	.365
105	Mathematics teacher joint evaluation of learning management of each other by considering a good performance and giving feedback on what should be developed.	.872
106	To appreciate the contribution of mathematics learning management of mathematics teachers. Prompted by a teachers' meeting.	.321
107	To appreciate the contribution of mathematics learning management of mathematics teachers by writing journal in supervision note.	.786
108	Bring the works of outstanding mathematics learning management of mathematics teachers to public.	.670
109	Bring the works of outstanding mathematics learning management of mathematics teachers. Notice to the school administrators or other mathematics teachers.	.750
110	Reward the mathematics teachers who have practical results of mathematics learning management through defined criteria.	.822

Table 10 (Continued)

No	Performance	Factors Loading
111	Award the classroom that have achievements through defined criteria.	.853
112	Evaluation of overall operations of learning management of mathematics teachers by supervisors.	.818
113	A mathematics teacher evaluation of the performance of mathematics learning management of supervisors.	.840

From Table 10, the first factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .321 - .872. The study of indicators showed the empowerment - based performance of supervisors in all of 26 items, the researchers named the first factor as " Clear common establishing for working acceptance."

Table 11 The indicator showing the performance of the empowerment-based supervision and factors loading in the second factor.

No	Performance	Factors Loading
89	Support the materials for making media of mathematics learning management to mathematics teachers according to their needs.	.916
90	Supporting the documents to increase knowledge of the teacher of mathematics learning management to mathematics teacher according to their needs.	.888
91	Support of media and materials to learn mathematics for mathematics teacher according to their needs.	.859
92	Preparation and sourcing of mathematics guide for mathematics teacher according to their needs.	.635
93	Preparation the supply sample lesson plans for mathematics teachers according to their needs.	.612
94	Preparations to supply sample measurement tools for mathematics learning management given to mathematics teachers according to their needs.	.663
95	Preparation of a DVD about mathematics learning management given to mathematics teacher according to their needs.	.789
96	Preparation and supporting mathematics teaching games given to mathematics teacher according to their needs.	.780
97	Preparation mathematics song given to mathematics teachers according to their needs.	.773

From Table 11, the second factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .612- .916. The study of indicators showed the empowerment - based performance of supervisors in all of 9 items. The researchers named the second factors as " Learning management factors supporting."

Table 12 The indicator showing the performance of the empowerment-based Supervision and factors loading in the third factor.

No	Performance	Factors Loading
26	Clarification for the mathematics teachers aware of the expectation of supervisors to gained from working together.	.533
43	Support the mathematics teachers to make the criterion of basic knowledge in mathematics under the guidance of their own curriculum.	.367
44	Support the mathematics teachers to determine the method to adjust the basic knowledge of each asset in the lesson plan.	.499
53	Support the mathematics teachers to make mathematics learning resources, both inside and outside the classroom.	.303
55	Support the mathematics teachers to determine the method of mathematics learning management by themselves.	.639
56	Support mathematics teachers to set a goal of learning achievement in mathematics that consistent with metrics for each class by themselves.	.827
57	Support mathematics teachers to target achievement in mathematics that corresponding to the reality of the students by themselves.	.861
58	Support mathematics teachers to focus on the purpose of learning about mathematical processes skills by themselves.	.867
59	Support mathematics teachers to target achievement about, mathematical processes skills by themselves.	.748
62	Support mathematics teachers to determine the method to measure learning in mathematics of students by themselves.	.683
63	Support mathematics teachers to set criteria to evaluate the result of mathematics learning of students that is in according with the school curriculum by themselves.	.757

From Table 12, the third factors, there were indicators showed the empowerment-based performance, that can describe the characteristics of the factors, and there were factors loading between .303- .867. The study of indicators showed the empowerment-based performance of supervisors in all of 11 items, the researchers named the third factors is " Encouraged to self-determination."

Table 13 The indicator showing the performance of the empowerment-based supervision and factors loading in the forth factor.

