Sustainable Social Development 2026, 4(6), 8838.
https://doi.org/10.23812/ssd8838

Article

Student teacher leadership development sustainable model

Tippawan Sukjairungwattana, Wanwisa Bungmark*

Faculty of Education, Silpakorn University, Nakhon Pathom 73000, Thailand
*** Corresponding author:** Wanwisa Bungmark, bungmark_w@su.ac.th

CITATION

Sukjairungwattana T, Bungmark W. Student Teacher Leadership Development Sustainable Model. Sustainable Social Development. 2026; 4(6): 8838. https://doi.org/10.23812/ssd8838

ARTICLE INFO

Received: 22 June 2026
Revised: 29 August 2026
Accepted: 8 September 2026
Available online: 26 November 2026

COPYRIGHT

Copyright © 2026 by author(s). *Sustainable Social Development* is published by Asia Pacific Academy of Science Pte. Ltd. This work is licensed under the Creative Commons Attribution (CC BY) license. https://creativecommons.org/licenses/by/4.0/

Abstract: Preparing student teachers with leadership competencies is essential for quality, equitable, and inclusive education aligned with SDG 4. This research aimed to (1) study the fundamental information of student teacher leadership, (2) develop the student teacher leadership sustainable model, (3) implement the model, and (4) evaluate and improve the model. This study employed a Research and Development (R&D) design. Data sources included 311 survey respondents, 15 interview participants, seven focus group participants, 30 student teachers participating in the model implementation, and five experts. Data were analyzed using percentages, means, standard deviations, stepwise multiple regression analysis, and content analysis. The findings showed that (1) overall student teacher leadership was high; personality and motivation ranked highest, followed by communication, knowledge, and ethics and morality. (2) The resulting ALPPI Model comprises Activities, Learning, Practice, Participation, and Improvements, supported by Principles, Objectives, Processes, and Conditions. (3) Following implementation with 30 student teachers, participants rated the overall appropriateness and acceptability of the ALPPI Model at a high level (M = 4.41, S.D. = 0.62), with the objectives rated at the highest level (M = 4.50, S.D. = 0.57). The overall post-implementation student teacher leadership score was also at a high level (M = 4.32, S.D. = 0.28). (4) The expert evaluation indicated that the model was rated at the highest level in terms of accuracy, appropriateness, feasibility, and usefulness. The ALPPI Model may be applied as a model for developing student teacher leadership in teacher education institutions.

Keywords: ALPPI; student teacher leadership; leadership development; equitable education; SDG 4

1. Introduction

Sustainable Development Goal 4, or SDG 4, focuses on creating quality, inclusive, and equitable education and promoting lifelong learning for everyone by 2030. It is considered a key goal that helps reduce educational inequalities and serves as a mechanism to support the achievement of other sustainable development goals. Therefore, it is necessary to have international cooperation, increased investment in education, and clear targets with indicators, especially in developing countries. In order to make education of quality and accessible to everyone, especially in the education of student teachers in Thailand, it demonstrates the potential for other countries to follow this model, focusing on quality, equality, inclusion, and lifelong learning [1]. According to the Office of the Permanent Secretary for Higher Education, Science, Research and Innovation [2], Thailand's higher education system is expected to produce graduates with an emphasis on the development of people of all ages. Therefore, universities have an important mission not only to provide knowledge, but also to develop leadership characteristics and professional ethics, particularly in teacher education institutions, where the preparation of future teachers and teacher

education aim to prepare individuals who are capable of leading educational change. Teacher education institutions therefore need to revise their curricula to prepare quality teachers with leadership who are able to organize equitable learning, promote sustainable development, and enhance education to respond to the needs of all learners in the 21st century.

Leadership is an essential attribute in the teaching profession. Student teachers must be trained to develop leadership in various dimensions, including (1) personality, in which they should have confidence and responsibility; (2) knowledge, in which teachers must have comprehensive knowledge of academic content and reasonable teaching techniques; (3) ethics and morality, in which teachers must have honesty, adhere to moral principles, and serve as good role models; (4) motivation; and (5) communication.

The research discusses the importance of leadership development in teacher preparation. Jean-Marie et al. [3] emphasized the importance of preparing educational leaders to address social justice in educational. Meanwhile, Kahila et al. [4] promoted teacher professionalism by supporting responsibility in leadership roles. Tsarkos [5] further emphasized that strengthening educational leadership is important for the effectiveness of future educators. In addition, Jammal [6] supported that both curricular and extracurricular activities can promote student leadership through the development and application of leadership skills in real-life situations.

Sustainable student teacher leadership is a concept that focuses on developing leadership capabilities alongside professional readiness for the teaching profession. It emphasizes collaborative learning, the development of leadership skills, and continuous support from teacher education institutions. Effective teacher professional development is considered an important factor influencing sustainable student learning outcomes [7].

Student teacher leadership is vital for sustainable educational and societal development. Beyond improving classroom environments and student outcomes [8], leader-teachers actively shape educational policy, curriculum design, and community partnerships. Such collective efforts create shared ownership of educational goals aligned with community values and priorities.

To sustain these competencies into professional careers, educational systems must foster continuous professional development and a culture of shared responsibility [7,9].

The development of student teacher leaders is an important force in driving the process of developing essential skills alongside academic and professional development in the teaching profession. A model for developing leadership among student teacher leaders should be studied as a practical guideline for cultivating student leaders. This would support universities in promoting holistic student development effectively, leading to the improvement of educational management quality. Therefore, it is essential to develop leadership competencies among student teachers from the early stages of higher education. Effective leadership training not only enhances their professional identity and confidence but also enables them to play a transformative role in improving the quality, inclusiveness, and equity of sustainable education. This study, thus, aims to develop a systematic and practical student teacher leadership

sustainable model (ALPPI Model) that ensures appropriateness, consistency, usefulness, and feasibility for application in teacher education institutions.

1.1. Research objectives

1. To study the fundamental information of student teacher leadership.
2. To develop the student teacher leadership sustainable model.
3. To implement the model.
4. To evaluate and improve the model for enhancing sustainable student teacher leadership development.

