

Enhancing the Psychological Traits of Positive Attitudes towards Environmental Conservation among Thai Youth through an Innovative Training Program

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Abstract: The main objectives of this experimental research were 1) to develop and evaluate the effectiveness of a training program designed to modify psychological traits on environmental conservation, 2) to assess the achievement outcomes of the training program on attitudes in three dimensions, and 3) to analyze the long-term retention of attitudes and the scalability of the program across different areas. The study employed a Two-Group Pretest-Posttest-Follow-up Design. The sample consisted of 160 purposively selected youths aged 13–15 years from Uttaradit Province, equally divided into an experimental group and a control group (N=80). The research instruments included a training program developed based on Experiential Learning Theory and Positive Psychology, integrating proactive activities such as concept mapping for environmental problem analysis and role-playing activities to cultivate environmental ethics. The program was validated by a panel of experts, achieving a perfect Item-Objective Congruence (IOC) index of 1.00 for all items. Data were analyzed using descriptive statistics and inferential statistics, including Repeated Measures ANOVA and Least Significant Difference (LSD) multiple comparison tests. The major findings revealed that; 1) the training program designed to promote positive attitudes towards environmental conservation among Thai youth were effective based on the academic criteria. 2) After participating in the training program, youths in the experimental group demonstrated significantly higher mean scores in all three attitude dimensions including evaluative cognition, feelings, and behavioral intention towards environmental conservation, compared with the control group ($p < 0.01$). Post Hoc analysis indicated that post-training and follow-up scores were significantly higher than pre-training scores. Meanwhile, no significant difference was found between post-training and follow-up scores, suggesting the sustained effect of the training. 3) Repeated measures analysis based on ANOVA further confirmed that these differences were statistically significant ($p < 0.01$). The Post Hoc results also showed that both post-experimental and follow-up (2 months later) scores were significantly higher than pre-experimental scores. Without significant difference between post-experimental and follow-up periods, it reflected the

persistence and stability of the psychological traits. 4) The implementation of the program in other areas yielded consistent results, confirming the resilience and effectiveness of the innovative approaches to changing youth attitudes broadly. This research proposes a new conceptual foundation for environmental education management by demonstrating that only cognitive dimensions and cognitive information transfer are insufficient to produce sustainable behavioral change. The key innovative concept of this study lies in the integration of affective dimensions and emotional engagement (Affective Integration) together with psychological readiness as mediating mechanisms that connect knowledge to internalized intention. This process transforms youth from passive learners into intrinsically motivated conservationists who possess an emotional commitment to nature. Such transformation constitutes a fundamental basis for the development of green citizenship characterized by responsibility towards the dynamic challenges of the 21st century. The findings further confirm that the intervention model employed in this study demonstrates empirical effectiveness in simultaneously enhancing knowledge, attitudes, and behavioral intentions in an integrated manner. Consequently, the model can serve as a principal framework for policies related to core curriculum development or the design of extracurricular activities in educational institutions that emphasize behavioral outcomes rather than merely knowledge-based assessment. Furthermore, the innovative training program functions as an operational prototype that local administrative organizations and civil society networks can adapt and scale up to create conservation-oriented learning processes in alignment with local cultural practices and ecological systems. This approach can strengthen community capacity for sustainable self-management of natural resources and reduce the gap between governmental policy and grassroots-level implementation.

Keywords: Psychological Traits, Attitudes, Environmental Conservation, Thai Youth, Training Program.

1. Introduction

Amid the transition towards the industrial and modern technological era, Thailand has accelerated development across various dimensions in order to enhance quality of life and strengthen the nation's competitiveness. Nevertheless, such development has continuously affected natural resources and the environment, particularly through the overexploitation of resources beyond the regenerative capacity of ecosystems, coupled with the lack of effective conservation measures and resource management practices (Nemethy, 2021). Consequently, environmental problems have become increasingly severe, including water pollution, soil degradation, deforestation, and the loss of biodiversity. These issues do not only impact ecological systems, but also adversely affect the quality of life, public well-being, and long-term resource security of the population.