No	Performance	Factors Loading
27	Create the knowledge and understanding of the content of mathematics to mathematics teachers according to their needs.	.731
28	Training on the procedures and techniques of mathematics learning management to mathematics teachers according to their needs.	.704
30	Training on preparation mathematics lesson plan to mathematics teachers according to their needs.	.819
31	Mathematics media workshop to mathematics teachers according to their needs.	.798
32	Demonstration and explaining how to use the media of mathematics learning to mathematics teachers according to their needs.	.697
33	Mathematics learning online resources workshop to mathematics teachers according to their needs.	.828
34	Operating training activities to increase mathematics learning such as: games, music according to their needs.	.794
35	Training on the measurement and evaluation of mathematics learning management to mathematics teachers according to their needs.	.691
36	Demonstration of mathematics learning management by mathematics teachers who have knowledge and expert to mathematics learning management according to their needs.	.829

From Table 13, the forth factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .691- .829. The study of indicators showed the empowerment - based performance of supervisors in all of 9 items, the researchers named the forth factors is " Learning management capacity building."

Table 14 The indicator showing the performance of the empowerment-based Supervision and factors loading in the fifth factor.

No	Performance	Factors Loading
42	Supporting mathematics teachers from 2 or more people to joint develop tools to measure basic knowledge in mathematics content.	.621
46	Support mathematics teachers in the same grade levels from 2 or more people to help organize mathematics lesson plans.	.477
48	Support mathematics teachers from 2 or more people to collaborate making learning mathematics media.	.619
50	Support mathematics teachers from 2 or more people to collaborate and prepare measurement and evaluation tools for mathematics learning.	.490
52	Support mathematics teachers from 2 or more people to collaborate creating activities to learn mathematics skills such as: games, music.	.329

From Table 14, the fifth factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .329- .621. The study of indicators showed the empowerment - based performance of supervisors in all of 5 items, the researchers named the fifth factor is " Learning management cooperation promoting."

Table15 The indicator showing the performance of the empowerment-based Supervision and factors loading in sixth factor.

No	Performance	Factors Loading
1	Assessment in mathematical learning management capacity of mathematics teachers before supervision.	.770
3	Work together with mathematics teachers to review the method of mathematics learning management	.791
6	Analysis of the problem or what are the obstacles to mathematics learning management with mathematics teacher.	.868
7	Asking the aims of mathematics teachers that they want to get from supervision.	.839
8	Explanation for teachers to understand the benefits that mathematics teacher can derive from supervision.	.679
11	Explain the practice of sharing between supervisors and mathematics teachers.	.652

From Table 15, sixth factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .652- .868. The study of indicators showed the empowerment - based performance of supervisors in all of 6 items, the researchers named the sixth factor is " Performance data Recognition."

Table 16 The indicator showing the performance of the empowerment-based supervision and factors loading in seventh factor.

No	Performance	Factors Loading
13	Asking for good mathematics learning management method of mathematics teachers in each content.	.523
14	Asking for the good achievements in mathematics learning management in each content	.708
15	Asking for the techniques to teach mathematics in each content that mathematics teachers make up.	.467
17	Joint analysis of the highlights of each mathematics teachers to be used in mathematics learning management.	.948
19	Asking for the measurable learning contents methods that mathematics teacher can use, and that have a good result.	.945
23	Asking for the grading method desirable for mathematics that mathematics teacher can use and that have a good result.	.952

From Table 16, seventh factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .523- .952. The study of indicators showed the empowerment - based performance of supervisors in all of 6 items, the researchers named the seventh factor as " Self esteem recognition."

Table 17 The indicator showing the performance of the empowerment-based Supervision and factors loading in eighth factor.

No	Performance	Factors Loading
69	Preparing the activities to exchange learning about mathematics media.	.368
70	Preparing the mathematics learning media contest.	.750
71	Preparing the activities to exchange learning about measurement tools for mathematics learning.	.678
72	Preparing the contest of measurement tools for mathematics learning.	.722
73	Preparing the activities to exchange learning about mathematics classroom research.	.684

From Table 17, eighth factor, there were indicators showed the empowerment - based performance, that can describe the characteristics of the factors, and there were factors loading between .368 - .750. The study of indicators showed the empowerment - based performance of supervisors in all of 5 items, the researchers named the eighth factor as " Learning network."