1.2. Operational definitions

Student teachers refer to student teachers from four autonomous universities in the academic year 2566 who participated in the traditional sports event of the Faculties of Education, which is an activity that builds relationships among students in the teaching profession, the Mai Riew Games, including performances, namely the Faculty of Education, Kasetsart University; the Faculty of Education, Srinakharinwirot University; the Faculty of Education, Silpakorn University; and the Faculty of Education, Burapha University.

Sustainable Student Teacher Leadership refers to the behaviors of student teachers that demonstrate their ability to persuade and influence others to listen, accept, and willingly cooperate in performing tasks or carrying out various activities based on their ideas and recommendations so that the tasks or activities can be successfully completed in accordance with the stated objectives; it consists of five dimensions—(1) personality refers to the unique characteristics of student teachers consisting of behaviors, thoughts, and emotions, which are reflected through consistent patterns of feeling, thinking, and behaving and influence learning and the development of professional teaching skills, (2) knowledge refers to, in summary, the knowledge aspect, the knowledge within student teachers that results from learning toward having leadership. It is newly acquired knowledge and self-development that can be applied to promote learning and activities, enabling them to have ideas and leadership, (3) morality and ethics refer to the goodness that arises within the minds of student teachers and is expressed through their conduct and behavior, (4) motivation refers to the process of inducing and persuading student teachers to make efforts to respond to certain needs and achieve success, and (5) communication refers to the roles and abilities of student teachers who serve as leaders in effectively conveying information, ideas, feelings, or various practices to groups of fellow students, educational communities, or other individuals in order to create good understanding and lead to development in learning and shared behavior.

Factors affecting student teacher leadership refer to various causes that affect student teacher leadership, consisting of: 1) social factors, refer to the roles of student teachers as leaders in providing assistance, encouragement, and support to fellow students or individuals 2) work skills refer to the abilities of student teachers as leaders in planning, coordinating, and working effectively with others., 3) self-development refers to student teachers who perform leadership roles and are committed to learning and continuously developing their potential in terms of knowledge, skills, personality,

morality, and ethics, 4) teacher characteristicsrefer to student teachers performing leadership roles and demonstrating characteristics appropriate to the teaching profession, having love and faith in the teaching profession, complying with the professional code of ethics for teachers, exchanging learning experiences and ideas among fellow student teachers within and outside the same organization, and 5) a learning-conducive environment refers to the roles of student teachers as leaders in creating, promoting, and maintaining physical, social, and psychological environments that support the learning of themselves, with the following meanings:

Development model refers to a pattern that demonstrates a conceptual development process conducted step by step, beginning with the study of knowledge concerning the subject for which the model is to be clearly developed and the study of the model development process by determining: 1) principles, 2) objectives, 3) processes, and 4) outcomes obtained from the implementation of the model.

2. Materials and methods

2.1. Conceptual framework

The study on the Student Teacher Leadership Development Sustainable Model was based on selected concepts, theories, and related studies concerning five influencing factors: (1) social factors [10], (2) work skills [8], (3) self-development [11], (4) teacher characteristics [9], and (5) a learning-supportive environment [11].

Student teacher leadership comprised five dimensions: (1) personality [12], (2) knowledge [11], (3) morality and ethics [13], (4) motivation [14], and (5) communication [11].

The model development process was informed by a related teacher leadership development model [15]. Consequently, the ALPPI Model comprises four components: (1) principles, (2) objectives, (3) process consisting of Activities, Learning, Practice, Participation, and Improvements, and (4) conditions. The conceptual framework is shown in **Figure 1**.

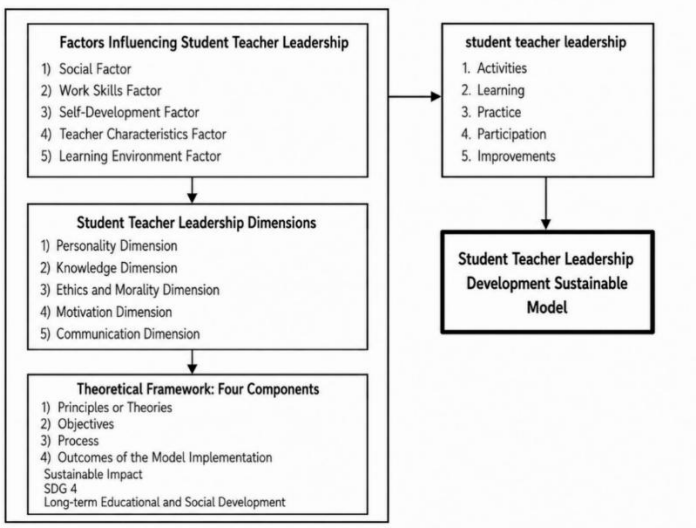


Figure 1. The conceptual framework of the study.

The ALPPI Model links Activities, Learning, Practice, Participation, and Improvements with the sustainable development of student teacher leadership. This model was designed to be appropriate for the context of teacher education by emphasizing activity-based learning, practice, participation, ethical cultivation, and continuous improvement.

The ALPPI Model extends this concept to cover professional practice, collaborative participation, and continuous iterative improvement for long-term sustainability. It also aims to cultivate the personal leadership potential of student teachers. Therefore, the ALPPI Model is characterized by the holistic integration of experiential learning, hands-on practice, participation, and continuous improvement, resulting in a sustainable model.

2.2. Research methodology

2.2.1. Population and sample

The population of this study comprised 6289 student teachers from four state universities participating in the Mai Riew Games, an inter-institutional relationship-building event for teacher education students.

The sample size was determined using the G*Power program by selecting F tests and Linear multiple regression: Fixed model, R^2 deviation from zero. The effect size was set at ($f^2 = 0.0436$), the statistical significance level at .05, the statistical power at .80, and the number of predictor variables at five. The calculation indicated that a minimum sample size of 300 participants was required from the total population of 6289, while the sample used in this study consisted of 311 participants. A total of 311 questionnaires were returned, and all 311 complete responses were included in the analysis, representing an overall response rate of 95.99 %. The population and sample size of the study are presented in **Table 1**.

Table 1. Population and sample size of the study.

