Empowering Teachers' Learning to Strengthen Students' Teamwork Skills

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Abstract

This study aimed to create an educational innovation called “Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills” conducted with Research and Development (R&D) to be effective according to specified criteria. It can be broadly applied to the development of teachers and students in target schools in research publications. This online self-training program consists of 2 projects that are continuously operated as follows: 1) a teacher development project involving the use of 7 self-training modules for teachers' learning, and 2) applying learning outcomes to a student development project, with 1 self-training module to be used as a guideline for teachers. The findings of the first online self-training program revealed that twelve teachers in the experimental group achieved 90/90 post-test scores, which were significantly higher than the pre-test scores. Furthermore, the results of the second project revealed that 300 students in the target group obtained statistically significantly higher post-test scores than pre-test scores. The findings are therefore consistent with the hypotheses. It illustrates that the educational innovation, “Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills”, is effective and meets the specified criteria. It can also be disseminated for teacher and student development in the target schools.

Keywords: educational innovation, online self-training program, teamwork skills

1. Introduction

In any administrative document or textbook, including educational administration, emphasis is placed on the principle of team management. This means working together with two or more people to accomplish a task. Everyone in the team has the same goal, there is a systematic division of work, helping each other develop skills and abilities, the working atmosphere is full of cooperation, and everyone on the team feels the importance of their duties. In addition, from studying the concept of education for the 21st century, it was found that developing people with teamwork skills is as important as developing other skills, such as skills regarding critical thinking, creativity, collaboration, communication, information literacy, media literacy, technology literacy, flexibility, leadership, initiative, productivity, and social skills.

Regarding teamwork skills, Keiling (2023) opined that these are the qualities and abilities that allow you to work well with others during conversations, projects, meetings, or other collaborations. Teamwork skills are made up of many other soft skills such as communication, responsibility, honesty, active listening; empathy, collaboration, and awareness. The Indeed Editorial Team (2023a) stated that teamwork is important in the workplace, for example, to reduce and eliminate workplace conflict, to reduce the rate of attrition, and to align employees to the core goals of the organization. At the same time, teamwork or working together brings many benefits such as innovation, confidence, efficiency, quality, happiness, growth, productivity, unity, diversity, and less stress.

From further study, it was found that there were interesting suggestions for developing teamwork skills, for example, The Indeed Editorial team (2023b) mentioned 8 techniques as follows: 1) ask for and give constructive feedback, 2) foster mutual trust, 3) resolve conflict quickly, 4) be a team player, 5) define separate responsibilities and roles, 6) learn from others with strong teamwork skills, 7) define the goals for the team, and 8) conduct frequent meetings.

Herrity (2 0 2 3) provides suggestions for steps to develop teamwork skills, he describes eight steps to create a successful team: 1) set SMART goals, 2) perform well-defined roles, 3) experiment regularly, 4) embrace diversity, 5) share a common culture, 6) be accountable to the team, 7) communicate effectively, and 8) welcome strong leadership.

As mentioned earlier, it demonstrates the significance of teamwork and demonstrates that there are several suggestions to strengthen teamwork skills. Especially when searching for information on the internet, there are different perspectives of knowledgeable people from all over the world such as perspectives on definitions, importance, features, development paths, development stages, obstacles, and challenges in development, including evaluation guidelines. These perspectives, according to researchers, are a valuable body of knowledge that can be used as an innovative educational approach called "Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills" through Research and Development (R&D) that achieves effectiveness according to specified criteria. It can be widely used in research publications for the development of teachers and learners in the target schools. Furthermore, it is an educational innovation based on the idea that "knowledge and action is power", applying such perspectives on cooperation skills as a framework for developing instructors so that they can learn, then motivate and encourage them to apply that learning outcome to the development of students to build their teamwork skills by the set indicators.

