
Promotion of vegetable gardening for household food storage during Covid-19 pandemic of farmers in Praibueng District, Srisaket Province

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Abstract Result found that most of the guardians (95%) of the students grew more than 5 kinds of vegetables. All of the guardians (100%) were chosen to grow organic vegetables and they could perform well in terms of vegetable growing methods and caretaking with their children. These vegetables were used for household consumption and it helped to reduce food expenses by 30%. The promotion of vegetable gardening was truly reduced household expenses with a statistical significance level of 0.05. Findings was showed a statistically significant difference level at 0.01 by student learning achievement before and after the promotion. The farmers were satisfied with the online suggestions of the teachers at the highest level ($\bar{x} = 4.65$). Learning together and attitude inspiration were also found at the highest level ($\bar{x} = 4.38$ and 4.25, respectively). Besides, the promotion process using online media technology stimulated actual practice and created skills in the management of vegetable gardening. The promotion of vegetable gardening also created the pride of local value, participatory learning, learning society (online social media), value-added of yields, and food security of farmer households.

Keywords: Vegetable gardening, Farmer household, Online media, Food security

Introduction

The current situation of Covid-19 pandemic impacts on livelihoods of people throughout the world. Because many measurements are determined by the public sector to, cope with various problems caused by Covid-19 pandemic. Thailand faces the problem of Covid-19 pandemic like other countries but it seems to violent and vaccination is likely cleared to do so. Nevertheless, the impacts and recovery are still different which depending on conditions in each countries such as business type and workforce groups. In other words, those areas under strict measures are under severe economic crisis, especially the service group with more than one - half of the country. Meanwhile, some other business groups have weak financial status before the Covid 19 pandemic crisis

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such as tourism business. For workforce aspect, those red zone with strictly control are expected to be seriously affected which approximately 4.7 million people). Likewise, the agricultural sector is also directly affected by the 19 covid pandemic crisis. Interestingly, almost all workforce in urban areas returned to their hometown due to the shutdown of the industrial sectors and others. As a result, both the public and the private sectors had to find measures to assist and rehabilitate the business sector and workforce in various forms (Chalaemwornng *et al.*, 2021).

Furthermore, it is found that the arised impacts also covered income/expense status and debt/ asset status both formal and informal system, insurance, and household social security. Agricultural household incomes are found to be highly different among farmers. That is household incomes of rice farmers were 60,276 baht per year on average but 27 percent of the household incomes were less than 12,559 baht and almost 10 percent had negative incomes. These households relied for income from the non-agricultural section with a high proportion which 80% of the total household incomes. In other words, 60 percent of the households relied or incomes from the non-agricultural sector. This was particularly for households which can not access to irrigation and those who lost from farming. In addition, more than 40% were dependent on money transfer from relatives who worked in other provinces. It showed that non - agricultural incomes were essential to liquidity enhancement and it helped to relieve financial arousal of most farmer households. Besides, it can be observed that the mismatching of agricultural incomes and expenses which are usually found in the form of seasonality (Chantararat *et al.*, 2020).

Therefore, it can be seen that problems near the farmer household were related to expenses; particularly or household food. The reuniting of family members and relatives, part of the problem was due to lack of food and basic consumables (Saduak, 2020). According to basic data gained from student home visit of Braibueng Wittayakhom School, Sisaket province, it is found that most students' families are engaged in agricultural careers and hired-working during off-season. Meanwhile, the school teaching/learning facilitation was of both onsite and online forms due to the measure of Covid 19 prevention and control. Thus, there was the occurrence of co-learning project between students and their guardians in terms of various forms of agricultural learning such as mixed or integrated learning (Petsangsri, 2012 and Panyakom *et al.*, 2020). Indeed, this study emphasized on the facilitation of co-learning activities between students and their guardians. In this project, the students and their guardians are promoted to do vegetable gardening as the household food warehouse during the current Covid 19 crisis.