University	Population, *n*	Invited, *n*	Returned, *n*	Usable responses, *n*
Faculty of Education, Silpakorn University	3017	155	149	149
Faculty of Education, Burapha University	1200	62	59	59
Faculty of Education, Srinakharinwirot University	1000	52	50	50
Faculty of Education, Kasetsart University	1072	55	53	53
Total	6289	324	311	311

The implementation of the ALPPI Model was conducted with 30 student teachers as a pilot study; therefore, the findings may have limitations in terms of generalization. However, this study employed multiple data sources, including questionnaires from 311 student teachers, interviews with 15 participants, focus group discussions with 7 participants, model implementation with 30 student teachers, and evaluation by 5 experts to confirm the findings from multiple dimensions.

The researchers requested permission to collect data through student leaders using an online questionnaire from October 2023 to May 2024. The returned questionnaires were subsequently followed up and checked for completeness before

the data were analyzed. The focus group discussion was conducted on 15 August 2024. The model was implemented during the second semester of the 2024 academic year, and the evaluation and refinement of the model were conducted on 15 November 2024.

The inclusion criteria were as follows: (1) being a student teacher enrolled at one of the four universities during the 2023 academic year; (2) being able to complete the questionnaire; and (3) voluntarily agreeing to participate in the study.

The exclusion criteria were as follows: (1) not meeting the specified eligibility criteria; (2) withdrawing consent to participate; and (3) submitting a questionnaire with incomplete data that could not be included in the analysis.

2.2.2. Research procedure

This study employed a Research and Development (R&D) design. The research procedure was divided into four phases, as follows:

Phase 1: Study the Fundamental Information of Student Teacher Leadership.

This phase aimed to examine the leadership of student teachers by synthesizing relevant theories of leadership, factors influencing student teacher leadership, and theoretical models from both domestic and international research. The results were used to construct a conceptual framework and develop a questionnaire to collect data from 311 student teachers.

Phase 2: Develop the Student Teacher Leadership Development Sustainable Model.

Based on the findings from Phase 1, a draft model and a user manual for the student teacher leadership development model were designed. The model and manual were then evaluated for appropriateness and feasibility by five experts.

Phase 3: Implementation of the Model

In this phase, the student teacher leadership was implemented through five activity plans involving 30 student teachers. Following the implementation, participants evaluated the ALPPI Model in terms of perceived appropriateness, acceptability, and satisfaction.

Phase 4: Evaluate and Improve the Student Teacher Leadership Development Sustainable Model.

The developed model was evaluated and refined using the connoisseurship evaluation approach conducted by five experts. Their feedback was analyzed and used to revise and finalize the student teacher leadership development sustainable model to ensure its completeness and applicability.

2.2.3. Research instruments

The research instruments were developed based on relevant concepts, theories, and previous studies. Their content validity was examined by five experts. The acceptance criterion was an IOC value of 0.50 or higher. All retained items obtained IOC values of 0.60 or above and were revised according to the experts' recommendations before data collection. The study employed five research instruments, as follows:

Student teacher leadership questionnaire

This instrument was a single questionnaire divided into four sections: (1) respondents' background information; (2) 42 items concerning factors influencing

student teacher leadership; (3) 38 items concerning student teacher leadership; and (4) preferred formats or characteristics of student teacher leadership development activities. Sections 2 and 3 employed a five-point rating scale. The questionnaire was administered via Google Forms and was voluntarily completed by 311 student teachers.

The questionnaire was pilot-tested with 30 student teachers from the Faculty of Education, Silpakorn University, who were not included in the study sample. The reliability coefficients for social factors, work skills, self-development, teacher characteristics, and a supportive learning environment were 0.96, 0.79, 0.95, 0.86, and 0.96, respectively. The reliability coefficients for the knowledge, motivation, personality, ethics and morality, and communication dimensions of student teacher leadership were 0.94, 0.84, 0.74, 0.85, and 0.92, respectively.

Semi-structured interview guide

This instrument was used to collect data from 15 purposively selected key informants. It consisted of three sections of open-ended questions concerning factors influencing student teacher leadership, the five dimensions of student teacher leadership, and the student teacher leadership development model, comprising 15 questions.

Focus-group discussion guide

This instrument was used to collect data from seven student club leaders from four universities. It consisted of five open-ended questions concerning approaches to activity development, the design of learning activities, activity formats, future leadership development, and factors influencing the success of leadership development.

Expert model validation form

This instrument was administered to five experts to evaluate the usefulness, feasibility, appropriateness, and accuracy of the principles, objectives, ALPPI process, and conditions of the model. The form used a five-point rating scale and included open-ended questions for additional recommendations.

Participant perception and satisfaction form

This instrument was used to assess participants' opinions regarding the principles, objectives, all five dimensions of the ALPPI process, and the conditions of the model. It consisted of 30 items using a five-point rating scale.

3. Results

The research findings were presented in four sections according to the research objectives. The details are as follows:

3.1. Fundamental information of student teacher leadership

3.1.1. Results of the study: The fundamental information of student teacher leadership

The findings revealed that the overall level of factors influencing student teacher leadership among the respondents was high (M = 4.13, S.D. = 0.26). When considering

each aspect individually, it was found that the social factor ranked first, with a high level (M = 4.22, S.D. = 0.20). The details are shown in **Table 2**.

Table 2. Factors influencing student teacher leadership.

Factors influencing student teacher leadership		Mean (M)	Standard deviation (S.D.)	Interpretation	Rank
1	Social Factor	4.22	0.20	High	1
2	Work Skills Factor	4.04	0.48	High	5
3	Self-Development Factor	4.09	0.44	High	3
4	Teacher Characteristics Factor	4.09	0.36	High	4
5	Learning Environment Factor	4.12	0.41	High	2
Overall		4.13	0.26	High	-

As shown in **Table 3**, the mean scores and standard deviations of opinions regarding student teacher leadership, both overall and by aspect, were analyzed. The findings revealed that the highest mean scores were found in two aspects: Personality (M = 4.10, S.D. = 0.38) and Motivation (M = 4.10, S.D. = 0.38). The details are presented in **Table 3**.

Table 3. Aspects of student teacher leadership.