The researchers believe that using the R&D methodology described in the following section could result in educational innovations with the expected effectiveness and can be disseminated for use in secondary schools under the Office of Basic Education Commission, the target population for disseminating this research across the country according to the principles of R&D methodology that develops any innovations. Based on the trial in the experimental area with a population representative, once the results demonstrated that the invention was effective per the established criteria, it could be disseminated to the advantage of those who were the target group.

1.1 The Purpose of Research

This study aimed to create an educational innovation called "Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills", conducted with Research and Development (R&D) to be efficient according to specified criteria and widely used for the development of teachers and students in schools, the target populations in research publications. This online self-training program is composed of 2 projects that are continually operating: 1) a teacher development project using 7 self-training modules for teachers' learning, and 2) a project of teachers applying learning outcomes to student development with a self-training module as a guideline for teachers (see Figure 1 for program structures and other details).

1.2 Research Hypothesis

Other research that intended for developing educational innovations using the concept of teacher development to continue applying with students yielded outcomes that were consistent with assumptions such as the research on “Developing Teachers to Enhance Students' Effective Teamwork Skills” by Saysin and Dhammapissamai (2023); “Empowering Teachers' Learning to Develop Students' Inspirational Skills” by Kromthamma and Supakicco (2023); and "Empowering Teachers' Learning to Develop Innovative Skills for Students" by Hatsanmuang and Sanrattana (2023). Therefore, it is expected that this study would produce an effective "Online Self - Training Program to Empower Teachers' Learning to Strengthen Students' Teamwork Skills". As a result, the following assumptions have been established.

- A teacher development program assumed that teachers in the experimental group had post-test scores of 90/90 by the standard criteria and were significantly higher than the pre-test scores.
- An assumption of a project of applying learning outcomes to learner development was that students in the target group had significantly higher post-test scores than the pre-test.

1.3 Literature Review

Based on this study, the researchers have explored the literature on teamwork in a wide range of issues to obtain knowledge that may be utilized in developing self-training modules for teacher learning in the following 7 issues: 1. The definition from the perspectives of Common Sense (n.d.), Fay and Patterson (2018), Juneja (n.d.), Moga (n.d.), and Tarricone and Luca (2002). 2. The importance from the perspectives of Bregar (2020), Drew (n.d.), Herzing University (2020), Middleton (2019), Pauli (2018), and Sands (2019). 3. The characteristics from the perspectives of Deering (n.d.), LaForce (n.d.), Reddy (n.d.), Schoultz (2017), and Trauma (2021). 4. The obstacles and ways to overcome obstacles from the perspectives of Flint and Hearn (2015), Williams (2017), and Windsor (2021). 5. The development guidelines from the perspectives of Ciston (2015), Dunne (2019), Hinn (2017), Kiser (2019), Meyer

(n.d.), Quigley (2013), Sessoms (n.d.), Smith (2019), The Belbin Team (2021), Weimer (2014), and Williams (n.d.). 6. The development stage from the perspectives of Cardinal (2015), Fronzek (2021), Mugavin (2017), and Wehbe (2020). 7. The evaluation from the perspectives of Christie (2009), Kuras and Moran (1997), Lencioni (2002), and QuestMeraki (2017).

