

# The Development of Teacher Leadership Indicators for Secondary School Teachers in the 21st Century in Thailand

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Received: October 16, 2018 Accepted: October 26, 2018 Online Published: October 30, 2018

doi:10.5539/par.v7n2p18

URL: <http://dx.doi.org/10.5539/par.v7n2p18>

## Abstract

This study aimed at developing the teacher leadership indicators for secondary school teachers in the 21st century and examining the goodness of fit for the structural model of teacher leadership indicators. There were two phases in this study. The first phase was the theoretical indicators construction by documentary synthesis, then synthesized the data for the teacher leadership indicators for secondary school teachers in the 21st. The second phase was to examine the structural model's consistency with the empirical data. The results of the indicator formation and development were found that the teacher leadership indicators for secondary school teachers in the 21st century were classified into 4 core factors, 15 sub-factors and 75 indicators. They were the teacher development with 4 sub-factors and 20 indicators; the development of thinking process with 5 sub-factors and 25 indicators; teamwork with 3 sub-factors and 15 indicators and the last one was the development of innovation and technology with 3 sub-factors and 15 indicators.

**Keywords:** teacher leadership

## 1. Introduction

One of the main aims of education is to make a balanced and sustainable country. According to Reeves (2009), it is important to emphasize the strengthening of the capital of the existing countries and to have sufficient power to drive the development process. They can be immune to changes in the future.

It includes enhancing the quality and standard of learners, teachers, faculty, educational personnel and schools. They promote and develop teachers. Teachers and educational personnel have the capacity to meet professional standards to ensure that students receive quality education and higher academic achievement. They can learn manually and live happily in society (Owings & Kaplan, 2012).

### 1.1 Statement of the Problem

However, if compared with other countries, it is found that the education of Thailand. The budget is much higher but the achievement is inferior in both quantity and quality. As can be seen from the Test of Educational Achievement Project, the international PISA 2015 72 countries. Overall, it was found that PISA scores of Thai students aged 15 years were lower than average. Thai reading ability has an average score. 409 was ranked 59th in Vietnam. It ranked at 30, with an average score of 487 on the math. Thailand has an average score of 415. Science Thailand has an average score of 421 points, ranked at 56, both in math's. Thai and science are also Vietnamese. They ranked at 8th and 21st, with an average score of 525 and 495. According to results of the evaluation of the country, The trend from PISA 2000 to PISA 2015 has revealed that all three assessments are likely to decline even in the PISA 2009 to PISA 2012 Reading Science Assessment. But in PISA 2015, all three were down on PISA 2012, with the lowest scores (32 points lower), followed by science (Down 23 points) and math (11 points lower) (OECD, 2015).

It can be said that Thai education system is underdeveloped to create Thai people with the skills and lifelong skills of the 21st century, due to Thailand has a curriculum: that is not in line with its educational objectives. They found that teachers lack of quality and efficiency in operation and lack of understanding of evaluation. Furthermore, if you compare the results of TIMSS 2007 to 2011, Thailand's overall mean scores of Thailand dropped both math and science. They based on recent international evaluations; the PISA and TIMSS projects have shown that Thailand cannot prepare young people for international competitiveness. (Office of the Secretary of the Education

Council, 2015)

### *1.2 The Needs Policy*

Thailand has a policy. Strengthen teacher professional standards for teachers. The ability and skills develop learners' learning by the media and information technology and communication systems, as well as promoting the creation of a learning network. They involve of stakeholders and all of them to the community of learning professional teachers. (Office of the Basic Education Commission, 2016) The conference "Dialogue of Education (OEC Forum) 1st look forward to the challenge: the role of education reform leadership of the Board of Education" proposed reform strategy, to quality learning. They should reform the curriculum. In particular, the role of teachers is the most important factor in the quality of education.

Policy Statement on Educational Involvement of Teachers are along with the action plan or roadmap for Educational Reform 2015-2021 of the Ministry of Education. The emphasis is on the development of teacher production and development systems. and the spirit of being a teacher by focusing on teachers who have the qualifications to meet the teaching and can use information technology. The appropriate tools use in teaching to help teachers is self-learning. They keep pace with changes in technology and to use technology to teach quality and effective response to the needs of students (Monroe, 2014).

