Cooperative Practices to Enhance the Quality of Work-Integrated Learning at Nong Khai Technical College

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Abstract: This study aimed at investigating the outcomes of the cooperation practices, which were utilized to enhance the quality of work-integrated learning at Nong Khai Technical College. The investigation covered the following three aspects: 1) the changes that had arisen from the development of specified indicators; 2) the learning that occurred, and 3) the body of knowledge, which had been obtained from the practice. A participatory action research methodology was adopted during two semesters. There were 19 teachers and 30 students involved in the project. The results of the study revealed three key features. Firstly, the post-practice evaluation in both the first and the second cycles was higher than in the pre-practice evaluation. Secondly, the researcher, research participants and the college learned from various issues of the practice. This learning included gaining an awareness of the importance of collaborative work, the importance of studying the theoretical perspective in order to enhance the existing knowledge and experiences, and the importance of planning, practice, observation, and reflection in comprehensive work. Finally, the knowledge gained was found to correlate with Kurt Lewin's Force-Field Analysis which consists of the following elements: 1) expected change, 2) driving factors for change, 3) resistance to change, and 4) overcoming resistance.

Keywords: *Collaborative practices, work-integrated learning, participatory action research, Nong Khai Technical College.*

Introduction

There are various scholarly views related to work-integrated learning. Cooper et al. (2010) stated that *Work-integrated Learning (WiL)* is a situation that combines academics with professionalism in the work environment. It is a common point and convergence between theoretical learning and practice, which is carried out by applying the process to productive work. Kramer and Usher (2011) noted that there are two forms of work-integrated learning as follows: 1) Structured Work Experiences (i.e., Co-operative Education, Internships, Field Trainings, Research Assistants, and Teaching Assistants) and 2) Unstructured Work Experiences (i.e., Volunteering, School, and Summer Work). Yamnun (2004) formulated the following nine forms of work-integrated learning: 1) Pre-Course Experience, 2) Sandwich Courses, 3) Cooperative Education, 4) Cognitive Apprenticeship or Job Shadowing, 5) Joint Industry-University Courses, 6) New Traineeship or Apprenticeship, 7) Placement or Practicum, 8) Fieldwork and 9) Post-course Internships. Barkhuizen et al. (2014) from the UAE suggested a conceptual model of work-integrated learning, which consists of 6 parts: 1) global circumstances, 2) government or professional organizations, 3) industry, 4) society & parents, 5) higher education institutions and co-operative education departments, and 6) students. Their model correlates with findings from a study by Andre et al. (2013), who presented the *ECU WIL model*, which is comprised of three stakeholders: the university, the students, and the industry. Presently, many countries are keen on adopting a work-integrated learning model for the purpose of continuously improving the quality of their graduates, who will be entering the workforce.

Moreover, the Higher Education Strategy Associates (HESA), which is a competitive research and development company in the education market in Toronto, Canada, has mentioned that WiL is a means of providing learning that is valuable and beneficial to students and to employers. As preparation for employment, it increases job opportunities for students after graduation (Kramer & Usher, 2011)

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In Thailand, the Vocational Education Act 2008 focuses on the production and development of manpower, skill levels, technical levels, and technological levels to meet the standards of the labor market by implementing both international theoretical knowledge and Thai wisdom with the goal of enhancing the knowledge and competencies of the learners. In this regard, the Office of the Vocational Education Commission has been assigned to take on a role in the management of Vocational Education and Vocational Training in accordance with the curriculum set by the Vocational Education Commission, namely the Vocational Certificate Program. The Diploma program, a Bachelor's Degree Program in Technology or Operations, includes courses that have been organized to assist students to gain knowledge or skills in a career or to further pursue a field of study that has been organized as a program or is targeted to a specific target group (Chininthon & Phlayamas, 2009).

In addition, based upon the philosophy and the objectives of Vocational Management, which are in accordance with the vocational qualification standards at the Vocational Certificate level of 2019, the focus is placed on the production of knowledgeable workers who have understanding and skills, who are competent and are able to perform professional work, who are moral and ethical, who display professional ethics, and who exhibit appropriate work habits. It also appears in the philosophy and objectives of Vocational Management and is in accordance with the vocational qualification standards of the Higher Vocational Education Diploma 2019, which focuses on producing individuals who have knowledge, understanding, and skills at the technical level. Furthermore, learners need to be able to perform their assigned work by using work control techniques, by behaving in a moral and ethical manner, displaying professional ethics, and by having the appropriate work habits. Training the learners to apply the knowledge, which they have studied, and to use the work skills that they have acquired, as well as to apply those skills in conjunction with real workplace learning, is known as Work-integrated Learning Management. (Secretariat of the Cabinet- Thailand, 2019)

Nong Khai Technical College is located in Pho Chai Sub-district of Muang District in Thailand's Nong Khai Province, and its website is www.nktc.ac.th. Besides offering a variety of short courses, the college has organized teaching and learning activities by providing Vocational Certificate Programs in 2013, Vocational Certificate Programs in 2014 and 2020, and Bachelor's Degree programs in 2019. The college offers two types of work-integrated learning management: Bilateral and Internship systems. There are three parties that are involved: educational institutions, students & enterprises, and government agencies. Past performance assessments have revealed that bilateral learning management has been successful and has been in line with the aims of learning and curriculum management. Regarding internships and the students, who participated in internships at enterprises and government agencies, the results revealed that 98 percent had achieved the goals of the courses and the curricula. Nonetheless, several problems were found as listed below: 1) the period of the internships was only 18 weeks, which caused students to have poor experiences; 2) there was a lack of experience with supervisory teachers; 3) the teaching skills were also lacking; 4) during the internship, there was a lack of responsibility and discipline, (i.e., no contact was made with the internship establishment or the internship record was not kept up-to-date); 5) there was delayed coordination between the establishment and the government agency; 6) the students were involved in non-internship related duties; 7) due to the lack of an appropriate monitoring system, students were prevented from developing the correct work experience; 8) gaps existed between the college and the establishments, and 9) there was a lack of understanding about the framework of the scope of work that the students needed to undertake, etc. (Nong Khai Technical College, 2017)