Summary result; The named of 1 - 8 factors were as follows: 1) Clear common establishing for working acceptance. 2) Learning management factors supporting. 3) Encouraged to self – determination. 4) Learning management capacity building. 5) Learning management cooperation promoting. 6) Performance data Recognition. 7) Self esteem recognition. 8) Learning network.

1.2 The consistency checking result of the factors and indicators of the empowerment–based supervision.

The consistency checking results of the indicators on each factor of the empowerment–based supervision by consideration of 4 learning management supervision of mathematics experts and 3 experts of model creating in an experts focus groups on January 15, 2015 at 01.00–03.00 p.m., at conference room, Holiday Garden Hotel, Muang Chiang Mai, Chiang Mai Province it showed as follows :

1) The first factor was consistent with all 26 indicators showed the supervisors performance as : Clearly created together to accept and appreciate the value of works.

2) The second factor was consistent with all 10 indicators showed the supervisors performance as : Supporting the factors for the learning management.

3) The third factor was consistent with all 11 indicators showed the supervisors performance as : Support to self-determination.

4) The forth factor was consistent with all 9 indicators showed the supervisors performance as : learning management capacity creating.

5) The fifth factor was consistent with all 5 indicators showed the supervisors performance as : The promotion of cooperation in learning management.

6) The sixth factor was consistent with all 6 indicators showed the supervisors performance as : The perception of learning management information.

7) The seventh factor was consistent with all 6 indicators showed the supervisors performance as : The self-esteem.

8) The eighth factor was consistent with 3 indicators showed the supervisors performance as : Networking exchange knowledge and inconsistent for 2 indicators such as : The contest of mathematics learning media and The contest of mathematics learning measurement tools. Experts were considered and found that it should be cut off because the contest was not a network of knowledge exchange.

Part 2: **The results of the empowerment–Based supervision model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region creating.**

The results 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 creation, the researchers divided the presentation into 2 parts as follows:

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

The results of study concept papers about the factors of the model were summarized as follows:

1. Principle.
2. Objectives.
3. Conditions.
4. The processes, methods, and media of the model.
5. The effectiveness of the model evaluation.

The Researcher takes these 5 common factors to determine the 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 as follows :

1. The 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

2.1 To develop the capacity of supervision by using the empowerment – based.

2.2 To 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

4.1 Preparation, include the activities of:

4.1.1 The meeting to clarify the supervision objectives, method and benefit.

4.1.2 Needs Assessment.

4.2 Operation, the supervisor perform supervision according to the result of needs index analysis in 8 factors as follows:

4.2.1 Clear common establishing for working acceptance.

4.2.2 Learning management factors supporting.

4.2.3 Encouraged to self – determination.

4.2.4 Learning management capacity building.

4.2.5 Learning management cooperation promoting.

4.2.6 Learning management data recognition.

4.2.7 Self esteem recognition.

4.2.8 Learning network.

4.3 Reflection, include the activities of:

4.3.1 Post - evaluation.

4.3.2 Asking the opinions of mathematics teachers.

5. The model effectiveness in 3 aspects such as: learning management planning, learning management process, and learning management assessment.

The structure shows the relationships of the factors 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 on the (draft) summarized in Chart 6.

