

Developing Participatory Learning Mechanism in Good Agricultural Practices Following Sufficiency Economy Lifestyle of Ban Pong Yaeng Nai School, Mae Rim District, Chiang Mai Province

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Received: April 18, 2022

Accepted: June 1, 2022

Online Published: July 6, 2022

doi:10.5430/jct.v11n5p79

URL: <https://doi.org/10.5430/jct.v11n5p79>

Abstract

This research's objective was to develop the participatory learning mechanism in good agricultural practices following the sufficiency economy lifestyle of Ban Pong Yaeng Nai School, Mae Rim District, Chiang Mai Province. The findings revealed: 1) the overall cognition of safe cultivation by applying good agricultural practices for the lunch project was low. As the guidelines of participatory learning mechanism, the school required safe food agriculture and applied information to develop nine learning bases the Kindergarten One to Grade Sixth. The design and learning mechanism's results were (1) a group of the participatory learning-driven working group performed the determined duties, (2) the nine learning bases with a high-level accuracy and appropriateness. Additionally, the results of driving a participatory learning mechanism for safe food were high. The overall satisfaction with the students' career skills, knowledge, and understanding of safe agriculture among the teachers and parents was high. Furthermore, the participatory learning mechanism in good agricultural practices following the sufficiency economy lifestyle of Ban Pong Yaeng Nai School, Mae Rim District, Chiang Mai Province as the possibility, satisfaction was at a high level, and the advantages were at the highest level.

Keywords: participatory learning mechanism, good agricultural practices, sufficiency economy lifestyle

1. Introduction

Schools are institutions creating important bodies of knowledge for the community. This knowledge needs to apply the strategies and guidelines formulated by the government in educational management. Therefore, they can develop people to become significant resources in the country's development to achieve the defined vision. Ban Pong Yaeng Nai School is an important community institution located in Ban Pong Yaeng Nai, Moo. 1, Pong Yang Sub-district, Mae Rim District, Chiang Mai Province. It is an agricultural area such as vegetable cultivation, orchards, etc. The teaching services from Kindergarten One to Grade Sixth have been provided to 258 students in 2019. It has employed 15 government teachers and educational personnel, covering an area of approximately 4,284 square meters, with service areas in five villages that send children to school. However, the previous educational management results showed that the urgent problems that schools must urgently address student health problems. According to the analysis of the metabolite substance of the organophosphate (Ops) chemical group in the urine of 79 students (Ban Pong Yang Nai School, 2019), it showed 11.72+12.56 mcg/g creatinine. This amount was higher than children who did not live in agricultural areas (equal to 6.11+5.26 micrograms per gram of creatinine) as 100%. It showed that no systematic assistance for Ban Pong Yaeng Nai School students to reduce the amount of organophosphate (OPs), chemicals, a group of phosphorus-based organic compounds found in insecticides and pesticides, or use small amounts of OPs can cause death to people and animals. The most common cause of death was respiratory failure due to the inability of the diaphragm and intercostal muscles, suppression of the brain's respiratory control centre, the constricted bronchi, and the presence of abnormal bronchial secretions. Moreover, Winai Wananukul et al. (2019) also described OPs and carbamate as a group of substances with frequent toxic effects. They have a higher mortality rate than general poisoning in Thailand. This is caused by touching while working, self-harm and food contamination, wide usage, and

easy availability. Moreover, many farmers do not have enough knowledge of the substance, lack self-defense in the application, and have poor storage without enough safety. Therefore, Ban Pong Yaeng Nai School, located in an agricultural village, recognized the need to address students' health problems urgently. As a result, the researchers came up with the idea to rely on the school as a mechanism to work with the community on systematic, safe cultivation from production, harvest, distribution of production until consumption. The Sufficiency Economic Lifestyle is applied relating to the social landscape, the context of the area, and responding to the community's needs. This lifestyle focuses on economy and simplicity, but high benefits to obtaining raw materials such as safe vegetables for students' breakfast and lunch program because they need to consume at school year-round for no less than 200 days. If started systematically, building cognition both in the school and the community, collaborating concretely, will result in a healthy solution and positively affect the students' intellectual development and the parents' health.