The researcher, who serves as an Assistant Director of the college, is, therefore, determined to cooperate with teachers to enhance the quality of the Work-integrated Learning Management and to enhance its efficiency. This study was conducted by utilizing the process of Participatory Action Research (PAR). This process is characterized by the following: 1) by utilizing critical social theory and theories of post-modernism, 2) by valuing the genuine experiences of humans, 3) by maximizing human potential, and 4) by placing a focus on participation, democracy in action, and on those deliverables that bring about change, learning, and the body of knowledge, which are derived from practice. In the research methodology portion, the details will be further discussed.

The Objective of the Study

This study aimed to cooperate with 19 teachers and 30 students to elevate the quality of work-integrated learning in Nong Khai Technical College. The expected outcomes were the following three aspects: 1) the changes, which had arisen from the development of specified indicators: the college, students, and workplaces; 2) the learning, which had been derived from the practices of the researcher, the research participants, and the college; and 3) the body of knowledge, which had been obtained from the practice as a foundation theory in Nong Khai Technical College context.

Literature Review

Understanding in the theoretical concepts of work-integrated learning management in cooperative action research is essential because the researcher must be knowledgeable and theoretical sensitive in the area that the study aims to develop. Therefore, theories can be applied to effectively strengthen the thinking and practice of the research participants. According to the idea that says, "*Practice without theory is like a blind person. He cannot go any further, but he can only walk around the old corner*", the researcher, therefore, studied the theoretical concepts of work-integrated learning management from various sources as described below.

Abery et al. (2015) made suggestions on work-integrated learning management as follows: 1) students' preparation should be done before starting the internship by studying the information of the organization and interpersonal relationships in the workplace; 2) students should be advised to set goals and directions for the internship; 3) setting a meeting that brings the seniors and the juniors together by inviting the experienced seniors to share the juniors their stories and lessons which they had learned from work training in that organization; 4) educational institution promotes future career opportunities for students, and 5) preparing student internship reports and space for students to share their experiences from internships in the organization or agency for further use.

Andre et al. (2013) mentioned that the effects of work-integrated learning are caused by components of knowledge exchange, communication, critical thinking, learning fundamentals of information management, project management, action plan, learning skills, self-learning management, creating career network and an in-depth policy.

Barkhuizen et al. (2014) suggested a conceptual model of work-integrated learning which consists of 6 parts as follows: 1) global circumstances, 2) government or professional organizations, 3) industry, 4) society and parents, 5) higher education institutions and co-operative education departments and 6) students.

Govender and Wait (2017) formulated 5 stages of management concepts: 1) Design, Development and Approval, 2) Preparation for WiL Model Implementation, 3) Implementation of the WiL Model, 4) Evaluation of the WiL Model, and 5) Review of the WiL Model.

Hom-Anek et al. (2017) mentioned the following ideas: (1) cooperation between educational institutions and establishments, (2) improving curriculum and teaching and learning styles are crucial for work-integrated learning, (3) real equipment and materials is an essential key for work-integrated learning.

Rajamangala University of Technology Thanyaburi (2011) presented the scope of six important success factors as follows: 1) the curriculum, 2) teaching and learning, 3) the learners, 4) the instructor, 5) the entrepreneurship, and 6) finance.

Wiwangsu et al. (2017) provided the following concepts: 1) establishing cooperation between the main agencies involved, 2) establishing appropriate timing for work training in the workplace, and 3) evaluating learning outcomes and cooperation between educational institutions and establishments.

The Working Group on Integrated Learning and Working in Thailand (2010) presented 4 concepts as follows: Layering Approach, Connectivity, Serializability, and Integration. The concepts consist of 6 layers, which are Stakeholder layer, Competency layer, Standard layer, WiL layer, Learning layer, and Success Factors layer. Moreover, there are also 3 supporting factors which are the public sector, private organizations, and community sector & local government organization.

Yawit (2019) suggested the following concepts: 1) the "*Project*" teaching must be used as the key, 2) the problem that students receive must lead to the *Central Concepts* of the subject, 3) students implement the *Constructive Investigation* to obtain knowledge*, 4) *Student-Driven* which means students must drive responsible work from planning and managing the work on their own, and 5) *Real World* which means the project must be practical and in the spotlight.

Methodology

There are various scholarly views related to Participatory Action Research (PAR). These concepts share some common features and express some differences. The researcher adopted the concepts created by Sanrattana (2018), which combined the studies of Arhar et al. (2001), Carr and Kemmis (1992), Coghlan and Brannick (2007), Creswell (2008), James et al. (2008), Chantasuriyawong (1985), Kaewthep (1989), Kemmis and McTaggart (1992), McTaggart (1991), McTaggart (2010), and Mills (2007). The key elements of PAR can be seen as *Critical Social Theory* and *Theories of Postmodernism* that value human's genuine experiences, maximizing human potential, a focus on participation and democracy in action, and deliverables that bring about change. The purpose of PAR is to gain learning and the body of knowledge from practice. It is bottom-up research in which the researcher participated in the research with the research participants in a collaborative manner. The researcher and the research participants were equal in planning, acting, observing, and reflecting in a spiral cycle with endless progress. Moreover, this study was not solely to investigate the phenomena that exist, but it aimed to bring about a change in a desirable direction. It was also expected to be a sustained change due to the commitment to a participatory role at every stage.