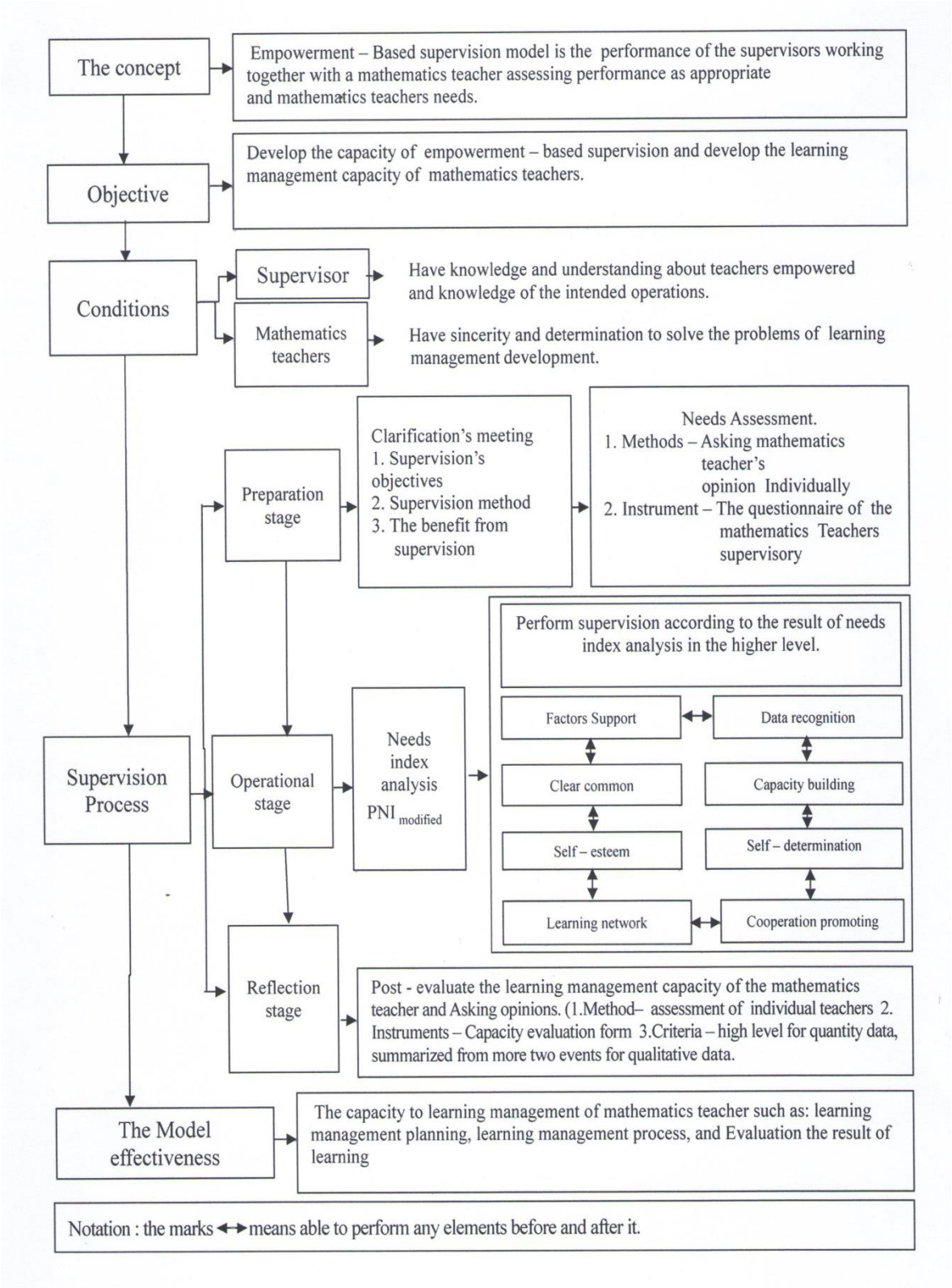

Chart 6 The draft of empowerment-based supervision model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region.

2.2 The quality audit of the Empowerment-Based Supervision Model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region.

The Audit of 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, The researcher's performance was observed in 2 states such as: 1) Consideration of the recommendations to improve the model and bring the model to use it with the consideration from 7 experts of mathematics learning management supervision and model creating. 2) The quality checking 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, by 23 supervisors who were responsible for learning management supervising of mathematics teachers, in the Schools Office of Primary Education Service Area in Upper Northern Region.

2.2.1 Considerate recommendations for improving the model and applying the model.

The result are reported of the considerate recommendations to improve the model and application of the model by the recommendations of 7 supervision experts of mathematics learning management and created patterns creating, in the focus group of experts on January 15, 2015 at 01.00 - 03.00 p.m. at Conference Room, Holiday Garden Hotel, Muang Chiang Mai, Chiang Mai Province as shown in table 18.

