

# Increasing the Potential of Teachers to Enhance Students' Collaborative Learning Skills

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## Abstract

This research project developed an innovative initiative titled “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills.” Its main goal is to support schools within the target demographic by sharing valuable research findings to improve educational practices. The program consists of two components. The first includes seven self-training modules designed to enhance teachers’ learning experiences, equipping them with skills to improve their teaching methods. The second component focuses on helping teachers apply their knowledge in the classroom, enriching students’ learning experiences. Results from the first phase showed that 16 teachers achieved performance criteria 90/90, significantly increasing average posttest scores. In the second phase, 634 students demonstrated marked improvement in their collaborative learning skills, as indicated by higher post-intervention scores. These findings confirm the initiative’s effectiveness and reinforce its design, underscoring its potential to improve teacher and student development, paving the way for broader dissemination of its outcomes to benefit more schools.

**Keywords:** online self-training program, teachers’ learning, collaborative learning skills

## 1. Introduction

Cooperative learning is an instructional methodology that strategically organizes students of diverse ability levels and learning styles into collaborative groups. This approach emphasizes group success over individual achievement, enabling students to engage in activities that promote mutual learning and teaching among peers. Consequently, each group member’s success is intrinsically linked to the group’s overall success (Khan, 2019). The implementation of cooperative learning has demonstrated numerous positive outcomes, including the enhancement of leadership and decision-making capabilities, development of conflict resolution skills, increased engagement in work-related tasks, improvement in communication skills and personal accountability, as well as the fostering of confidence and a positive attitude towards fellow students and colleagues (Andreev, 2023).

Various strategies can be employed in educational contexts to cultivate cooperative learning tailored to the specific objectives of lessons. Such strategies include focused lists, concise writing assignments, sentence completion tasks, numbered accountability assignments, collaborative quiz activities, jigsaw methods, and peer interviews (Birt, 2023). Moreover, several frameworks exist to organize teaching and learning processes to facilitate effective cooperative learning. For instance, in the jigsaw approach, five essential components are integral: positive interdependence, promotive interaction, individual accountability, instruction of social skills, and an emphasis on the quality of group processing (Eachempati, Kumar, & Ismail, 2017).

The information above highlights the critical importance of collaborative learning and the numerous scholars who propose diverse strategies for enhancing collaborative learning skills. A literature review reveals various scholarly perspectives from different regions worldwide, addressing multiple dimensions, including definitions, significance, characteristics, guidelines for development, stages of progression, challenges, methods for overcoming barriers, and evaluation techniques. These scholarly insights regarding collaborative learning skills represent a valuable resource that can be effectively utilized to enhance the collaborative learning capabilities of secondary school students under the Office of the Basic Education Commission in Thailand.

While the perspectives presented in this literature may not always derive from empirical studies or academic textbooks, they originate from credible authors and agencies with verified qualifications. The content of these

articles is responsive to the needs of this research, which needs to be more adequately addressed by existing academic literature. This body of knowledge reflects contemporary understanding that aligns with the requirements of the 21st century and can be adapted into learning modules for use in professional development programs for educators. This approach is based on the premise that “knowledge and action are power,” contrasting with the former notion that “knowledge is power.”

To bring this vision to fruition, the research employed a Research and Development (R&D) methodology to design an educational innovation entitled “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills.” This program was developed with the fundamental concept that “knowledge and action are power,” utilizing various perspectives on collaborative learning skills as the framework for teacher development. Initially, teachers were encouraged to engage in their learning processes. Subsequently, according to the defined performance indicators, these educators must apply the knowledge gained to enhance students’ collaborative learning skills.

The research team firmly believes that the application of the R&D methodology will result in an effective “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills,” which will provide significant benefits to both educators and students within the schools governed by the Office of the Basic Education Commission. This initiative aims to disseminate the research findings nationwide. According to the principles of R&D methodology, any developed innovation must undergo testing in a representative population. If the findings indicate that the innovation is practical and meets the established criteria, it can be disseminated to benefit the target research population.

### *1.1 The Purpose of Research*

This research presents an online self-training program to empower teachers to enhance students’ collaborative learning skills. Using the Research and Development (R&D) methodology, the program includes two projects: 1) a development project where teachers engage in online training through learning modules based on literature covering definitions, importance, characteristics, development approaches, and evaluation challenges; and 2) a project for teachers to apply their learning in the classroom by reviewing practices, setting expectations, and conducting evaluations and reflections. Further details will be provided in the Research Methodology section.

