REVISTA ESPACIOS

Strategies for Using the Satellite Distance Education System in Thailand that Affect Student Quality of Marginal Schools in the Lower North Region

Estrategias para utilizar el sistema de educación a distancia por satélite en Tailandia que afecta la calidad de los estudiantes de las escuelas marginales en la zona norte del país

PETSUWAN, Sakchai 1; PIMDEE, Paitoon 2 & PUPAT, Phadungchai 3

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ABSTRACT:
Few remote schools in Thailand use distance education systems. The strategy, namely, basic operation, administrative action, and teacher actions, has established. Analysis of the strategy that affects the quality of students is applying linear multiple regression analysis shows the basic operation strategies able to predict the student's quality in the test by 36.90 percent and necessary competencies of learners such as a skill in the 21st century 57.90 percent — the remote schools in other countries with a similar Thailand context able to adapt the strategy.
Keywords: Sattelite distance education, strategies, marginal schools, student quality

RESUMEN:
Pocas escuelas remotas en Tailandia utilizan sistemas de educación a distancia. La estrategia, a saber, la operación básica, la acción administrativa y las acciones del maestro, se ha establecido. El análisis de la estrategia que afecta la calidad de los estudiantes está aplicando un análisis de regresión múltiple lineal que muestra las estrategias básicas de operación capaces de predecir la calidad del estudiante en la prueba en un 36.90 por ciento y las competencias necesarias de los estudiantes, como una habilidad en el siglo XXI 57.90 por ciento: el escuelas remotas en otros países con un contexto similar en Tailandia capaces de adaptar la estrategia.
Palabras clave: Educación satelital a distancia, estrategias, escuelas marginales, calidad estudiantil

1. Introduction

Presently, Thailand has three forms of education management systems, namely; formal education, non-formal education, and informal education system. The formal school education is a study system that determines the purpose, method of study, curriculum, duration of the study, evaluation systems, and graduations requisites. The primary and secondary education (Grade 1 to

Grade 11) and the higher education, most of the educational institutions in Thailand provide education by the formal school education

Non-formal education is a flexible study of the purpose, the model of educational management method, and the duration of the study. The content and curriculum are designed to be appropriate by the problems and needs of each student group. It is widely promoted as lifelong learning.

Besides, informal education is a study that allows students to learn by themselves according to their interests, potential, readiness, and opportunities. The students can study from individuals, experiences, society, environment, or other sources of knowledge. For example, basic education management (Grade 1 to Grade 11) and education management for professional development, the development of the life skills in social and community development as well as free educational services and promote non-formal education through public TV through educational television programs (Educational Television, Ministry of Education(ETV), 2008). This program was done by the Office of the non-formal and informal education. Besides that, the Distance Learning Foundation, Thailand, is developed the satellite distance education system and via the internet to solve the shortage of teachers in educational institutions that provide formal education which is located in a remote area and is also used as a learning medium for organizing non-formal education and informal education.

Education institutions may arrange the study based on one or all three systems (formal, non-formal, or informal). The Thai education system allows student´s mobility between systems and institutions. The students in informal education, professional training, or their work experiences and teaching, will encourage the school to organize all three forms of the education system (Sakchai, P, 2017). Some of these systems are focusing on adults as the students too.

Nowadays, access to education is almost everywhere in Thailand, but there are still some schools located in remote areas where the quality of education is lower compared with those in urban and accessible rural areas. Schools in remote areas usually lack teachers, especially those teaching the six core subjects; Thai language, English language, Science, Mathematics, Social Studies, and Health Education. Many of the remote schools now use the satellite Distance Education System, to substitute for unavailable teachers (The Information Technology Foundation under the Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn, 2011). It was a very kind gesture of King Rama IX, as His Majesty was concerned about the education of children in the remote, inaccessible areas; his Majesty gave 50 million baht (about 1.65 million United States Dollar) to start the program for the satellite Distance Education System on His Majesty's birthday since 1995. The use of this system is not only for students in remote areas, but it is also used by everyone interested in learning. Schools with satellite Distance Education Systems have to manage their class schedule according to the television broadcasting schedule. Broadcasting is from Hua Hin TV Station. It has 15 channels broadcasting 24 hours. Everyone can also view the classes and download copies of the books used in the classes from the website; http://www.dltv.ac.th. Currently, the students can watch the live programs by class, rerun, set alerts in advance, and chat directly via an application on mobile (DLTV Application) (Distance learning television foundation, 2019).

