

## Cooperation to Develop the E-Officesystem: A Case of Wangmaidang Pittayakhom School

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### ABSTRACT

The purpose of this research was to study the results of the cooperation to enhance the quality of E-Officesystem development: the case of Wangmaidang Pittayakhom School E-Office in 3 issues as follows; 1) Changes arising from the development of e-Officesystems. 2) Learning from the practice of the researcher, co-researcher, and educational institution. And 3) the body of knowledge that arises from practice as a Grounded Theory. It uses a participatory action research methodology that consists of two cycles of planning, action, observation, and reflection. It is a one-semester cycle, with 20 administrators and teachers as co-researchers, and one researcher, for a total of 21 people. The results of the research showed that; 1) The results of the development of the system “e-Office” Wangmaidang Pittayakhom School had high averages from the evaluation results after the implementation of Circuit 1, and Circuit 2 more than before practice. 2) Researcher and co-researcher learned from action as follows; Awareness of the importance of participating in work. Awareness of the importance of being lifelong learners. An awareness of the importance of Reflecting from Acting, which was originally often neglected. Awareness of the importance of studying theoretical perspectives to complement existing knowledge and experience, and Awareness of the importance of a comprehensive work of Planning, Acting, Observing, and Reflecting. And 3) Gain knowledge from practice as a model based on Kurt Lewin's drive analysis framework, considering Expected Change and Force for Change applied, Including Resistance to Change and Overcome Obstacles, each of which has a description that meets the expectations of Wangmaidang Pittayakhom School e-Office, which is a guideline for developing skills in using e-Officesystem programs until learning skills. It works well in the system. The development of learning to use the e-Officesystem results in Administrators, teachers, and co-researchers have good skills in using the e-Officesystem effectively.

**Keywords:** E-Officesystem development, Participatory Action Research

### INTRODUCTION

The current situation with the practice of documenting with the electronic document system.

Government administration, a new approach that focuses on cost-effectiveness and reduces operational procedures, therefore, it is appropriate to set up a document system to be a systematic operation, with speed, efficiency, and reduce redundancy in governmental operations by adding the definition of “Electronics” and the words “Electronic Correspondence System” which correspond to the Notification of the Office of the Basic Education Commission Re: Guidelines on Document Management Systems with Electronic Office Systems (e-Office). As for the document system for the implementation of the document management system with the electronic office system (e-Office). In the part of the document system to achieve the objectives and meet the goals, can be carried out smoothly, quickly, and about the document management system with the electronic office system (e-Office) (Office of the Basic Education Commission, 2014).

Modernization of the bureaucratic system by stipulating measures for government agencies to apply modern information and communication technology in their administration by using information and communication technology to develop the bureaucratic system into effective practice to enter the Successful in the administration of the new state affairs. Which aims to use the electronic

document system to the maximum benefit to government agencies, increase the efficiency of book delivery, track job status, reduce redundant work processes, and save resources. However, the Office of the Public Sector Development Commission (2008) on the documentary work that is currently used as a document system is a system related to document management and is an important factor in organizational development,

This includes creating, receiving, transmitting, storing, borrowing, and destroying documents to make the search, follow up, which can be done conveniently and quickly according to the regulations of the Prime Minister's Office on Documentation System 1985 (Prime Minister's Office, 2010). Electronic Correspondence System (e-Office) is a system for storing copies of documents digitized and can be retrieved from computer networks and the Internet anytime, anywhere under security. In addition, it also increases the efficiency of communication within the organization to be flexible, convenient, fast, and achieve the objectives of that communication, as well as checking, tracking document status, document processing through the document system in a shorter time (Prisana Mutchima, Saisuda Pantrakool, Benjawan Laoprasert, and Krit Saijung, 2012).

From the results of a pilot study of the current situation and problems of Wangmaidang Pittayakhom School E-Office, it was found that Schools need to develop a system e-Office, because, at present, the school still uses the same management model as the document-focused management system which requires the preparation, receiving, sending, storage, borrowing, and destroy. The work in each step requires a lot of time spent on the journey of documents, which takes a long time to complete each task, and paper copies have to provide a place to store them to wait for further destruction of the book. Schools still lack the use of information technology for convenience, speed, and thoroughness to increase operational potential as a tool to assist in internal and external management by linking wirelessly through the Internet network, which has a form, method of use, and a circuit of electronic archives and has a security system with Username and Password to control access rights. Therefore, Wangmaidang Pittayakhom School should accelerate the development of e-Officesystem to achieve technological efficiency, enhance the efficiency of personnel and agencies, including bringing bugs to improve and correct them to be effective for personnel involved in using the E-Officesystem.

From the main characteristics of Participatory Action Research as mentioned, the researcher believes to be able to respond to the background and significance of the above problems and considers that the development of Wangmaidang Pittayakhom School's e-Officesystem to achieve the research objectives, it is necessary to Receive cooperation and participation from all teachers and administrators to be successful. Which aims to change the original document system to develop the system e-Office, for information management within the organization, allowing staff, personnel, teachers, and related persons to be aware of various information or operations easily. Called the Task system or task calendar, it is easy to assign those responsible for tasks and monitor their performance. In addition to being convenient and fast, it also saves resources within educational institutions and departments.

## **OBJECTIVES**

This research aims to develop the e-Officesystem: A case study of the E-Office of Wangmaidang Pittayakhom School, using participative action research methodology, the nature of this research being the implementation of the Spiral Cycle that no end of Planning, Acting, Observing, and Reflecting.