### *1.2 Research Hypothesis*

This research utilizes the R&D methodology based on the principle that “Knowledge and Action are Power.” It focuses on updating knowledge in the 21st century through insights from trusted individuals and agencies to develop learning modules to enhance teachers’ skills, which they can then apply to students. The research follows the steps R1D1, R2D2, etc. Previous studies, including those by Saysin and Dhammapissamai (2023), Thammabut and Thacha (2023), and Mopara and Sanrattana (2023), confirmed that developed educational innovations align with these hypotheses.

We hypothesize that the “Online Self-Training Program for Empowering Teachers’ Learning” will lead to the following outcomes: 1) the experimental group will achieve post-experiment test scores of 90/90 or higher, significantly exceeding their pre-experiment scores. 2) Students in the experimental group will show significantly improved self-assessment scores after the experiment.

### *1.3 Literature Review*

As previously mentioned, a review of various scholarly articles provides diverse insights from knowledgeable individuals across the globe. These trustworthy perspectives address modern educational needs through learning modules that enhance teacher development. Teachers can then apply these learnings in the classroom, though the information may only sometimes stem from formal research or academic texts.

The literature on collaborative learning skills includes viewpoints categorized as follows:

- 1) Definitions: Insights from Baker (2015), Dillenbourg (1999), Ingleton, Doube, and Rogers (1968), Smith and MacGregor (1992), and Sonthara and Vanna (2009).
- 2) Importance: Perspectives from Atieno (2020), Chandra (2015), Gates (2018), Laal and Ghodsi (2011), and Ralhan (2019).
- 3) Characteristics: Contributions from Khan (2019), Singh (2011), and Tinzmann, et al. (1990).
- 4) Obstacles and Solutions: Views from Ford (2013), Le, Janssen, and Wubbels (2017), and Osipov and Ziyatdinova (2017).
- 5) Development Guidelines: Insights from Barton (2020), Davis (2020), Foster (2020), Guidot (2017),

Jacaranda (2018), Parkhill (2021), Ong (2017), Slavin (2014), Thomson (2014), and Zezima (2017).

- 6) Development Stages: Perspectives from Grigg (2019), Levin (2018), Saekhowa (2015), and Uren (2013).
- 7) Evaluation: Insights from Foresman (n.d.), IT Learning and Development (2017), and Knight and Oaks (2011).

The development guidelines for collaborative learning skills are critical as they offer teachers various principles, concepts, methods, and activities to enhance their teaching approaches. Teachers can effectively develop students' collaborative learning skills by integrating these guidelines into their practices. The research team synthesized insights from multiple sources, including contributions from Barton (2020), Davis (2020), Foster (2020), and several others. As a result, they identified 34 actionable development guidelines, which include:

- 1) Create jigsaw exercises.
- 2) Implement group mind maps or brainwriting.
- 3) Try virtual co-working for remote teams.
- 4) Use think-pair-share strategies.
- 5) Allow time for students to prepare collaboratively.
- 6) Facilitate learning through clear explanations.
- 7) Encourage building upon ideas.
- 8) Provide support and guidance.
- 9) Outline class expectations clearly.
- 10) Divide into small groups.
- 11) Use relevant curriculum activities.
- 12) Define expectations and purpose clearly.
- 13) Give clear group instructions.
- 14) Keep groups small for effectiveness.
- 15) Monitor and support groups closely.
- 16) Set etiquette guidelines for participation.
- 17) Devise topic-relevant activities.
- 18) Implement various collaborative methods (e.g., tea party discussions, round robins).
- 19) Assess teamwork practices.
- 20) Play trust games to foster teamwork.
- 21) Ask divergent questions to stimulate discussion.
- 22) Hold multiple discussions to deepen understanding.
- 23) Integrate technology to streamline collaboration.
- 24) Designate specific roles within groups.
- 25) Conduct pre- and post-assessments.
- 26) Ensure individual accountability in teams.
- 27) Teach communication and problem-solving skills.
- 28) Create a community feel in the classroom.
- 29) Establish and adhere to group norms.
- 30) Leverage discussions to resolve conflicts.
- 31) Promote active listening and personal accountability.
- 32) Align goals among all stakeholders.
- 33) Keep structures flat to enhance communication.
- 34) Overcome barriers to effective collaboration.