Recognizing the significance of environmental problems at the global level, the United Nations formulated the environmental development approaches through the United Nations Conference on the Human Environment held in Stockholm (Alam, 2006). This marked a significant starting point for the advancement of Environmental Education at the international level. Environmental education emphasizes the development of knowledge, awareness, and environmental responsibility among people of all age groups through formal education, non-formal education, and informal learning processes (Diković & Plavšić, 2015; Latchem, 2014). In this regard, environmental education focuses on three dimensions of learning; Education in Environment, Education about Environment, and Education for Environment. These dimensions collectively aim to foster behavioral transformation and environmentally sustainable ways of living.

In the context of Thailand, the National Education Plan B.E.2560–2579 (2017–2036) has stipulated key objectives for developing learners with characteristics and lifestyles consistent with the conservation of natural resources and the environment. This direction is correspondent with the 20-Year National Strategy and the National Economic and Social Development Plan, both of which emphasize the development of

a quality society grounded in morality, ethics, and social responsibility (Doungsuwan et al., 2013). From a psychological perspective, “attitude” is considered a fundamental component influencing individual behavior, encompassing cognitive, affective, and behavioral intention dimensions. These dimensions are critical factors in fostering environmental conservation behavior among youth.

Furthermore, within the context of global sustainable development, the United Nations has formulated the Sustainable Development Goals (SDGs) as a framework to guide countries towards balanced development in the economic, social, and environmental dimensions. The research entitled “Enhancing the Psychological Traits of Positive Attitudes towards Environmental Conservation among Thai Youth through an Innovative Training Program” is in alignment with several Sustainable Development Goals, particularly Goal 4: Quality Education, which aims to promote learners’ knowledge, skills, and awareness necessary for sustainable development; Goal 13: Climate Action, which emphasizes raising public awareness and participation in environmental conservation; as well as Goal 12: Responsible Consumption and Production and Goal 15: Life on Land, both of which focus on the conservation, restoration, and sustainable utilization of natural resources and terrestrial ecosystems. Therefore, fostering environmental conservation attitudes among youth is considered an essential mechanism for developing citizens who are socially and environmentally responsible, ultimately contributing to the development of a green society and long-term sustainability (Adipat & Chotikapanich, 2022; Thiengkamol, 2012).

Nevertheless, despite continuous efforts to promote environmental learning, there remains a lack of educational innovations capable of comprehensively developing environmental conservation attitudes across the dimensions of knowledge, emotion, and behavioral commitment (Sakdapat et al., 2025a). Accordingly, the research team developed a training program aimed at strengthening positive attitudes towards environmental conservation among Thai youth by integrating diverse learning activities, including mind mapping, video-based media, role-playing, and group brainstorming activities, in order to promote experiential learning and creative participation.

The innovative training program was designed to develop the psychological traits of youth in three major dimensions: 1) evaluative knowledge towards environmental conservation, which aims to cultivate understanding of the value and significance of natural resources, 2) the affective dimension towards environmental conservation, which focuses on fostering positive emotions, awareness, and emotional attachment to nature, and 3) commitment to action towards environmental conservation, which aims to strengthen intention and psychological readiness to continuously engage in environmentally responsible behaviors in daily life.

Moreover, the training program underwent a systematic process of development and academic quality assessment, including content validity evaluation and the Index of Item-Objective Congruence (IOC) conducted by experts. This ensured that the research instruments were appropriate, accurate, and effective for developing youth attitudes. Therefore, this study was not only intended to generate academic knowledge, but also to develop an operational innovation capable of being expanded towards community and societal development, as well as the promotion of sustainable environmental conservation behaviors in the long term.

2. Literature Review

This research focuses on enhancing positive attitudes towards environmental conservation through an experiential training process. The researchers synthesized relevant bodies of knowledge and theoretical frameworks to establish the academic foundation of the study, as detailed below.

1. Concepts and Theories Related to Attitudes towards Environmental Conservation: Attitude is a psychological trait variable that exerts a significant influence on directing human behavior (Akintunde, 2017). According to the Tripartite Model of Attitude, attitudes consist of three components including the cognitive dimension, the affective dimension, and the behavioral intention dimension (Barr & Gilg, 2007; Milfont, 2007).