Materials and methods

This study employed qualitative and quantitative research in order to gain detailed data from the sample group and concerned informants (Leekitwattana, 2012 and Chalakbang, 2017). The sample group consisted of 38 and their guardians out of 145 secondary school students who enrolled in Agriculture subject in academic year 2020, Praibuang Wittayakom School (Academic Affairs section, Praibuang Wittayakom School, 2020). All of the sample group members were obtained by purposive sampling and they were willing to be in the sample group. The research design was performed by One Group Pre Test-Post Test Design. The research instruments included a learning content on "Organic Agriculture for the household Food warehouse during the Covid-19 Crisis", learning achievement test, questionnaire, behavioral observation form and in-depth interview schedule. Obtained data were analyzed by using frequency, percentage, mean, standard deviation and t - test (dependent).

Research procedures

Step 1, Preparation and development of agricultural learning activities on "Organic Agricultural for the Household Food warehouse during Covid-19 Crisis" This was under the participatory process of learning activities design among the teacher, guardians, and community scholars. The learning achievement test (Pretest and Posttest) comprised 50 question items with 4 alternative choices, Index of Item Objective Congruence: IOC was under the consideration of 5 specialists. This was on the basis of discrimination value, difficulty, validity and reliability.

Step 2, The process of learning facilitation was done under the learning kit learning stations of the school agriculture learning center as well as a home on vegetable gardening of the sample group. Predict Observe Explain: POE (Tortop, 2013) and Blended Learning: BL were used in the teaching step, Meanwhile, learning activities were done through Smartphone, Line and Facebook (Carman, 2005) for 1 semester. learning achievement was assessed through in-depth interview and inquires on student/guardian satisfaction.

Step 3 Learning activities and vegetable gardening practice under learning networks were done.

These are emphasized on the learning activities holding between the Agriculture teacher, students, and guardians under Line and Facebook for 1 semester. Monitoring was conducted once a week for 16 weeks. Also, monthly seminar and learning exchange were done for 4 times, Assessment was done by using observation from, in-depth interview schedule and questionnaire on

student/guardian satisfaction. Home visit was aimed to collect data from the students and their guardians through in-depth interview.

Data were analyzed by using frequency, percentage, mean, standard deviation and t-test (dependent). Data results were interpreted by using content analysis and compared with 5 levels of average Mean score criteria of Boomchom Sri-ard (2010) as follows:

Scale limits	Descriptive Equivalents
4.51 - 5.00	Highest
3.51 - 4.50	High
2.51 - 3.50	Moderate
1.51 - 2.50	Low
1.00 - 1.50	Lowest

Results

Development of agricultural learning activities kit

According to the study revealed that the agricultural learning kit improved in terms of correctness and content consistency under the inspection and suggestions of the 5 specialists. The agricultural learning kit comprised 8 parts as follows: standards or indicators, essence, learning objectives, learning content, learning activities or learning facilitation process, learning sources and teaching/learning media, measurement/evaluation and recorded result after the facilitation of learning activities-besides, there were 6 sub-activities as organic vegetable gardening activities, organic compost making activities, soil improvement activities, crop growing in a container and narrow area, packaging and yield selling and yield utilization and processing. Moreover, the following were found ICO range = 0.50-1.0, discrimination value (r) of the learning achievement test for non-sample group = 0.42-0.93, difficulty value (p) = 0.25-0.74, and reliability value was at 0.94. As a whole, the agricultural learning kit was appropriated.

Organizing learning activities in agricultural learning centers in schools and learning activities with parents at students' homes

Regarding of the study in step 2, findings showed statistically significant between that learning achievement score of the pretest and posttest ($\bar{x} = 25.48$, S.D. = 7.099 and $\bar{x} = 42.26$, S.D. = 3.382 respectively). This step involved the process of agricultural learning activities using the agricultural learning kit, the school agricultural learning center, and organic vegetable gardening at home. It was done under Predict Observe and Explain: POE,

Blended Learning: BL and Smartphone network. It concluded that the agricultural learning kit could develop learning achievement of the student sample group effectively (Table 1). Results of the household vegetable gardening together with the student food learning management for the household good warehouse during the Covid-19 pandemic is shown in Table 2.