Aspects of student teacher leadership		Mean (M)	Standard deviation (S.D.)	Interpretation	Rank
1	Knowledge Dimension	4.07	0.36	High	3
2	Motivation Dimension	4.10	0.38	High	1
3	Personality Dimension	4.10	0.38	High	1
4	Ethics and Morality Dimension	4.06	0.41	High	4
5	Communication Dimension	4.08	0.39	High	2
Overall		4.09	0.29	High	-

The independence of the residuals was examined using the Durbin–Watson statistic, which yielded a value of 1.459 and did not indicate serious autocorrelation. The tolerance values ranged from 0.242 to 0.860, exceeding the threshold of 0.10, while the VIF values ranged from 1.163 to 4.140, below the threshold of 10. These results indicated no serious multicollinearity among the predictors and supported their inclusion in the multiple regression analysis.

An analysis of the relationships among the factors influencing student teacher leadership revealed that social factors, work skills, self-development, teacher characteristics, and the learning environment were all positively and significantly inter-correlated ($p < 0.01$), with correlation coefficients (r) ranging from 0.179 to 0.737.

The strongest relationship was found between teacher characteristics and the learning environment ($r = 0.737$, $p < 0.01$), followed by self-development and teacher characteristics ($r = 0.710$, $p < 0.01$). Conversely, the weakest correlation was between social factors and the learning environment ($r = 0.179$, $p < 0.01$). Since all correlation coefficients remained below the .80 threshold, there was no threat of multicollinearity,

confirming that these variables were suitable for subsequent stepwise multiple regression analysis. The regression results are presented in **Table 4**.

Table 4. Results of multiple linear regression analysis of factors influencing student teacher leadership.

	Unstandardized		Standardized		
Variables	**B**	**Std. error**	**Beta**	***t***	**Sig**
Constant	-0.199	0.094		-2.125*	0.034
Self-Development (X_1)	0.279	0.015	0.463	18.900*	0.000
Social Factor (X_2)	0.504	0.023	0.390	22.087*	0.000
Teacher Characteristics (X_3)	0.210	0.024	0.289	8.654*	0.000
Learning Environment (X_4)	0.049	0.016	0.077	3.039*	0.003
R = 0.958, R^2 = 0.918, Adjusted R^2 = 0.917, SE = 0.0769, F = 854.401					

The results indicated that the four independent variables together could predict student teacher leadership at a statistically significant level ($p < 0.05$). The multiple correlation coefficient (R) was 0.958, and the coefficient of determination (R^2) was 0.918, suggesting that these four variables could explain 91.8% of the variance in student teacher leadership. Therefore, the regression equations can be formulated as follows:

Raw score regression Equation:

$$Y = -0.199 + 0.279(X_1) + 0.504(X_2) + 0.210(X_3) + 0.049(X_4) \quad (1)$$

Standardized score regression Equation:

$$Z = 0.463Z(X_1) + 0.390Z(X_2) + 0.289Z(X_3) + 0.077Z(X_4) \quad (2)$$

Where:

X_1 = Self-development

X_2 = Social factor

X_3 = Teacher characteristics

X_4 = Learning environment

3.1.2. Qualitative data

The findings from in-depth interviews with 15 key informants identified the factors affecting the development of student teacher leadership, including social factors, work skills, self-development, teacher characteristics, and a learning-supportive environment. Such development relies on support from families, teacher education institutions, various personnel, networks, and activity formats that promote leadership. Student teacher leadership comprises personality, knowledge, morality and ethics, motivation, and communication. Therefore, leadership development should emphasize learning through actual practice, collaboration with others, and systematic and continuous support.

3.2. Development of the student teacher leadership development sustainable model

The one-sample t-test results showed that the overall level of student teacher leadership after the implementation of the ALPPI Model was significantly higher than the criterion value of 4.00 (M = 4.32, S.D. = 0.28, $t = 6.270$, $p < 0.001$). When each dimension was considered separately, four dimensions—Personality, Ethics and Morality, Motivation, and Communication—had mean scores that were significantly higher than the criterion value. In contrast, the mean score for Knowledge did not differ significantly from the criterion value ($p = 0.789$). These findings indicate that the student teachers demonstrated a high level of leadership, particularly in Ethics and Morality, which had the highest mean score (M = 4.58). However, Knowledge should be further developed to ensure that its mean score clearly exceeds the specified criterion. The results are presented in **Table 5**.

Table 5. One-sample *t*-test results for student teacher leadership after implementation of the ALPPI model ($n = 30$).

Dimensions	M	S.D.	*t*	*p*
Personality	4.36	0.38	5.236	<0.001
Knowledge	3.97	0.54	-0.270	0.789
Ethics and Morality	4.58	0.28	11.360	<0.001
Motivation	4.42	0.35	6.577	<0.001
Communication	4.28	0.44	3.525	0.001
Overall student teacher leadership	4.32	0.28	6.270	<0.001

Note: The test value was 4.00.

The validation results of the ALPPI Model are presented in **Table 6**.

Table 6. Validation results of the student teacher leadership development sustainable model (ALPPI model) ($n = 5$).

Components of the ALPPI model		Mean (M)	Standard deviation (S.D.)	Interpretation
1	Activities (A)	4.30	0.65	High
2	Learning (L)	4.38	0.63	High
3	Practice (P)	4.46	0.65	High
4	Participation (P)	4.01	0.57	High
5	Improvements (I)	4.05	0.55	High
Overall		4.24	0.61	High

The initial draft of the ALPPI model was developed from a literature review, a questionnaire completed by 311 student teachers, interviews with 15 key informants, and a focus group discussion with seven student leaders.

Regarding the sustainable model for developing student teacher leadership, The overall validation rating of the ALPPI Model was at a high level (M = 4.24, S.D. = 0.61). The three components with the highest mean scores were Practice (P) (M =

4.46, S.D. = 0.65), Learning (L) (M = 4.38, S.D. = 0.63), and Activities (A) (M = 4.30, S.D. = 0.65), respectively.

Findings from the literature review, quantitative data, and qualitative data were synthesized into the five ALPPI components: Activities, Learning, Practice, Participation, and Improvements.