Research Process

Although PAR focuses on sustainable development with the spiral cycle of planning, acting, observing, and reflecting, as mentioned, there were limitations of the educational period according to the curriculum. Therefore, the researcher set up 2 cycles: the first cycle was in the first semester, and the second cycle was in the second semester of the academic year 2020. Cycle 1 and Cycle 2 were performed in the following steps.

Cycle 1

Step 1 Preparation this step consisted of 3 activities as follows:

1) The researcher clarified the research outline to the research participants to ensure their perception and understanding of the content and method of the research. Their understanding helped them decide to participate in the research voluntarily and willingly according to the code of conduct that said, "*The researcher must demonstrate the nature of the research process from the outset including providing suggestions and benefits to the research participants*." 2) The research participants explained the research techniques that will be used to the research participants, such as planning techniques and planning implementation, observation and recording techniques, brainstorming techniques and lessons learned, as well as techniques for creating research tools. 3) Lesson transcription process was conducted to obtain the following information: 1) performance results, 2) defects or obstacles, 3) observations, comments or suggestions, 4) learning from practice that occurred with the researcher, the research participants and agencies and knowledge gained from practice that arises in this process.

Step 2 Planning this step consisted of 4 activities as follows:

1) The researcher conducted the brainstorming process based on basic knowledge and experience by asking questions, "*How to enhance the quality of learning integrated with working in Nong Khai Technical College according to your knowledge and experience? What development approaches should be developed and how?*". It was based on the principle that said, "The research participants are a stream of experiences with the knowledge and experience accumulated. They are not an empty glass, but they have the potential, and knowledge." 2) The researcher presented the theoretical development path to the research participants, "*What theoretical views do you want to suggest in order to enhance the quality of work-integrated learning in Nong Khai Technical College?*". It was based on the principle that said the researcher is an academic stream with theoretical knowledge and sensitivity in matters to be developed and to create positive attitudes to the research participants that theory and practice go hand in hand. They are not a parallel that never converges. 3) The researcher conducted brainstorming to converge streams of experience and academics in order to combine the development path determined by the research participants and the development trend from the theoretical point of view presented by the researcher. It was based on the principle that said, *"Practice without theory is like a blind person. He cannot go any far, only walks around the old corner."* The result of this activity was an action plan. 4) Lesson transcription

Step 3 Acting This step aimed to achieve the results of the action plan set out in step 2. It was based on the principle of "Focus on change and actions to achieve results." It consisted of 4 activities as follows. 1) Preparation of achievement evaluation forms for 3 phases: pre-practice, post-practice in cycle 1, and cycle 2 2) Evaluation of Current Condition (pre-practice in Cycle 1) 3) Implementation of the jointed action plan defined in No. 2. 4) Lesson transcription

Step 4 Observing This step used different types of tools of the research to collect information on the results of the operations at this stage.

Step 5 Reflecting The researchers used Kurt Lewin's Force-Field Analysis conceptual framework (Lunenburg & Ornstein, 2000). The analysis covered the following aspects: a) what are the current conditions?; b) what are the desired conditions?; c) what is the force for change? d) what are resistances to change? and e) what are suggestions to increase the force and to reduce the force resistance?. The findings were used for the force improvement in Cycle 2 operation.

Cycle 2

Step 6 Planning- It consisted of 2 activities: 1) The researcher and the research participants jointly evaluated and created a new action plan after the revision of performance results from the cycle and 2) conducted the lesson transcription.

Step 7 Acting- It consisted of two activities: 1) implementing the specified action plan and 2) removing lessons.

Step 8 Observing- It was similar to Step 4, using different types of research tools to collect information on the results of the operations at this stage.

Step 9 Reflecting- It adopted Kurt Lewin's concept of Force-Field Analysis which was similar to Step 5.

Step 10 Summarizing the results of the performance in Cycle 1 and Cycle2- It was the implementation of observations, interviews, audits, notes, assessments, and lessons learned from each step, and including the results in step 5 and step 9. The researcher and the research participants met in the seminar to conclude the research results according to the research objectives set.

Research Participants

In the designation of research participants, the researcher explained the details of the research method to the teachers in the College in order to adhere to the principle that **"***The researcher must show the nature of the research process in the first place, including recommendations and benefits to the research participants"* and the principle *"Those who do not wish to participate must be recognized and respected for their individual rights*". After that, 19 teachers voluntarily participated in the research, consisting of 1 of each type as follows: Head of Curriculum Development, Head of Vocational Education, Head of Measurement and Evaluation, Cooperation Supervisor, Head of Research, Innovation and Invention Development, Head of the Automotive Department, Assistant Head Teacher of Automobile Department, Head of Business Administration, Head of Factory Mechanic Department **.**Two of each type are as follows: Assistant Head Teacher of Factory Mechanic Department, Factory Mechanic Department teacher, Assistant Head Teacher of Business Administration Department, Business Administration teacher, and Auto Mechanic Department teacher.

Research Instruments

The researcher set the research tools according to the Mills conceptual framework (2007), which was classified into four groups: 1) Observation, 2) In-depth Interview and group interviews, 3) Examining / Record forms such as Journal, Maps, Audiotapes and Videotapes, Artifacts, Field Notes and 4) Evaluation form for the achievement of development.