As mentioned in the previous seven issues, it is considered that an emphasis on "development guidelines" is essential because it illustrates "principles/concepts/techniques/methods/activities" for teacher learning, allowing teachers to use the learning outcomes as a guideline for further student development. The researchers, therefore, have synthesized "development guidelines" from diverse reference sources as previously stated, there are 44 methods as follows: 1) do not complain, 2) icebreakers, 3) talking triads, 4) positive mindset, 5) Socratic talk, 6) gallery critique, 7) exercise together, 8) develop diversity, 9) group presentations, 10) share enthusiasm, 11) focus on building trust, 12) discover self-strengths, 13) snowballing and jigsaw, 14) find out what others think, 15) mastery modeling, 16) respect for team members, 17) coaching teamwork skills, 18) establish team rules and purpose, 19) create transparency in decision-making, 20) learn to appreciate all contributions, 21) thoughtfully consider group formation, 22) emphasize the importance of teamwork, 23) be information sharers, not information hoarders, 24) accept and encourage initiative, 25) understand that conflict can be constructive, 26) realize that silos can kill your business, 27) build a collaboration strategy around the human element, 28) encouragement of communication, 29) clarify roles and responsibilities, 30) manage time efficiently, 31) enabling success through smart team formation, 32) think-pair-share and think-pair-square, 33) assigning a challenging and multidimensional project, 34) building in time for group processing, 35) use team-building exercises to build a cohesive group, 36) require individual members to keep track of their contributions, 37) include peer assessment in the evaluation process, 38) accept and encourage initiative, 39) use collaboration as an organizational change strategy, 40) help people develop relationships, 41) make visioning a team sport, 42) problem-solving and conflict management, 43) utilize diversity in problem-solving, and 44) project-based learning/problem-based learning

2. Research Methods

2.1 Concepts and Process

This study was conducted with Research and Development (R&D) based on Sanrattana (2023). This notion has evolved to the concept of “starting with development for teacher learning, and applying learning outcomes to further develop learners.” The study was carried out in four stages, as follows:

Stage 1 studying literature on teamwork in these 7 issues to construct online self-training modules for teacher learning: 1) definition, 2) importance, 3) feature, 4) obstacles and ways to overcome them, 5) development approach (principles/concepts/techniques/methods/activities), 6) development stages, and 7) evaluation (details mentioned in "Literature Review").

Stage 2 examines the quality of online self-training modules in two phases: Phase 1 - Preliminary Field Testing and Revision, 5 teachers in a school that was not in an experimental area, and Phase 2 - Main Field Testing and Revision, 10 teachers in another school where was not in the experimental area, using the focus group discussion for both phases.

Stage 3 creating 2 sets of research instruments: 1) a test for teacher learning outcomes test and 2) a student teamwork skills assessment form (details will be discussed in Research Tools).

Stage 4 investigates the effectiveness of online self-training programs based on the assumption by applying "Online Self–Training Program to Empowering Teachers' Learning to Strengthen Students' Teamwork Skills" to conduct an experimental study with one group pretest-posttest in research area schools selected by purposive sampling. The experimental group consisted of 12 teachers and 300 students in the second semester of the academic year 2023. The research was divided into 2 phases: 1) an experimental study of a one-month project on the learning development of teachers and 2) an experimental study of a two-month project on applying learning outcomes to student development.

2.2 Research Tools

2.2.1 A test for teacher learning outcomes is a multiple-choice question with four alternatives. Its goal is to examine teachers' learning outcomes before and after the experiment in the development of teacher learning projects.

The researchers have created based on six issues which are definition, significance, feature, development guidelines, development approach, and evaluation. The following issues were used to design the test based on their cognitive domain, from lower to higher thinking skills, remembering, understanding, applying, analyzing, evaluating, and

creating, according to The Revised Taxonomy 2001 by Benjamin S. Bloom (Armstrong, 2010). This test has been used for 2 phases of quality investigation as follows:

Phase 1 Content validity was verified by 5 experts in Curriculum and Instruction and Educational Measurement and Evaluation using a method by Rovinelli and Hambleton (1977) called Indexes of Item-Objective Congruence (IOC). According to the data analysis, all questions had an IOC that exceeded the criteria of 0.50 (Chaichanawirote & Vantum, 2017).

Phase 2 Quality investigation was experimented with a sample of 30 teachers in a school outside the study area. The data analysis indicated that 1) all test items had an index of difficulty as a criterion, ranging from 0.20 - 0.80, and also the power of discrimination as a criterion, ranging from 0.20-1.00, 2) a KR-20 that represents the confidence coefficient equal to 0.92 which is higher than the criterion of 0.70, and 3) the difficulty of the test was 60.64.