These guidelines provide diverse strategies for educators to use to support their students' development of

collaborative skills.

## 2. Research Methods

### 2.1 Concepts and Process

This research utilizes a Research and Development (R&D) methodology to create a groundbreaking educational innovation entitled the “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills.” This program aims to ensure its effectiveness, aligning seamlessly with the research hypothesis.

At the heart of this initiative lies the development of teachers to foster the generation of “knowledge.” Once equipped with this “knowledge,” educators are poised to transform it into “action,” which subsequently cultivates “power.” This concept encapsulates the idea that “Knowledge and Action are Power.” Sanrattana (2023) notes that the focus is on integrating modern insights and perspectives from credible experts and organizations to construct dynamic learning modules to enhance teacher development.

The process starts with teachers undergoing a self-training regimen that imparts critical skills and knowledge. Armed with this expertise, they can apply their newfound understanding in classroom settings, significantly enriching student learning. This approach acknowledges that genuine teacher development requires a practical application of knowledge, moving beyond the antiquated belief that “Knowledge is Power” prevalent in the previous century. Instead, it emphasizes a transformative relationship between knowledge acquisition and its practical implementation, benefiting students’ educational experiences. There are research steps in the form of R1D1.... RiDi is as follows.

In the first stage of our project (R1D1 step), we conducted an extensive literature review focusing on seven critical issues related to collaborative learning skills. This thorough investigation laid the groundwork for creating seven comprehensive online self-training modules for educators. Each module is a vital resource, guiding teachers through essential aspects of collaborative learning. The modules encompass: 1) definitions of key concepts, 2) the significance of collaborative learning in educational settings, 3) distinctive characteristics that define effective collaborative learning practices, 4) potential obstacles teachers may face and strategies for overcoming them, 5) developmental guidelines that include foundational principles, concepts, techniques, methods, and engaging activities, 6) stages of development relevant to implementing these practices, and 7) evaluation methods to assess their effectiveness. A visual representation of the program structure and additional details can be found in Figure 1.

Transitioning to the second phase (R2D2 step), we undertook a rigorous quality assurance process for the online training modules through two distinct phases. The first phase involved preliminary field testing, where we gathered feedback from five educators at a school that was not part of the experimental site, allowing us to incorporate valuable insights for initial revisions. The second phase utilized main field testing, which involved a more extensive group of ten teachers, also from a different school setting, to ensure the modules met the diverse needs of educators. Throughout both phases, we facilitated focus group discussions, which provided a platform for teachers to share their experiences and suggestions, further enriching the development process.

In the third stage of our research (R3D3 step), we developed two crucial sets of experimental research tools. The first tool was a test designed to evaluate the learning outcomes achieved by the teachers after completing the training modules. The second tool was an assessment form to measure the students’ collaborative learning skills. Detailed discussions regarding these research tools are in the “Research Tools” section.

Finally, in the fourth phase (R4D4 step), we assessed the effectiveness of the online self-training program relative to our research hypotheses. Dubbed the “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills,” this initiative was implemented in a school randomly selected for experimental research. The study adopted a one-group pretest-posttest design, which included a sample of 16 teachers and 634 students during the second semester of the Academic Year 2023. The research unfolded in two distinct phases: the first was a one-month experimental study focused on developing the teachers’ learning processes, followed by a two-month experimental phase where teachers applied their newly acquired skills to benefit their student’s development.

### 2.2 Research Tools

**The Test of the Teachers’ Learning Outcomes:** This multiple-choice assessment with four options evaluates teachers’ learning outcomes before and after the development project. It focuses on six key themes: definitions, importance, characteristics, development guidelines, development stages, and evaluation. According to the Revised Bloom’s Taxonomy (2001), it addresses cognitive skills from remembering to creating.

To ensure the test's quality, we conducted two verification phases: *Phase 1: Content Validity* - Five experts utilized the Index of Item-Objective Congruence (IOC) methodology to evaluate content validity. All items surpassed the acceptable IOC threshold of 0.50 (Chaichanawirote & Vantum, 2017). *Phase 2: Test Quality* - The test was administered to 30 teachers from a non-experimental school. Key findings included a difficulty index of 0.20 to 0.80 and discrimination power between 0.20 and 1.00. The Kuder-Richardson Formula 20 (KR-20) indicated a reliability coefficient of 0.6222, while the overall test difficulty was measured at 0.85, suggesting it was adequately challenging for participants.