For the evaluation form for the achievement of development was a rating scale of 5levels, namely, strongly disagree, disagree, neither agree or disagree, agree, and strongly agree. There are 3sets: 1) the college evaluation form with 20 questions; 2) the student evaluation form with 16questions and 3) the workplace evaluation form contains 10 questions. The researcher asked 19research participants to jointly examine the congruence of the questions with the development expectations by applying the audit concept of Index of Congruence (IOC) .The results of the data analysis revealed that the IOC values in all of questions were greater than the established criterion of 0.50 (Rovinelli & Hambleton, 1977), meaning that all of questions were consistent with the expectations to be gained from development.

The three complete evaluation forms were trialed with 30individuals in the target audience of each assessment form (proportion of individuals mentioned in the data collection below) in Udon Thani Technical College. The data collected were analyzed in order to obtain the alpha coefficient of reliability using Cronbach's method. The results of the data analysis revealed that the college, student, and workplace assessment form had an alpha coefficient of reliability at the value of 0.911, 0.912, and 0.890 respectively. These figures indicated that the evaluation forms had a high alpha coefficient of reliability than the established criterion of .70)Prasitratasin, 2003).

Data Collection

The researchers and the research participants played a role in collecting the data at every step of the way by observing, interviewing, photographing, and recording text. Starting from the field practice between June 1, 2020to March 31, 2021.

For the evaluation form for the achievement of development, the researcher used the college evaluation form with 4 administrators of Nong Khai Technical College, 1researcher and 19researcher participants .The student evaluation form was used with 2 student supervisors and 30internship students. The workplace evaluation form was used with 2 student care teachers, 2 workplace trainers, and 30 internship students.

Data Analysis

The qualitative data obtained from the activities of the 10 stages were analyzed periodically by applying the concepts of Pongsapich (1983). The followings are the concepts used in this stage: (1) Categorize information into categories, (2) Actions or behaviors of people involved in the research, (3) Actions or behaviors that are a process with a continuous process, (4) Meaning is a description of a person's action or activity to know the worldview, beliefs, attitudes of the community, (5) Interpersonal relationships in the community involved, (6) Participation in activities, (7)) Setting a picture of all aspects that can be recorded from the field of activities in all stages of research, (8) Organize data from textual recordings as descriptive events in all activities, and (9) Verification of the data analysis by the personnel involved and providing suggestions for improvement and completion.

The quantitative analysis was descriptive statistics which were percentage, mean, and standard deviation. Inferential statistics were not used because participatory action research is context-specific research. It is not experimental research that requires research results from a sample to a population.

Findings / Results

The findings were correlated with the objective of the study as described in the following paragraphs.

1) The Indicators of Changes Arising from The Development

　　1.1　　The findings in *the college's indicators* revealed that the quality of work-integrated learning was improved. The comparison illustrated that the pre-operation mean was 3.06 while the means of post-operation in Cycle 1 and Cycle 2 were 4.21 and 4.60, respectively, as shown in Table 1.

Table 1. Comparisons of means of work-integrated learning quality enhancing between the pre-operation and the post-operation in Cycle 1 and Cycle 2 according to the college's indicators.

Indicators	Pre-practice Cycle 1		Post-practice Cycle 1		Post-practice Cycle 2	
	x̄	S.D.	x̄	S.D.	x̄	S.D.
Step 1 Management of Bilateral Vocational Training Courses						
1. A career training plan through a process created by an educational institution in conjunction with the establishment	3.08	0.28	4.79	0.41	4.92	0.41
2. The vocational training plan contains appropriate sequences of course content.	2.92	0.65	4.33	0.48	4.63	0.48
3. The vocational training plan contains complete details of the courses according to the curriculum.	3.33	0.48	4.46	0.51	4.58	0.51
4. The vocational training plan contains complete details of the course and can be used in courses transferring.	3.13	0.68	4.38	0.49	4.67	0.49
5. The vocational training plan contains complete details of the course and can be used for further study.	3.50	1.14	4.83	0.48	4.88	0.48
Step 2 Prepare for modern equipment.						
6. The department has modern tools, machines, materials, and equipment.	3.00	0.42	3.21	0.41	4.75	0.41
7. The department has sufficient equipment, machinery, materials, and equipment for teaching and learning.	3.21	0.83	3.50	0.66	4.71	0.78
Step 3 Develop foreign language skills.						
8. Implementation of teaching and learning of foreign languages in educational institutions by integrating them into the courses and each field of study/field of work	3.33	0.48	3.67	0.48	4.50	0.64
9. The project to develop foreign language skills for students who practice vocational training abroad	3.50	0.59	4.42	0.50	4.63	0.46
Step 4 Organize internship that accommodates supervision						
10. Organizing internship groups that accommodate supervision	3.38	1.21	4.21	0.51	4.54	0.48
11. Supervising students using social media	3.33	0.87	4.25	0.44	4.46	0.44
12. Conduct internship supervision twice a semester.	2.75	0.53	4.33	0.48	4.63	0.48
13. Internship supervision can be done across all establishments.	3.13	0.45	4.46	0.51	4.58	0.46
14. Educational institutions provide a sufficient budget for internship supervision.	3.04	0.46	4.42	0.50	4.50	0.44
Step 5 Continuously Focus on quality and improvement of WiL.						
15. The operational planning for WiL covers the entire academic year.	3.08	0.28	4.29	0.55	4.42	0.56
16. PDCA quality cycle is adopted in operating procedures according to the action plan.	2.29	0.46	4.13	0.74	4.54	0.70
17. Having clear and consistent performance monitoring periods.	3.08	0.28	4.38	0.58	4.46	0.59
18. Performance summary consists of problems, causes, obstacles, solutions, and reflected results leading to operational development.	2.33	0.48	4.25	0.74	4.54	0.76
19. There is a clear written assignment.	2.92	0.50	4.33	0.64	4.63	0.65
20. Prepare reports on WiL operation on a regular basis for every academic year.	2.83	0.48	3.50	0.72	4.50	0.85
Total	**3.06**	**0.70**	**4.21**	**0.68**	**4.60**	**0.72**

Note 1) Standard Deviation (SD) is low, indicating that the variance or dispersion of the respondents is not high. 2) There were a total 24 respondents: 4 administrators of Nong Khai Technical College, 1 researcher, and 19 research participants.