2.2.2 The teamwork skills assessment form for students is a 5-point rating scale with five levels: highest, high, moderate, low, and lowest.

The researchers have created findings from the studies of demonstrating teamwork skills from the perspective of Deering (n.d.), LaForce (n.d.), Reddy (n.d.), Schoultz (2017), and Trauma (2021), including from studies on the concept of teamwork skills, the perspective of Christie (2009), Kuras and Moran (1997), Lencioni (2002), and QuestMeraki (2017). This evaluation form has been inspected for quality with the following 2 phases.

Phase 1 Content validity was examined by 5 experts in Educational Administration and Educational Measurement and Evaluation using Rovinelli and Hambleton's method. The results showed that all test questions had an IOC value higher than the threshold of 0.50, indicating that they could be applied to the objectives (Chaichanawirote & Vantum, 2017).

Phase 2 to verify reliability or internal consistency, the assessment was tested on a sample of 30 students in a non-trial school. The result indicated that the alpha coefficient of reliability of the whole assessment form was equal to 0.85. When each aspect was examined, it was found that team management skills, team leadership skills, personal values and ethics in teamwork, team spirit and team communication skills, engagement and trust in a team, including investigation, follow-up, and creative improvement, were equal to 0.89, 0.86, 0.75, 0.88, 0.85 and 0.90 respectively. When comparing the reliability coefficient with the specified criteria, which is equal to or greater than 0.70 (UCLA: Statistical Consulting Group, 2016), it was found that it is higher than the specified criteria, indicating that the items have relatively high internal consistency.

2.3 Data Analysis

There has been data analysis in 2 cases, namely, 1) analyzing the scores from the posttest compared with the criteria of 90/90, where the first 90 means the percentage of an average score of the entire group of teachers obtained from the knowledge test. Another 90 refers to the percentage of teachers who take the test and pass the criteria for all objectives (Yamkasikorn, 2008). 2) Comparative analysis of the pre-test and post-test was done by t–test dependent statistics.

3. Results

3.1 Results in terms of Educational Innovation

The findings resulted in an educational innovation called “Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills” that consisted of 2 continuous projects: *1. Teacher Development Project,* using 7 self-training modules for teacher learning about teamwork skills as follows: 1) definition, 2) importance, 3) characteristics, 4) obstacles and ways to overcome obstacles, 5) development guidelines, 6) development stage, and 7) evaluation. *2. Project of Applying Learning Outcomes to Student Development,* using 1 self-training module to be used as a guideline for teachers' practice. It consists of the following issues: 1) instruction, 2) summarize the expected characteristics, 3) summary of development guidelines, 4) summary of the development process, 5) students’ teamwork skills assessment form, 6) self-assessment form for teachers on the level of implementation of development guidelines (google form), 7) teachers' self-assessment on the selection of a development process model for implementation (google form), and 8) teacher's self-reflection form on practice (google form). The additional details are shown in Figure 1. *(Please see the characteristics of the program in the original Thai language from https://shorturl.at/fpyOP)*