In the context of environmental conservation, these components interact in complex ways. 1) Cognitive Dimension and Evaluative Knowledge: Effective environmental learning must go beyond the mere acquisition of scientific information towards the construction of value-oriented meaning connected to ethical, social, and cultural dimensions. Integrating academic knowledge with local values enables youth to recognize the relationship between themselves and real-world ecosystems (Braun & Dierkes, 2019; Vallacher, Read & Nowak, 2002). 2) Affective Dimension: Contemporary researches emphasize the affective dimension of learning as a more powerful driving force than legal enforcement alone. Positive emotions such as pride in local resources, appreciation, and Nature Appreciation are significant predictors of conservation behavior and Commitment to Action. According to Ajzen's (1991), Theory of Planned Behavior, intention is the strongest predictor of actual behavior. Psychological readiness, which emerges from the integration of knowledge and emotions, enables youth to sustain environmental conservation behaviors even after the completion of training activities.

2. Environmental Education and Experiential Learning: Environmental education emphasizes the transformation of awareness into practical action. Research-based learning and experiential learning through various activities such as brainstorming, role-playing, and the use of multimedia resources play a significant role in narrowing the Knowledge–Action Gap (Kantamaturapoj et al., 2023). Furthermore, successful environmental conservation requires community participation. Organizing activities that allow youth to exchange ideas and engage in practical actions within their own local contexts helps foster both intrinsic and extrinsic motivation in correspondence with real-life ways of living.

3. Related Research Studies: A review of both domestic and international studies revealed several consistent findings. International studies by Andrews and Wolfe (2025) indicated that emotions constitute a crucial dimension in promoting sustainability in conservation efforts. Similarly, Kotyza et al. (2024) confirmed that social norms and perceived behavioral control are key factors influencing environmental intentions. In addition, Restović and Bulic (2024) found that research-based learning directly affects students' attitudes and sense of responsibility. The study conducted by Lee (2011) confirmed that emotional attachment to local areas influences attitudes and participation in conservation activities. This finding is consistent with the study by Kaewprasert (2022), discovering that integrating affective activities within educational institutions significantly enhances positive attitudes among youth. Moreover, Praneetham (2020) demonstrated that happiness and positive impressions directly influence conservation

behaviors in daily life. The literature reviewed above reflects that fostering positive attitudes towards environmental conservation requires a holistic learning process integrating cognition, emotion, and intention in order to create continuous and sustainable behavioral transformation among youth.

The core of experimental research aimed at producing changes in psychological characteristics and attitudes lies in the validity and reliability of the instruments used in the experiment. The development of a training program is not merely the compilation of activities, but rather the design of a systematic innovation grounded in theoretical frameworks and rigorous quality assessment in accordance with principles of psychological measurement (Gilbody, Morley & Snaith, 2006; Ngamcharoen, Sakdapat & Bhanthumnavin, 2024). To ensure that the research instruments employed in this study were comprehensive and capable of accurately measuring changes, the researchers conducted a review of literature related to the development of educational innovations and statistical principles used for evaluating instrument effectiveness. Particular emphasis was placed on content validity and the Index of Item-Objective Congruence (IOC), which serve as essential mechanisms for confirming that the developed training program met high standards and was appropriate for practical implementation with the target population. The details are presented in the following sections.

1. Development of Training Packages: Training Package is an educational innovation systematically developed to include manuals, instructional management plans, and teaching materials aligned with specified objectives (Bollen, 1989). The development of an effective training package must begin with problem analysis and a review of literature related to the variables under study in order to determine content boundaries appropriate for the target group (Cohen, Swerdlik & Phillips, 2021). Furthermore, activity design should emphasize interaction and experiential learning to facilitate changes in psychological traits according to the defined operational concepts.