3.3. Implementation of the model

The findings revealed that the participants' perceived appropriateness and acceptability of the implementation of the Student Teacher Leadership was at a high level (M = 4.41, S.D. = 0.62). When considering each aspect, the principles of the model were rated at a high level (M = 4.43, S.D. = 0.50), while the objectives of the model were rated at the highest level (M = 4.50, S.D. = 0.57). Regarding the process component, the overall evaluation was also at a high level (M = 4.46, S.D. = 0.57). Specifically, the Practice (M = 4.52, S.D. = 0.32) and Participation (M = 4.52, S.D. = 0.56) aspects were rated at the highest level. The aspects of Improvements (M = 4.28, S.D. = 0.86), Activities (M = 4.38, S.D. = 0.63), and Learning (M = 4.26, S.D. = 0.70) were also rated at high levels. The conditions for implementation were evaluated at a high level (M = 4.38, S.D. = 0.80). Details are presented in **Table 7**.

Table 7. Results of the implementation of the student teacher leadership development sustainable model (*n* = 30).

	Content	Mean (M)	Standard deviation (S.D.)	Interpretation
1	The principles of the model are clear and appropriate.	4.43	0.50	High
2	The objectives of the model are clear and appropriate.	4.50	0.57	Highest
3	Process			
	1. Activities	4.38	0.63	High
	2. Learning	4.26	0.70	High
	3. Practice	4.52	0.32	Highest
	4. Participation	4.52	0.56	Highest
	5. Improvements	4.28	0.86	High
4	Conditions	4.38	0.80	High
	Overall	4.41	0.62	High

3.3.1. Implementation of the student teacher leadership development sustainable model

The Student Teacher Leadership Development Sustainable Model was implemented with 30 student teachers during the second semester of the 2024 academic year. The program comprised five non-formal training activity plans, each lasting 6 h, for a total of 30 h. The activities included mindset adjustment, motivation enhancement and personality development, communication, project writing, and Walk Rally activities. They were conducted through lectures, practical exercises, group work, participatory experiences, and reflection, with facilitators and senior student teacher leaders serving as activity leaders. The program aimed to develop student

teacher leaders' personality, knowledge, morality and ethics, motivation, communication, and teamwork. Evaluation was based on participation behaviors and satisfaction.

The structure of the model was developed based on the results of Phase 1 (study of leadership and influencing factors) and Phase 2 (model development). The final model comprised four main components:

1. Principles 2. Objectives 3. Process 4. Conditions. The overall conceptual framework of the student teacher leadership development sustainable model (ALPPI Model) is illustrated in **Figure 2**.

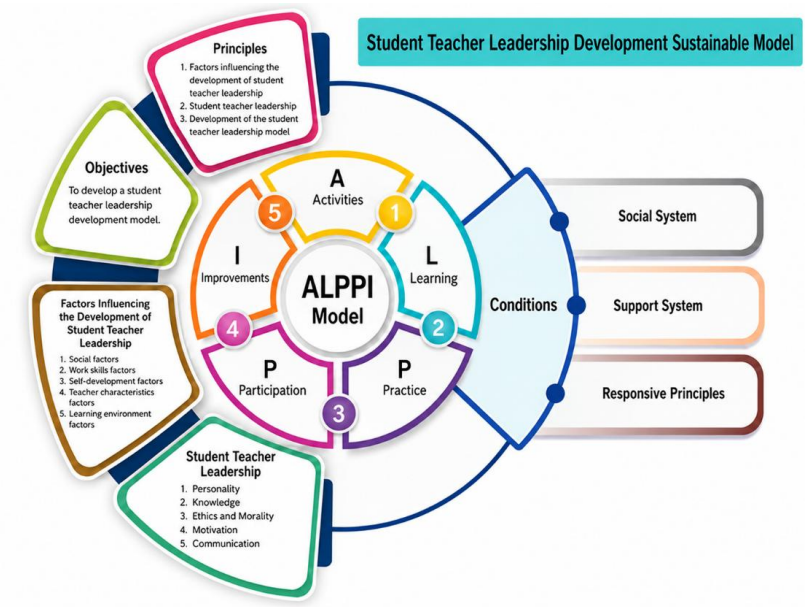


Figure 2. The student teacher leadership development sustainable model (ALPPI Model).

3.4. Evaluation and improvement of the student teacher leadership development sustainable model

The evaluation and refinement of the Student Teacher Leadership revealed that the model achieved the highest level of quality in all assessed aspects. Specifically, the experts rated the model as highly accurate, appropriate, feasible, and beneficial for application in teacher education programs. The five core ALPPI components were retained, while the operational details of Activities, Learning, Practice, Participation, and Improvements, together with the guidelines for model implementation, were clarified based on the evaluation results. The findings indicate that the model is theoretically sound and practically applicable for developing the student teacher leadership development sustainable model.

4. Discussion

4.1. To study the fundamental information of student teacher leadership

To study the fundamental information of student teacher leadership, the study found that the personality dimension had the highest mean score among all dimensions of student teacher leadership. This finding is consistent with Abd Rahim et al. [11],

Yang and Mhunpiew [16], and Fernández Espinosa and López González [17], who studied teacher leadership and concluded that personality traits are the foundation of effective leadership. Similarly, Cáceres-Reche et al. [18], in their research on university student leadership, found that students who participated in university activities and held leadership positions demonstrated stronger leadership abilities.

The research findings revealed that the ethics and morality dimension had the lowest score. However, this indicates its importance and is consistent with the findings of Albez [19], who stated that ethics education helps promote ethical awareness, and Maidee [13], who recommended the use of ethical simulations, analysis, and reflection. In addition, Halvorsen et al. [20] emphasized that discussions of ethical cases promote systematic professional reasoning among teachers.

To develop the Student Teacher Leadership Development Sustainable Model, the development of Student Teacher Leadership, called the ALPPI Model, consisted of five main components: Activities (A), Learning (L), Practice (P), Participation (P), and Improvements (I).

4.2. To develop the student teacher leadership development sustainable model

The development of the Student Teacher Leadership, named the ALPPI Model, comprised five major components: Activities (A), Learning (L), Practice (P), Participation (P), and Improvements (I).