Elevating and developing teachers are still the most important factors affecting the quality of education. The teacher must be well-versed. Be professional. It is an innovative teaching that can meet the needs of students. In addition, teachers must learn new things all the time (Marzano, 2015).

The importance of teachers to the quality of education and affect the quality of students. Many scholars have studied the problem. The problem of poor quality teachers is not a single system. Most of the time, the teacher development system makes teachers lack motivation to teach. They lack of inspiration in self development. It is including lack of good knowledge management because there is no chance to exchange and share knowledge. Everything in the school is no less important than teaching. It means that every urgent activity can always be substituted for teaching. The teacher is often called to do or even meetings. The teaching must be before. Consideration of goodness is often determined by teaching. Teachers who teach well are often not encouraged. When teachers focus on teaching, other work will be degraded. This is often the teacher who wants to progress, so focus on work other than teaching. Especially the work makes teachers' progress. But the quality of the child backwards at the most crisis is. These conditions have become a habit and everyday life of people in the Thai education system (Woodward, 2010).

### *1.2 Teacher Leadership*

The easiest solution is teachers. They must be full time. The ability of the students depends on teachers who teach good teaching, and quality children. They must consider the favor before or have a way to strengthen and accept. Continuous consistency is linked to academic excellence because teacher progress should be tied to student learning. Teacher reform should increase motivation for teachers, good teachers, and continue to work more effectively.

The motivate people to become more teachers. The teacher has done honor. No worries about the cost of living under the fluctuating economic system (Holtz, 2007). The emphasis on the leadership of the teachers (Teacher Leadership) is something that happens in school is more complicated than ever. It cannot be achieved by teachers or administrators. Leadership and responsibility for learning must be a collaborative effort. Leadership of teachers can change the school culture so teachers work together. They create a culture of learning that everyone benefits (Seltz, 2014). Teacher leadership is not new. Every teacher is in itself already. According to Fennel (2014), all teachers have the opportunity to lead. Especially teachers want to learn and get more support from schools and work environments. The teacher is looking for an environment.

Role of Teachers in collaboration with administrators and other School will lead to better student learning outcomes. Leadership of the teacher to make the most effective is the principal authority for the management of the teacher can do that freedom (Katzenmeyer &, Moller, 2013). Teachers have the ability and knowledge to strengthen the reform school, where teachers need to be recognized and they have the power to work together and get support from the school administration. Schools in the 21st century must work together actively. Encourage common problem solving, which is called collective intelligence. which corresponds to the concept(McNulty, 2012)

It found that teachers with leadership are important features three areas: 1) leadership to other teachers by training (Coaching) introduced (Mentoring) bringing the working group. Mentoring of new teachers or teachers with little experience, 2) leadership and operations. The improvement of learning and teaching are leadership development

Team 3) Leadership can develop the effective teaching styles, students can develop their curriculum (Baker, 2012).

### *1.3 Research questions*

- 1) What are Leadership Indicators for secondary School Teachers in the 21st Century
- 2) Indicator structure model Leadership School Teachers in Century 21 was developed with empirical data or not.

### *1.4 Research Objectives*

- 1) Develop indicators of secondary school teachers in the 21st century.
- 2) Check the consistency of the model structure indicator Leadership School Teachers in Century 21 with empirical data.

### *1.5 Research Hypothesis*

The structural model indicates leadership school teachers in century 21. The development is consistent with empirical data

## **2. Methodology**

This research is on the development of indicators for secondary school teachers in the 21st century. The Quantitative Research Methodology is aimed at studying the development of the 21st-year senior secondary school leadership indicators. The research was synthesized from papers, principles, theories, and related research. The researcher has conducted 2 steps: 1) the modeling of the theoretical indicators, the leadership of secondary school teachers in the 21st century and 2) conformance check of structural model of leadership of secondary school teachers in the 21st century.

*Step 1: Modeling structure, theoretical indicators, leadership, and secondary school teachers in the 21st century*

1. Synthesis of papers, principles, theories, and related research.

1.1 Study documents, principles, concepts, theories, and research related to the indicator Secondary Teacher Leadership in the 21st Century

1.2 Synthesis of textbooks, principles, concepts, theories, and related research.

(Content Synthesis), then summarized as the main components. Sub-elements And indicators of secondary school teachers in the 21st century.