2. Content Validity refers to the extent to which the items or activities contained within an instrument comprehensively measure the intended characteristics (Berk, 1990). A widely accepted method for assessing content validity is the use of expert judgment involving at least three experts to evaluate the consistency between each item and the research objectives or operational definitions (Davis & Delcambre, 1992). The experts are responsible for examining linguistic accuracy, content completeness, and the appropriateness of activities incorporated into the training package.

3. Index of Item-Objective Congruence: Turner and Carlson (2003) proposed the calculation of the Index of Item-Objective Congruence (IOC) as a method for determining content validity. Experts evaluate each item using a three-point scale: +1 (clearly congruent), 0 (uncertain), and -1 (clearly incongruent). According to academic standards, an acceptable IOC value must be at least 0.50 (Hambleton & Rovinelli, 1986). If any item or activity receives a value below the criterion, the researchers must revise and improve it according to the experts' recommendations. In cases where substantial structural modifications are made, the revised instrument should be resubmitted to the experts for further evaluation to ensure the highest possible standard.

4. Pilot Testing and Try-out: The implementation of a pilot test with participants who possess characteristics similar to those of the actual sample group aims to examine operational feasibility, such as the duration required for activities, the comprehensibility of instructional language, and participants' responses to the training package (Susiyawati, Sudibyo & Sari, 2021). This process enables researchers to

identify potential deficiencies prior to actual data collection, thereby enhancing the internal validity of the research. The review of literature, concepts, and related theories presented above clearly reflects that attitudes towards environmental conservation constitute a complex psychological dimension requiring the integrated cultivation of cognition, emotion, and behavioral commitment (Abun et al., 2019). Although extensive environmental studies have been conducted, there remains a significant gap in the development of innovations capable of systematically integrating these psychological dimensions in order to promote sustainability among youth (Liu, Xu & Li, 2024).

From this reason, the research team synthesized the aforementioned body of knowledge in order to design and develop a training package that meets academic standards. The emphasis was put on problem-solving and the in-depth enhancement of attitudes to achieve concrete outcomes and sustainable societal impact. Accordingly, to ensure that the research would achieve its intended goals and address the issues discussed above, the researchers established the following research objectives:

1. To develop and determine the effectiveness of a training package for enhancing positive attitudes towards environmental conservation among Thai youth. This objective focuses on creating an innovative learning program in the form of a training package integrating various activities such as mind mapping, video clips, and role-playing activities. The program aims to develop psychological traits in three dimensions; evaluative knowledge, affective feelings, and commitment to action towards environmental conservation. The effectiveness of the training package must be validated through expert evaluation using the Index of Item-Objective Congruence (Ismail & Bt Zubairi, 2022; Laosinchai, 2025). In addition, the package must meet established academic standards before actual implementation in order to ensure that it serves as a high-quality instrument for transforming youth attitudes.

2. To examine the effects of the training package for enhancing positive attitudes towards environmental conservation among Thai youth. This objective involves a statistical comparison of differences in attitude levels between the experimental group receiving the training package and the control group. The analysis is conducted using ANOVA and Post Hoc statistical procedures (Hilton & Armstrong, 2006). The objective includes repeated measurements across three periods: pre-training, post-training, and a two-month follow-up phase, in order to verify that the program can continuously and sustainably generate positive changes in attitudes over time.

3. To expand the implementation of the training package for enhancing positive attitudes towards environmental conservation among Thai youth. This objective aims to confirm the effectiveness of the training package on a broader scale by implementing it with sample groups in other areas (such as the expansion group in Laplae District) to examine whether the innovation remains effective in different contextual settings (Tello Chan et al., 2026). This process is intended to establish a policy-oriented prototype for extending knowledge and impact to the community and local levels, using the training package as a prototypical model for developing sustainable conservation-oriented learning activities for local organizations and schools.

Based on the review of literature and related studies discussed above, it is evident that the process of enhancing psychological traits through a training package integrating cognitive, emotional, and intentional dimensions constitutes an important mechanism for systematically transforming youth attitudes. The theoretical foundation clearly indicates that experiential learning and participation in meaningful activities

lead to the development of higher levels of positive attitudes.