1.2 The findings in the *students' indicators* revealed that the quality of work-integrated learning was improved, as can be seen in comparing the pre-evaluation mean (3.31) with the results of the post-evaluations of Cycle 1 (4.11) and Cycle 2 (4.71), respectively, as shown in Table 2.

Table 2. Comparisons of means of work-integrated learning quality enhancing between the pre-practice and the post-practice in Cycle 1 and Cycle 2 according to the students' indicators.

Indicators	Pre-practice Cycle 1		Post-practice Cycle 1		Post-practice Cycle 2	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Step 1 Continuously develop foreign language skills.						
1. Students acquire foreign language skills regularly and continually in the normal course of teaching and learning.	3.03	0.31	3.53	0.51	4.75	0.65
2. Students have developed their foreign language skills before traveling to pursue professional training abroad.	2.97	0.65	4.72	0.46	4.84	0.40
Step 2 Identify career training goals						
3. Students are clearly informed about the place where the internship is accepted before deciding on the establishment.	3.53	0.51	4.75	0.44	4.94	0.44
4. Students, together with their parents, decide on the establishment	3.56	0.62	4.66	0.48	4.66	0.46
5. Students decide on an establishment with an emphasis on workplace internships that are relevant to the course and field of work.	3.59	0.67	4.38	0.55	4.75	0.57
6. Students decide on an establishment with a focus on workplace internships that are partially aligned with the curriculum and pay remuneration	3.53	0.72	4.50	0.51	4.63	0.50
7. Students decide on an establishment with a focus on workplace internships that pay remuneration	3.69	0.59	4.41	0.50	4.81	0.51
Step 3 Choose non-scattered establishments						
8. Students choose an establishment according to the school's grouping.	3.41	0.50	4.59	0.71	4.78	0.64
9. The selection of non-scattered establishments makes the management smooth and able to supervise it thoroughly.	3.25	0.51	4.44	0.67	4.56	0.67
Step 4 Be positive and rational						
10. Educational institution provides a continuous and regular process of monitoring and advising students' behavior.	3.53	0.88	4.03	0.40	4.66	0.42
11. Teachers, workplace trainers, and students are involved in fostering positive behaviors, develop rational behaviors, and controlling emotions	3.69	0.93	4.16	0.37	4.78	0.37
Step 5 Be disciplined and responsible.						
12. Students are punctual.	3.00	0.40	3.53	0.62	4.56	0.74
13. Students strictly comply with the regulations of the establishment.	3.16	0.57	3.59	0.71	4.63	0.82
14. Students are responsible for the work they are assigned for an internship.	3.31	0.78	3.75	0.84	4.59	0.90
15. Students are responsible for the work assigned by the school.	3.13	0.34	3.53	0.67	4.81	0.77
16. Students prepare completed internship reports on a regular basis. and submit them on time	2.59	0.50	3.13	0.98	4.69	1.12
Total	**3.31**	**0.67**	**4.11**	**0.79**	**4.71**	**0.80**

Note 1) Standard deviation (S.D.) was low, indicating that the variance or dispersion of the respondents was not large. 2) There were a total 32 respondents: 2 supervisors and 30 interns.

1.3 The findings in the *workplaces' indicators* revealed that the quality of work-integrated learning was improved, as can be seen in comparing the pre-evaluation mean (3.28) with the results of the post-evaluations of Cycle 1 (4.01) and Cycle 2 (4.58), respectively, as shown in Table 3.

Table 3. Comparisons of average means of work-integrated learning quality enhancing between the pre-practice and the post-practice in Cycle 1 and Cycle 2 according to the workplaces' indicators.

Indicators	Pre-practice Cycle 1		Post-practice Cycle 1		Post-practice Cycle 2	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Step 1 Provide an internship that covers the entire content according to the course.						
1. Creating an internship plan with content consistent with the teaching and learning plan.	3.15	0.36	4.00	0.74	4.56	0.81
2. The internship program was created as a result of a collaboration between educational institutions and establishments.	3.03	0.67	3.88	0.79	4.62	0.86
3. Students receive an internship with complete content according to the course.	3.24	0.43	3.85	0.78	4.38	0.89
Step 2 Provide an internship as planned						
4. The establishment uses an internship plan for students.	3.21	0.64	3.91	0.90	4.41	0.98
5. Establishments give priority to internships in order to achieve the course objectives	3.32	0.94	4.35	0.77	4.74	0.75
Step 3 Assign work according to the field of study						
6. Establishments assign students the work in an internship in accordance with the field of study.	2.97	0.46	3.82	0.94	4.50	1.01
7. An internship in the establishment helps students develop their knowledge and working skills.	3.56	0.70	4.18	0.72	4.74	0.77
Step 4 Provide care and attention.						
8. Establishments give priority to the safety and living conditions of students properly.	3.79	0.41	4.06	0.69	4.85	0.75
9. Establishments give priority to the safety of students properly.	3.59	0.56	3.97	0.76	4.65	0.83
10. Establishments make everyone be attentive and focus on the safety of students	2.91	0.75	4.09	0.97	4.38	0.99
Total	**3.28**	**0.67**	**4.01**	**0.81**	**4.58**	**0.87**

Note 1) Standard deviation (S.D.) was low, indicating that the variance or dispersion of the respondents was not large. 2) There were a total 34 respondents: 2 supervisors, 2 establishment trainers, and 30 interns.