1.3 A draft of the theoretical framework for theoretical leadership of secondary school teachers in the 21st century.

*Step 2: Checking consistency of the Leadership Structure Model for Secondary School Teachers In the 21st century with empirical data.*

Conformity check of the leader model structure, secondary school teachers in the 21st century, in step 2, the researchers conducted an audit for compliance procedures covering these issues: 1) population and sample. 2) Research tools. 3) Data collection and 4) data analysis as follows:

### *2.1 Populations and Sample*

Population used in the research is secondary school teachers. There are 37, 144 students from 933 schools (Basic Education Commission, 2016).

The samples were secondary school teachers under the jurisdiction of the Office of the Basic Education Commission in Northeastern Region. The researcher defined the sample as follows.

2.1.1 Sample Selection Researchers Randomized Multistage (Multi-stage Random Sampling). as follows:

**Random1** by the County Office of Education School in the Northeast region using simple random sampling (Simple. Random Sampling)

**Random 2** is a randomized, stratified (Stratified Random Sampling) stratified by the proportion of school. The size of the school is divided into 4 sizes, including small schools (499 students ), medium schools ( 500 - 999 students) and large schools ( 1,000--2,499 students ). And extra large schools (2, 500 students up)

**Random3** is a random sampling of stratified samples. (Proportional Stratified Random Sampling) by size of school. These samples each school size proportional to the sample of 512 people was conducted by simple random to get a list of schools in each size. as shown in Table 1.

Table 1.

County office of Education	Random 1		Random 2				Random 3			
	County office of Education	province	Number of Teachers				Number of Teachers			
			small	middle	big	huge	small	middle	big	huge
19	-	-	-	-	-	-	-	-	-	-
20	20	Udonthani	535	866	344	1,092	13	17	6	20
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	23	Sakonnakorn	528	571	364	435	10	12	7	5
24	24	Kalasin	403	910	515	601	8	10	11	12
25	25	Khonkaen	897	1,158	463	1,466	16	20	8	38
26	-	-	-	-	-	-	-	-	-	-
27	27	Roi-et	814	960	596	1,140	16	28	11	32
28	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-
30	30	Chaiyaphum	734	1,638	653	1,175	14	32	12	33
31	31	Korat	283	950	848	1,859	7	18	26	46
32	-	-	-	-	-	-	-	-	-	-
33	33	Surin	744	773	457	532	14	15	8	10
<b>8provinces</b>			<b>4,938</b>	<b>7,826</b>	<b>4,240</b>	<b>8,300</b>	<b>98</b>	<b>137</b>	<b>81</b>	<b>196</b>
			<b>25,304</b>				<b>512</b>			

## 2.2 Data Collection Instrument

The researcher used the indicator of secondary school teachers' leadership under the Office of the Education Commission. Documents concepts related research in step 1 to create a questionnaire, which is divided into 2 parts: 1) a questionnaire survey items (Checklist) to inquire about the status of the respondents, including the location, gender, age and educational qualification and 2. ) is a questionnaire rating scale (Rating scale) has 5 levels and a questionnaire of 75 questions asked by the sample.

Main components Sub-elements and the indicator of the human condition. Secondary teachers in the 21st century proposed in the questionnaire. In practice, the quality of the instrument was established and tested.

Bring the Leader Indicator for Secondary School Teachers in the 21st Century Created in step 1 to create a query using the method to determine the sense (Likert's Scale) used to form the 5 levels, each level has Scoring

Rated 5 points	Means	The most practical
Rate 4 points	Means	very practical
Rate 3 points	Means	Moderate
Rate 2 points	Means	Less practice
Rate 1 point	Means	minimal practice.

Present a questionnaire to the advisor for the dissertation to verify the validity and correct it. Then submit the questionnaire to five experts with the criteria for consideration. They must have a doctoral degree in management, education or academic position from the Associate Professor. The quality of the instrument examine the content validity (Content Validity) by analyzing the correlation coefficient (Index of Item-objective Congruence: IOC) and the content validity of the questionnaire item by item selection criteria to select the item with the IOC since. 60 go up. The lower part is 60. Cut off or modify to the advice of the experts, which determine the level of opinion of the experts as follows.

+1            Make sure the text is a leader indicator.