Based on the aforementioned principles and rationale, the researchers hypothesized that the systematically developed training package would significantly influence changes in the psychological traits of youth in both the experimental group and the expansion group. Therefore, in order to verify the effectiveness of the research instrument and fulfill the established research objectives, the following research hypotheses were formulated:

Hypothesis 1: Youth who participate in the training program designed to enhance positive attitudes towards environmental conservation will demonstrate higher environmental conservation attitude scores in the post-experimental phase than in the pre-experimental phase.

Hypothesis 2: Youth in the expansion group who participate in the training program designed to enhance positive attitudes towards environmental conservation will demonstrate higher environmental conservation attitude scores in the post-experimental phase than in the pre-experimental phase.

3. Research Methodology

3.1. Research Design

This study employed an experimental research design using a Two-Group Pretest-Posttest-Follow-up Design, consisting of an Experimental Group and a Control Group in order to systematically compare the effects of the independent variable (Rausch, Maxwell & Kelley, 2003; Sharpe & Cribbie, 2023). The research was funded by the national budget through the Thailand Science Research and Innovation Fund (TSRI Fund) under the Fundamental Fund (FF69) research grant project, Grant Agreement No. 4/2569. The research procedures are detailed as follows:

1) This research project underwent ethical review and received approval for human research ethics from the Research Ethics Committee of Uttaradit Rajabhat University, Project No. 069/2568, in accordance with international standards for the protection on the rights and safety of youth participants involved in the study.

2) The study utilized repeated measures assessment across three phases in order to evaluate continuous attitudinal changes, consisting of: 1) Pre-test Phase conducted to measure the baseline levels of attitudes towards environmental conservation in all three dimensions prior to participation in the training program, 2) Post-test Phase conducted to examine immediate outcomes following completion of the training program, and 3) Follow-up Phase conducted two months after the completion of the experiment to examine the retention of attitudes and the stability of changes in psychological traits (Table 1).

Table 1: Experimental Group and Control Group.

Group	Pretest	Organized Activities / Programs	Posttest	Repeated	Designated
1	√	Training on Positive Attitudes Towards Environmental Conservation	√	√	100%
2	√	Training on Other Topics	√	√	Controlled
Follow-up Phase:		Outcome were assessed two months after the completion of the experiment.			

3.2. Population and Sample Group

The population used in this study consisted of Thai adolescents aged between 13–15 years who were currently enrolled in compulsory education and resided in Ban Khok District and Laplae District, Uttaradit Province.

The researchers selected the samples in two phases according to the research objectives, as follows:

1) The sample group for the experimental research consisted of 80 adolescents residing in Ban Khok District, Uttaradit Province. The participants were selected through purposive sampling based on the specified inclusion criteria (Robinson, 2023). Subsequently, random assignment was conducted to divide the participants into an Experimental Group of 40 participants and a Control Group of 40 participants.

2) The sample group for the extended study consisted of 80 adolescents residing in Laplae District, Uttaradit Province. This group was used to examine the retention and effectiveness of the training package in a different geographical context.

3) The participants in both the experimental research and the extended study were required to meet the following criteria. Voluntary Participation: Participants had to be adolescents who were interested in and willing to participate voluntarily in the research project, with parental consent obtained in accordance with research ethics principles (Dooly, Moore & Vallejo, 2017). Geographic Residency: Participants were required to have permanent residency and household registration in the target areas (Ban Khok District or Laplae District), Uttaradit Province, in order to ensure that the samples accurately reflected the social and environmental context of the area. Availability: Participants had to be available to attend all training activities throughout the entire training program according to the structure of the training package, in order to ensure the validity and continuity of the experimental results.

3.3. Research Instrument

The primary research instrument used in this study was a training package designed to promote positive attitudes towards environmental conservation among Thai youth. The instrument demonstrated an overall average reliability coefficient of 0.83. It consisted of three subscales; an evaluative knowledge scale regarding environmental conservation, with a reliability coefficient (Cronbach's Alpha) of 0.83, an affective attitude scale towards environmental conservation, with a reliability coefficient (Cronbach's Alpha) of 0.87, and A behavioral intention scale towards environmental conservation, with a reliability coefficient (Cronbach's Alpha) of 0.80, respectively (Tavakol & Dennick, 2011). The research team developed all measurement instruments independently and systematically controlled the instrument development process as follows:

1. The development process began with a review and synthesis of literature, concepts, and theories related to psychological traits and positive attitudes towards environmental conservation in order to establish the conceptual framework and operational definitions. During this phase, consultations with experts were conducted periodically through meetings concerning factors related to natural resource and environmental conservation among youth and students.