Activities (A) This component is consistent with the findings of Thaoto et al. [21], who emphasized that professional teacher attributes can be strengthened through structured learning activities. Such activities integrate academic knowledge with moral and professional awareness, cultivating the spirit and identity of professional teachers, which are essential characteristics of students in faculties of education.

Learning (L) Effective learning connects knowledge, skills, and attitudes. It also generates participation in co-curricular activities and experiential learning activities that shape student teacher leadership. This is consistent with Kolb [22] and Kuh [23], who emphasized that experiential learning is a form of leadership development. Similarly, Maysa Nuansri and Kulachart Phanthuwarakul [24] found that persistence in learning reflects a growth mindset among student teachers, while Ajani [25] confirmed that the learning component should include authentic and practical activities that promote reflective leadership. This is consistent with Sustainable Development Goal 4 (SDG 4), which aims to promote quality education, equity, access to education, and lifelong learning. Higher education institutions play an important role in supporting this goal through educational management [26,27]. In addition, universities play an important role in driving the Sustainable Development Goals [28].

Practice (P) Practice-based activities, such as workshops, help expand the scope of learning by providing opportunities for students to develop analytical thinking, teamwork, and confidence in creative problem-solving. This is consistent with Bonesso et al. [29], who reported that experiential learning can support the development of leadership behaviours in higher education. who emphasized that practice activities enhance leadership through experiential participation. Likewise,

Zhang [30] found that opportunities to learn in real organizational contexts are necessary for developing students' practical leadership competencies.

Participation (P) Participation both inside and outside the classroom is an important component affecting the Student Teacher Leadership Development Sustainable Model. Participation provides opportunities for students to engage in planning, collaboration, and decision-making processes, which promote holistic learning. This finding supports Kuh [23], who stated that student participation promotes leadership growth. Kittitach Thongjeen [31] also found that participation is driven by several factors, including motivation, social involvement, responsibility, social recognition, and peer relationships, all of which collectively promote active participation in learning and leadership activities.

Improvements (I) Continuous improvement is important for a high-quality Student Teacher Leadership Development Sustainable Model. This is consistent with Kuh [23], who stated that good educational activities must include systematic evaluation and continuous improvement from students and empirical evidence. Therefore, higher education institutions should establish participatory monitoring and evaluation systems, including those of stakeholders, to support continuous improvement.

The ALPPI Model is therefore a model for the sustainable development of student teacher leadership. It integrates Activities, Learning, Practice, Participation, and Improvements and helps develop leadership through activities and practical learning, which promote teamwork, problem-solving, and decision-making [32]. Practice and Participation provide opportunities for student teachers to practice leadership through real practice, participation, and collaboration with communities [7,33]. Meanwhile, Improvements emphasizes continuous development through reflection, feedback, and professional development [34,35].

The ALPPI Model (Activities, Learning, Practice, Participation, and Improvements) offers a sustainable student teacher leadership model. The findings suggest that the model may contribute to the development of responsibility, ethics, and professional readiness among student teachers. This is consistent with Tedla and Redda [9] and Ali [7], who confirmed that leadership development promotes professional development, collaboration, and school sustainability. In addition, by promoting quality, equity, inclusion, and lifelong learning, this model supports SDG 4 [1,36] through coordinated actions at the individual, institutional, and societal levels [37].

4.3. To implement the student teacher leadership

The implementation results showed that participants rated the principles, objectives, process, and conditions of the ALPPI Model at a high overall level of perceived appropriateness and acceptability. These results indicate that the ALPPI Model was comprehensively designed and aligned with the needs of student teachers. The principles of the model were clear and appropriate, as they clearly explained the core concepts, covered relevant theories, and responded to the goal of developing student teacher leadership. The objectives of the model indicated that they were clear, comprehensive, and practical for developing leadership among student teachers. In addition, the components and procedures of the model reflected that the

implementation process, such as planning frameworks, activity organization, and evaluation, was systematic, appropriate, and easy for student teachers to understand.

These findings align with Leithwood et al. [38], who emphasized that the successful implementation of a leadership development framework requires clearly defined operational procedures and systematic execution. Similarly, Weng and Yan [39], in their study on leadership development among Chinese university students, found that leadership programs focusing on value cultivation effectively enhanced students' leadership performance and self-efficacy. This is consistent with participants' positive perceptions of the model's appropriateness and acceptability. Furthermore, these findings are consistent with the theoretical perspective of Leithwood et al. [38], who stated that the adoption of a clear and structured leadership development framework contributes significantly to effective and sustainable implementation. Hence, the clarity of the ALPPI Model's design and step-by-step process was positively perceived by participants during implementation.

4.4. To evaluate and improve the student teacher leadership development sustainable model

The evaluation and improvement of the ALPPI Model, conducted through an expert panel seminar, indicated that the model was at the highest quality level in terms of accuracy, appropriateness, feasibility, and usefulness. This indicates that, in its application to the concrete development of student teacher leadership, particularly in faculties of education that emphasize active learning and practical experience, the model can respond to both theoretical and practical needs in a balanced manner. This finding is consistent with Guskey [40], who proposed that leadership development models should be evaluated in various ways in order to generate more useful and comprehensive improvement. It is also consistent with Fullan [41], who stated that sustainable educational change arises from continuous improvement based on real practice rather than theory alone. This is consistent with Khamsaenpan et al. [42], who found that the leadership development model for student organization committees of Rajabhat Universities in Northeastern Thailand had the highest levels of appropriateness, feasibility, and usefulness. The evaluation and improvement of the model according to the SDG 4 concept is important for enhancing the quality of education because it helps promote inclusive and equitable learning opportunities and also supports social progress. Therefore, using evaluation results to improve the model helps make educational management more effective, increases access to education, and integrates sustainable development values into the curriculum. However, achieving these goals requires continuous cooperation from all stakeholders [43].

The ALPPI Model (Activities, Learning, Practice, Participation, and Improvements) offers a practical framework for sustainable student teacher leadership. The findings suggest that the ALPPI Model may contribute to the development of long-term competencies, particularly confidence, responsibility, ethics, and professional readiness. This is consistent with Tedla and Redda [9] and Ali [7], who confirmed that leadership development helps drive professional growth, collaboration, and school sustainability. In addition, by promoting quality, equity, inclusion, and

lifelong learning, this model supports SDG 4 [1,36], which ultimately requires coordinated actions at the individual, institutional, and societal levels [37].