*The Assessment Form of Students' Collaborative Learning Skills* utilized a 5-point rating scale (highest to lowest) and was developed based on collaborative learning skill characteristics from Khan (2019), Singh (2011), and Tinzmann (1990). The assessment's quality was verified in two phases: 1. *Content Validity*: Verified by five experts using Rovinelli and Hambleton's method, with IOC values above the 0.50 criterion (Chaichanawirote & Vantum, 2017). 2. *Reliability*: Tested with 30 students outside the experimental site, yielding an overall alpha coefficient of 0.93. Specific dimensions showed reliability coefficients of 0.86 (planning and goal setting), 0.89 (responsibility skills), 1.03 (leadership), and 0.96 (teamwork), all exceeding the 0.70 criterion (George & Mallery, 2003), indicating high internal consistency.

### 2.3 Data Analysis

Data analysis consisted of two comparisons: 1) Teachers' learning scores were assessed against a 90/90 standard, with the first 90 representing the mean percentage of all teachers and the second indicating the percentage of those passing the test on all learning objectives (Yamkasikorn, 2008). 2) A dependent t-test was used to compare teachers' and students' pretest and posttest scores.

## 3. Results

The research led to the development of an "Online Self-Training Program for Empowering Teachers' Learning to Enhance Students' Collaborative Learning Skills," which consists of two main projects.

### 3.1 Teacher Development Project

This project involves seven self-training modules to help teachers enhance students' collaborative learning skills. The modules cover definitions, importance, characteristics, obstacles, development guidelines, stages, and evaluation.

### 3.2 Teacher Implementation Project

Focused on classroom application, this project provides a practical guide for teachers, including a summary of collaborative learning characteristics, development guidelines, assessment of student perceptions, and self-evaluation forms.

The efficiency test revealed significant results: teachers in the experimental group achieved an average posttest score of 32.81 (91.15% of 36 points), surpassing the 90/90 criteria, with 98.96% passing. A comparison between pretest and posttest scores showed an increase from 16.56 to 32.81, with a statistically significant difference at the 0.05 level. The results of the data analysis in Table 1.

Table 1. Teachers' pretest and posttest mean scores using dependent t-test

Testing	Sample size	Mean	Standard Deviation	t
Pre-test	16	16.56	3.58	20.90*
Post-test	16	32.81	1.47	

\*  $p < 0.05$ .

The test results related to the research hypotheses indicate a strong effectiveness of the "Online Self-Training Program for Empowering Teachers' Learning to Enhance Students' Collaborative Learning Skills," particularly within the "Teacher Learning Development Project."

In this project, data collected from a cohort of 16 teachers revealed that they not only met but exceeded the established performance criteria of 90/90, underscoring the program's success in enhancing their learning experiences. The structured self-training modules provided a comprehensive approach to teacher development, covering crucial skills and knowledge for effective teaching practices.

The significant improvement in teachers' pretest and posttest scores showcases the program's impact on their ability to implement collaborative learning strategies in the classroom. These results reinforce the validity of the research hypotheses, confirming that the training provided through this initiative effectively equipped teachers to

foster an engaging and supportive learning environment for their students.

Overall, the Teacher Learning Development Project findings affirm the program's potential to advance teacher competencies and enhance the overall educational experience, ultimately facilitating better collaborative learning outcomes for students. This establishes a solid foundation for further implementation and dissemination of the program within various educational settings.

The research outcomes from the project aimed at teachers implementing learning outcomes for student development reveal significant findings. Following the experimental research associated with the project, teachers incorporated the learning results into their classroom practices during the R4D4 step. Subsequently, students in the experimental group assessed their achievement results to evaluate the effectiveness of the educational innovations. The findings indicated that self-assessment results, including the mean and standard deviation, were recorded before and after the experiment. These results encompass the overall data and classifications for each specific aspect, as illustrated in Table 2.