The satellite distance education system is under the management of the Satellite Distance Education Foundation in Royal patronage where located in Wang Klai Kang Won School. There are eleven recording rooms, a transmission control room, and the studio control room. Schools that watch live programs are the schools that installed a free satellite receiver. There is more than 30,000 schools member. Consist of primary school and secondary school under the Ministry of Education management, private school, and Dhamma Studies Department. Including schools in neighboring countries in which the satellite signal is available such as Cambodia, Laos, Myanmar, Vietnam, China, and Malaysia. (Distance learning television foundation, 2019).

Satellite Distance Education Foundation in Royal patronage manages satellite distance education from Wang Klai Kang Won School in the form of a live broadcast of one channel, one floor, for the whole country. (Distance learning television foundation, 2019).

The use of the satellite distance education system of schools in remote areas has givens opportunities to many students from remote, inaccessible rural areas, as well as to anyone willing to learn more from the classes offered by the satellite Distance Education System.

Unfortunately, the Lower Northern Region of Thailand has many Border Patrol Police Schools that do not have enough teachers. Most of their teachers are the Border Patrol Police. The villages around the border have a large number of children who need access to education because their areas are usually located in isolated places or some places that have risks of border wars or conflicts. In 1955, the first school for hill tribe villagers in the region was established in the area

for communication and to strengthen government presence. The school was turned into the first Border Patrol Police School in 1996 and was registered as an official school following the education standards of the Ministry of Education. (Information science, Udon Thani Rajabhat University, 2016). Now, there are many of these schools using the satellite Distance Education System as a core administration and management tool. In order to ensure the efficiency and effectiveness of the distance education system via satellite, the Satellite Distance Education Foundation, together with the Office of the Basic Education Commission (2018), has established guidelines for the operation of teaching and learning by using distance education systems via satellite to meet standards. It was namely strategies that consist of "4 Basic Rules", "5 Management Strategies," and "6 Teacher Implementation". The strategies were established by Satellite Distance Education Foundation together with the Office of the Basic Education Commission (2018), and Anusorn Foochaloen (2017), consists of:

"4 Basic Rules"

This strategy is purposing the schools to survey and environment system, and basic infrastructure as a whole to facilitate teaching and learning by using satellite distance education system as follows;

1. The school environment and classroom are clean and organized.

2. The television is suitable for the classroom, and the number of students is equipped with a television for the student's eye level.

3. The teacher supervised the students before, during, and after classes.

4. The students participate in activities and intend to learn together with the students in the source school.

"5 Management Strategies"

This strategy focuses on the school administrators to act as the head of the school to facilitate the teaching and learning by using the satellite distance education system. The management should proceed as follows;

1. Plan systematic management, promote, and support the teaching of satellite distance learning seriously. Facilitating teaching and learning management to be active and continuous.

2. Be a leader with commitment and lead all teachers and parties to realize the importance of cooperation activities.

3. Support the satellite receiver and the television, which is suitable for the classroom, and the number of students is equipped with a television for the student's eye level.

4. Providing, promoting, and supervising to produce a handbook of satellite distance education for a teacher through the hourly learning plan.

5. Supervision, monitoring, and evaluation of teaching and learning by using the satellite distance education system of every classroom regularly.