For the reasons mentioned earlier, the school collaborating with the research team of Chiang Mai University, initiated a research project, "Developing Participatory Learning Mechanism in Good Agricultural Practices Following Sufficiency Economy Lifestyle of Ban Pong Yaeng Nai School, Mae Rim District, Chiang Mai Province." It is a project that will be applied to systematically solve and prevent problems both inside and outside the school, including developing a prototype for the good agricultural school-based practices. It is a practical integration to achieve concrete results as the school base that can create the area-based and local economy as a platform for integrating cooperation between networks with the community for sustainable strength. The main objective of this research focuses on developing the participatory learning mechanism in good agricultural practices following the sufficiency economy lifestyle of Ban Pong Yaeng Nai School. Additionally, it also has the sub-objectives: 1.1) to study the cognition and participatory learning; 1.2) to design and develop the participatory learning mechanism; 1.3) to drive the participatory learning mechanism; and 1.4) to assess the participatory learning mechanism in good agricultural practices following the sufficiency economy lifestyle.

2. Method

This research is the development of the participatory learning mechanism in good agricultural practices following the sufficiency economy lifestyle of Ban Pong Yaeng Nai School, divided into four steps as follows:

The first step is to study cognition and participatory learning in good agricultural practices following the sufficiency economy lifestyle, integrating two processes:

1.1) The public hearing is a method for studying, allowing all stakeholders to jointly propose and make decisions about the level of knowledge, the same understanding, and consensual needs leading to concise goals. The total subjects were 220, the representatives of the Basic Education Commission Committee and student parents, school administrators, teachers, and qualified experts. They were randomly selected by Purposive Sampling. The questionnaire on cognition of the participatory learning in good agricultural practices was used as the research instrument.

1.2) There were 38 representatives of the Basic Education Commission committee and student parents, school administrators, teachers, and qualified experts, and they were randomly selected by Purposive Sampling. They attended workshops and interview with qualified experts to study the guidelines of participatory learning in good agricultural practices. Consequently, all stakeholders, both operators and those with good practice, have cooperatively presented the operational guidelines that have been practiced in the past and have been accepted for implementation to achieve the goals set. The data were recorded by workshop recording and interview forms.

The second step is to design and develop the participatory learning mechanism in good agricultural practices, gathered the data from the workshop so that all stakeholders and scholars have summarized as an operational guideline for implementation in accordance with the goals set. The subjects included 38 representatives of the Basic Education Commission committee and student parents, school administrators, teachers, and qualified experts, and they were randomly selected by Purposive Sampling. The data were collected by (1) workshop recording form and (2) accuracy and suitability assessment form of the participatory learning mechanism.

The third step is to drive the participatory learning mechanism in good agricultural practices, employed 170 the representatives of the participatory learning-driven working group, student parents participating in this project, school administrators, teachers, and Basic Education Commission Committee. Purposive Sampling was applied for the subject selection. The research tools consisted of a workshop recording form, a questionnaire on the students' satisfaction with career skills, as well an opinions survey questionnaire.

The fourth step is to assess the participatory learning mechanism in good agricultural practices and use public hearings for the data collection. Finally, all stakeholders jointly assess and make decisions about the operation's feasibility,

usefulness, and satisfaction, whether it achieves the set goals or not, and how. A total of 60 subjects obtained by Purposive Sampling included the representatives of the Basic Education Commission committee, student parents, school administrators and teachers, qualified experts, and learning networks. The research instrument comprised the assessment of feasibility, usefulness, and satisfaction.#

The statistics used in the data analysis were percentage, mean, standard deviation, and content analysis.