2) Learning from Practice

The results showed that the researcher, the research participants, and the college learned from the implementation research processes in many aspects. The common learning aspects were: 1) realize the importance of working together that it will empower the driving force of development even better than the traditional practices or working individually; 2) realize the importance of researching theoretical perspectives in strengthening the vision of the research participants which was different from the traditional working style that relies on existing experience, habit and background knowledge; and 3) realize the importance of the cyclical work of planned cooperative action research which put the plan into action, observing and reflecting the results whereas originally they often acted without planning, lack of observation and lesson transcription to properly reflect results.

3) Body of Knowledge from Practice

It was grounded theory knowledge, particularly in the context of work-integrated learning quality enhancing in Nong Khai Technical College. It was not a body of reference knowledge that resulted from quantitative research or experimental research. The overall results of lesson transcription and reflection revealed that this study created the body of knowledge from practice in accordance with *Force-Field Analysis* by Kurt Lewin. The relevant aspects of the analysis are discussed below.

3.1 Expected Change resulted by work-integrated learning quality enhancing in Nong Khai Vocational College consisted of expectations based on the indicators of college, students, and workplaces as shown in Tables 1 - 3 above.

3.2 Force for Change is a principle adopted by the researcher, and it resulted in better changes. The obtained body of knowledge is described below.

3.2.1) Concepts for Development was the direction of operation that the researcher and the research participants followed to increase the performance in this research. The concepts are described as in the following: 1) aim to create participation and promote cooperation among educational institution, establishment, and students; 2) aim to

encourage students, teachers, and personnel to appreciate learning and self-development; 3) aim to develop students, teachers, and personnel to be responsible for themselves and the public; 4) aim to develop students, teachers, and personnel to learn and work together as a team; 5) aim to prepare educational institutions to be ready and have the potential to develop efficient vocational workforce; and 6) aim to create good relationships, unity and understand each other within the agency.

3.2.2) Strategies for Development was the framework of cooperation which consists of the following: 1) build understanding, awareness, and love for what you do or in your job responsibilities; 2) strengthen and support your work with thoughtfulness, patience, and perseverance; 3) encourage work with care, determination, commitment, and responsibility; 4) establish an evaluation method to review performance; 5) use positive reinforcement to encourage action to develop work.

3.2.3) Ways for Development consist of the following 3 operation models:

3.2.3.1) 5-step model for the college's WiL enhancing consisting of the following: (1) management of bilateral vocational training courses; (2) prepare for modern equipment; (3) develop foreign language skills; (4) manage internships that accommodate supervision; and (5) continuous quality improvement in WiL.

3.2.3.2) 5-step model for student's WiL enhancing consisting of the following: (1) develop foreign language skills continuously; (2) identify career training goals; (3) select non-scattered establishments; (4) be positive and rational; (5) be disciplined and responsible; and (6) develop morality and ethics in life and work.

3.2.3.3) 4-step model for workplaces' WiL enhancing consisting of the following: (1) provide an internship covering the entire content according to the course; (2) provide an internship as planned; (3) assign work according to the field of study; and (4) provide care and attention to students.

3.3 Resistance to Change occurred in this study was the attempt to adjust one's self from the traditional working style to a collaborative and creative working style.

3.4 Overcome Obstacles was related to the above. In this research, the emphasis has been placed on understanding the anti-changeable nature and finding solutions. The students were encouraged to understand the importance and necessity of change. They learned to develop a commitment to the goals and create an open work environment by stimulating the habit of thinking and working together at every stage.

Knowledge from the practice mentioned above is a collection of thoughts and beliefs used by the researcher in this research. It is an important lesson that Nong Khai Technical College will review and improve to enhance the work-integrated learning quality of the college in the future. Even though the research is over, the development will be continued according to the nature of the spiral development cycle.

Discussion

The discussion was done in the following aspects.

1. The Indicators of Changes Arising from The Development

From the research results that the enhancement of the quality of work-integrated learning at Nong Khai Technical College has improved changes based on indicators of the college, students, and workplaces as shown in Table 1-3 above. Which in order to see a clearer picture of the change, the researcher would like to illustrate the comparative changes in each area as charts 1-3 below.
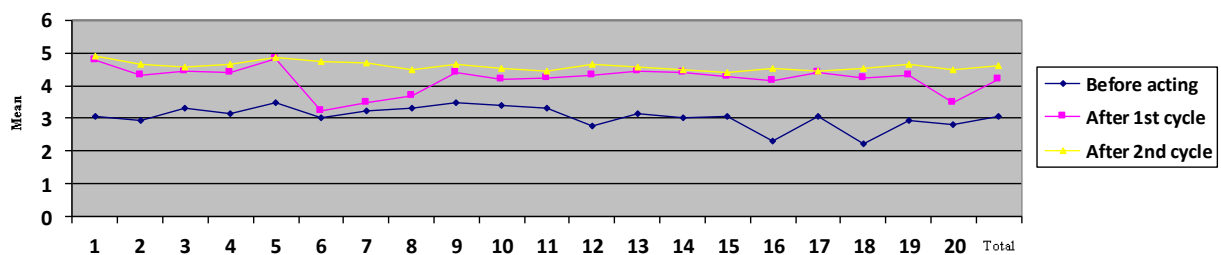