Table 18 Shows the recommendations from experts for issues to the efficiency 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, considerate by the experts in a focus group

Issues to consider	Suggestion	The results to adjust model.
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.	Should present an image that shows the relationship in the process of supervision, from preparations, operation, and reflection supervision to point out the obvious relationship of 8 factors.	Adjust the present structure of the model that shows the process of supervision and the relationship of factors in the supervision model.
2. Principle	-	-
3.Objectives	-	-
4. Conditions	Should define the qualifications of supervisors and separate from the qualifications of the supervision recipient clearly.	Define the qualifications of supervisors and mathematics teachers. Write it separately to 2 point.
5. Process	-	-
6. Model effectiveness	-	-
7. Needs assessment	Should define clear criteria that any level needs to be receiving the supervision.	Additional criteria based on the analysis of needs from 2.01 and up.
8. The operation needs supervision in the high level	-	-
9. Evaluation of the model effectiveness	Should allow the personnel involved in the schools and also participate in the assessment.	Additional evaluators such as: school administrators and academic teachers.

2.2.2 The result of quality monitoring 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.

An audit of 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. This was done by 23 experts, who were supervisors and are responsible for the supervision of learning management of mathematics teachers, the School under Office of Primary Education Service Area in Upper Northern Region on 23 were as shown in table 19.

Table 19 Shows quality monitoring, mean, standard deviation and interpretation of the quality checking.

Quality checking	Quality checking results		
	Mean	Standard deviation	The interpretation of mean
1. Accuracy	4.81	0.39	The most level
2. Propriety	4.91	0.28	The most level
3. Utility	4.83	0.38	The most level
4. Feasibility	4.66	0.53	The most level
Mean	**4.79**	**0.43**	The most level

From table 19 found that the quality checking 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, from experts in overall was at the most level. (Mean score of 4.79, Standard deviation of 0.43). Considering in each part were as follows : the part with the highest mean is the propriety. (Mean score of 4.91, Standard deviation of 0.28).The part with the lowest mean is the feasibility. (Mean score of 4.66, the standard deviation was 0.53). Quality checking of the empowerment– based supervision model on each part, as shows the results in table 20 -23.

Table 20 Shows quality checking, mean, standard deviation, and interpretation of mean quality of accuracy

Items	Quality checking results		
	Mean	**Standard deviation**	**The interpretation of mean**
1. The factors of supervision model have accurate technical basis.	4.57	0.51	Highest
2. Development of the model having accurate technical basis.	4.70	0.47	Highest
3. The concept principles in each process of supervision according to the supervision model having accuracy and clarity.	5.00	0.00	Highest
4. Define the contents of the supervision having accuracy to the development of talent on learning management of mathematics teachers.	5.00	0.00	Highest
5. The supervision model has identified the objective of the supervision clearly.	5.00	0.00	Highest
6. The model has to define a goal of clear and adequate supervision.	5.00	0.00	Highest
7. Evaluation of the supervision model has accuracy, systematic, and reliable.	4.74	0.45	Highest
Mean	**4.81**	**0.39**	Highest

From table 20 found that the accuracy of the empowerment–based supervision model from the experts in overall was at the highest level (The mean score of 4.81, standard deviation 0.39).When considering each items it was found that the highest mean value were such: 3rd, 4th, 5th, and 6th.(Mean score of 5.00, the standard deviation equal to 0.00). And with the lowest mean being the factors of supervision model have an accurate technical basis. (Mean score of 4.57, the standard deviation was 0.51).

Table 21 Shows quality checking, mean, standard deviation, and interpretation of mean quality of propriety

Items	Quality checking results		
	Mean	**Standard deviation**	**The interpretation of mean**
1. The supervision model is appropriate to the context of a primary school.	4.70	0.47	Highest
2. The supervision model is appropriate to the capacity basis of mathematics teachers.	4.87	0.34	Highest
3. The supervision model is an appropriate approach to education reform.	5.00	0.00	Highest
4. The supervision model is appropriate guidelines for education quality assurance.	5.00	0.00	Highest
5. The supervision model has been implemented in a systematic and on going fashion.	5.00	0.00	Highest
6. The supervision model is consistent with the core curriculum of the Basic Education Act 2551.	5.00	0.00	Highest
7. The method of the supervision model is clear, transparent, and verifiable.	4.74	0.45	Highest
8. The method of assess the capability of learning management can be evaluated individually before and after the supervisory.	5.00	0.00	Highest
Mean	**4.91**	**0.28**	Highest

From table 21 found that the quality checking for appropriate of the empowerment–based supervision model from the experts in overall was at highest level.(Mean score of 4.91, the standard deviation was 0.28).When considered in each items found that the highest mean value such as: 3rd, 4th, 5th, 6thand 8th.(Mean score of 5.00, the standard deviation equal to 0.00). And with the lowest mean is the model is appropriate to the context of elementary school. (Mean score of 4.70, the standard deviation was 0.47).