3. Results

The findings of the cognition and participatory learning in good agricultural practices following the sufficiency economy lifestyle are as the following:

Before starting the project, the overall level of cognition about safe cultivation for the lunch program was low. The least mean item was cognition of safe cultivation by applying good agricultural practice for the lunch project was at a low level. The top three demands are sorted in descending order as vegetables included yard long beans, kale, and chayote, and livestock with chicken eggs, chicken, and fish, respectively. The cause may be that generally, most people and parents understand that the role and responsibility of the school teachers are to supervise and is responsible for the arrangement of lunch for all students each semester by choosing good and safe agricultural produces. As a result, people do not need to participate in the operations from cultivation to producing raw materials and pass them on to the lunch project. It may be understood that the products used in cooking should be inspected for cleanliness toxic substances by the responsible persons. Moreover, some people and parents still believe that safe cultivation has a problematic and complex operation inconsistent with the original conditions of occupation in the community. Therefore, it resulted in the overall cognition of safe farming for the lunch project was low.

The study of information on the demand for production and agricultural methods with the good agricultural practice for the lunch project following the sufficiency economy lifestyle revealed that vegetables with the safe cultivation could be developed as a learning base for Kindergarten One to Grade sixth of nine bases, project-based learning management developed jointly between the Basic Education Commission committee, school, and parents. They collaborated preparing the details about safe cultivation according to the sufficiency economy lifestyle as 1) preparation of materials, equipment, and space; 2) collaborative learning among teachers and student parents; 3) learning management in the designated areas, and 4) monitoring, evaluation and publicity to achieve systematic operation. This may be because most of the demanded agricultural produces as vegetable gardens exist and are grown in the community. They are easy to find, and some families grow them for sale and cook for household food. Consequently, it creates demand for producing and farming methods by applying good agricultural practices.

The findings of the design and development of the participatory learning showed that:

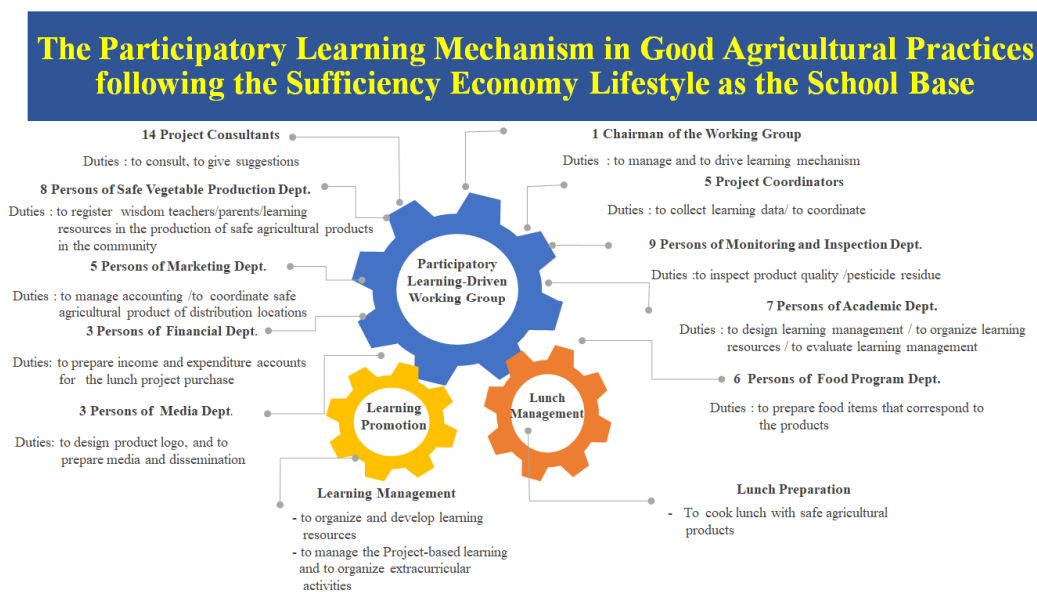


Figure 1. The Participatory Learning Mechanism in Good Agricultural Practices

The participatory learning mechanism included 1) 61 persons in the participatory learning-driven working group, consisting of (1) project consultants; (2) chairman; (3) project coordinators; (4) Monitoring and Inspection Department; (5) Academic Department; (6) Food Program Department; (7) Safe Vegetable Production Department; (8) Marketing Department; (9) Financial Department; and (10) Media Department, and 2) the results of the development of a learning base for good agricultural practices showed the nine bases of the participatory learning management: Kindergarten One to Grade Six. The overall results of the accuracy and suitability assessment of the participatory learning mechanism were at a high level. Therefore, there will be a participatory learning mechanism as a cooperative learning-driven working group with a clear structure and composition. There is a design plan for the operation, clear follow-up, and consultation, allowing the operation to achieve the set goals. This is consistent with the participatory learning mechanism in good agricultural practices that has been developed.

According to the drive of the participatory learning mechanism pointed out that 1) all parties of the participatory learning-driven working group worked on their responsible duties as an assignment. This might be because driving the learning mechanism is the collaboration of all parties with the readiness to learn and work collaboratively to achieve the set goals, starting from planning, implementing, and systematically monitoring the results as the school as a base and extending the results the community. For example, the chairman was the leader in driving learning about safe cultivation in school and coordinated with the working group of 61 people. The academic department worked with teachers to design learning management for students using learning resources, and wisdom teachers working on safe cultivation in the community created nine learning bases using project-based learning. The Food Program Department prepared a food menu corresponding to the Thai school lunch program each month and prepared a lunch list for students in one semester. The lunches were cooked from products of community-safe agriculture. Safe Vegetable Production Department created a register of wisdom teachers/learning resources to manage safe cultivation in the community and followed up on producing safe agricultural products to deliver to the lunch project. Media Department collected photos, clips of the operation of teachers, students, learning resources, wisdom teachers to produce short video clips about safe cultivation both inside and outside the school, publicize student work, and learn management via online media such as YouTube for Ban Pong Yaeng Nai School and Safe Vegetable Channel, etc., 2) the finding of learning management on the participatory learning mechanism as the learning bases for each level was learning management with the project-based- learning for all levels. This may be because cooperative learning management is the design and planning of the learning-driven working group, teachers, parents, wisdom, and students for safe cultivation according to the sufficiency economy lifestyle. It brings the cognition and co-operating according to the planned design, and 3) the follow-up and consulting results revealed the significant problems and obstacles as (1) the budget for the supply of seeds and equipment was insufficient; (2) the area for safe vegetable cultivation was limited. The suggestions include: (1) publicizing and inviting parents to participate in planting safe vegetables distributed to the scheduled lunch program; (2) preparing lunch menus to determine the needs of safe vegetables for producers; (3) announcing honoring parents participating in the project “Family plants Safe Vegetables” and expanding it to the other parents; and 4) creating the effect of driving participatory learning mechanism that consists of:

4.1) The metabolite determination of organophosphate, OPs) in the urine of students by Ban Pong Yaeng Nai Sub-district Health Promoting Hospital (2021) were reported as detailed in Table 1.

Table 1. The Results of the Metabolite Determination of Organophosphate, OPs) in the Urine of Students

Checking Time	Date	Results (with person)				Total (person)
		Normal	Safe	Risky	Not Safe	
1	20 July 2020	13 (13%)	27 (27%)	56 (56%)	2 (2%)	100
2	19 March 2021	25 (25%)	64 (63%)	8 (8%)	4 (4%)	101

Resource: Ban Pong Yaeng Nai Sub-district Health Promoting Hospital (2021)

4.2) Amount of agricultural produce for food safety of the lunch project showed the important vegetable as yard-long beans, kale, squash, Chinese cabbage, cabbage, pumpkin (shoots), chayote, sweet bamboo shoots, Japanese cucumbers, and queen tomatoes. In one semester (five months), the consumption amount was 600 kilograms per type, chicken eggs at 160 stalls, and quail eggs at 20,000 stalls.

4.3) The overall satisfaction with the students' career skills was at a high level.

4.4) The overall cognition about safe cultivation among teachers and student parents was high.