Limitations

Sampling bias. The survey included 311 student teachers from only four teacher education institutions, which may introduce sampling bias and limit representativeness.

Methodological limitations. The ALPPI Model was piloted with 30 student teachers; therefore, the implementation findings may have limited generalizability to other contexts.

Potential common method bias. The high R^2 (0.918) warrants caution, as measuring predictors and leadership using the same questionnaire may have inflated associations through common method bias. Validation with diverse samples and independent data sources is recommended.

5. Conclusion

The ALPPI Model integrates the components of Activities, Learning, Practice, Participation, and Improvements to support the development of student teacher leadership. Participants provided positive ratings of the model's appropriateness and acceptability, while experts evaluated the model positively in terms of accuracy, appropriateness, feasibility, and usefulness. These findings suggest that the ALPPI Model may serve as a practical framework for teacher education institutions seeking to organize activities that support the continued development of student teacher leadership.

Therefore, the ALPPI Model may serve as a practical framework for developing student teacher leadership and promoting the application of leadership in classrooms, schools, and communities. In addition, the model is aligned with the principles of SDG 4, particularly those related to educational quality, equity, and lifelong learning.

The sustainable development of student teacher leadership is therefore the result of the continuous organization of developmental processes that emphasize experiential learning, practice, participation, reflection on learning outcomes, and support from teacher education institutions. Continuous evaluation and improvement of the model can enhance the quality of leadership development and help prepare student teachers to become capable and sustainable educational leaders in the future.

Author contributions: Conceptualization, TS and WB; methodology, TS; validation, TS and WB; formal analysis, TS; investigation, TS; resources, TS; data curation, TS; writing—original draft preparation, TS and WB; writing—review and editing, TS and WB; visualization, TS; supervision, TS; project administration, TS; funding acquisition, TS. Both authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the Faculty of Education, Silpakorn University, through a research grant for fiscal year 2023, grant number: B.E. 2566. This article is part of the research project entitled "Student Teacher Leadership Development Model."

Ethical approval: This study was reviewed and approved by the Human Research Ethics Committee of Silpakorn University (approval number: 68.0502-080-3786). Participation in the study was voluntary, and participants had the right to withdraw without any consequences. Anonymity and confidentiality were maintained, including data storage and destruction.

Informed consent statement: Informed consent was obtained from all participants involved in the study.

Acknowledgments: The authors would like to acknowledge the Faculty of Education, Silpakorn University, for supporting this research. Artificial intelligence tools were used only to assist with English language editing, grammar checking, and formatting review. All study design, data collection, statistical analysis, interpretation, and final manuscript content were prepared, reviewed, and verified by the authors. No artificial intelligence tools were used to generate research data, results, or conclusions.

Conflict of interest: The authors declare no conflict of interest.

References

1. Sunthonkanokpong W, Murphy E. Quality, equity, inclusion and lifelong learning in pre-service teacher education. Journal of Teacher Education for Sustainability. 2019; 21(2): 91–104. doi: 10.2478/jtes-2019-0019
2. Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation, Strategy and Planning Division. Higher education plan for national human resource development B.E. 2564–2570 (Revised Edition 2023–2570). Strategy and Planning Division; 2022.
3. Jean-Marie G, Normore AH, Brooks JS. Leadership for social justice: Preparing 21st century school leaders for a new social order. Journal of Research on Leadership Education. 2009; 4(1): 1–31. doi: 10.1177/194277510900400102
4. Kahila S, Heikka J, Sajaniemi N. Familiar and comfortable vs. unfamiliar and demanding: Students' discourses on teachers' responsibility and leadership in Finnish early childhood education. Teaching and Teacher Education. 2024; 140: 104495. doi: 10.1016/j.tate.2024.104495
5. Tsarkos A. Coaching and educational leadership development. In: Coaching and Educational Leadership Development. Routledge; 2024. pp. 166–188. doi: 10.4018/979-8-3693-5242-7.ch009
6. Jammal K. Student leadership: Basic skills and appropriate activities. International Journal of Innovative Research and Development. 2015; 4(13): 20–39.
7. Ali F. Transforming primary education in under-resourced contexts: Leadership, teacher development, and community engagement for sustainable learning in Bangladesh. International Social Sciences and Education Journal. 2025; 3(4): 28–41. doi: 10.61424/issej.v3i4.491
8. Warren LL. The importance of teacher leadership skills in the classroom. Education Journal. 2021; 10(1): 8–15. doi: 10.11648/j.edu.20211001.12
9. Tedla BA, Redda EH. Teacher professionalism as an impetus for teacher leadership to lead schools: A retrospective study. Eurasian Journal of Social Sciences. 2022; 10(1): 1–15. doi: 10.15604/ejss.2022.10.01.001
10. Santos W, Hoeh E. The role of professional organizations in developing preservice teacher leaders. The Power of Teacher Leaders: Their Roles, Influence, and Impact. Routledge; 2022. pp. 131–143. doi: 10.4324/9781003123972-12
11. Abd Rahim SA, Abd Hamid HS, Samsudin N, Ghani MFA. Teacher leadership models: A directed analysis of content. In: Proceedings of the 3rd International Conference on Research of Educational Administration and Management (ICREAM 2019). Atlantis Press; 2020. pp. 172–176. doi: 10.2991/assehr.k.200130.164
12. Saidi SM, Teoh SH, Aperapar Singh PS, Retnawati H. The relationship between teachers' personalities and students' attitudes. Jurnal Pendidikan Sains dan Matematik Malaysia. 2024; 14(1): 61–70. doi: 10.37134/jpsmm.vol14.1.6.2024
13. Maidee W. Development of ethics literacy pedagogical innovation for pre-service teachers within the post-digital society context. Journal of Practical Studies in Education. 2025; 6(3): 51–60. doi: 10.46809/jpse.v6i3.106