Table 22 Shows quality checking, mean, standard deviation, and interpretation of mean quality of utility

Items	Quality checking results		
	Mean	**Standard deviation**	**The interpretation of mean**
1. The supervision model is useful for the development of the capacity of learning management plans of mathematics teachers.	4.83	0.39	Highest
2. The supervision model is useful to develop the capacity of the learning management process of mathematics teachers.	4.96	0.21	Highest
3. The supervision model is useful for the development of the capacity to measure and evaluate learning management of mathematics teachers.	4.96	0.21	Highest
4. The supervision model is useful for the development of mathematical achievement for students.	4.65	0.49	Highest
5. The supervision model is useful for the supervision planning of mathematics learning management.	4.83	0.39	Highest
6. The supervision model is useful for the supervision operation of mathematics learning management.	4.83	0.39	Highest
7. The supervision model is useful for the evaluation of supervision mathematics learning management.	4.78	0.42	Highest
Mean	**4.83**	**0.38**	Highest

From t able 22 found that the quality checking result of the utility of the empowerment–based supervision model from the experts in overall was at highest level. (Mean score of 4.83, standard deviation 0.38). When considered each item found that the highest mean value such as: 2nd and 3rd.(Mean score of 4.96, the standard deviation of 0.21). And with the lowest mean was the supervision model has useful for the development achievement of learning mathematics to student. (Mean score of 4.65, standard deviation 0.49).

Table 23 Shows quality checking, mean, standard deviation, and interpretation of mean quality of feasibility

Items	Quality checking results		
	Mean	**Standard deviation**	**The interpretation of mean**
1. The supervision model can be implemented in primary schools.	4.61	0.50	Highest
2. The supervision model has the possibility to get cooperation from all who are involved with.	4.30	0.70	Highest
3. The supervision model can be easy to understand and is not complicated to use.	4.57	0.51	Highest
4. The result of applying the model when compared to the time taken was worth it.	4.52	0.51	Highest
5. The supervision model allows mathematics teachers to plan the learning management.	5.00	0.00	Highest
6. The supervision model allows teachers to have committed to learning management and showed the results effectively.	4.87	0.34	Highest
7. The supervision model actually supports the mathematics teachers interested in using innovations for learning management.	4.74	0.50	Highest
8. The supervision model can support teachers using creativity in learning management.	4.74	0.50	Highest
9. The supervision model actually can develop the capacity for learning management of mathematics teachers.	4.87	0.34	Highest

Table 23 (Continued)

Items	Quality checking results		
	Mean	**Standard deviation**	**The interpretation of mean**
10. The supervision model can be modified to suit the situation within a schools context.	4.35	0.71	High
Mean	**4.66**	**0.53**	Highest

From Table 23 found that the quality checking results of the feasibility of the empowerment–based supervision model from the experts in overall was at the highest level. (Mean score of 4.66, the standard deviation was 0.53).When considering each item found that the highest mean value of the supervision model allows mathematics teachers to plan for the learning management. (Mean score of 5.00, the standard deviation equal to 0.00).And with the lowest mean was the supervision format has the feasibility to get cooperation from those involved. (Mean score of 4.30, the standard deviation of 0.70).

From an asking the opinions and suggestions on 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 as follows:

1.1 Problems and obstacle in using 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.

1.1.1 Supervision model require a lot of activities, supervisors may not be able to implement completely.

1.1.2 Recognizes the importance of mathematics teachers, If they do not recognize the importance to develop themselves, It will make the implementation of the model ineffective.

1.1.3 Teachers have a heavy work load, supervision may be ineffective from within the model.

1.2 General recommendation to complete the model.

1.2.1 Due to it is the good supervision model, It should include making curriculum for supervisor development to make understanding and recognizes the importance of the empowerment – based supervision model

1.2.2 Operations should start from small target first, and then expanded to a larger group.

Part 3: The results of the Empowerment - Based Supervision model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region implementation.