From the effectiveness of driving participatory learning mechanism in good agricultural practices, items 4.1-4.4 have resulted in better performance and meet the specified goals. Furthermore, it showed that the student parents and students gain the cognition and awareness of safe vegetable consumption, thus likely resulting in increased toxicity testing among the safe group.

The results of the participatory learning mechanism assessment indicated that the overall feasibility and usefulness of the mechanism were at a high level and the highest level. In addition, the overall satisfaction of those involved in the mechanism was at a high level. It might be that the developed participatory learning mechanism was initiated from hearing the actual problems in the area, and seeking solutions by using participation from all sectors to work on design, plan, operate, monitor, audit systematically, and follow the established procedures. Therefore, the results of the feasibility assessment and the overall usefulness were at a high level and the highest, respectively.

4. Discussion

Before the project, the findings on the cognition and the participatory guidelines showed that the overall cognition on safe cultivation with the application of the good agricultural practices for the lunch project was low. These reasons are consistent with the findings of Phunphiphuk Ratharattanasakul (2012) found that farmers felt that the produces with safe and qualified cultivation are in the market's demand, worth the investment, are safe for consumers, improve farmers' lives, and do not affect the environment and living things. However, they also feel that organic cultivation is safe based on good agricultural practices, but it is also a complex implemented system.

The study on demand for safe cultivation produces for the student lunch project sorted from the highest to the lowest demand; the first three types of vegetables are a yard long beans, kale, and chayote, and livestock is eggs, chickens, and fisheries, respectively. Moreover, they are also suitable for cultivation in the Ban Pong Yaeng Nai area and are necessary to build food security by own growing and eating in the community. It is consistent with the study of Nikom Sri Ngoen (2019). It indicated that to build food security based on the diversity of vegetable crops; there should have 1) adhere to the principle of building food security by self-reliance by increasing enough variety of vegetables, being safe for life, and being environmentally friendly to the soil, water, and air.

The study of information on demand for produce and cultivation methods revealed that the vegetable garden with safe cultivation could be developed as a learning base for Kindergarten One to Grade Six with nine bases. Moreover, the project-based learning management can be developed collaboratively between the Basic Education Commission Committee, school, and parents. It may be because community leaders, Basic Education committees, student parents, and the teachers in the school were informed significance and facts concerning the problems occurring in the community, which significantly exceeded the standard of toxic residues in the students. This is consistent with the data obtained on demand for products in the community. That should cooperate in the implementation of safe vegetable cultivation for the school lunch project and see the possibilities from the information from the school administrators as a learning center according to the Sufficiency Economy Philosophy and the qualified persons with knowledge and experience in safe cultivation. As a result, all parties are aware and voluntarily collaborate for agriculture by applying good agricultural practices. It is consistent with Nawin Kaewduang (2015) study that there should be cooperation of those involved, including those with knowledge, expertise, and farmers, for correct practice in the promotion and development of safe vegetable production.

The results of the design and development of the participatory learning mechanism revealed that the mechanism in good agricultural practice consisted of 1) The working group to driven- participatory learning had 61 people, and 2) The result of the development of a learning base for good agricultural practice revealed the management of project-based learning from Kindergarten One to Grade Six because the participatory learning required by the stakeholders must derive from the involvement of all parties with clear roles, duties, and missions consistent with the knowledge and each individual's ability. It is compatible with Thomas (2015), participatory learning is a learning method that engages learners with community, a learning process fostering analysis and learning. It includes needs analysis, planning, monitoring, and evaluation. The study of Watcharaporn Jantanukul (2017) also showed that creating a precise cooperation mechanism could coordinate and is a vital force in work leading to further success.