## **LITERATURE REVIEW**

Participatory action research assumes that the researcher must focus on the study of theoretical perspectives on the development of e-Officesystems: the case of the e-Office of Wangmaidang Pittayakhom School. Because the researcher has to develop himself to have Theoretical Sensitivity, will be able to bring those theoretical perspectives to present to the research co-authors, create discussions, strengthen thinking, and the practice of the research participants to be more effective

according to the concept that *“Practice without additional theories, is like a blind person who can't go far, keeps on the same methods”*.

Therefore, the researcher has studied the theoretical perspectives on the development of E-Officesystems from various sources as follows: Government Gazette (2005, 2017) Kachonsak Phetcharat (2011) Suthida Chailek et al (2012) Thawat Rattanamontri (2009) Janjira Talabkaew and Penpan Pecharasorn (2016) Prisana Mutchima, Saisuda Pantrakool, Benjawan Laoprasert, and Krit Saijung (2012) Rampian Noychiangkun, Suchart Bangwiset and Utai Pleeklum (2016) Kanungsri Nindee and Thanadol Phuseerit (2018) Sudarat Yothawong (2015) Duangjai Pattarasritanawong and Kitti Kaewjumlong (2017) Areerat Meeyen, Chesada Kaewwit, Kudkoa Santhanasuk, and PrayongMahakittikun (2018) Chatchai Somsuk and Kotchakorn Jetinai (2016) ThanwaratKrajang (2014) Warunee Wattanaputi (2015) as following;

Kachonsak Phetcharat (2011) mentioned “Electronic Correspondence System” as a type of information system commonly used by offices for document management nowadays. which according to the regulations of the Prime Minister's Office on Correspondence (No. 2)2005 defined the meaning of electronic documentary system as "the transmission of information or books through the communication system by electronic means. The information systems used to manage documents in some departments may be called electronic office systems (e-Office) or office automation (oa–Office Automation), it depends on the program system (software) of each department.

The advantages of using an electronic document system are: 1) Facilitate the performance of work. 2) Save a place to store documents. 3) Increase the convenience and speed of collecting and searching for information of the agency. 4) Reduce the cost of office operations such as labor, tools, and document storage locations. 5) Improve operations to a globalized or virtual office (Virtual Office). 6) Reduce the staff's process of creating manuscripts, making copies, and destroying documents. 7) Reduce the problem of creating, storing duplicate documents by using the principle of Paperless Office. And 8) saving natural resources.

Disadvantages of implementing an electronic document system include: 1) Reduce face-to-face contact between operators in the agency, causing executives to feel that they have lost control over their subordinates. 2) The use of automation in everyday life can pose a risk when the automatic control system malfunctions. 3) Changes in operating methods may cause operators not to accept the change in work practices and require additional training.

Janjira Talabkaew and Penpan Pecharasorn (2016) Has said that the electronic archive system of Rajamangala University of Technology Isan is a system for storing copies of documents to be digital, and can be retrieved from a computer network anywhere, anytime under a security system developed to increase communication efficiency. within the organization to be flexible, convenient, and fast and achieve the objectives in that communication. In addition, it can also check the status of documents, document processing through the document system in a shorter time. The Electronic Document System uses a Multi Tiers Architecture based on technology, Microsoft.NET that provides data and information services through Webservices, which makes the system able to provide services through the Internet network with full efficiency to support work and document services for all departments and personnel in the organization. Both services are provided through Workstation Client Back office via web browser and E-Mail. The system also facilitates the expansion of the server for document storage services (Document/Storage server) for flexibility in document distribution.

Prisana Mutchima, Saisuda Pantrakool, Benjawan Laoprasert, and Krit Saijung (2012) said that Suan Dusit Rajabhat University is aware of the importance of using information technology to manage and provide services to customers to be convenient, fast, and thorough. This is to increase the potential of working in the organization, thus bringing electronic document systems and electronic management systems. Used to manage the organization by linking all the organization's

information systems into a single E-Office system. Using E-Office information technology as a management tool, it is believed that it will benefit from the 7 P-lesses principles of this electronic office system effectively: 1) Paperless Reducing paper usage through the use of electronic document systems (e-Document) and digital signatures. Signature) instead of signing on paper according to the TH e-GIF standard. 2) Process less, reducing the process and increasing the speed with every connection. Including seeing the work of every process involved in a transparent and immediately verifiable. 3) Placeless, reducing the purchase of office equipment, and being able to work from anywhere over the Internet network. 4) Pollutionless Reducing the use of toner and paper in operations. 5) Powerless, reducing the use of cars and fuel because it is a system that can record the time in – out so it can work anywhere as if coming to work at the office. 6) Peopleless, reducing the number of people working in each process and reducing errors. 7) Paymentless, reducing office expenses such as paper, toner, and copiers, etc.

From the study of theoretical perspectives on the development of e-Office systems from various sources mentioned above, the researcher summarizes the steps for developing e-Office systems as follows; Electronic Correspondence System (e-Office) refers to the use of information technology to manage, and provide services to service users to be convenient, fast and thorough, having an important characteristic in enhancing the potential of working in an organization, which is a system. Electronic documents. The advantages are reduced paper usage, reduced process and increased speed with all systems connectivity, reduced purchasing of office equipment and being able to work from anywhere over the Internet, reducing toner and paper usage. in operation, reducing the use of cars and oil Reducing the number of people working in each step and reducing errors, and reducing office costs. The disadvantages may be caused by the scanner, sometimes the user is not perfect, the machine crashes, causing delays, usefulness is the conversion of documents into a digital format that can store large amounts of data, which also has programs that can compress data for storage, including a laser printer Printer) that shows the results of printing quality images.