The results 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 implementation. Presented the results of state 1, the researchers used supervision model and state 2, the extension to use the supervision model of 2 supervisors in the Office of Primary Education Service Area in Upper Northern Region.

3.1 Assessment result of the capacity of learning management of mathematics teachers by the researcher, and supervisors who tried a joint trial model, school administrators and academic teachers of 9 peoples, the results as shown in table 24.

Table 24 Shows the result of learning management capacity evaluation of mathematics teacher before and after supervision

Supervisor	Mathematics teacher	Learning management capacity												Summary
		Before supervision						After supervision						
		learning management planning	learning management process	Evaluation the result of learning	Mean	SD	Mean interpretion	learning management planning	learning management process	Evaluation the result of learning	Mean	SD	Mean interpretion	
1. Researcher	M.T.1	0.92	0.39	0.78	0.70	0.58	medium	1.72	1.39	1.33	1.52	0.22	much	pass
	M.T.2	0.92	1	0.83	0.93	0.10	medium	1.69	1.85	1.39	1.69	0.24	much	pass
	M.T.3	0.69	0.56	1.11	0.77	0.29	medium	1.59	1.67	1.56	1.52	0.12	much	pass
	M.T.4	0.46	0.45	1.17	0.60	0.39	medium	1.54	1.73	1.50	1.60	0.12	much	pass
	M.T.5	0.46	0.56	1.11	0.67	0.35	medium	1.54	1.61	1.44	1.54	0.08	much	pass
2. MS.1	M.T.6	0.85	0.94	0.94	0.90	0.05	medium	1.64	1.79	1.22	1.61	0.30	much	pass
	M.T.7	0.77	0.82	0.94	0.88	0.10	medium	1.64	1.79	1.17	1.60	0.33	much	pass
3. MS.2	M.T.8	0.69	0.49	0.89	0.69	0.20	medium	1.51	1.73	1.22	1.53	0.20	much	pass
Total		**0.72**	**0.71**	**0.97**	**0.77**	**0.16**	medium	**1.61**	**1.69**	**1.35**	**1.58**	**0.18**	much	

From table 24 found that the capacity of learning management of mathematics teacher before supervision in overall image was at a medium level (Mean of 0.77, standard deviation 0.16). When considering each side, it was found that the side with the highest mean is the measurement and evaluation of learning management.(Mean of0.97) and the side with the lowest mean is learning management process (Mean of 0.71). After supervision in overall image at a high level (Mean score of 1.58, standard deviation 0.18). When consider each side found that the side with the highest mean was the learning management process (Mean of 1.69) and the side with the lowest mean is the measurement and evaluation of learning management. (Mean of 1.35) When consider from the evaluation criteria through high levels (Mean 1:34-2:00) found that mathematics teachers have the capacity to learn management after supervision and everyone passed the evaluation criteria.

The comments and suggestions of mathematics teachers, the researcher and supervisors who attended trial the empowerment - based supervision model, Allowed 8 mathematics teachers who received supervisory review of the benefits gained from supervision and provide additional feedback.

1. The benefits of supervision.

1.1 Having a recognized approach to learning management that is aligned with Brain Based Learning and learning management in Backward Design clearly.

1.2 Having confidence in the design of the learning management in line with the Brain Based Learning and learning management in Backward Design and creation of the tool of evaluation.

1.3 Using the knowledge about learning online resource that can be useful to mathematics learning management.

1.4 Being encouraged to performance more, and having the support materials, knowledge supplement, follow up advice from supervisors regularly, and having honored certification from The Educational Faculty, Chiang Mai University, giving pride and a willingness to operate learning management better.

2. Other suggestions additional

2.1 Supervision should begin operating after the second semester because teachers will know the information of the achievement results in learning management and the problems, to use as a guide for planning the supervision together. There are

many activities that can be carried out during the summer recess to prepare for the learning management in the first semester of the academic year in the future.

2.2 Should take supervision model expansion for supervisory the teachers who are teaching other subjects.

2.3 Should be extended to other schools because it increases a partnership network.

From 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, and to reform appropriately, According to the suggestions of experts and those involved in the supervision model. It will give 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, as shown in chart 7.