"6 Teacher Implementation"

The implementation of this strategy, focus on the teachers in destination school to work in relevant tasks. Such as, to facilitate teaching and learning by using the satellite distance education system. There are the criteria that teachers should consider as follow;

1. Arranging the classroom environment to be suitable for conducive to practice and participate in activities as the learning management plan.

2. Prepare the teaching activities in advance, including media, material, equipment, and assignment. Also, additional activities as specified by the satellite distance instructor manual. The teacher should motivate the students to prepare for the next class.

3. Participate in learning management along with the source school. The teacher should attend and supervise students to practice and learning the activities every time.

4. Summary of the content with the students after the learning activity ends and also records the result of learning management after teaching every time.

5. Measure and evaluate when the learning activity ends every time. Each learning lesson seems to show the learning result. Know whether or not the students learned and achieve their objectives and will be further information for improvement.

6. Arrange activities for teaching and repairing outside the broadcast schedule. It will help students who do not meet the learning objectives or provide additional knowledge to students.

In evaluating distance education management in Thailand, the Center for Educational Quality Development with Distance Learning Technology (Distance Learning Thailand). The Office of the Basic Education Commission (OBEC) has established the Distance Learning Standards, consisting of Educational Service Area Office and DLTV Educational Standards for the Primary Educational Service Area (PESA). The Educational institutions in the evaluation of the distance education via satellite (DLTV) have the scope of evaluation in 2 levels, consisting of the standard of the educational service area, there is one standard, which is the standard 1 in the operation of the Educational Service Area Office. There are four standards of educational institution standards, which are Standard 1, Basic Educational Institution, Standard 2, Educational Administrators, Standard 3, Teacher. And the 4th standard for students (Center for Educational Quality Development (Distance Learning Technology), 2018).

For the 4th standard for students, productivities are determined by Learners' Key Competencies, which consist of Communication Capacity, Thinking Capacity, Problem-Solving Capacity, Capacity for Applying Life Skills, Capacity for Technological Application. For output / Outcome, considering from result of Desired Characteristics, Result of Reading, Analytical Thinking and Writing Skills, Ordinary National Educational Test (O-NET), National Test (NT), mentioned in Distance Learning Thailand (2018).

The researcher who conducted this study is part of the Satellite Distance Education System development team of Border Patrol Police School in the Lower North of Thailand. Therefore, it is necessary to study the strategies of using the satellite distance education system in Thailand that will affect the students' quality.
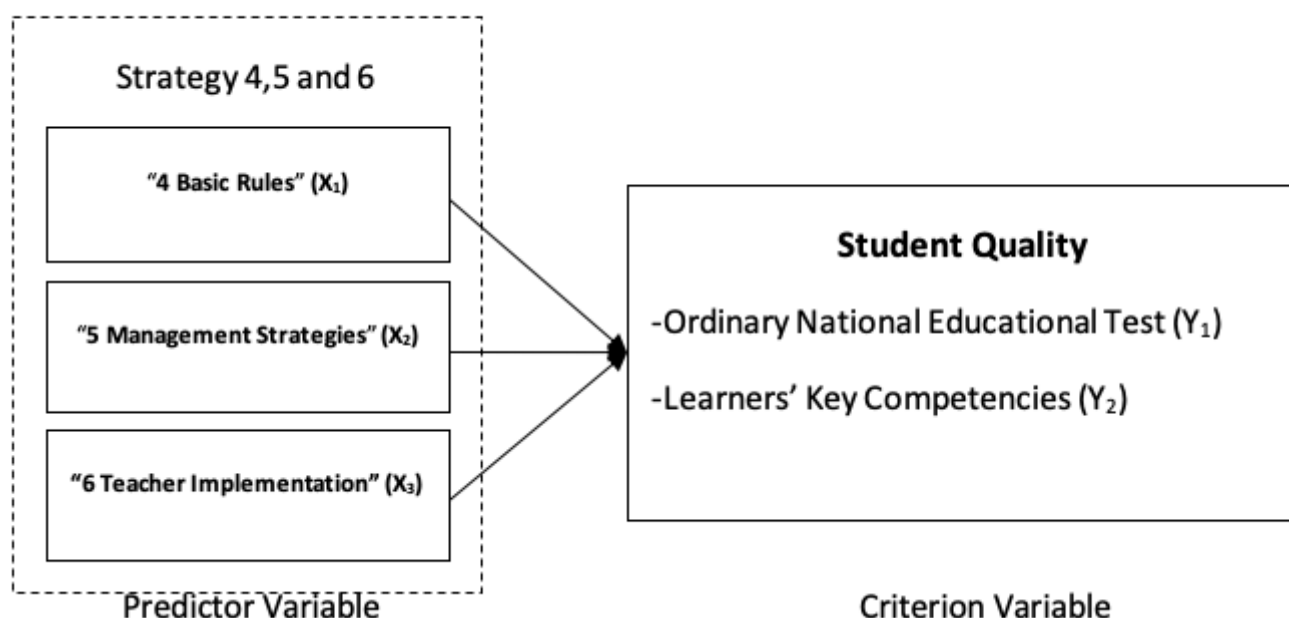
2. Methodology