Table 2. Mean and standard deviation from the evaluation results of the students' collaborative learning skills before and after the experiment

Characteristics of collaborative learning skills of students	Result			
	Pre-test		Post-test	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.
<i>Planning and goal-setting skills</i>	2.53	0.34	4.41	0.31
1) I participate in setting the team's goals and objectives.	2.59	0.55	4.38	0.48
2) I fully participate in the meeting.	2.56	0.53	4.47	0.50
3) I have clear roles and responsibilities.	2.57	0.54	4.39	0.49
4) I come to a consensus on the team's goals and plans to achieve them.	2.49	0.59	4.40	0.52
5) I share the work fairly.	2.48	0.61	4.40	0.54
6) I understand the results and steps before work.	2.50	0.63	4.38	0.48
<i>Responsibility skills</i>	2.49	0.35	4.43	0.31
7) I take my assigned responsibilities seriously.	2.50	0.64	4.41	0.52
8) I am fully committed to my goals and plans.	2.48	0.61	4.44	0.52
9) I am committed to the team's success.	2.49	0.64	4.43	0.51
10) I efficiently use all resources to complete tasks.	2.48	0.61	4.45	0.54
11) I give full participation and cooperation.	2.52	0.62	4.43	0.51
12) I am fully committed to responsibility.	2.46	0.64	4.46	0.53
13) I manage my time and use other team members' time effectively.	2.49	0.65	4.40	0.54
<i>Leadership skills</i>	2.50	0.32	4.44	0.30
14) I demonstrate democratic and collaborative leadership.	2.49	0.60	4.45	0.52
15) I resolve conflicts effectively.	2.49	0.61	4.50	0.52
16) I can control my emotional reactions and anger effectively.	2.50	0.59	4.45	0.53
17) I allow others to solve problems or make decisions.	2.50	0.60	4.42	0.52
18) I listen to the opinions of others on my team.	2.52	0.59	4.42	0.53
19) I ask in-depth questions that lead to deeper analysis.	2.46	0.62	4.48	0.52
20) I promote and support the full participation of all members in decision-making.	2.51	0.60	4.41	0.53
21) I identify reasons and differences when there are disagreements.	2.53	0.60	4.44	0.52
<i>Teamwork skills</i>	2.53	0.33	4.42	0.31
22) I treat my team members with respect.	2.55	0.63	4.37	0.51
23) I value and recognize the contributions of all team members.	2.57	0.58	4.40	0.52
24) I give compliments and constructive criticism.	2.54	0.62	4.41	0.52
25) I maintain the points and focus of the group discussion.	2.51	0.63	4.43	0.52
26) I listen to others carefully and do not interrupt them.	2.49	0.59	4.43	0.53
27) I fully participate in decision-making.	2.53	0.61	4.43	0.51
28) I fully express my opinions in meetings.	2.48	0.59	4.45	0.53
29) I allow others to explain their reasons.	2.56	0.56	4.38	0.51
30) I truly enjoy working with others.	2.58	0.52	4.44	0.50
<i>Total</i>	2.51	0.26	4.43	0.25

According to the findings presented in Table 2, there was a notable improvement in the average scores for collaborative learning skills after the experimental intervention compared to the scores recorded before the experiment. Specifically, the average score following the experiment was 4.43, accompanied by a standard deviation of 0.25, indicating a relatively consistent level of performance among participants. In contrast, the average score before the experiment was significantly lower at 2.51, with a standard deviation of 0.26, suggesting more significant variability in the collaborative skills of participants prior to the intervention.

A statistical analysis was conducted using the Dependent t-test to validate these findings further, confirming a statistically significant difference between the two scores. This difference was assessed at the 0.05 significance level, indicating that the improvement in collaborative learning skills after the experiment is unlikely due to chance. It may suggest the effectiveness of the experimental intervention implemented, 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	634	2.51	0.26	130.26*
Post-test	634	4.43	0.25	

\*  $p < 0.05$ .

The comprehensive research hypothesis testing results present strong evidence supporting the initiative “Teachers’ Project Leads Learning Outcomes to Enhance Students’ Collaborative Learning Skills.” This initiative transcends being a simple educational strategy; it has been thoughtfully designed to foster active participation among teachers in continuous professional development.

The initiative seeks to engage educators and provide them with a wide range of effective teaching strategies and resources tailored to improving their students’ academic performance and cognitive and emotional well-being.