Table 1. Number of students, an average mean score, S.D. and pretest/posttest scores with the agricultural learning set on organic agriculture for the household food warehouse during the Covid-19 crisis, t-test values and statistical significance

Item	No.of student	mean	S.D.	t	Sig.
Before	38	25.84	7.099	-12.977	0.00*
After	38	42.26	3.382		

* Statistical significance level at 0.1

Table 2. Number of student (100%) and percentage of results of household vegetable gardening together with student learning management on agriculture subject

Item	n=38	%
Utilization of vegetable gardening yields (More than 1 answer is allowed)		
- Household good cooking	38	100.00
- Selling and giving to neighbors	15	39.47
- Vegetable scraps are made to be Organic fertilizer	29	76.32
- Vegetable scraps are fed to domestic animals such as native chicken, buffaloes and oxen	32	84.21
Sufficiency in vegetable gardening yields using		
- The surplus is sold in the local market	5	13.16
- The surplus is given to neighbors	10	26.31
- Enough for household consumption	22	57.90
- Not enough for household consumption	1	2.63
Impacts on household food expenses		
- Reduction of the expenses for less than 10%	10	26.31
- Reduction of the expenses for 11-20%	11	28.95
- Reduction of the expenses for 21-30%	5	13.16
- Reduction of the expenses for more than 30%	12	31.58
Needs for vegetable gardening		
- Continue and add vegetable growing	13	34.21
- Continue but no adding	18	47.37
- Continue but reduce vegetable growing	7	18.42
- Discontinue	-	-

Table 3. An average means score, S.D. and data interpretation on guardian satisfaction with the facilitation of agriculture learning

Items	Level of satisfaction (n=38)		
	\bar{x}	S.D.	Description
1. The agricultural learning kit on Organic Warehouse Vegetable Gardening as the Household food warehouse during Covid-19 Pandemic	4.30	0.356	High
1.1 Learning content is interesting easy to understand and up-to-data	4.02	0.752	High
1.2 Learning content is useful in knowledge extension	3.92	0.850	High
1.3 Activities are diverse and appropriates in terms of time span	4.10	0.689	High
1.4 Activities can be practiced easily and actual practice can be done	4.68	0.471	Highest
1.5 Authentic teaching media can be found easily, including online media	4.47	0.556	High
1.6 Acquired knowledge and skills can be utilized in daily life activities	4.63	0.488	Highest
2. Farm of mixed learning facilitation	3.75	0.309	High
2.1 Acquisition of co-learning between the teacher, students and guardians	3.31	0.808	Moderate
2.2 Suggestions and learning exchange about vegetable gardening are done through online system	3.89	0.763	High
2.3 This learning type makes students and their guardians have available time to be together	3.58	0.758	High
2.4 The Agriculture teacher can create learning content understanding as well as appropriate practice	3.76	0.883	High
2.5 An appportunity to practice create technology to gain additional knowledge	3.89	0.831	High
2.6 Understanding about teaching/learning facilitation of the school	4.03	0.636	High
3. Change happening to the students / guardians	3.99	0.340	High
3.1 Guardians offspring have more discipline	3.50	0.963	Moderate
3.2 Students have more responsibility, patience and diligence	3.97	0.884	High
3.3 Students can help do house chores more Than before	3.87	0.963	High
3.4 Good attitude towards the teaching/ learning facilitation of agriculture subject	4.52	0.556	Highest
3.5 Students are confident in their guardians more than before	3.94	0.733	High
3.6 Expectation to have a bitten leaning performance	4.11	0.763	High
Total	4.01	0.192	High