2.1. Theoretical Framework

The theoretical framework of this research has applied the teaching and learning of the satellite distance education system via using Strategy 4,5 and 6, which established by the Satellite Distance Education Foundation together with the Office of the Basic Education Commission (2018). The strategy is defined as the predictor of students quality based on a test score of Ordinary National Educational Test (O-NET) of the National Institute of Educational Testing Service (Public Organization) (2019), and also considering Learners' Key Competencies under the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) of Ministry of Education, Thailand (2008), as describe in following figure.

Figure 1

Theoretical Framework

2.1.1 Ordinary National Educational Test (O-NET)

The student quality is considered from test score, which conducts under the Ordinary National Educational Test on 3 February 2018 for the students grade 6. The test conducted by the National

Institute of Educational Testing Service (Public Organization) for six subjects as following;

- Mathematics: 20 questions divided into 15 items of multiple choice and 5 items of painted numbers that answer, totally 100 scores.

- Thai Language: 34 questions divided into 32 items of multiple choice and 2 of closed construct/short answer, totally 100 scores.

- Sciences: 32 questions divided into 30 items of multiple choice and 2 of multiple complex choices, a totally of 100 scores.

- English: 40 questions of multiple-choice, totally 100 scores.

2.1.2 Learners' Key Competencies

An essential factor for Learners' Key Competencies of the Ministry of Education Thailand (2008) shows in the Basic Education Core Curriculum is aimed at teaching learners with the following five key competencies as follows;

a. Communication Capacity

Capacity to receive and transmit information; linguistic ability and skills in expressing one's thoughts, knowledge and understanding, feelings and opinions for exchanging information and experience, which will be beneficial to oneself and society; negotiation for solving or reducing problems and conflicts; ability to distinguish and choose whether to receive or avoid information through proper reasoning and sound judgement; and ability to choose efficient methods of communication, bearing in mind possible negative effects on oneself and society.

b. Thinking Capacity

Capacity for analytical, synthetic, constructive, critical, and systematic thinking, leading to bodies of knowledge creation or information for judicial decision-making regarding oneself and society.

c. Problem-Solving Capacity

Capacity to properly eliminate problems and obstacles, based on sound reasoning, moral principles and accurate information; appreciation of relationships and changes in various social situations; ability to seek and apply knowledge to prevent and solve problems; and ability for judicious decision-making, bearing in mind possible negative effects on oneself, society and the environment.

d. Capacity for Applying Life Skills

Capacity for applying various processes in daily life; self-learning; continuous learning; working; and social harmony through strengthening of happy interpersonal relationships; elimination of problems and conflicts through proper means; ability for self-adjustment to keep pace with social and environmental changes; and capacity for avoiding undesirable behaviour with adverse effects on oneself and others.

e. Capacity for Technological Application

Ability to choose and apply different technologies; skills in the application of technological processes for the development of oneself and society regarding learning, communication, working, and problem-solving through constructive, proper, appropriate, and ethical means.