The focus on collaborative learning skills is particularly significant, as these skills are crucial for navigating complex social interactions and working effectively in team environments. Through this initiative, teachers can refine their pedagogical techniques, share best practices, and implement innovative methods that promote a supportive learning atmosphere. The initiative is poised to create a more enriched educational experience for teachers and students, leading to enhanced collaboration, critical thinking, and resilience among learners.

### 3.3 Educational Innovation Outcomes

This research focuses on “Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills,” rooted in the principle of “Developing Teachers to Lead to Student Development.” An Online Self-Training Program serves as a crucial tool for adapting to the digital age, which supports learning “anywhere, anytime,” unlike the heavily print-dependent past.

The first initiative is the Teacher Learning Development Project. This project introduces self-learning modules derived from the literature review that covers critical areas including Definitions, Importance, Characteristics, Obstacles and Solutions, Development Guidelines, Development Stages, and Evaluation. Seven self-learning modules are crafted for teachers to conveniently study and learn at their own pace.

The second initiative is the Teachers Leading Learning Outcomes to Development Project, aimed at developing Collaborative Learning Skills for students. This includes a comprehensive module containing several key components:

- 1) Instruction
- 2) Summary of expected characteristics
- 3) Summary of development guidelines
- 4) Summary of the development process
- 5) Questionnaire for assessing students’ Collaborative Learning Skills
- 6) Self-assessment form for teachers regarding the implementation of development guidelines (via Google Form)
- 7) Teachers’ self-assessment on the selection of a development process model for implementation (via Google Form)

## 8) Teacher's self-reflection form on practice (via Google Form)

Further details are presented in the accompanying diagram.

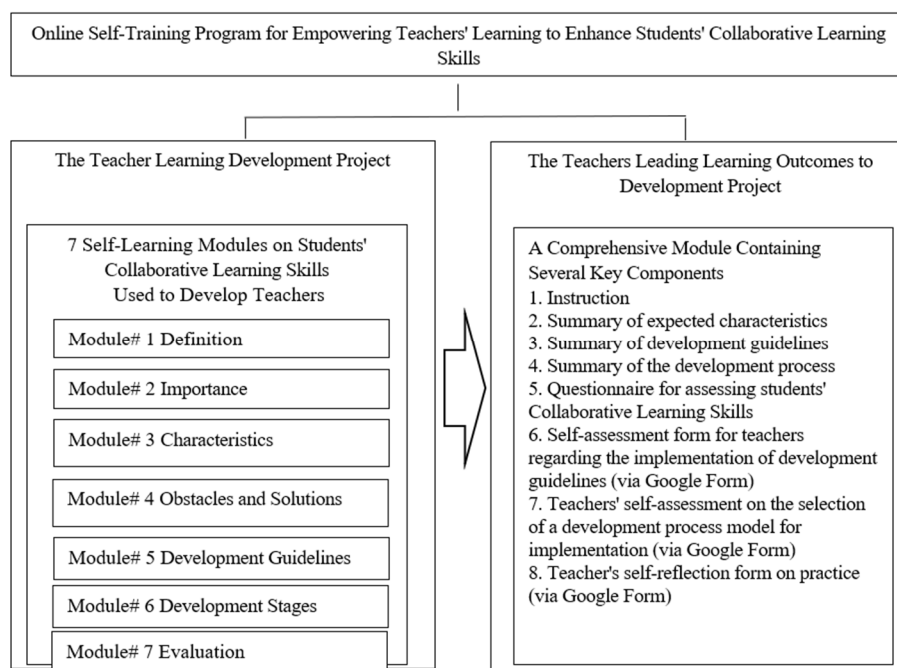


Figure 1. Online self-training program for empowering teachers' learning to enhance students' collaborative learning skills

The findings of the research, conducted utilizing a Research and Development (R&D) methodology featuring a one-group pretest-posttest design, reveal significant outcomes within a randomly selected school, which included an experimental group of 16 teachers and a target demographic of 634 students. The primary objective of the study was to evaluate the effectiveness of the “Online Self-Training Program for Empowering Teachers’ Learning to Enhance Students’ Collaborative Learning Skills.” This educational innovation, arising from the research, demonstrates practical applicability as anticipated, particularly in relation to enhancing teachers’ professional development and the implementation of an experimental research project focused on achieving beneficial learning outcomes for students.