## METHODOLOGY

There is a wide range of principles, concepts, and practices about participatory action research, with both common and different sections. For this research, the researcher has used principles, concepts, and practices, as follows: Sanrattana (2018) concluded from the results of the study of the writings of Arhar, Holly, & Kasten (2001), Carr & Kemmis (1992), Coghlan & Brannick (2007), Creswell (2008), James, Milenkiewicz, & Bucknam (2008), Kaewthep (1989), Kemmis & McTaggart (1992), McTaggart (1991), McTaggart (2010), and Mills (2007), which is characterized as; participative action research is bottom-up research in which the researcher and co-researcher participate collaboratively; (Collaboration) that each has equal status (Equally). It is research in which the subject changes their role from being passive to active, or participant or changing the research method from them (On Them). It is researched by them and for them (By Them and for Them) from the processes of Planning, Acting, Observing, and Reflecting as a spiral cycle of continuous operation, and aims for a change that is expected to be a lasting change due to the commitment to what is made out of the participatory role at every stage.

Participatory action research aimed at sustainable development is characterized by an endless cycle of activities in Planning, Acting, Observing, and Reflecting as a Spiral Cycle. However, since this research has limitations on the duration of the curriculum, the researcher has set up 2 research cycles, one semester per academic year, in the 2020 academic year between 1 June 2020 and 31 March 2021. Which are performed in each circuit and each step as follows.

### Circuit 1

**Step 1: Preparation consists of 3 activities:** 1) The researcher explains the research structure to the research participants, their perception and understanding of the subject matter, and research methods so that the decision to participate in the research is voluntary and willing according to the ethics that “The researcher must demonstrate the nature of the research process initially, including the recommendations and benefits to the study participants.” 2) Understanding the techniques used

in research such as planning and Implementation Techniques, Observing and Recording Techniques, brainstorming techniques and lessons learned, and techniques for creating tools for use in research, etc. and 3) Lesson transcripts to know (1) performance, (2) defects or obstacles, (3) observations, comments, or suggestions. 4) Learning from Practice that occurs with the researcher, co-researcher, and agency, and Knowledge Gained from Practice that occurs at this stage.

**Step 2: Planning consists of 4 activities:** 1) Researchers brainstormed using basic knowledge and experience that they had and had done before to find out, “Based on the knowledge and experience of the research participants who have done it before, to develop an e-Office system: the case of the e-Office of Wangmaidang Pittayakhom School, what development guidelines should be developed and how?”. This is to draw out the potential in the research participant to their fullest following the principle that “Participants are a stream of experience with accumulated knowledge and experience, it is not an empty glass, but the potential of self-knowledge.”. 2) The researcher presents the development guideline from a theoretical point of view to the co-researcher as follows: “To improve learning by e-Office system: in the case of The e-Office of Wangmaidang Pittayakhom School, what theoretical views do you have and how?”. This is because the researcher has studied the principles, concepts, and theories about the subject to be developed beforehand, and is therefore considered to be knowledgeable and theoretically sensitive to that principle. The researcher is considered an academic stream with theoretical knowledge and sensitivity in the areas to develop and to create a positive attitude among the research participants that theory and practice are compatible, it's not a parallel line that never meets. 3) Brainstorming for the convergence of the experiential and academic streams to integrate the development approach that the co-investigators have determined and the development path from the theoretical point of view proposed by the researcher according to the principle that “practice without the addition of theories is like a blind person, going nowhere, will continue to do the same thing.” The result of this activity is the action plan and 4) Lesson Learned.

**Step 3: Acting Aim to achieve the results of the action plan set out from Step 2 following the principle of “change-oriented and action-oriented” consisting of 4 activities:** 1) Developing an evaluation form for the achievement of development expectations for the evaluation of three phases: pre-implementation and post-implementation in Cycle 1 and Cycle 2. 2) Assessment to know Current Condition before performing in Circuit 1. 3) Implementation of the action plan set out in step 2. And 4) Lesson Learned.

**Step 4: Observing is the use of various types of tools used in research and collecting data on the results of operations in this step.**

**Step 5: Reflecting,** the researcher uses the conceptual framework of Force-Field Analysis by Kurt Lewin (Lunenburg & Ornstein, 2000) to analyze the Current Condition. What is the Desired Condition that defines both qualitative and quantitative? What is the Force for Change driving force that is used to produce change or how much has it caused the expected change? What resistances to change have occurred, out of the anti-changes, what are some suggestions to increase? The drive power is efficient and reduces the resistance to those changes to a minimum or less. This is to affect the planning of the next 2<sup>nd</sup> round of development. This may be to improve the current drive power to be more efficient or seek a new, more efficient drive to replace, or in the case of adjusting the old and new drive power.

## **Circuit 2**

**Step 6: Planning consists of two activities:** 1) Reviewing the results of the first cycle to bring together the alternatives assessed by the researcher and co-investigators to develop a new action plan. and 2) Lesson Learned

**Step 7 Acting** consists of two activities: 1) Implementing the prescribed action plan, and 2) Lesson Learned.

**Step 8 Observing** Like Step 4 is to use the different types of tools used for research and data collection.

**Step 9 Reflecting** uses Kurt Lewin's Force-Field Analysis framework as reflecting in step 5.

**Step 10 Summarizing** the results from the results of the first and second circuits is the implementation of the Observing results, Interview results, audits, recordings, assessments, and Lesson Learned are given at each stage. Including the results from Reflecting in step 5 and step 9, come to a joint seminar between the researcher and co-researcher to summarize the research results according to the research objectives set.