- 0 Not sure if the text is a teacher leadership indicator.  
 1 Make sure the text is not a teacher leadership indicator.

Present the questionnaire to the advisor of the dissertation for further consideration. The questionnaires were analyzed using IOC criteria to try out the sample groups (Try Out). Office of the Secondary Education The data is analyzed for reliability. The reliability of the questionnaire was determined by the Cranach's Alpha Co-efficient method, which measured the confidence level of .70. In this research, the reliability of the questionnaire was 986.

See Table2. From the collection of data from the sample of 512 teachers, the reliability is .977, as shown in Table2.

Table 2. Reliability of the research questionnaire

Research Questionnaire	Confidence	
	Try out	Real sample
1. Being a professional teacher	.935	.909
2. Development of Thinking Process	.954	.959
3. Teamwork	.946	.934
4. Innovation and Technology Development	.942	.944
<b>Overall questionnaire</b>	<b>.986</b>	<b>.977</b>

### 3. Data Collection

1) The researcher collected information by asking for cooperation from the Graduate School. Udon Thani Rajabhat University asks for permission and ask for support from the Director of the Office of the Secondary Education Area. They inform the sample school and ask for assistance in answering the questionnaire.

2) Researcher sends a letter of support to the questionnaire. A questionnaire was mailed to the sample school by one school mail and asked to be answered within 2 weeks after receiving the questionnaire. Attach the envelope and postage. They facilitate the return of questionnaires.

3) Examine and complete the completed questionnaire to analyze the data in the next step and if any school does not return the questionnaire as scheduled. The researcher will send a letter of cooperation to answer the questionnaire again. The minimum questionnaire was 80%. Of all queries

### 4. Data Analysis

The researcher reviewed and excluded the completed questionnaire. Brought down by code (Coding) used for data analysis using the computer program LISREL 8.72.

4.1 Basic Statistics Analysis Percentage of respondents Analyze the average standard deviation And the level of performance of secondary teachers in each indicator. The average rating is as follows:

Average 4.50	Meaning	is most practical.
Average 3.50-4.49	Meaning	is very practical.
Average 2.50-2.49	Meaning	is a moderate practice.
Average 1.50-2.49	Meaning	is less practice.
Average 1.49 loier	Meaning	is minimal practice.

Indicators with average values of 3.50 and above are considered to be indicators.

4.2 Data Analysis and Components There are basic agreements:

4.2.1 Correlation Co-efficiency is used to analyze data relationships. Prior to analyzing the elements and data, it should be at least 30.

4.2.2 KMO (Kaiser-meyer-olkin Measure of Sampling Adequacy) analysis is used to analyze whether the data is suitable for the analysis of the elements. The KMO index is between 0-1 where the value is 1. Each can be predicted by another variable.

.80 Upwards, appropriate to analyze elements very well.

.70--.79 suitable to analyze components well

.60--.69 suitable for medium composition analysis.

.50--.59 suitable to analyze less elements.

Less than .50 is not appropriate to take this data to analyze components.

4.2.3 Statistics of Bartlett, (Bartlett, Test, Of sphericity's ) use of the test parameters. Are they related? If Bartlett's values are significant, the variables are related. They can be analyzed.

4.2.4. Factor Loading for Confirmatory Factor Analysis must be greater than or equal to .50.

.30--.40 is believed to be the lowest level to describe the structure.

Values ranging from .50 and above are good values to be able to explain the composition and believe that it leads to significant.

Values greater than 1.70 indicate the composition can be described as very good.

4.3 Confirmatory Factor Analysis By checking the consistency of the component structure model and weight Variable used to create a sub-indicator on empirical data (as empirical: Data), which analyzed data from questionnaires. The program LISREL 8.72 for weighting variables used to create sub- indicator and check the fit of the model, the research is a theoretical model that the researchers created with empirical data. The researcher has defined criteria for interpretation according to the following popular criteria:

4.3.1 Chi - square statistics  $\chi^2$  (Statistic Square, Goodness Of-chi) in.

Confirmatory factor analysis was not significant (P-value was greater than .05).

4.3.2 Relative chi - square values  $\chi^2 / DF$  are less than 2

4.3.3 Index harmony ( , Goodness Of the Fit Index is: the GFI ) is greater than .90.

4.3.4. The index measures the degree of harmonization already revised (the Adjusted Index is the Fit, Goodness Of: AGFI) more valuable. 90.