2.2 Scope of Research

2.2.1 Population and Sample

The population was composed of about 30 school teachers in remote areas of the Lower Northern region of Thailand, coming from; Ban Rak Thai Border Patrol Police School, Ban Lat Reur Border Patrol Police School, Ban Nuch Thian Border Patrol Police School and Athorn Uthit Border Patrol Police School. The sample size was determined using the Krejcie and Morgan Table (Krejcie, R . V ., & Morgan, D.W., 1970). It selected 28 respondents using simple random methods.

2.2.2 Research Variable

- Predictor Variable is "Strategy 4,5 and 6", a totally of three variables as of "4 Basic Rules" (X1), "5 Management Strategies" (X2), and "6 Teacher Implementation" (X3).

- First Criterion Variable is Ordinary National Educational Test (O-NET) (Y1) in 4 subjects; Mathematics, Thai language, Sciences, and English.

- Second Criterion Variable is Learners' Key Competencies (Y2) consist of 5 topics; Communication Capacity, Thinking Capacity, Problem-Solving Capacity, Capacity for Applying Life Skills, and

Capacity for Technological Application.

2.3 Research Tools

The tools used to collect research data as follows;

2.3.1 The questionnaire in 5 level rating scale (5 = most practice, 4 = very practical, 3 = moderate practice, 2 = Less practice, and 1 = minimal practice) inquire about the implementation of the "Strategy 4 5 6" in the teaching and learning by satellite distance education system of remote areas schools in the Lower Northern of Thailand, consisting of 15 questions. The reliability of the whole questionnaire equal to 0.95

2.3.2 Data Recording Form for the result of Ordinary National Educational Test (O-NET) (Y1) in 4 subjects; Mathematics, Thai language, Sciences and English for Ban Rak Thai Border Patrol Police School, Ban Lat Reur Border Patrol Police School, Ban Nuch Thian Border Patrol Police School and Athorn Uthit Border Patrol Police School.

2.3.3 Evaluation Form for Learners' Key Competencies (Y2), which total score is 5 for every five criteria; Communication Capacity, Thinking Capacity, Problem-Solving Capacity, Capacity for Applying Life Skills, and Capacity for Technological Application.

2.4 Data Collection

The data obtained from the interview of 26 teachers from four schools, representing 92.85 percent from the sample group (28).

2.5 Data Analysis

The data analysis methods used were as follows; Pearson Product Moment Correlation Coefficient, which applies for Predictor Variable and Criterion Variable. The Multiple Linear Regression Analysis used to study the strategies for using the satellite distance education system in Thailand that affects student quality of marginal schools in the Lower Northern region.

3. Results

3.1. Correlation Coefficient between "Strategy 4, 5 and 6", totally three variables as of "4 Basic Rules" (X1), "5 Management Strategies" (X2) and "6 Teacher Implementation" (X3) and Result of O-NET (Y1)

Table 1
Correlation Coefficient between "Strategy 4,5 and 6", totally three variables as of "4 Basic Rules" (X1), "5 Management Strategies" (X2) and "6 Teacher Implementation" (X3) and Result of Ordinary National Educational Test (O-NET) (Y1)

Variable	Y1	X1	X2	X3
Y1	1.000	0.607*	0.564*	0.345
X1		1.000	0.708**	0.685**
X2			1.000	.828**
X3				1.000

*p<0.05
**p<0.01

From Table 1, it showed that the variables that were positively correlated with the O-NET (Y1) were statistically significant at the level of 0.05, including the strategy "4 Basic Rules "(X1) and "5 Management Strategies" (X2). When considered between the Predictor Variable, it is found that the" 4 Basic Rules "(X1), "5 Management Strategies" "(X2), and "6 Teacher Implementation" (X3) are related to each other. The statistical significance level is 0.01.