14. Ryan RM, Deci EL. Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology. 2020; 61: 101860. doi: 10.1016/j.cedpsych.2020.101860
15. Promket W, Phengsawat W, Jantarak S. A model of teacher leadership development on competency-based learning management for teachers in science and technology department in large-sized secondary schools under the Office of the Basic Education Commission in the Northeast. International Education Studies. 2023; 16(4): 37–47. doi: 10.5539/ies.v16n4p37
16. Yang Y, Mhunpiew N. A development of student leadership characteristic practice model at normal universities in Hebei Province, China. Scholar: Human Sciences. 2019; 11(1): 123.
17. Fernández Espinosa AJ, López González JA. The effect of teacher leadership on students' purposeful learning. Cogent Social Sciences. 2023; 9(1): 2197282. doi: 10.1080/23311886.2023.2197282
18. Cáceres-Reche MP, López-Gómez M, Sadio-Ramos FJ, et al. Student leadership at the university: An explanatory model. Education Sciences. 2021; 11(11): 703. doi: 10.3390/educsci11110703
19. Albez C. Does online ethics education affect pre-service teachers' ethics position? A mixed-method study. SAGE Open. 2025; 15(3). doi: 10.1177/21582440251356756
20. Halvorsen OW, Bukkestein IS, Hilt LT, et al. Pre-service teachers' forms of reasoning in discussions of ethical cases. European Journal of Teacher Education. 2025. doi: 10.1080/02619768.2025.2526443
21. Thaoto R, Aphipunno PB, Sarin M. Enhancing teacher professional attributes according to the identity of students, Faculty of Education, Mahamakut Buddhist University. Journal of Education MBU. 2023; 11(2): 286–300.
22. Kolb DA. Experiential Learning: Experience as the Source of Learning and Development. Prentice-Hall; 1984.
23. Kuh GD. What student affairs professionals need to know about student engagement. Journal of College Student Development. 2009; 50(6): 683–706. doi: 10.1353/csd.0.0099
24. Nuansri M, Phanthuwarakul K. Growth mindset and perseverance of student teachers. Valaya Alongkorn Review Journal. 2023; 13(3): 55–72.
25. Ajani OA. Exploring the alignment of professional development and classroom practices in African contexts: A discursive investigation. Journal of Integrated Elementary Education. 2023; 3(2): 120–136. doi: 10.21580/jieed.v3i2.17693
26. Kilasonia Z. Higher education and the sustainable development goals. Scientific Journal Spectri. 2023; 1. doi: 10.52340/spectri.2023.15
27. Ashida A. The role of higher education in achieving the sustainable development goals. In: Sustainable Development Disciplines for Humanity. Springer; 2023. pp. 71–84. doi: 10.1007/978-981-19-4859-6_5
28. Chankseliani M, McCowan T. Higher education and the sustainable development goals. Higher Education. 2021; 81(1): 1–8. doi: 10.1007/s10734-020-00652-w
29. Bonesso S, Cortellazzo L, Gerli F. Developing leadership behaviours in higher education: A quasi-experimental study on the effect of experiential learning. Innovations in Education and Teaching International. 2024; 61(1): 70–84. doi: 10.1080/14703297.2023.2214125
30. Zhang Y. The impact of second classroom activities on university students' leadership. International Journal for Multidisciplinary Research. 2024; 6(3). doi: 10.36948/ijfmr.2024.v06i03.21722
31. Thongjeen K. Factors influencing the participation in activities of undergraduate students in the Faculty of Political Science, Chulalongkorn University [master's thesis]. Chulalongkorn University; 2020.
32. Jiang X. Diversified connotation and action promotion of sustainable education leadership based on action learning. Frontiers in Educational Research. 2022; 5(5): 43–46. doi: 10.25236/fer.2022.050508
33. Yuntasilo PY, Sutheejariyawattana P. Teachers with participation to enhance students' leadership skills. World Journal of Education. 2023; 13(4): 34–48. doi: 10.5430/wje.v13n4p34
34. Burns H. Learning sustainability leadership: An action research study of a graduate leadership course. International Journal for the Scholarship of Teaching and Learning. 2016; 10(2): 8. doi: 10.20429/ijsotl.2016.100208
35. Tolstikova S, Osechkina L, Tabolova E, Travinova G. Development of teachers' professional skills in education for sustainable development. E3S Web of Conferences. 2021; 250: 07007. doi: 10.1051/e3sconf/202125007007
36. Adipat S, Chotikapanich R. Sustainable Development Goal 4: An education goal to achieve equitable quality education. Academic Journal of Interdisciplinary Studies. 2022; 11(6): 174–183. doi: 10.36941/ajis-2022-0159

37. Boeren E. Understanding Sustainable Development Goal (SDG) 4 on quality education from micro, meso and macro perspectives. International Review of Education. 2019; 65(2): 277–294. doi: 10.1007/s11159-019-09772-7
38. Leithwood K, Louis KS, Anderson S, Wahlstrom K. How leadership influences student learning. The Wallace Foundation; 2004. Available online: https://www.wallacefoundation.org/knowledge-center/pages/how-leadership-influences-student-learning.aspx (accessed on 30 July 2026).
39. Weng W, Yan W. The four-stage values-based Chinese college student leadership development model. Humanities and Social Sciences. 2019; 7(5): 171–178. doi: 10.11648/j.hss.20190705.15
40. Guskey TR. Does it make a difference? Evaluating professional development. Educational Leadership. 2002; 59(6): 45–51. Available online: https://pdo.ascd.org/LMSCourses/PD13OC010M/media/Leading_Prof_Learning_M6_Reading1.pdf (accessed on 30 July 2026).
41. Fullan M. The New Meaning of Educational Change. Teachers College Press; 2020.
42. Khamsaenpan W, Pailai T, Pawabutra C. Leadership development model for the Student Organization Committee of Northeastern Rajabhat University. Northeastern University Academic and Research Journal. 2023; 13(4): 220–235.
43. Nogueiro T, Saraiva M, Jorge F. The sustainable development goal 4 and the impact ranking: Quality education in portuguese higher education institutions. Journal of Biomedical Research & Environmental Sciences. 2022; 3(11): 1353–1362. doi: 10.37871/jbres1603