### **THE RESEARCH INSTRUMENTS**

In this research, the researcher has defined tools for use in research according to the conceptual framework of Mills (2007), which can be classified into 4 groups as follows: (1) Observation. (2) In-Depth Interview and Focus Group Interview. (3) Examining/Record such as Journal, Maps, Audiotapes and Videotapes, Artifacts, Field Notes. (4) Evaluation form for meeting development expectations. and (5) Research Collaboration Assessment Form.

### **DATA COLLECTION**

Researchers and co-researchers played a role in data collection beginning with fieldwork in schools designated research areas in the 2020 academic year between 1 June 2020 and 31 March 2021. It is 2 semesters, 1 cycle per semester by dividing the working time into tables, defining days and months to reveal the facts, both the obvious and the latent, from the 10 steps of participatory action research using various tools.

### **DATA ANALYSIS**

The data obtained from the selected research instruments obtained from the 10 stages of activities, will be jointly analyzed periodically by applying the concept of Amara Pongsapich (1985) as follows: (1) Organize the data into categories based on the objectives of the research to classify phenomena and determine the frequency of their occurrence.(2) Acts are the daily activities, actions, or behaviors of the research personnel. (3) Activities are actions or behaviors that are stepwise and continuous.(4)Meaning is a person's description of an action or activity to know the worldview, beliefs, attitudes of a community.(5) Relationship is the relationship between people in the community involved to know the relationship, conflict, relationship with personnel. (6) Participation is a personal adaptation, cooperation. and allow it to be part of the service activity structure, ready to be united, to know the conflict and the smoothness clearly. (7) Setting is a visual representation of every aspect that can be captured from the field of activities in the 10 stages of participatory action research. (8) Divide the data from the research field recordings into descriptive text sections about activities in the 10 phases of participatory action research. (9) The analysis of the data is based on the descriptive text of events in the 10 stages of participatory action research. Bring the data analysis report of the objectives of the analyzed participant action research to the relevant personnel to confirm and revise the analysis results. and make suggestions to improve the report to be more accurate and complete. Data verification is used by multiple personnel in the event of activity. For the quantitative analysis of the data, the researcher uses the basic statistical values such as percentages and mean values to provide data to compare with goals or to show changes occurring.

## RESULTS

Development of e-OfficeSystem: The case of the e-Office of Wangmaidang Pittayakhom School with the principles, concepts, and practices of such participatory action research. The results of the research objectives are as follows:

### 1. Changes Arising From The Development Of A Given Indicator

In the development of the e-Office system, the researcher and co-researcher jointly developed an evaluation form from 20 administrators and teachers, and 1 researcher, including 21 people in 3 areas: 1) The use of programs in the development of e-Office systems. 2) Enhancing skills in using e-Office programs. And 3) the development of learning to use the E-Office system. The evaluation was conducted in three phases: before and after the first cycle, and after the second cycle. The evaluation results for each program are shown in Table 1-3 as follows:

1.1 The results of the development of the e-Office system before the implementation of Cycle 1 and Cycle 2 showed that there was a change for the better, considering the comparison of the average evaluated before implementation of 3.50 with the evaluation results after implementation. Circuit 1 and Circuit 2 have mean values of 4.48 and 4.66 respectively. The mean and standard deviation are shown in Table 1.

**Table 1:** Comparison results of cooperation for the development of e-Office systems: the use of programs in the development of e-Office systems Overall and item

Using the program in development E-Office system	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
1. Administrators, teachers, educational personnel know using electronic office rooms (e-Office).	2.35	0.67	4.25	0.63	4.55	0.51
2. Administrators, teachers, and educational personnel can use the Electronic Correspondence System, which is a system used to receive and send official documents between departments.	2.65	0.67	4.35	0.58	4.40	0.50
3. Administrators, teachers, educators can use the tools of electronic office systems, including electronic processing and publication systems and group communication systems.	2.75	0.91	4.30	0.47	4.30	0.47
4. Administrators, teachers, educators can work in the use of electronic office tools to communicate through writing and can increase the productivity of work.	2.35	0.87	4.20	0.41	4.65	0.48
5. There is staff to provide knowledge of the operating procedures in the use of electronic office tools.	2.25	0.63	4.55	0.51	4.60	0.50
6. Administrators, teachers, educational personnel can do Image Processing, which is a scan of paper to turn into an Image that can be stored in a database for further use.	2.20	0.69	4.40	0.50	4.75	0.44
7. Project management team can procure and develop hardware and software to support the operation of the designed government letter delivery system.	4.00	0.56	4.65	0.58	4.70	0.47
8. The project management team can monitor internal and external management tasks and have guidelines for the development of the e-Office system.	3.75	0.63	4.65	0.48	4.70	0.47

Using the program in development E-Officesystem	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
9. There is an e-Officesystem manual that is suitable for the context of leading educational institutions, with appropriate innovation and technology to encourage the development of teachers and educational personnel.	3.50	0.68	4.65	0.48	4.75	0.44
10. Administrators, teachers, and educational personnel can practice, have trials, and evaluations of developments to identify flaws and make improvements further.	3.65	0.67	4.65	0.48	4.75	0.44
<b>Total</b>	2.94	0.23	4.46	0.21	4.61	0.20

*Note:* that the Standard Deviation (S.D.) is low, indicating that there is not much variance or distribution of opinion among respondents.