3.2. Correlation Coefficient between "Strategy 4,5,6", totally three variables as of "4 Basic Rules" (X1), "5 Management Strategies" (X2) and "6 Teacher Implementation" (X3) and Learners' Key Competencies) (Y2)

Table 2
Correlation Coefficient between "Strategy 4,5 and 6", totally three variables

as of "4 Basic Rules" (X1), "5 Management Strategies" (X2) and "6 Teacher Implementation" (X3) and Learners' Key Competencies) (Y2)

Variable	Y2	X1	X2	X3
Y2	1.000	0.553*	0.761**	0.757**
X1		1.000	0.708**	0.685**
X2			1.000	0.828
X3				1.000

*p<0.05
**p<0.01

From Table 2, it was found that the variables that were positively correlated with learners' key competencies (Y2) were statistically significant at the level of .05, namely the "4 Basic Rules" (X1) section "5 Management Strategies"(X2). "6 Teacher Implementation"(X3) positively correlates with Learners' Key Competencies (Y2) with statistical significance at .01 level. When considering Predictor Variable showed that the "4 Basic Rules" (X1) strategy with "5 Management Strategies" (X2). The "4 Basic Rules" (X1) and "6 Teacher Implementation" (X3) are positively related statistically significant at 0.01 level.

3.3. Results from analysis of Strategy (X1, X2, X3) using satellite distance education system to the student quality in the O-NET (Y1) of the marginal schools in Lower Northern Thailand by Multiple Linear Regression Analysis in Stepwise, in order to identify the best predictor, details follow

Table 3
Results of Multiple Linear Regression Analysis in
Stepwise from using three predictor variables

Predictor Variable	R	R Square	Std. Error of the Estimate	F
X1	0.607	0.369	3.730	10.505*

*p<0.05
**p<0.01

From Table 3, it was found that the "4 Basic Rules" (X1) can predict the quality of students in the Ordinary National Educational Test (O-NET) (Y1) at 36.90 percent significantly with reliability statistics at the level of 0.05

Table 4
Value of Constant, B, Bata,
Std. Error, t by using Stepwise

Predictor Variable	Constant	B	Beta	Std. Error	t
X1	17.128	4.983	0.607	1.537	3.241*

*p<0.05
**p<0.01

From Table 4, it was found that the "4 Basic Strategies" strategy (X1) can predict the quality of students in the basic national educational test (Ordinary National Educational Test: O-NET) (Y1) at statistically significant levels. 0.05 with value Constant=17.128, B=4.983, Beta=0.607, Std. Error=1.537, t=3.241*

The prediction equation for student quality via Ordinary National Educational Test: O-NET) (Y1) in unstandardized is

$$\hat{Y}1 = 17.128 + 4.983(X1)$$

(1)

The multiple regression equation shows that if the implementation of the "4 Basic Rules" (X1) of marginal schools is increased, 1 unit is expected to affect the quality of students in the Ordinary

National Educational Test (Y1) has risen by 4.983 units.

Prediction equations for students Quality in the Ordinary National Educational Test (O-NET) (Y1) in Standardized has the following equation

$$\hat{Z}1 = .607(Z1)$$

(2)

3.4. Results from analysis of Strategy (X1, X2, X3) using satellite distance education system to the Learners' Key Competencies (Y2) of the marginal schools in Lower Northern Thailand by Multiple Linear Regression Analysis in Stepwise in order to identify the best predictor, details follow;

Table 5
The result of Multiple Linear Regression Analysis
in Stepwise from using three predictor variables

Predictor Variable	R	R Square	Std. Error of the Estimate	F
X2	0.761	0.579	0.342	24.774**

*p<0.05
**p<0.01

From Table 5, it was found that the strategy "5 Management Strategies " (X2) can predict student quality in learners' key competencies (Y2) by 57.90 percent with a statistically significant level 0.01