2. The research team conducted meetings with the team of trainers to determine

the key components of the training package, including activity titles, objectives, implementation procedures, instructional media, and evaluation instruments.

3. The training team developed draft versions of the training package, which were divided into three sections. The strengths and advantages of each draft instrument were analyzed, and a voting process was conducted to select the most appropriate version for implementation. The package focused on strengthening positive attitudes through diverse activities that promoted rational thinking, critical thinking, and systematic thinking.

4. The preliminary draft of the training package was submitted to experts for language review and content validity assessment. At least three experts and qualified specialists (Berk, 1990; Davis & Delcambre, 1992) evaluated whether the content and scope were comprehensive, appropriate, measurable, and aligned with the intended objectives (Bollen, 1989; Cohen et al., 2021). A commonly used method for content validity assessment, namely the Index of Item-Objective Congruence (IOC), was employed. The draft training package and operational definitions of the evaluation criteria were presented to the experts for consistency evaluation. The acceptable criterion for the IOC value was set at greater than 0.50 (Hambleton & Rovinelli, 1986; Yuangngoen, Sakdapat & Ngamcharoen, 2025). The rating criteria consisted of three levels; + 1 = clearly measuring the intended characteristics according to the content or operational definition, + 0 = uncertainty regarding the congruence between the item and the operational definition, and - 1 = clearly not measuring the intended characteristics according to the content or operational definition.

5. The draft training package was revised according to the recommendations provided by the experts. The resulting Index of Item-Objective Congruence (IOC) values ranged between 0.66–1.00, indicating an acceptable level of content congruence (Laosinchai, 2025).

6. Any parts of the training package draft that did not meet the Index of Item-Objective Congruence (IOC) criteria were returned to the experts for further language review and content validity assessment.

7. The revised training package was pilot-tested with a sample group that possessed characteristics similar to those of the actual participants, consisting of both an experimental group and a control group.

8. After passing the quality assurance and efficiency evaluation procedures according to standard criteria, the finalized training package was implemented for data collection with the actual sample in accordance with the established research design.

3.4. Research Findings

The findings corresponding to Objective 1, which aimed to develop a training package to promote positive attitudes towards environmental conservation among Thai youth, are presented in Table 2. The analysis revealed that the training package achieved effectiveness according to the Index of Item-Objective Congruence (IOC) criteria. The mean IOC values for all evaluated aspects were greater than 0.66. The evaluated aspects included activity titles, objectives, activity implementation procedures, instructional media, and evaluation methods.

Table 2: Index of Item-Objective Congruence (IOC) Values of the Training Package for Promoting Positive Attitudes towards Environmental Conservation.

Evaluated Aspects	1	2	3	ΣR	$IOC = \Sigma R/N$	Remark
Activity Titles	1	1	1	3	$3/3 = 1$	Passed
Objectives	1	1	1	3	$3/3 = 1$	Passed
Activity Implementation Procedures	1	1	1	3	$3/3 = 1$	Passed
Instructional Media	1	1	1	3	$3/3 = 1$	Passed
Evaluation	1	1	1	3	$3/3 = 1$	Passed
Overall Evaluation Results of the Training Package for Positive Attitudes towards Environmental Conservation						Passed