The posttest scores of teachers in the experimental group exceeded the predetermined criterion of 90 out of 90, and these scores were statistically significantly higher than their pretest results. Moreover, the students in the same group exhibited a significant increase in their posttest scores relative to their pretest scores. These findings correspond with the results of previous studies employing comparable R&D methodologies, notably those conducted by Saysin and Dhammapissamai (2023), Thammabut and Thacha (2023), and Mopara and Sanrattana (2023). The guiding principles of “Knowledge” and “Power” inherent in the framework of “Teachers’ Learning for Student Development” were effective in fostering meaningful educational innovation, suggesting the potential for widespread implementation across various educational institutions.

Moreover, the research team sought to evaluate the effectiveness of the developed educational innovation while gathering additional insights from the teachers in the experimental group concerning their experiences and reflections drawn from practical fieldwork. Several significant observations emerged from this investigation.

Firstly, challenges related to preparing students for practical collaborative activities were identified, particularly regarding time management, resource procurement, follow-up, and evaluation. This observation aligns with the findings of Le, Janssen, and Wubbels (2017), who noted the difficulties students often face in structuring collaborative activities, including monitoring engagement, managing group work time, providing necessary materials, assigning individual responsibilities, and establishing normative behaviors for teamwork. Furthermore, challenges related to assessing student performance during Collaborative Learning activities were also underscored. Ford (2013) proposed several principles and strategies to mitigate these obstacles: (1) arranging classrooms to enhance engagement through collaborative discussions, (2) defining group tasks



alongside establishing operational ground rules, (3) providing explicit instruction in teamwork by assigning distinct student roles, (4) developing tasks that necessitate shared expertise among students, (5) offering opportunities for both individual and collaborative decision-making pertaining to learning tasks, (6) encouraging students to set personal learning goals and self-monitor their progress, and (7) defining clear assessment criteria for student collaboration prior to task initiation.

Secondly, issues concerning students' lack of familiarity with individualized instruction, their reluctance to participate in group work, and teachers' tendencies to avoid collaborative teaching methodologies emerged as considerable barriers. These concerns reflect the observations made by Osipov and Ziyatdinova (2017), which highlighted students' unwillingness to engage in collaboration. Additionally, Ford (2013) discussed the challenges in teaching and learning environments, indicating that students predominantly work in isolation, limiting opportunities for class or group discussions, with a prevailing focus on teacher-led discourse. Consequently, this environment restricts chances for student interaction and support, thereby prioritizing knowledge acquisition over skill development and effective learning behaviors; decisional authority regarding all tasks remains largely centralized with the teacher, who determines all student targets and objectives.

#### 4. Conclusion

Despite the apprehensions expressed by educators, the "Online Self-Training Program for Empowering Teachers' Learning to Enhance Students' Collaborative Learning Skills," developed through a comprehensive research and development methodology, exemplifies the potential for effective educational innovation. This program is closely aligned with established research hypotheses and possesses significant potential to benefit both teachers and students within the targeted schools, thereby paving the way for meaningful transformation.

For the successful implementation of this educational initiative, it is imperative that teachers acknowledge the vital importance of fostering collaborative learning skills among students. As Chandra (2015) articulates, these skills encompass a range of essential elements, including the celebration of diversity, recognition of individual differences, interpersonal development, opportunities for meaningful contributions within small groups, and enhanced channels for personal feedback.

Furthermore, Gates (2018) highlights the myriad advantages of fostering a collaborative educational environment for both students and teachers. First and foremost, collaboration serves as a catalyst for the generation of innovative ideas. Additionally, professional collaboration enables educators to reflect on and refine their instructional practices while concurrently supporting students' learning trajectories. The benefits of collaborative learning extend to the enhancement of higher-order thinking skills and the bolstering of students' confidence and self-esteem. Engaging in group projects not only deepens educational experiences but also cultivates social and interpersonal skills, as students learn to interact with diverse learners and develop leadership competencies.

However, educators face substantial challenges in preparing students for collaborative activities. A significant proportion of students, having become accustomed to individualized instruction, may exhibit reluctance to participate in group work. Moreover, some educators may hesitate to adopt group teaching methodologies due to the perceived increase in workload that such approaches might entail. Nevertheless, by collaboratively addressing these challenges, educators can empower the next generation and cultivate a dynamic and thriving learning environment.

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### **Data sharing statement**

No additional data are available.

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