4.3.5. The index measures the comparative harmony (of Comparative Index is the Fit:: CFI ) is greater than .95.

4.3.6 The index of the sample size to accept the model fit ( Critical N ) index is greater than 200.

4.3.7 and the root mean square of the remainder of the variance (the Standardized a Mean Square This the Residual A Root: SRMR) is less than .05.

4.4.8 the errors in estimation parameters, or the square root of the mean squared error of approximately ( A Root Of a Mean Square This Error-Approximation: RMSEA ) is less than 0.5. Below.

If values between .05 and .08 indicate that the model is relatively consistent

If there is a value between .08 and .10, the model is slightly consistent.

If the value is greater than 0.10, the model is not consistent with the data.

#### Empirical

In the analysis of this confirmatory element, The consistency of the model is to have the RMSEA less .05, which show that there is consistency (Close the Fit).

4.4.9 Standard error (Largest the Standardized the Residual) values. Less than 2.00

### 5. Results

Baertlett statistics and Kaiser-Mayer- Olkin index values.

Measurers of Sampling Adequacy MSA) of sub-models, teacher leadership. Secondary education in the 21st century

Table 3.

Model	Baertlett test of Sphericity	p	Kaiser-Mayer-Olkin Measurers of Sampling Adequacy (MSA)	suitability
Being a professional teacher	6631.757	.000	.958	excellent
Thinking Process Development teamwork	9759.802	.000	.969	excellent
Innovation and Technology Development	6857.201	.000	.953	excellent
	6743.020	.000	.961	excellent

From Table, the results of the analysis to determine the suitability of the correlation matrix prior to the analysis of the affirmative components revealed that the correlation matrix between the variables was different from the identity matrix At the .01 level, the Baertlett test of Sphericity was 6631.757, 9759.802, 6857.201 and 6743.020, respectively, with a probability of less than .01 (  $p < .01$ ). The Kaiser-Mayer -Olkin Measurers of Sampling Adequacy (MSA) were .958, .969, .953 and .9 . 61. All values are greater than .80 indicating that the indicator is very relevant.