Table 6
Constant, B, Bata, Std. Error,
t value by Stepwise

Predictor Variable	Constant	B	Beta	Std. Error	t
X2	1.858	0.399	0.761	0.080	4.977**

*p<0.05
**p<0.01

From Table 6, it was found that the strategy of "5 Management Strategies" (X2) can predict student quality in the learners' key competencies (Y2) with statistical significance at .01 level. The value are follows; Constant = 1.858, B=0.399, Beta=0.761, Std. Error=0.080, t=4.977*

Student quality predictions equation for learners 'key competencies (Y2) in raw scores (Unstandardized) has the following equation;

$$\hat{Y}2 = 1.858 + 0.399(X2)$$

(3)

From the multiple regression equation shows that If the implementation of the strategy "5 Management Strategies" (X2) of marginal schools increases, 1 unit is expected to affect the quality of students in the Learners' Key Competencies (Y2) has increased to 0.399 units

Student quality prediction equation for learners 'key competencies (Y2) in standard score format (Standardized) has the following equation

$$\hat{Z}2 = .761(Z1)$$

(4)

4. Conclusions

According to the study of the strategy of using the satellite distance education system in Thailand that affects the quality of students of marginal schools in the Lower Northern, the best strategy is

- "4 Basic Rules" (X1) can predict the quality of students in the Ordinary National Educational Test (O-NET) (Y1) with statistical significance at the level of .05. The implementation of this strategy

focuses on the school to explore. Moreover, arranging the environment, including general fundamentals as a whole to facilitate teaching and learning by using the satellite distance education system, is an essential requirement that every school must provide.

- "5 Management Strategies " (X2) can predict student quality in the learners 'key competencies (Y2) with statistical significance at .01 level. Focus on school administrators has acted as the head of the department, which is conducive to teaching and learning by using the satellite distance education system.

5. Discussion and Suggestion

As a result of this study, it can be discussed in essential issues as follows; the "4 Basic Rules" (X1) can predict the student's quality in the O-NET (Y1) with statistical significance at the level of .05. The implementation of this strategy focuses on the school to explore and organize the environment, including necessary infrastructure as a whole to support the teaching and learning by using the satellite distance education system. It is an essential requirement that every school should provide.   Most of the teachers, who teach at the Border Patrol Police School, are not graduated in the education program. When the environment is not well organized to teaching and learning by using the satellite distance education system, teachers were unable to manage the learning process for the learners adequately. It is affecting the student quality test score of O-NET. Therefore, it is necessary for teachers in a school to establish the distance education system should have competencies in manage distance classes, the basic principle in operation, and maintenance of distance education equipment.

The "5 Management Strategies " (X2) able to predict the student quality in the learners 'key competencies (Y2) significantly. The implementation of this strategy purposes the school head and administrators to support the teaching and learning of the satellite distance education system. This strategy plays an important role in the school head-on supporting the Learners' Key Competencies in 21st-Century Skill, to monitor and evaluate the teaching competencies of teachers. Also, supporting the student to gain quality in knowledge and Learners' Key Competencies at the same time for the whole country.

Schools in Thailand mainly focus on developing students to have high O-NET test scores. The testing of O-NET is conducting every year. Besides O-NET, the Learners' Key Competencies are not included in the test, but it is the school duty to develop for the students. Including, the school support the others teaching and learning system supplement the satellite distance education system such as the Development of Thai Learners' Key Competencies by Project-based Learning Using ICT that revealed by Soparat, S., Arnold, S.R., & Klaysom, S., (2015), and the activities increasing the Learners' Key Competencies design by Elena Yuryevna Pogozheva & Natalia Mikhailovna Ushakova, (2018).

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1. Faculty of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand. & Faculty of Education, Pibulsongkram Rajabhat University, Thailand. sakchai@psru.ac.th

2. Faculty of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand

3. Faculty of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand

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