1.2 The results of the development of the e-Officesystem, indicators for enhancing skills in using e-Officeprograms, found that there was a better chance based on comparing the mean assessed before the implementation of 3.62 with the assessment results after the implementation of Cycle 1 and Cycle 2 having mean values of 4.62 and 4.75, respectively. The mean and standard deviation are shown in Table 2.

**Table 2:** Comparison results of cooperation to develop e-Officeenhancing skills in using e-Officeprograms overall and item

Enhancing skills in using E-Officeprograms	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
1. Responsibilities are clearly defined for maximum benefit in working with the e-Officesystem.	3.55	0.68	4.60	0.59	4.80	0.52
2. Educational personnel are involved in planning the use of electronic office system tools.	3.60	0.59	4.60	0.75	4.75	0.55
3. There is a guideline to promote educational personnel about training in the use of the e-Officesystem.	3.50	0.51	4.65	0.67	4.65	0.48
4. The committee responsible for the project provides advice and recommendations to educational personnel in their work.	3.70	0.47	4.55	0.60	4.85	0.36
5. There is an administrator who has already registered the user and can also verify that all users can access the system with the user ID and password generated by the system.	3.70	0.47	4.80	0.41	4.75	0.44
6. Understand special roles/duties and have complete tools	3.70	0.47	4.60	0.59	4.55	0.60
7. Admin has a security system with Username and Password to control access rights and to be a tool for sending and receiving official documents between agencies under the Office of the Basic Education Commission at all levels and in all levels of local administrative organizations.	3.65	0.48	4.40	0.68	4.65	0.58



Enhancing skills in using E-Officeprograms	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
8. Admin can solve problems of electronic document system such as the automatic control system malfunctioned.	3.60	0.50	4.45	0.75	4.90	0.30
9. Admin can help improve and increase work efficiency, whether it is a document system, a training system, a financial system, and supplies, etc.	3.55	0.60	4.80	0.52	4.85	0.36
10. Educational personnel capable of working in using the E-Officesystem effectively	3.70	0.65	4.75	0.55	4.75	0.44
<b>Total</b>	3.62	0.26	4.62	0.15	4.75	0.16

Remarks: Standard Deviation (S.D.) is low, indicating that the variance or distribution of the respondents' opinions was not large.

1.3 The results of the development of e-Officesystems, indicators of learning development in the use of E-Officesystems found that the change was improved based on the comparison of the mean assessed before the implementation of 2.96 with the assessment results after the implementation of Cycle 1 and Cycle 2 having mean values of 4.38 and 4.63, respectively.

The mean and standard deviation are shown in Table 3.

**Table 3:** Comparison results of cooperation to develop e-Officesystems Development of learning in the use of e-Officesystems Overall and item

Developing learning to use the E-Officesystem	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
1. Arrangement by providing electronic office rooms in schools to increase knowledge for administrators, teachers, staff, and use them for effective decision-making.	3.80	0.52	4.45	0.60	4.55	0.51
2. Planning for the use of electronic office system tools, including electronic processing and publication systems and group communication systems.	3.85	0.58	4.50	0.51	4.55	0.60
3. There are practical procedures for using electronic office tools to facilitate communication through writing and can increase the productivity of work operations.	3.75	0.63	4.40	0.68	0.70	0.65
4. There is staff observing the results of operating procedures in the use of electronic office tools.	3.50	0.68	4.50	0.82	0.80	0.41
5. Systematic Reflecting that facilitates communication and increases operational productivity	2.60	0.82	4.55	0.82	4.80	0.52
6. Information in Reflecting, there is the new planning on the management of electronic offices in schools and the use of electronic office tools.	2.25	0.55	4.55	0.88	4.95	0.22
7. Prepare new operating procedures for the use of electronic office tools that enable communication through writing and can increase the productivity of operations.	2.55	0.51	4.50	0.94	4.55	0.51
8. There are tools in Observing, clearly performance to take advantage of for effective decision making.	2.70	0.57	4.25	0.63	4.40	0.50

Developing learning to use the E-Officesystem	Before practice		Circuit 1		Circuit 2	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
9. Take the results of Observing, the results of operations to reflect the results of the performance with the operating procedures of using the tools of the electronic office.	2.20	0.69	4.05	0.82	4.55	0.51
10. The results were summarized in the preparation of Planning, Acting, Observing, and Reflecting in Electronic Office Management.	2.40	0.59	4.05	0.82	4.50	0.51
<b>Total</b>	2.96	0.20	4.38	0.25	4.63	0.17

**Remarks:** Standard Deviation (S.D.) is low, indicating that there is not much variance or distribution of opinion among respondents.

## 2. Learning From Practice

As a result of the development of the e-Officesystem by the principles, concepts, and practices of the aforementioned participatory action research, researchers and co-researchers have learned from the operation. The researcher would like to bring to the attention of the important issues that are mutually agreed upon by both the researcher and the co-researcher in 3 issues as follows: 1) Awareness of the importance of participation in work. 2) An awareness of the importance of being lifelong learners. And 3) an awareness of the importance of Reflecting from a practice that was traditionally neglected.

## 3. Knowledge Gained From Practice

3.1 It is a body of knowledge as a Grounded Theory in the specific context of practical research to enhance the quality of the use of the “e-Office” system in working with the e-Office of Wangmaidang Pittayakhom School. This is not a reference body of knowledge that is the result of quantitative or experimental research. From the overall image processing from Lesson Learned and Reflecting, it was found that this research contributes to the knowledge gained by following Kurt Lewin's framework of Force-Field Analysis considering Expected Change and the Force for Change applied. Including Resistance to Change and Overcome Obstacles.