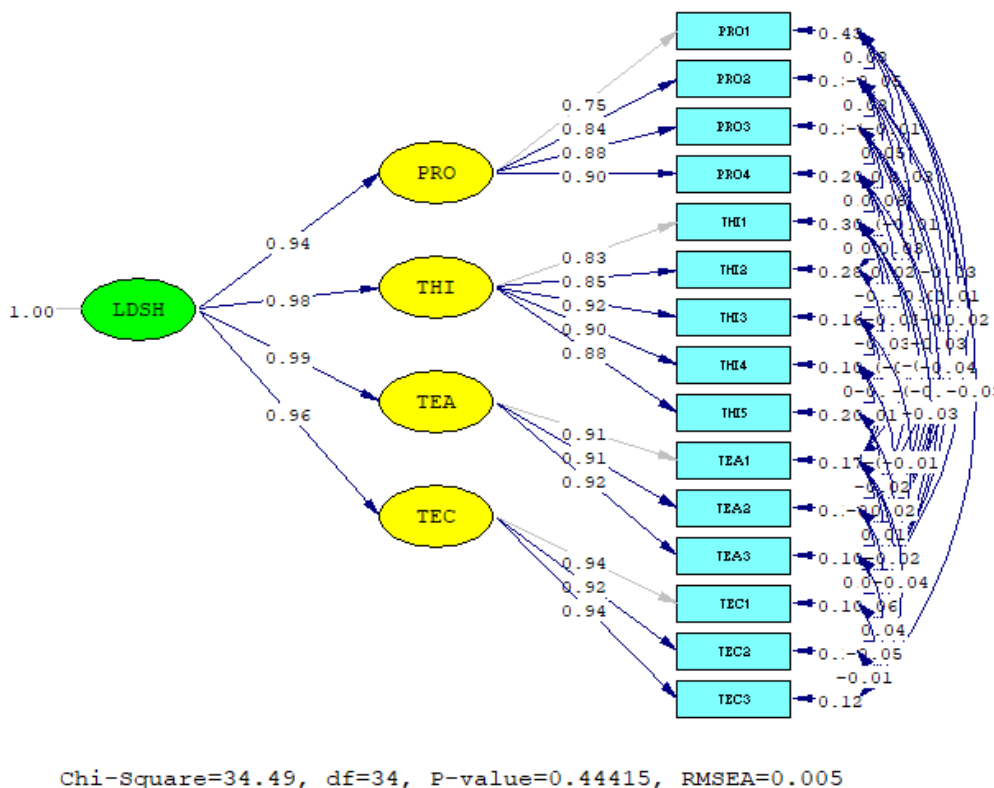


Figure 1. The second confirmation model of secondary teacher leadership indicators in the 21st century

From Table 3 and Figure 1, the second-highest affirmation of leadership indicators of primary school teachers The model was consistent with the empirical data. Considering the chi - square equals 34. 49 the degrees of freedom (the df) equal to 3 to 4 values were statistically significant (P-value) of 0.444 means that the Chi - Square is not statistically significant. The Chi-square was not statistically significant . The relative chi - square (df) was 1.014. The relative harmony index (CFI) was 1.00. The GFI Equal to 0.99, with an index measuring the level of compliance of the modified, (AGFI) equals 0.97 square root of the mean square of the remaining standards (SRMR) equal to 0.0, 08 and tolerances in parameter estimation (RMSEA) was 0.005. The crisis and the sample size (the CN) equal to 826.96.

## 6. Summary and Conclusion

1. The result of the development of the indicator. Study and synthesize texts, principles, theories, theories and related research. Can be an indicator of the 75 indicators in the framework of the main elements of teacher leadership component and subcomponent 15, 4 element.

1) The professional teachers 2) the development process, 3) teamwork 4) developing innovative technologies and below.

### 6.1 *The Main Components of Being a Professional Teacher*

It consists of 4 sub-components:

6.1.1 Creating a Learning Community Referring to the behavior of teachers at secondary level in the 21st century, observed from 5 indicators are: (1) integration and networking and knowledge exchange within and outside the school, both in the field of the same and different disciplines, (2) design activity. (3) organize learning activities;(4) Participate in the activities of the network. (5) Develop and expand the network to find out how to conduct activities.

Or new projects.

6.1.2 Having research skills in the classroom. The behavior of secondary school teachers in the 21st century is evident from the five indicators: (1) the students' learning problems in the classroom; (2) the instructional design for problem solving in the classroom; 21st century. (3) Take the solution from the classroom activities to try it. (4) Assist students individually. (5) Cultivate thinking skills and problem solving skills for learners.

6.1.3 promote a learning environment refers to the behavior of secondary school teachers in the 21st century, observed from 5 indicators are: (1) not disclose stories ever malfunction. Then the crash came as a lesson, (2) understand and accept the ideas and decisions of teachers using principles of reason and public interest first (3) Treat your colleagues with courtesy. Be humble and if it is appreciated. I have to give credit to my colleagues in the team. (4) Strengthen the atmosphere of good relationships between teachers and students and students. (5) Focus on and promote the difference between students.

6.1.4 love the service means The behavior of secondary school teachers in the century.

The 21 observations from the 5 indicators are (1) they are ready and willing to educate students at all times. (2) Helping teachers to develop curriculum or counseling for problem solving in class and in school. (3) Facilitate parents to participate in teaching activities. In the classroom and online (4) Participate with fellow teachers in the development of education to achieve the goals. (5) Improve the service system. (Library group) to be effective.

### 6.2 *Core Element in the Development Process*

It consists of 5 sub-components:

6.2.1 Creative thinking Refers to the process of teacher education in the 21st century, observed from 5 indicators are: (1) can be versatile and unique with the imagination and does not stick to the original idea in the event of instruction. (2) Presenting issues in class to fellow teachers. Then determine the combined solution (3) have the opportunity to develop strengths and improve the weaknesses of themselves (4) to support, promote and open new perspectives. (5) Finding useful information to develop effective teaching and learning activities.

6.2.2 Critical Thinking Refers to the process of secondary school teachers in the 21 observed at the 5 indicators are: (1) there is a discussion going on in the classroom. Between teachers and fellow teachers And it must be considered together for a common conclusion. (2) There are comments. (Good and bad points) between teachers and fellow teachers. Sharing the curriculum in the course taught. (3) Organize learning activities for students to think critically about their teaching. (4) Compile problems in class and find solutions to problems with their teachers. (5) Explore the causes of problems in the classroom and find solutions to problems with fellow teachers.