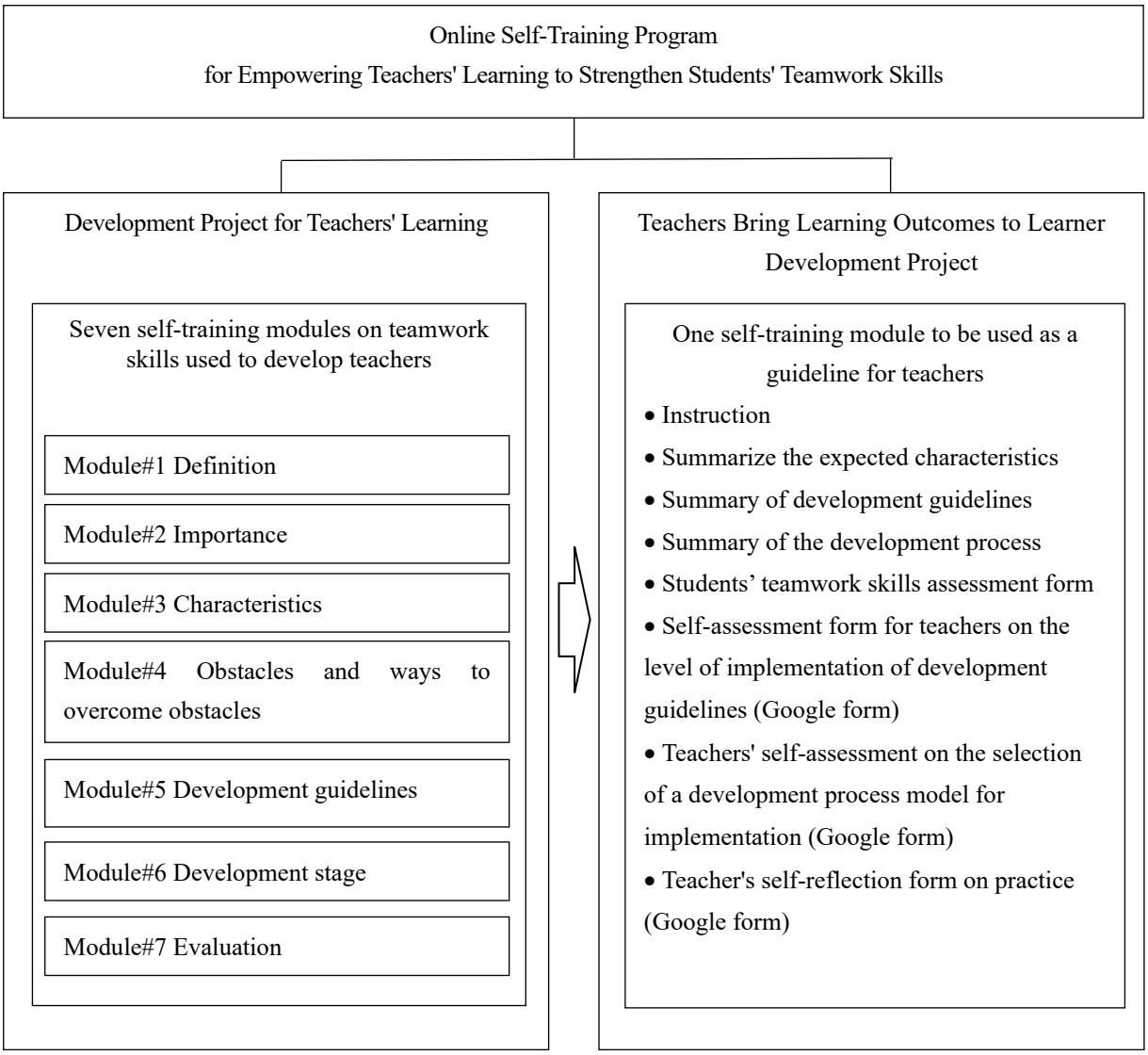

Figure 1. Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills

3.2 Results in terms of the Effectiveness of the Online Self-Training Program

The results of the experimental research in the development of teachers learning project were following the assumptions, namely, 1) teachers in the experimental group gained average scores from post-test 33.75, as 93.75 percent of the full score, passing all objectives specified with 97.22 percent, which meets the criteria of 90/90. 2) Teachers had an average score from the pre-test equal to 24.83 and an average score from the post-test equal to 33.75 which by t-test had a higher value than the average score from the pre-test statistically significant at a level of 0.05, as shown in Table 1.