3.2 Expected Changes in research on E-Officesystem development include: Using a program to develop an e-Officesystem, it is expected that Wangmaidang Pittayakhom School has a standard e-Officesystem and has a good user manual. Enhancing skills in using e-Officesystem programs expect administrators, teachers, and staff to develop skills in learning to use the system as well. And the development of learning to use the “e-Office” system expects administrators, teachers, and staff to develop good skills in using the “e-Office” system.

3.3 Force for Change that the researcher has adopted and believes that results in expected changes for the better in the case of educational institutions, administrators, teachers, and staff. As mentioned before the practice, after the 1st cycle and after the 2nd cycle. The results of each aspect of the assessment can be detailed as shown in Tables 4.23 to 4.26.

3.3.1 Concepts for Development as a direction of operation that the researcher and co-researcher will adhere to increase the efficiency of work as follows: (1) Aim to create participation and promote cooperation between educational institutions in the same area and those involved. (2) Aim to develop educational institutions, teachers, and personnel to have knowledge and understanding of various forms of application systems. (3) Focus on developing learners, teachers, and personnel to learn and work together as a team. (4) Aiming to prepare educational institutions to be ready and have the potential for systematic and efficient work development

3.3.2 Strategies for Development as a framework for the implementation of the development concept that the researcher and co-researcher will adhere to as follows: (1) Build understanding,

awareness, and love for what you do or in your job responsibilities. (2) Strengthen and support operations with prudence, patience, and diligence. (3) Encourage work with care, determination, and responsibility. (4) Create a method for reviewing performance for evaluation. and lead to better development

3.3.3 Ways for Development consists of 3 operating models as follows: (A) Using the program to develop the e-Officesystem consists of 5 steps: (1) Project Planning, (2) draft storyboard messages, (3) develop the program, (4) review the program, and (5) deliver the program. (B) Enhancement of skills in using E-Officesystem programs consists of 5 steps: (1) goal setting, (2) design development, (3) content creation, (4) analysis, (5) optimization. (C) development of learning to use the “e-Office” system consists of 9 steps (1) needs analysis, (2) understanding the content, (3) learning objectives. Use the system, (4) choose a learning strategy to use the system, (5) create an outline, (6) prepare a content outline, (7) create an implementation storyboard, (8) develop an application program, and (9) Upload the application.

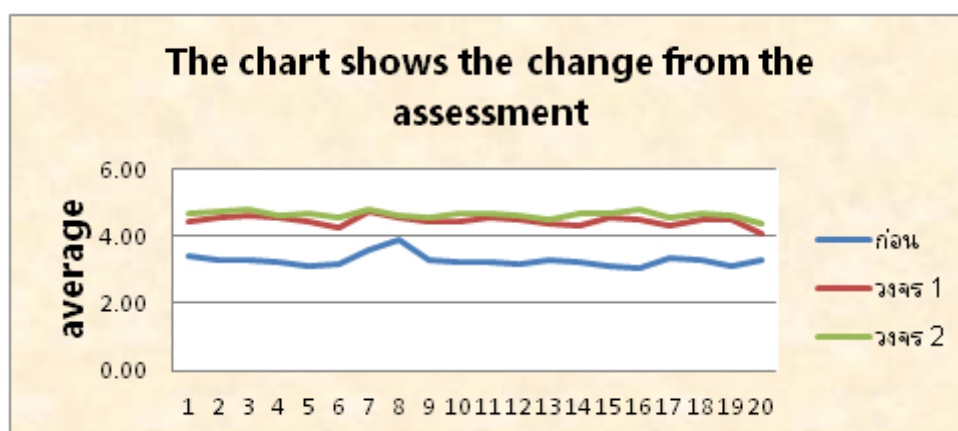
3.3.4 Resistance to Change that occurs in the development of the E-Officesystem is (1) Some of the research participants may not have enough time to participate in the research due to the burden of teaching work. and various tasks that are responsible. (2) Some of you may not have much experience in using technology, making training to increase joint-supervision.

3.3.5 Overcome Obstacles that occur above are as follows; (1) To influence the planning for the development of the e-Officesystem, there should be a collaborative learning process for a complete understanding of the various steps in the joint research process, along with ongoing skills training in every step to achieve proficiency. (2) Adjust the original propulsion and increase the new propulsion to be better than it is, should increase the potential development of the co-researchers on the process, the usability system in the e-Officesystem by increasing the useful skills. Joint work. (3) building a lot of understanding to create awareness of the operation, prudence, and perseverance to take responsibility for the role Functions to use in the e-Officesystem effectively.

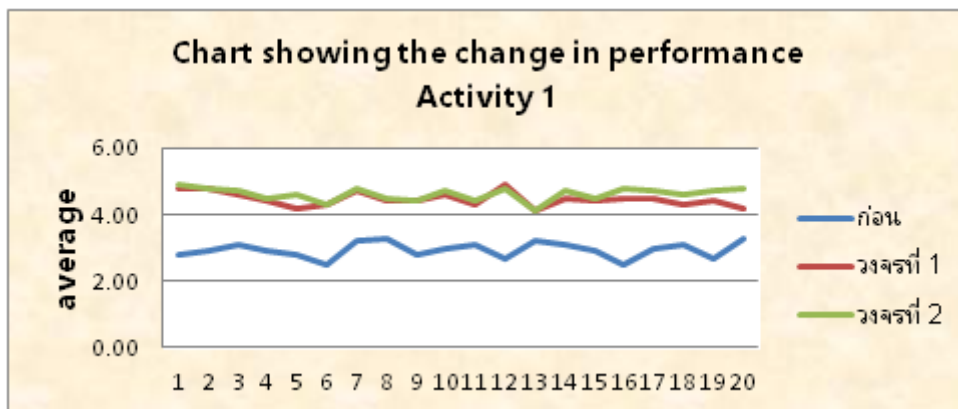
## DISCUSSION

As a result of the above research, there are issues discussed by the researcher as follows:

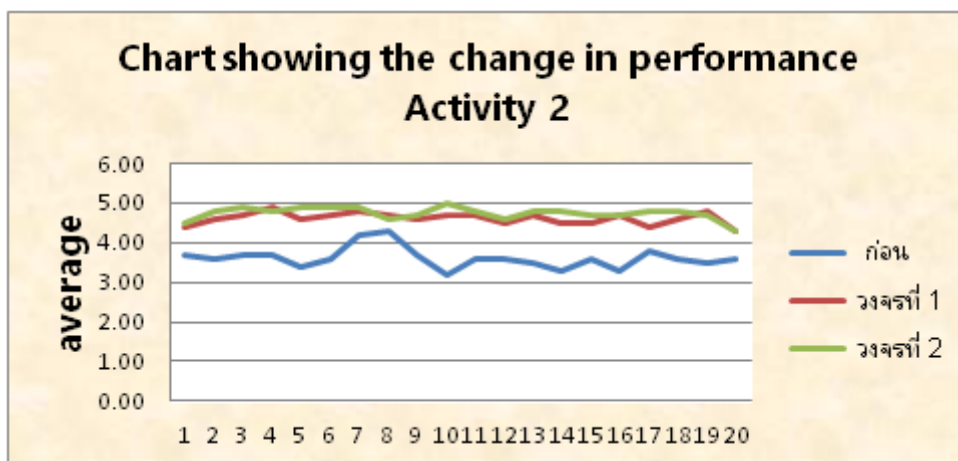
1. Changes resulting from the development of a given indicator found that there were improvements in both the use of the program in the development of the e-Officesystem; Using programs to develop e-Officesystems, enhancing skills in using e-Officeprograms for administrators, teachers, and educational personnel. And the development of learning to use the e-Officesystem to visualize the changes more clearly. The researcher would like to bring a chart showing the comparative changes in each aspect as shown in Figures 1-4.



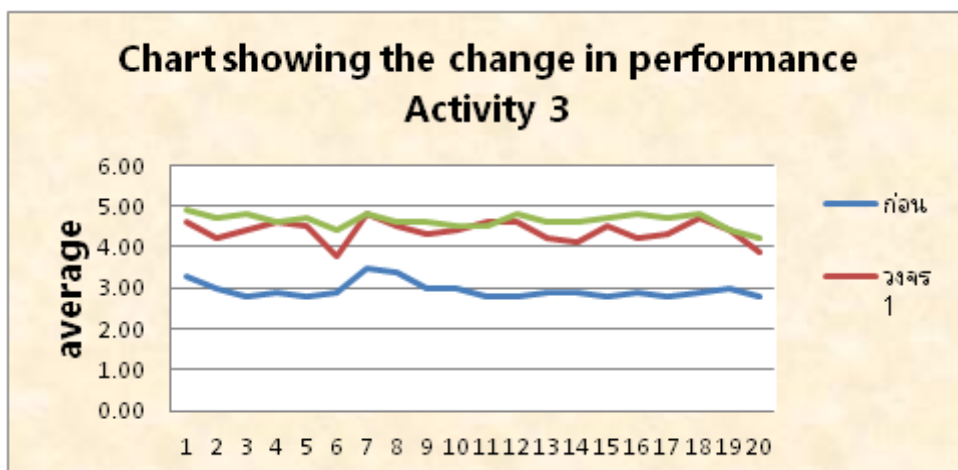
**Figure 1:** Chart showing changes from the evaluation of application implementation in e-Officesystem development before cycle 1, after cycle 1, and after cycle 2.



**Figure 2:** Chart showing the change from the evaluation of the use of programs in the development of e-Officesystems and the use of programs in the development of e-Officesystems before the 1st cycle, after the 1st cycle, and after the 2nd cycle.



**Figure 3:** The chart showing the change from the evaluation of e-Officesystem used in the development of e-Officesystem skills before the 1st cycle, after the 1st cycle, and after the 2nd cycle.



**Figure 4:** The chart showing the change from the evaluation of application practice in e-Officesystem development, learning development in e-Officesystem usage before cycle 1, after cycle 1, and after cycle 2.

The results of the research in Chapter 5 are because the researcher and co-researcher have adopted the Buddhist doctrine as a reminder to work effectively by working following and under the Sanghavathu 4 for use in research, it has the following characteristics: (1) Donation (Giving) is to

advise the research participants to understand. Share enough materials and equipment to operate. Sacrificing time to help occasionally at school's urgent tasks. (2) Speak pleasantly (good speech) is to say polite words to the research team. There is harmony to create goodwill and love and respect, as well as the use of rational use of words as evidence to motivate them to comply. (3) Make as useful (benefit behavior) public benefit as well as helping to improve and improve the ethical way of working together by organizing e-Office system development activities in schools, improving the bug fixes, and presenting creative ideas to the meeting. (4) Equality (always presence) is to act consistently. correct and sanctioned in each case by jointly developing the school on the development of the e-Office system, which makes it very successful and effective in operating the use of the e-Office system.