6.2.3 Critical thinking means Thinking of School Teachers in the 21st century, observed from 5 indicators include (1) the ability to distinguish and divide their time between acting jobs with special functions assigned clearly (2) classification and aptitude. The individual student's interest is to promote student learning. (3) Promote learning through situations or problems. To make students more interested in editing. (4) Get support. Encourage and open new perspectives that are beneficial to teaching and learning from fellow teachers (5). Dare to accept even the wrong answer. It also encourages students to solve systematic problems.

6.2.4 Systematic thinking means Thinking of School Teachers in the 21st century, observed from 5 indicators are: (1) planning activities, teaching the teachers with teachers in line with the curriculum in a course that (2) can solve the problem. in class, step by step (3) a change process and external factors that affect teaching and learning (4)



encourage the learning management integrated check. 8 strand of thought and practice (5) have a benchmark to measure the evaluation of teaching, step by step, from the brainstorming of a fellow teacher.

6.2.5 Questioning means Thinking of School Teachers in the 21st century, observed from 5 indicators are: (1) create issues to discuss with the teachers about the learning activities to teach or solve problems in class (2). Can use the existing knowledge to apply to teach the next lesson. (3) Careful observation of fellow teachers. And crawl Who is the key? What, where, why, and how to identify issues in the classroom more clearly. (4) Think about the challenging and curious issues of co-learning with friends, teachers and students. (5) Identify issues that are consistent with school policy and goals.

### 6.3 *The Main Elements of Teamwork*

It consists of 3 sub-components:

#### 6.3.1 Common vision Meaning of the behavior of secondary school teachers in the century.

Observed from the 5 indicators are: (1) Course Description (2) Establish criteria for evaluation and evaluation of teaching and learning co-operation. (3) Monitor and evaluate the willingness to work / activities in accordance with the vision to achieve learning. (4) Report the results of the school's goals and (5) Publish target groups for teachers in the school.

6.3.2 Acceptance of the difference of persons means Behavior of School Teachers in the 21st century, observed from 5 indicators are: (1) respect for teachers, both as individuals and as friends, teachers, (2) an opportunity to hear different opinions of friends. teachers (3) to honor the teachers all the difference with praise (4) provides an opportunity for teachers to comment on the meeting, and (5) to consult with teachers before. Each event teaching initiatives or new projects.

6.3.3 Reduction of conflict means The behavior of secondary school teachers in the 21st century was observed from 5 indicators: (1) Be sincere (2) forgive the opportunity for colleagues to practice (3) avoid gossip (4) try to listen to the opinions in resolving the problem of teaching and learning in the classroom in a variety of ways and openly; and (5) explain the problem to the teacher's friends in order to cooperate with each other. To solve problems in the classroom.

### 6.4 *The Main Elements of Innovation and Technology*

It consists of 3 sub-components:

6.4.1 Teaching Innovation means The behavior of 21st-year secondary school teachers is evident from the five indicators: (1) The teaching methodology, as well as tools for measuring new assessments. (2) interested in learning and researching for the continuous development of teaching and learning. (3) solving problems that are creative. (4) creating teaching materials to meet the needs of the learner. And (5) provide local content for use as a learning medium.

6.4.2 The use of technology refers to the behavior of secondary school teachers in the century. Observed by 5 indicators (1) Computer-based instruction (2) Searching, collecting information and collecting information by computer. (3) Establishing understanding. Communicate with the computer both inside and outside the school. (4) Develop educational documents. And reporting activities for teaching with computers and (5) the computer lab that is conducive to teaching and learning and the conditions use the device.

6.4.3 Development of learning resources means the behavior of secondary school teachers in the last century from five indicators. (1) There is a library service that facilitates learning. my own students (2) network the learning between statements the school. (3) Provide books for reading at home. (4) The library has a favorable environment for studying. Know of the students And (5) encourage teachers and students to use the library within the school.