According to Table 2, it was found that the guardian sample group grew vegetables together with learning management of the students or their off-springs. They considered and choose varieties and a number of vegetables which was consistent with needs of their families (1 semester). All of the

guardians (100%) used their yields for household food cooking most. This was followed by using vegetable scraps for feeding to their animals (84.21%); making organic fertilizer from vegetable scraps (76.32%); and giving part of the yields to neighbors (39.47%), respectively. The vegetable yields were mostly enough for household consumption (57.90%) which resulted in the reduction of household food expenses for more than 30 percent. The guardians also wanted to grow vegetable in the same amount as before (47.37%). Meanwhile, 34.21% grew vegetables in the greater amount than before due to different reasons such as for increased supplementary incomes and gaining safe vegetables.

Guardian satisfaction with the process of learning facilitation on Agriculture subject based on the agricultural learning kit during the Covid-19 pandemic

Based on data collection through the structured interview schedule conducted with the guardian sample group interview was also conducted with some guardians, details of obtained data were presented in Table 3.

According to Table 3, findings found that the guardian sample group a high level of satisfaction with the facilitation of co-agricultural learning ($\bar{x}=4.01$). Based on its details, they were satisfied to all aspects with high level. However, It was found that the guardian sample group were satisfied with activities which were easy to practice in the actual situation ($\bar{x}=4.68$), and followed by utilizing in daily life activities ($\bar{x}=4.63$). Regarding the happening change to students and their guardians, it was found to be satisfied with and their guardians, it was found to satisfy with the occurrence of good attitude towards the facilitation of agricultural teaching/learning most ($\bar{x}=4.52$).

Besides, the almost all aspects were satisfied at a high level, only 2 aspects were found at a moderate level, occurrence of co-learning between the teacher, students and guardians ($\bar{x}=3.31$) and 2) guardians' offspring had more discipline than before ($\bar{x}=3.50$).

Student satisfaction with the process of agricultural teaching/ leaning facilitation through the leaning kit about organic agriculture as the household food warehouse during Covid-19 pandemic

Details of data gained from the student questionnaires related to student satisfaction with the learning kit and other aspects were shown in Table 4. According to table 4, results of the study revealed that, as a whole, the student sample group were satisfied with the learning kit at a high level ($\bar{x}=4.14$). All aspects was also found at a high level as follows: benefits gained from the

learning kit (\bar{x} =4.34); learning media (\bar{x} =4.12); learning activities (\bar{x} =4.11); learning content (\bar{x} =4.05); and measurement/evaluation (\bar{x} =3.97); respectively. The following were found at a highest level: each activity has authentic media (\bar{x} =4.79); skills acquired from actual practice (\bar{x} =4.79); learning through. Application in the cell-phone and computer program (\bar{x} =4.78); and self-actual practice (\bar{x} =4.66).

Table 4. Mean, S.D. and data interpretation lasted on a level of student satisfaction with the learning kit