## **2. Learning From Practice As A Whole**

From the research results, it was found that the researcher, co-researcher, and the e-Office of Wangmaidang Pittayakhom School all agreed on the lessons learned from practice in 3 areas as follows: (1) Awareness of the importance of participation in work. (2) Awareness of the importance of being lifelong learners. and (3) an awareness of the importance of the Lesson. Learned, an often-neglected practice that reflects the positive effects of participatory action research that can transform the thinking and beliefs of all research involved into a better direction. This is considered good learning and valuable because in any future job opportunities. Everyone will apply the learning gained from this research all the time to make their work more efficient and productive (Liebenguth, 2018).

First, the awareness of the importance of participation in the work is because participation is essentially democratic. As Wynton Marsalis said, "We always hear about the rights of democracy, but the major responsibility of it is participation" and participation makes "everyone has the right to express their opinion freely".

Second: Awareness of the importance of being lifelong learners. This is because participatory action research requires individuals with lifelong learner characteristics to implement new learning initiatives for more efficient development. This is because people who learn all the time are those who develop new skills, self-study, learn new activities, learn to use new technologies, and acquire new knowledge "developing a new skill, self-taught study, learning a new activity, learning to use a new technology, and acquiring new knowledge".

Third: An awareness of the importance of Reflecting through practice because "The process of reflection helps us make sense of our day-to-day experiences, it can help us to move forward, to come to decisions, to create a course. of action, to challenge ourselves to switch off autopilot and our habitual ways of doing and thinking".

## **3. Knowledge Gained From Practice**

According to the findings, elements of Expected Change, Force for Change, Resistance to Change, Overcome Obstacles are a set of ideas and beliefs that researchers and co-authors use to influence change according to the given indicator in a better way. It is the knowledge gained from participatory action research in a specific context of the Wangmaidang Pittayakhom School, which is not experimental research or any reference research. Therefore, the knowledge gained from such practice has the characteristics of Grounded Theory that will only be used as a model for the development of operations using the "e-Office" system in the future only, cannot be referenced to apply to other universities. But other educational institutions that are interested may be able to study it, analyze it, and apply it to suit their own context. As Coghlan & Brannick (2007) and James, Milenkiewicz, & Bucknam (2008) stated that "action research results are limited in their dissemination or reference, but it can take into account important points, ideas or events that are suggested for use in other similar situations or that are aiming for a similar change."

## **RECOMMENDATION**

### **1. Research Result Recommendations**

Because the results of this research are not experimental or reference research of any kind. Thus, the knowledge gained through practice is a set of ideas and beliefs about determining the indicators that represent the expected changes. Adoption of the driving factors for change including Concepts for Development, Strategies for Development, and Ways for Development, which comprises the “e-Office” system development program. This includes recognizing anti-change and seeking ways to overcome the anti-change in schools, which will continue to have an endless stream of education from one generation to the next, or from one school year to another in such a way that the workload remains the same. But the students will rotate and turn into new pages every academic year, must take the set of ideas and beliefs from the results of this research as valuable knowledge as a body of knowledge that will be used to enhance the quality of educational institutions. Let it rise longer. Including the search for new ideas and beliefs added at every stage, as there are issues in the recommendations for implementation as follows.

1.1 Adopting a model of development of the “e-Office” system by using a participatory action research process is a work that requires coordination in many areas, whether it is a unit from the Nakhon Ratchasima Provincial Administrative Organization, an expert in using the program. However, due to the factors that educational institutions want to develop the “e-Office” system, along with the development of the skills of administrators, teachers, and staff to work skills that are linked to educational institutions under same Succeed and achieve the objectives according to the expectations of the educational establishment. This cannot be accomplished if the researcher and co-researcher lack principles to facilitate the research, whether it is compassion for one another, sacrificing their own time, using principles of collaboration, brainstorming, acceptance. The opinions of the study participants were very different. This point caused a huge change in the researcher and the co-researcher, otherwise, the collaboration in the development of the “e-Office” system would certainly not be successful.

1.2 Implementing the “e-Office” system development model by using participative action research process to carry out the three activities, sometimes it cannot be carried out all the time due to the outbreak of COVID-19. Constantly, thus causing some activities to stop doing because there is always a risk of disease outbreaks. Therefore, there will be liquidity in the implementation of such activities, and in the implementation of the activities, planning must always be prevented in advance and appropriate activities can be organized from time to time, sometimes requiring training with concise in time.

1.3 Implementing the “e-Office” system development model by using the participative action research process, the performance of the activities performed may be achieved and achieved somewhat normally, due to disease. Covid-19 epidemic and others. Therefore, the researcher and the co-researcher discuss ways together that will make the next activity develop how, or where there is some improvement, should encourage each other to develop each other's potential. next to be beneficial to educational institutions. But what they all have in common is that they work together, so unity is important in doing this research.

1.4 Developing an “e-Office” system using participatory action research processes involves working with a wide range of co-researchers in areas of individual knowledge and education with different qualifications. Therefore, contributing to the success of activity requires sincerity, humility, willingness, respect, and assistance to those who have weaknesses and to create enthusiasm to participate in the activities. Participants work effectively and everyone has a passion to work every time and is motivated to work together to achieve the goals of the school.

### **2 Further Research Recommendations**

2.1 The School should encourage teachers to conduct participatory action research to develop educational institutions to continually organize learning experiences, especially in terms of

developing new skills that are beneficial to the public.

2.2 The School should encourage teachers to conduct participatory action research by encouraging cooperation from other organizations in the community as well, which will generate a wealth of knowledge to develop Participation in the management of education sustainably with participation from all sectors.

2.3 The School should encourage personnel to conduct participatory action research to develop other departments in other affiliations to create a collaborative working literacy.

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