Chart 1. Comparisons of means of work-integrated learning quality enhancing between the pre-operation and the post-operation in Cycle 1 and Cycle 2 according to the college's indicators.
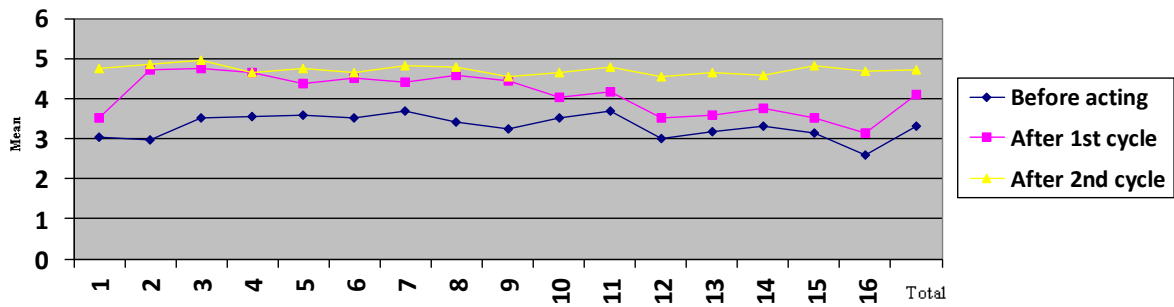
Chart 2. Comparisons of means of work-integrated learning quality enhancing between the pre-practice and the post-practice in Cycle 1 and Cycle 2 according to the students' indicators.
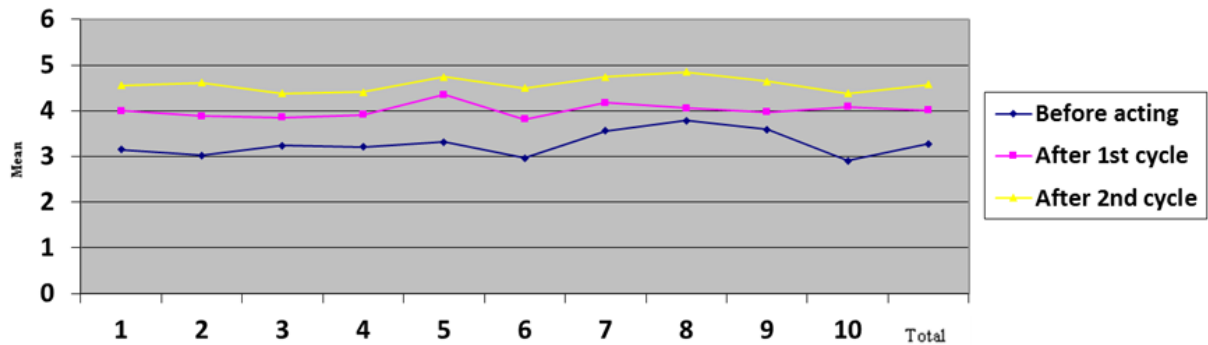

Chart 3. Comparisons of means of work-integrated learning quality enhancing between the pre-practice and the post-practice in Cycle 1 and Cycle 2 according to the workplaces' indicators.

Changes resulting from the development based on selected indicators are found to be positive for the college, students, and workplaces, as shown in the arithmetic mean comparison chart above. From the lesson and combined results of researcher and participants, it was found that apart from using various forces for change factors, including concepts for development, strategies for development, and ways for development that consist of the three operating models as mentioned in the above research summary, democratic work environment is also a cause to changes. The democratic work environment that promotes equality in the expression of opinions and actions, stimulates positivity, as well as ensures that the development is created by them and for them, is important at the overall social level, organizational level and groups of people, or even for individuals. Levin (2006) discussed that the major problem of working in the organization is the highly authoritarian nature, and there is a need for greater response to the principles of democracy in the workplace by promoting participation in the process of decision-making, selection and evaluation, as well as ensuring mutual benefits. In addition, Wang (2018) said that the effectiveness of democratic management as perceived by employees is reflected through three aspects, i.e., an employee's right to know, to participate and to voice. Wang (2018) also mentioned that democratic management effectiveness is positively associated with employee job performance and organizational citizenship behaviors.

2. Learning from Practice where research results show that the researcher, research participants, and the college are agreed with the importance of collaboration, theoretical perspectives in strengthening the vision of research participants, and working followed the cycle of participatory action research.

The first point is a shift from an attitude of working separately or waiting for order from management to a collaborative attitude - one of the most important work skills for the 21st century. According to Stauffer (2020), collaboration is one of 13 skills for the 21st century, namely critical thinking, creativity, collaboration, communication, information literacy, media literacy, technology literacy, flexibility, leadership, initiative, productivity, and social skills. Yan (2019) noted the importance of collaboration as it promotes problem-solving, spurs innovation, connects teams to the bigger picture, boosts learning and skills-sharing, increases employee satisfaction, and aligns distributed or remote teams. This is in line with the views of as well as Arinaitwe (2021), Sauli (2021), and Simsek (2020) that also recognized the importance of collaboration by using collaboration as a key variable in their researches, namely "Practices and strategies for enhancing learning through collaboration between vocational teacher training institutions and workplaces", "The collaboration between Swiss initial vocational education and training partners: Perceptions of apprentices, teachers, and in-company trainers", and "Towards emancipatory l2 instruction: Exploring significant learning outcomes from collaborative digital storytelling", respectively.

The second point is a shift from an attitude of working based only on experience and existing knowledge to an attitude of working with theoretical support, as theory and practice can go hand in hand and they are not a parallel that does

not converge (Kaewthep, 1989). Theories help shorten the trial and error process, as people who know theories will have choices and can make the right decision, serve as a source of new ideas, and create new things (Sanrattana, 2018; Sergiovanni, 1999).