Items	Level of satisfaction (n=38)		
	\bar{x}	S.D.	Description
1. Content	4.05	0.260	High
1.1 Easy to understand	4.08	0.539	High
1.2 Interesting	4.21	0.703	High
1.3 Up-to-date	3.60	0.823	High
1.4 Appropriate and consisted with time span	4.05	0.566	High
1.5 Useful and can be extended	4.30	0.731	High
2. Facilitation of learning activities	4.11	0.231	High
2.1 Appropriate with time span	3.66	0.745	High
2.2 The teacher is friendly	4.34	0.480	High
2.3 Student participation in teaching/learning activities	4.47	0.889	High
2.4 Environment contributes to the facilitation of activities	3.42	0.480	High
2.5 Student actual practice	4.66	0.569	Highest
3. Learning media	4.21	0.231	High
3.1 Appropriate with learning content	4.00	0.569	High
3.2 Appropriate with learning activities	4.45	0.760	High
3.3 Help understand learning content	3.55	0.541	High
3.4 Up-to-data and consistent	4.23	0.759	High
3.5 Each activity has authentic media	4.79	0.591	Highest
4. Measurement and evaluation by the teacher	3.97	0.335	High
4.1 Appropriate evaluation method	3.74	0.759	High
4.2 Appropriate evaluation criteria	4.03	0.592	High
4.3 Appropriate evaluation time span	3.95	0.612	High
4.4 Evaluation is based on fact	4.36	0.541	High
4.5 Learner participation in evaluation	3.79	0.576	High
5. Benefits gain from the learning kit	4.34	0.262	High
5.1 Able to learn and understand learning content easily	4.03	0.636	High
5.2 Skill acquisition through actual practice	4.79	0.413	Highest
5.3 learning through diverse	4.18	0.608	High
5.4 learning through application the cell-phone and computer program	4.78	0.410	Highest
5.5 Able to apply to daily life activities	3.92	0.673	High
Total	4.14	0.139	Hugh

Regarding interview and group discussion, most students were confident due to the blended learning, teacher’s suggestions and actual practice. They perceived that the process of technology and online media using in teaching/learning activities encouraged being energetic and eager to learn. Besides, organic vegetable gardening activities could build disciplines, pride and good attitudes towards agriculture. Furthermore, the student sample group were proud of their guardians as food producers for people in their community or the country. They believed that organic vegetable gardening was safety and it built the food security especially during Covid-9 pandemic crisis.

Results of the study related to the promotion of organic vegetable gardening during Covid-19 pandemic together with the integrated agricultural teaching and learning of the student sample group and their guardians can be illustrated as in Figure 1.

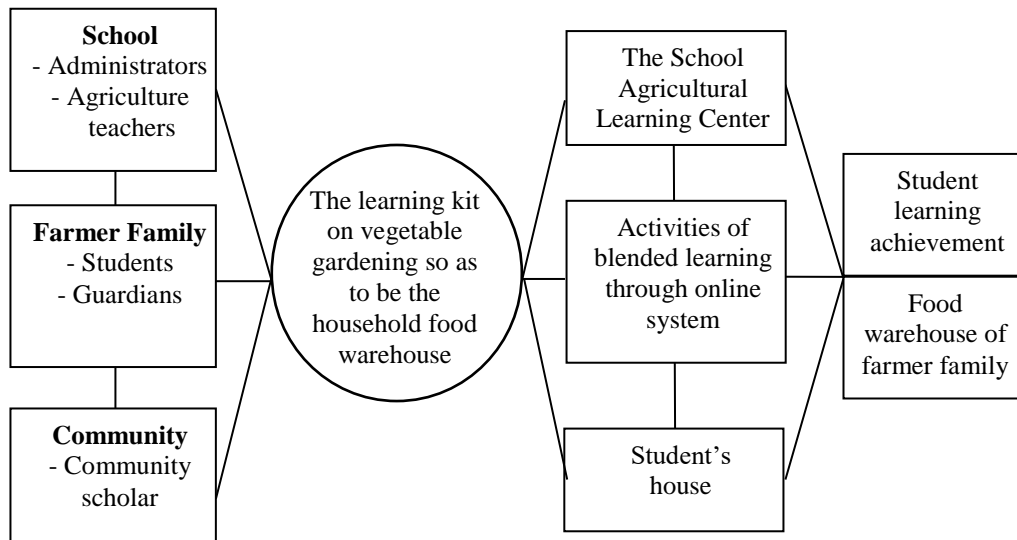


Figure 1. Connection of the agricultural learning activities facilitation by promoting organic vegetable growing so as to be the household food warehouse during Covid-19 pandemic for farmers in Phraibueng district, Sisaket province (2020)