Table 1. Mean of Teachers' Pre-test and Post-test Scores Using Dependent t-test

Testing	Sample size	Mean	Standard Deviation	t
Pre-test	12	24.83	7.16	5.53*
Post-test	12	33.75	1.66	

* $p < 0.05$

Table 2. Mean and Standard Deviation of Students' Teamwork Skills Assessment Before and After the Experiment

Characteristics demonstrating students' teamwork skills	Evaluation			
	Pre-test		Post-test	
	$\bar{\chi}$	S.D.	$\bar{\chi}$	S.D.
Team management skills	**2.96**	**1.14**	**4.20**	**0.76**
• I understand the objectives and goals of the team.	2.90	1.15	4.14	0.74
• I can adjust to the team	3.04	1.13	4.17	0.75
• I am assigned tasks based on my proficiency and competency.	3.00	1.14	4.21	0.76
• I can prioritize well.	2.95	1.10	4.19	0.74
• I concentrate on my work.	3.11	1.20	4.22	0.72
• I am willing to work in any situation.	2.99	1.12	4.23	0.76
• I follow the team's plans systematically.	2.99	1.15	4.20	0.75
• I am willing to sacrifice (e.g., budget, aptitude, time, etc.) for effective work.	2.86	1.07	4.25	0.75
• I receive advice from the team leader or experts.	2.91	1.13	4.21	0.77
• I finish my work on time.	2.88	1.17	4.19	0.81
Leadership skills in teamwork	**2.91**	**1.13**	**4.19**	**0.75**
• I have effectively practiced leadership.	2.69	1.09	4.05	0.80
• I strongly encourage each team member to take responsibility for their work.	3.02	1.15	4.20	0.72
• I am responsible for my duties and tasks.	2.93	1.15	4.21	0.74
• I can be a leader in appropriate and changing situations.	2.78	1.13	4.21	0.76
• I can build trust in the team.	2.86	1.12	4.15	0.76
• I believe that my team members have the abilities required to complete the tasks.	3.05	1.14	4.28	0.76
• I have a technique for sharing information with all team members.	2.96	1.11	4.17	0.76
• I appropriately assign work according to my abilities and aptitudes.	2.95	1.16	4.27	0.72
Personal values and ethics in teamwork	**3.04**	**1.13**	**4.24**	**0.75**
• I am willing to compromise and empathize with others to achieve the team's goals.	2.93	1.09	4.19	0.76
• I am honest with my team.	3.20	1.16	4.26	0.75
• I am polite to team members.	2.98	1.11	4.27	0.72
• I and my team members work well together.	3.06	1.14	4.24	0.75
Team spirit and communication skills	**3.15**	**1.15**	**4.30**	**0.70**
• I can interact with my team in an open, clear, accurate, and honest manner.	3.09	1.16	4.24	0.70
• I enjoy working together.	3.11	1.13	4.28	0.67
• I pay attention to others' opinions with empathy.	3.24	1.18	4.31	0.71
• I am willing to contribute my skills to the team.	3.11	1.15	4.31	0.70
• I accept differences in opinions among members.	3.16	1.15	4.30	0.71
• I am aware of my work and pay attention to its outcomes.	3.18	1.15	4.35	0.71
Teamwork and trust	**3.10**	**1.14**	**4.28**	**0.73**
• I have faith and respect for my teammates.	3.15	1.11	4.25	0.76
• I have a strategy for enhancing the morale of my team members.	3.07	1.10	4.24	0.74
• I am willing to help my team solve problems.	3.13	1.10	4.26	0.73
• I treat all team members equally.	3.17	1.18	4.35	0.73
• I am bound and want to be a part of the team.	3.05	1.19	4.27	0.71
• I am accepted by team members.	3.05	1.16	4.30	0.72
Inspection, follow-up, and creative improvement	**2.96**	**1.13**	**4.25**	**0.77**
• I have a follow-up report and information with creative improvement.	2.85	1.12	4.20	0.80
• I have clear goals and a creative work strategy.	3.03	1.17	4.27	0.73
• I conduct self-evaluation to identify errors so that I can improve them.	2.98	1.13	4.24	0.75
• I carry out interesting meetings and can explain my work by allowing team members to independently express their thoughts and be able to summarize key points effectively and clearly.	2.96	1.10	4.27	0.79
Total	**3.01**	**0.94**	**4.24**	**0.54**

The results of the experimental research in the project of applying learning outcomes to students' development were by the assumptions, according to the analysis of the mean and standard deviation from the teamwork skills

assessment of the students before and after the experiment shown in Table 2 , and the comparative analysis by dependent t-test in Table 3.