The overall assessment of the accuracy and suitability of a developed participatory learning mechanism was high. This may be because the participatory learning mechanism developed through brainstorming, collaborative design, and a learning mechanism along with the community context can achieve concrete goals that have been designed in the future. It is also in line with Sarawanee Kitdet (2015), who found that creating mutual awareness about the process and using the meeting for exchanging knowledge and organizing activities allowing each person to reflect on

their thoughts will lead to further goals. The driven participatory learning mechanism results indicated: 1) The performance of the participatory learning-driven working group showed the assigned roles. This is consistent with Caldwell (2003), which details that school-based administration is the decision on the resource usage (including knowledge, technology, authority, materials, staff, time, and budget) to make decisions at the school level within the framework of local and state policy. They can share the responsibility and check on resource allocation. Additionally, the drive of the participatory learning mechanism is the application of good agricultural practice in the safe cultivation of food for students. Emphasis is placed on operations being in line with the sufficiency economy lifestyle, social landscape, local context, and responding to community needs. The focus is on the economy, simple but highly beneficial by making cultivation available in the community as a raw material for the student lunch project, and if implemented under the developed mechanism, it will create sustainability and affect the health of all villagers; 2) The results of participatory learning management developed into a learning base for students at each grade level include, participative learning management by using the projected base for Kindergarten One to Grade Six. This is in line with Preeyanuch Pibulsarawut (2007) concept that driving the sufficiency economy philosophy in the education sector must encourage everyone to have cognition its principles first. It may be based on "understanding, accessing and developing" methods cultivated through school activities; 3). Follow-up and consulting results found problems and obstacles such as the insufficient budget for seed and equipment procurement, and limited area, and there are suggestions such as public relations and inviting parents to participate in the planting of safe vegetables for sale to the scheduled lunch project; 4) Effectiveness of driving the participatory learning mechanism is: (1) the decrease of the metabolite content of organophosphate, Ops. in the students' urine. It is compatible with the study of Wanakorn Yoosun (2017), which indicated that a concise learning management structure, conducting life with a sufficiency economy would reflect on the students had a statistically significantly higher educational achievement after school at the 0.05 level than before, (2) the overall satisfaction with the students' career skills was at a high level. This may be because the students learned from both theory and practice in schools and community learning centers. Consequently, it enabled them to gain knowledge and skills in raising safe vegetables, resulting in a positive attitude towards the project, (3) the overall cognition about safe cultivation of teachers and student parents was at a high level. This may be because they had the opportunity to obtain information on the impact of agricultural academics, qualified persons with safe cultivation knowledge and experiences, and attendance of training sessions, including study visits from learning centers that are exemplary in safe cultivation in various projects. Finally, it led to an accurate understanding. It is in line with the National Bureau of Agricultural Commodity and Food Standards guidelines, the Ministry of Agriculture and Cooperatives (2020). It has the summarized details on Good Agricultural Practices (GAP), such as not toxic planting crops for consumption (unless there is a recommendation for consumption), agricultural tools and equipment must be provided appropriately sufficient for work performance, etc.

The results of the participatory learning mechanism assessment pointed out that 1) the overall feasibility and usefulness of the participatory learning mechanism were at a high and the highest levels, respectively. This is consistent with the study of Phrakrupaladsuwattanabuddhikun (Suthep Deeyiam) (2017) with an actionable suggestion that If the government provides the opportunity to people in the community to participate more, every step, it will lead to the strength of the community development, sustainable community development, and creating motivation to learn, self-development with problem-solving skills. As the overall satisfaction of the people involved in the participatory learning mechanism was at a high level. This may be because they were parents, participatory learning-driven working group, Basic Education Commission committee, teachers, and students have seen a systematic operation and willingly participated, thus creating a new dimension of work with the same goal and being ready to be a good leader and follower. They also create a process of exchanging knowledge and enhancing the sufficiency lifestyle both at the individual and community levels, therefore; causing satisfaction at a high level. It is supported by the recommendations of Sorawanee Kitdet (2015); she revealed that there were recommendations such as agencies or organizations under the Ministry of Education should encourage the implementation of a self-sufficiency lifestyle process aiming to enable everyone to understand themselves and their problems for changing to a self-sufficient lifestyle at the individual and social levels. It can be concluded in Figure 2.