Discussion

The promotion of organic vegetable gardening to the household food warehouse during Covid-19 pandemic found the seamless link of the problem solving on the agricultural learning facilitation affected by COVID - 19 epidemine. The properation and development of the agricultural learning kit

was also concerned on the basis of experience in the development of the school agricultural learning center for students people in the community and interested people. They were given an opportunity to learn agricultural theories and practice supervised by the Agriculture teacher and the local scholars (Saduak *et al.*, 2019 and Sangnate, 2019). Indeed, the agricultural learning facilitation was adapted to be appropriate and consistent with current situations. The student sample group and their guardians were chosen for appropriate agricultural learning activities on organic vegetable gardening. This blended learning was taken place in the school agricultural learning center and at home for organic vegetable gardening. This passed discussion and consideration of the agricultural teaching, local scholar, students and guardians which more than crop varieties for choosing, for example spring onion, water spinach, shallot, chili and local herbal plants. Vegetable growing and care were systematic passing co-learning with between the agricultural students and guardians communication channels were mostly through to facebook and application line. Home visit was sometimes practice. This truly conformed to practice guidelines of the school during COVID-19 pandemic (Phraibueang Wittayakom School, 2020).

Results of the agricultural learning facilitation could be classified into 2 main paths as follows:

Learning achievement of the student sample group based on the agricultural learning kit. There was statistically significant difference in averaged mean score before and after using the learning facilitation which developed knowledge, skills and experience of the sample group. Findings showed that the students and their guardians were satisfied with it at a high level; particularly on actual practice and using of application in the cell phone and computer program. This conforms to a study of Saduak *et al.* (2015); Srisuwan *et al.* (2019); and Ritsongmuang *et al.* (2018) which found that blended learning and online media using to improve learning management of students at a statistical significance level. It was found mostly satisfied. Besides, the student/guardian sample group perceived activities of the agricultural learning facilitation which the actual practice and not difficult to utilize the daily life activities. Student/guardian participation in the agricultural learning facilitation was also consistent with the educational facilitation under the National Educational Facilitation Act which was importance on actual practice or experience and continual learning. Importantly, learning facilitation can happen any where and anytime depending on potential, interest, readiness and satisfaction of the learner (Government Gazette, 2013). Also, guardian participation had a positive effect on student learning and the guardians are satisfied with their offspring participation. (Sathanasaowapak *et al.*, 2013; and Saduak *et al.*, 2015).

Outcomes of the organic vegetable gardening at home together with learning management of the student sample group during Covid-19 pandemic *was recorded. It was found that the students grew organic vegetables with their guardians* in accordance with steps of the agricultural learning facilitation. All student and guardians in the sample group received the yields for cooking or household consumption and given to their neighbors. The remaining some was sold in the local market for supplementary income. Moreover, it reduced household food expenses for more than 30 percent. Most of the students and the guardians continued growing organic vegetables to gain safety food, reduced food expenses and obtained supplementary incomes. Saduak *et al.* (2015) claimed that guardians of students taking Agriculture course were aimed to support the students for agricultural activities at home due to safety food expenses. The vegetable gardening is convenient and consistent with the needs of the family for safety food, reduction of household food expenses and food security. It can be seen that the agricultural teaching/learning facilitation is related to daily life activities. In other words, it can be explained for crop husbandry, yield management, using technology for increased yields, etc and helped instill thrift, responsibility, discipline, diligence, tolerance, carefulness, environmental conservation and code of conduct. Importantly, agricultural subject become the importance in actual practice/experience and skills. Hence, the agriculture teacher must facilitate to diverse learning activities both inside and outside the classroom. Moreover, the agricultural teachers are most deeply understood about teaching/learning forms or styles of themselves and their students for good planning of teaching/learning facilitation (Srisut *et al.*, 2020; Tanapanyaratchawong, 1988; and Moonkham and Moonkham, 2002). The mentioned result led to the integrated educational facilitation, blended learning and teaching methods which are consistent with current situations, technology/innovation, needs of learners and guardian satisfaction.

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