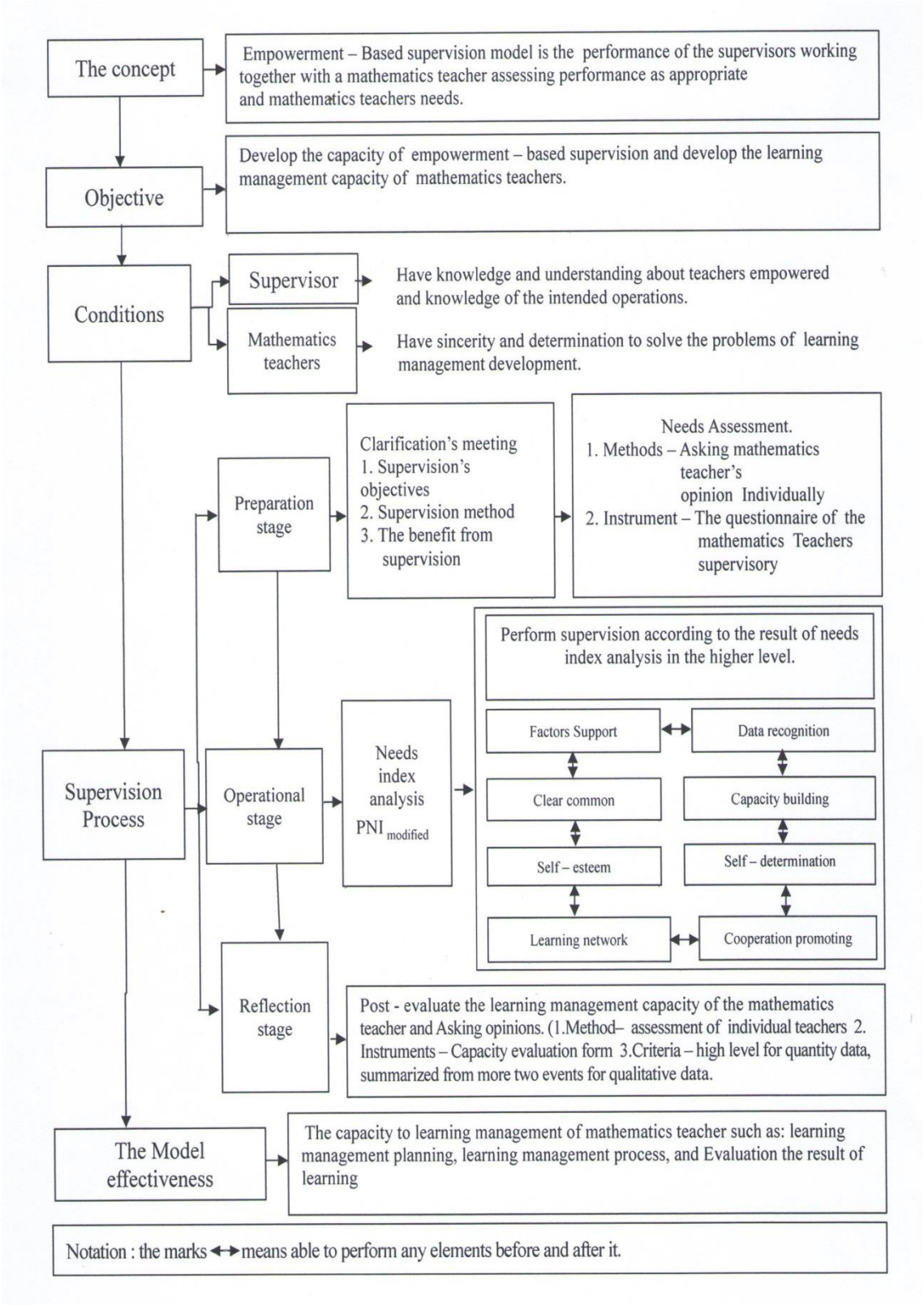

Chart 7 Empowerment-based supervision model for Learning Management Capacity Development of Mathematic Teacher, School under Office of Primary Education Service Area in Upper Northern Region.