## 2. Analysis results from the confirmatory components of the model.

Teachers' leadership is that when the model is aligned This is consistent with the empirical data. Determined by chi - square equals 34. 49 is not statistically significant, the DF is 3 and 4 on the chi - square relative equals 1.014 GFI equal. 99 AGFI equal. 97 CFI was 1.00 SRMR there 0.008 RMSEA 0.005 CN 826.96 Leadership of Secondary School Teachers in the 21st Century under the Office of the Basic Education Commission in the Northeast. Consistent with empirical data.

The subgroup analysis showed that the weight of all 15 components was positive and more than 30, ranging from .75 to .90, and statistically significant at .01 . these 15 elements are key components of the core element by element, with the proportion of variance explained by the elements or the coefficient of May. The Korn since . 57, a . 98.

Confirmation Results Two of the teachers' leadership indicators in place.

Basic education The model was consistent with very good empirical data, based on the chi - square test of 34. 49 There was no statistical significance, DF was 3 4, and the GFI was .99. The adjusted correlation coefficient (AGFI) was .97 and the RMSEA parameter estimation error was 0.005.

The factorial load of all four components is positive and at the .01 level of significance. Can be summarized as follows: **1) the elements of a professional teacher ( the PRO)** weight elements are positive values from 0. 75 - 0. 90 and is statistically significant at the .01 level. All the sorting of the elements much weight. a few love the service (PRO4) a factor equal to 0.90 promote learning atmosphere (PRO3) with a value equal to the weight of 0. 88 skills to do research in class (PRO2) with water. The composition of 0.84 , and create a community of learning (PRO1) has the factor 0.75 **2) the development process thought ( THI's)** weight elements are positive values ranged from 0.83 to 0.92 and is statistically significant at the .01 level. Every. the order of the elements descending weight is critical thinking (THI3) a factor equal to 0. 92 systems thinking (THI4) a factor equal to 0. 90 of a probe. The critical factor (THI5) has an elemental weight equal to 0. 88 Critical thinking (THI2) has an elemental weight equal to 0. 85 and creativity (THI1) a factor equal to 0. 83 **3) elements of teamwork (TEA)** factor is positive, with values ranging from 0.91 to 0.92 and is statistically significant at the .01 level. All values. order the descending factor is the acceptance of individual differences (TEA3) is equal to the weight of 0. 92 to creativity (TEA1) a factor equal to 0. 91 of the regulations. Shared Vision (TEA2) a factor equal to 0. 91 and **4) the development of Innovation and Technology (TEC)** factor is positive, with values ranging from 0.92 to 0.94 and is statistically significant at the .01 level. All the sort of weighting factors descending is to produce innovative teaching (TEC1) is worth its weight composition equal. 0. 94 developing learning resources (TEC3) a factor equal to 0. 94 and the use of technology (TEC2) a factor equal to 0. 92 respectively.

Research also found that. The developmental component of learning resources has a very high coefficient or weight. The majority of team members had the highest coefficient or weight, indicating that they were more involved in predicting teacher leadership than the other components. And it shows that the samples focus on teamwork and the development of learning resources. In particular, the ability to develop teacher learning resources. This may be because. The development of learning resources is part of the teaching and learning process, consistent with Joanne ( JoAnn, 2012: 144 ). Teacher leadership can improve the effectiveness of teachers in different ways. Focus on continuous learning. And teaching excellence can improve the quality of teachers. It focuses on spreading good work to colleagues. And to increase the expertise for teachers in the school thoroughly. The teacher's increased expertise and confidence make teachers more responsible, enabling teachers to innovate. And the risk to use in schools. This will directly affect the effectiveness of teachers and critics. (2013 : 46-47, 60-61 , 178). Teacher leadership can improve the effectiveness of teachers in different ways. Focus on continuous learning. And teaching excellence can improve the quality of teachers. It focuses on spreading good work to colleagues. And to increase the expertise for teachers in the school thoroughly. The teacher's increased expertise and confidence make teachers more responsible, enabling teachers to innovate. And the risk to use in schools. This will directly affect the effectiveness of the teacher.

Teacher leadership is therefore very important for the development of the learning process and the quality of education because the teacher leadership is based on being a professional teacher. Thinking Process Development teamwork And continuous innovation and technology development. These will make the school quality. It is important to develop the Teacher Leadership Indicator in the context of Thailand in order to develop the teacher leadership that will affect the quality of education and the quality of education.

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