Table 2 indicates that the average score from the teamwork skills assessment of students after the experiment was higher than before the experiment, that is, the average score after the experiment was 4.24 (standard deviation was 0.54). the average score before the experiment was 3.01 (standard deviation was 0.94). When comparing with the dependent t-test, it was found that there was a statistically significant difference at the threshold of 0.05, as shown in Table 3.

Table 3. The Results of Data Analysis Comparing the Mean Scores of the Pre-test and Post-test of the Students Using a Dependent t-test

Evaluating	Sample size	Mean	Standard Deviation	t
Pre-test	300	3.01	0.94	19.69*
Post-test	300	4.24	0.54	

* $p < 0.05$

4. Discussion and Conclusion

The study was conducted with R&D methodology, with the final stage being experimental research in one group pretest-posttest in schools that were randomly selected as research areas, with 12 teachers in the experimental group and 300 students in the target group, having the purpose to examine the efficiency of "Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills", which is considered an educational innovation expected to be obtained from this study, indicated that such educational innovation was effective according to the hypotheses specified in both the teacher development project and the project of applying learning outcomes to student development. The posttest scores of the experimental group were by the criteria of 90/90 and were significantly higher than the pretest scores. The students who were in the target group gained higher posttest scores than the pretest with statistical significance. It can be seen that the findings are consistent with other studies that applied R&D methodology, with a similar research design, namely, "Developing Teachers to Enhance Students' Effective Teamwork Skills" by Saysin and Dhammapissamai (2023), "Empowering Teachers' Learning to Develop Students' Inspirational Skills" by Kromthamma and Supakicco (2023), "Empowering Teachers' Learning to Develop Innovative Skills for Students" by Hatsanmuang and Sanrattana (2023), "Developing Teachers to Enhance Project Management Skills for Students" by Nukoonkan and Dhammapissamai (2023), "Empowering Teachers' Learning to Enhance Students' Change Leadership Skills" by Praneetpolkrung and Supakicco (2023), and "Enhancing Teachers' Learning to Develop Students to Become Successful Students" by Thammabut and Thacha (2023). Therefore, this indicates that the concepts of "Knowledge and Action is Power" and "Development for Teachers' Learning to Student Development" used in this research methodology, including the online self-training program that consists of two projects carried out consecutively: 1) Teacher Development Project using 7 self -training modules for teacher learning about teamwork skills, and 2) Project of Applying Learning Outcomes to Student Development using 1 self-training module to be used as a guideline for teachers' practice, has resulted in effective educational innovation as expected. In addition, it can be further applied in other target schools.

According to the study, besides the primary objective of investigating the effectiveness of the educational innovation created, the team also sought additional insights from teachers in the experimental group, particularly knowledge seen as learning and reflection from practice. Furthermore, several important points are covered further below.