5. Conclusion

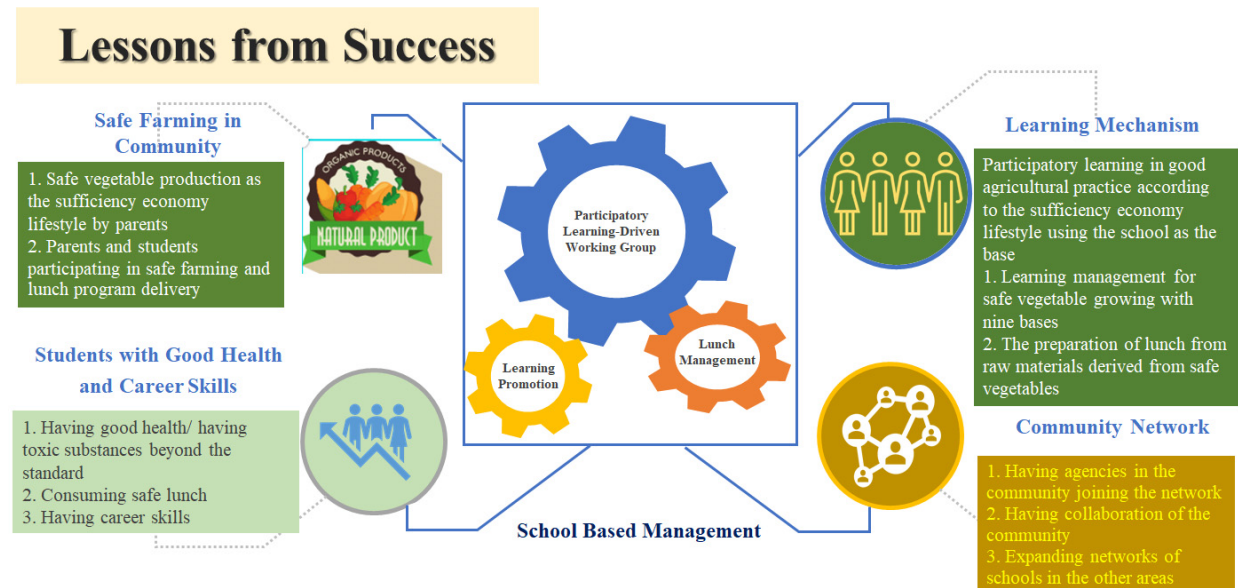


Figure 2. Lessons from Success

According to the input from the students' health problems at Ban Pong Yaeng Nai School, it can be concluded that the solution must be taken urgently. The method used is school-based management. Participatory learning—the driven working group is an important driving mechanism in the school's operation. It is the development of nine learning bases from Kindergarten One to Grade Six for students to learn through project-based learning. In the community is a network of cooperation between parents and local authorities to grow safe vegetables in preparing lunches for students and general consumption and distribution. Key findings include systematic management of problems occurring within the community, adjusting a new concept (Mindset), creating an understanding of all parties involved, setting clear goals together to create concrete cooperation, causing the solutions to students' health problems, and having a positive effect on various fields development such as knowledge and career skills of students. The outcome in the community is parents and community leaders focusing on growing vegetables safer, enabling people in the community to receive safe food at every meal.

This approach is regarded as a new operation regarded as community innovation that will result in an area-based and local economy. It integrates cooperation between schools, and networking with communities for sustainable strength.

Acknowledgments

I wish to acknowledge the help provided by the school administrators for the good practices of Wichaya Agricultural Center under the Royal initiative of His Royal Highness Crown Prince Maha Vajiralongkorn, Pong Yaeng Nai Sub-District, Mae Rim District, Chiang Mai Province, Agricultural Product Efficiency Development Center, Mae Rim District Network, Chiang Mai. They have provided the experts to interview and valuable information for conducting research. I would also like to show my deep appreciation to the participatory learning-driven-working group and Basic Education Commission committee at Ban Pong Yaeng Nai School, administrators, teachers, student parents, and students of Ban Pong Yaeng Nai School. They have cooperated in conducting research and making this research achieve the goals set.

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