The third point is a shift in attitudes towards working with the emphasis of planning, practice, observation and evaluation process, from the traditional attitude that often takes action without planning, observation, or evaluation. The shift follows the principle of project cycle management, which consists of 5 phases, i.e., programming, identification, formulation, implementation, and evaluation and audit (Landau, 2018) or the PDCA Cycle developed by Dr. William Edwards Deming as a problem-solving cycle or for change management used in Total Quality Management or Six Sigma, consisting of Plan (P), Do (D), Check (C), and Act (A) (Hargrave, 2019).

Therefore, the changes in working attitudes of the researcher, the research participants, and Nong Khai Technical College are the precious lesson learned experiences that benefit the further improvement of collaboration in a creative way. Consistent with the viewpoint of Philosblog (2013) stated that *"A person, with a bit of basic preparation and a willingness to work, a person who is willing to learn can get a great deal accomplished. By learning from their experiences, failures become stepping stones to success."* Similar ideas can be seen in the famous quotes collected by Lagacé (2021): *"To improve is to change; to be perfect is to change often."* - Winston Churchill; *"Change the way you look at things and the things you look at change."* - Wayne Dyer; and *"Progress is impossible without change, and those who cannot change their minds cannot change anything."* - George Bernard Shaw.

3.   The Findings in The Body of Knowledge from The Operation revealed that the set of thoughts: Expected Change, Force for Change, Resistance to Change, and Overcome Obstacles, used in the study affected the successful changes that occurred in this study. Nevertheless, there are quotes that said, *change itself is accelerating. As Ray Kurzweil, author of The Age of Spiritual Machines, says: "We're entering an age of acceleration. The models underlying society at every level, which are largely based on a linear model of change, are going to have to be redefined. Because of the explosive power of exponential growth, the 21st century will be equivalent to 20,000 years of progress at today's rate of progress; organizations have to be able to redefine themselves at a faster and faster pace"* (Loyd, 2015) and *"Change is a process, not an event"* (Wang, 2019) Additionally, from the research of Munawaroh et al. (2018) found that if teachers were to perceive that the innovative learning process they adopted had an impact on any development success. It will further motivate teachers to more innovative and creative practices in the future. As well as from the research of Qiao and Hua (2019) found that when students recognize their entrepreneurial abilities, they will inevitably have the enthusiasm that will be applied to their future careers. However, Nong Khai Technical College has a mission to integrate learning and work for students of all generations and academic years. Therefore, the knowledge gained from the practice of this research will be useful to improve and enhance the quality of work-integrated learning management.

Conclusion

This study aimed at investigating the outcomes of the cooperation practices, which were utilized to enhance the quality of work-integrated learning at Nong Khai Technical College. The investigation covered the following three aspects: 1) the changes, which had arisen from the development of specified indicators: college, students, and workplaces; 2) the learning, which had been derived from the practices of the researcher, the research participants, and the college; and 3) the body of knowledge, which had been obtained from the practice as a foundation theory. The results of the study revealed three key features. Firstly, the post-practice evaluation in both the first and the second cycles for the college, students, and workplaces had been higher than the pre-practice evaluation. Secondly, the researcher, co-researchers, and the college had learned from various issues of the practice, such as gaining an awareness of the importance of collaborative work, the importance of studying the theoretical perspective in order to enhance the existing knowledge and experiences, and the importance of planning, practice, observation, and reflection in comprehensive work. Finally, the knowledge gained had been found to correlate with Kurt Lewin's Force-Field Analysis which consists of the following steps: *1) Expected change, 2) Driving factors for change, 3) Resistance to change, and 4) Overcoming resistance*. Each component describes a set of thoughts and beliefs that Nong Khai Technical College will implement as a basis for reviewing and strengthening an additional set of ideas and beliefs. This implementation will elevate the cooperation practices, which will, in turn, enhance the quality of work-integrated learning at Nong Khai Technical College in the future.

Recommendations

The results of this participatory action research are in the specific context of Nong Khai Technical College. It is not a quantitative study or experimental research that affects references from the sample to the target population. Therefore, in the operation to enhance the quality of work-integrated learning in the future, the college should focus on the lessons that arise from the practice of the researcher, the research participants, and the college, as well as the body of knowledge gained from the operation .The college must reinforce new learning management attitudes and behaviors that this research has found to have a positive effect on the quality of work that is better than before. Especially adopting the principles, concepts, and approaches for participatory action research on a continuous basis. The college must focus on the core of cooperation, the principles of seeking new knowledge or theories to enhance the existing

experience, and non-neglect of any stage of the qualitative management cycle. In addition, because participatory action research has a key focus on action for transforming. So, Kurt Lewin's Force-Field Analysis which consists of expected change, driving factors for change, resistance to change, and overcoming resistance should be implemented as a framework for the work.

Nong Khai Technical College needs to study them in-depth and periodically search for endless additional ideas. In the meantime, the scope of the research involving participants and students should be broadened. If possible, do so at college level.

Limitations

Participatory action research is characterized by an endless process of planning, acting, observing, and reflecting activities. It is a spiral cycle. But as this research is part of study in the doctoral program in Educational Administration, there is a time limit. However, although this research was able to determine the duration of the study in only two cycles, it was satisfactory. This is because the results of this research lead to positive change, learning, and valuable practice knowledge. The researcher therefore considered it a good opportunity to make further developments in this subject in the future starting from the lessons learned from this research as a ladder to climb higher.

Authorship Contribution Statement

Sarapoom: Concept and design, data acquisition, data analysis / interpretation, drafting manuscript, critical revision of manuscript, statistical analysis and securing funding. Phrakrudhammapissamai: Reviewing, supervision.

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