For the teachers in the experimental group, challenges to students' development of Teamwork Skills were caused by a variety of factors including cultural and social context, custom, and ineffective management. This is compatible with the findings of the synthesis of Williams (2017), Flint and Hearn (2015), and Windsor (2021), which highlighted both challenges and approaches for overcoming those difficulties as follows. 1. Unclear Goals - when team members have no confidence in the goal or objective from the beginning, successful teamwork is difficult. Consequently, any organization ought to create clear goals or objectives so that teamwork can be targeted and accomplished. 2. Demotivation - from Unclear Role and Collaboration Burnout, including working with more responsibilities, can cause boredom and burnout in teamwork. As a result, it is essential to arrange a clear work system based on duties, seek work goals, discover mistakes and collaborate to fix them, know how to build morale among teammates, and have activities to relieve stress and energize team members. 3. Poor Communication –if communication is not good and complete, it can cause damage to teamwork. Therefore, team members or leaders need to arrange for clear

communication and understanding to achieve the goals efficiently. 4. Company Culture - The working environment greatly affects teamwork, especially in administration. Leadership that lacks support or vision can result in less collaboration or discrimination, and team member discrimination may have an impact on seamy output. Therefore, teamwork should not be discriminatory, and everyone should be treated equally. Each individual's viewpoint is valuable, and all team members should be encouraged, as well as good leaders in managing the team or organization. 5. Lack of Transparency - which is a desirable rule for working as a team. If team members or leaders are not transparent, this will result in poor team governance. Therefore, transparency in team management is critical. Leaders should be good role models in their work and understand how to respect one another in both work and decision-making, including honest problem-solving. 6. Not Sharing Information - each team member has different abilities. If they do not know how to share their knowledge or skills, it may result in ineffective or difficult teamwork. 7. Not Going in the Same Direction - causing work to lack guidance, goals, and working at their own pace; because of this, the team requires a clear aim. Building a great team requires aligning team behavior.

Moreover, it is essential to be aware of the emphasis on trust, transparency, and communication to ensure effective and efficient teamwork skills, according to Windsor (2021), stated that “Collaboration relies on trust, transparency, and communication. The team needs to know the purpose of the project and the role each person plays in reaching these objectives. Collaboration still needs some structure to work well, especially when making decisions. A collaborative team will have many opinions and ideas. When faced with too many choices, reaching a decision collectively can be a slow process”.

However, even though there are development challenges, the teachers in the experimental group still focused on their actions to overcome those challenges, in particular, attempting to incorporate 46 development approaches derived from the synthesis Ciston (2015), Dunne (2019), Hinn (2017), Kiser (2019), Meyer (n.d.), Quigley (2013), Sessoms (n.d.), Smith (2019), The Belbin Team (2021), Weimer (2014), and Williams (n.d.) (please refer to the literature review), into serious practice until this study resulted in an educational innovation called “Online Self-Training Program for Empowering Teachers' Learning to Strengthen Students' Teamwork Skills” that was effective and be applied among the larger population.

5. Recommendations

The research team noted that the factors that would enable the implementation of educational innovation derived from this study into effective and successful practice should include a process to encourage teachers to recognize the importance of Teamwork Skills when disseminating it to a larger population, as the research team has synthesized recommendations from the views of Bregar (2020), Drew (n.d.), Herzing University (2020), Middleton (2019), Pauli (2018), and Sands (2019) revealed that strengthening Teamwork Skills is important as follows: 1) gaining multiple perspectives; 2) learning to manage personalities; 3) being able to use talents; 4) learning to negotiate; 5) strengthen self-confidence; 6) reducing bullying; 7) reinforcing communication, time management, problem-solving, listening, critical thinking, cooperation, and leadership; 8) assisting in the creation of ideas and creativity; 9) supporting in the increase of productivity and the achievement of better outcomes; 10) assisting in the increase of morale and motivation at work; 11) encouraging to take good risks; 12) assisting in the acceleration of learning; 13) facilitating diverse perspectives to create successful innovations; 14) decreasing burnout; and 15) developing personal skills.

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Authors contributions

Panida Kratumnok was responsible for designing, and studying literature, developing the program, conducting research, and presenting research results. Assist. Prof. Dr. Phrakhrusutheejariyawattana was responsible for providing advice and consultation in the research process. Panida Kratumnok drafted the manuscript and revised it. Assist. Prof. Dr. Phrakhrusutheejariyawattana approved the final manuscript.

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