The research findings corresponding to Objective 2, which aimed to examine the effects of the training package designed to enhance positive attitudes towards environmental conservation among Thai youth, are presented in Table 3. The results revealed that the experimental group demonstrated a continuous increase in mean scores for evaluative knowledge towards environmental conservation, rising from 5.06 (SD = 0.67) to 5.23 (SD = 0.78) and 5.44 (SD = 0.81), respectively. In contrast, the control group showed only a slight increase in mean scores, from 4.98 (SD = 0.55) to 5.01 (SD = 0.64) and 5.13 (SD = 0.71). The ANOVA results indicated an F-value of 41.31 with statistical significance at $p < 0.001$, demonstrating that the scores of the experimental group were significantly higher than those of the control group. This finding reflects that the training package was effective in enhancing positive attitudes towards environmental conservation. In addition, the analysis of mean scores and standard deviations for the affective dimension towards environmental conservation revealed that the experimental group exhibited a continuous increase in mean scores from 4.46 (SD = 0.56) to 4.78 (SD = 0.58) and 4.98 (SD = 0.63). The control group also showed an increase, though at a lower level, from 4.33 (SD = 0.78) to 4.54 (SD = 0.65) and 4.76 (SD = 0.77). The ANOVA test yielded an F-value of 8.35 with statistical significance at $p = 0.002$, indicating that the experimental group achieved significantly higher scores than the control group. This finding suggests that the implemented activities effectively promoted positive attitudes and emotional engagement towards environmental conservation. Furthermore, the analysis of mean scores and standard deviations for commitment to action towards environmental conservation demonstrated that the experimental group showed a steady increase from 4.67 (SD = 0.89) to 4.98 (SD = 0.74) and 5.11 (SD = 0.80). The control group also exhibited an increase, though at a lower level and in the same direction as the experimental group. The ANOVA results revealed an F-value of 17.28 with statistical significance at $p < 0.001$, indicating that the experimental group obtained significantly higher scores than the control group. This finding reflects that the activities employed were capable of genuinely stimulating positive behavioral commitment towards environmental conservation.

Overall, the data analysis demonstrated that the experimental group achieved higher mean scores than the control group across all dimensions, including evaluative knowledge, affective attitudes towards environmental conservation, and commitment to environmental conservation actions. The ANOVA results confirmed that these differences were statistically significant ($p < 0.01$). At the same time, the Post Hoc analysis indicated that post-training and follow-up scores were significantly higher than

pre-training scores, while no significant difference was found between post-training and follow-up scores. This finding reflects that the effects of the training program remained stable and continuous over time.

These findings clearly indicate that the activities or intervention implemented in this study were effective in promoting knowledge, attitudes, and behaviors related to environmental conservation. The observed changes were not limited to immediate post-training effects but were sustained during the follow-up period, providing important evidence of the durability of learning outcomes and behavioral transformation. Therefore, this type of activity can be applied as a guideline for curriculum development and environmental conservation promotion activities in educational institutions and communities in order to cultivate youth who possess knowledge, awareness, and practical engagement in environmental preservation.

Table 3: Comparison of Mean Scores of the Studied Variables during the Pre-training, Post-training, and Follow-up Phases between the Experimental Group (N=40) and the Control Group (N=40).

Variables	Pre-test M(SD)	Post-test M(SD)	Follow-up M(SD)	SS	df	MS	F	p-value
Knowledge of environmental conservation assessment (scores)								
Experimental group	5.06 (0.67)	5.23 (0.78)	5.44 (0.81)	54.20	2.00	27.10	41.31	0.001**
Control group	4.98 (0.55)	5.01 (0.64)	5.13 (0.71)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	-0.17/ [-0.30, -0.04]	-0.38/ [-0.52, -0.24]	-0.21/ [-0.36, 0.02]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: p < .05	Pre-test vs Follow-up: p < .01	Post-test vs Follow-up: p > .05					
Affective dimension on environmental conservation (scores)								
Experimental group	4.46 (0.56)	4.78 (0.58)	4.98 (0.63)	34.29	2.00	17.15	8.35	0.002**
Control group	4.33 (0.78)	4.54 (0.65)	4.76 (0.77)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	-0.32/ [-0.58, -0.06]	-0.52/ [-0.78, -0.26]	-0.20 /[-0.45, 0.05]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: p < .05	Pre-test vs Follow-up: p < .01	Post-test vs Follow-up: p > .05					
Commitment to Action on environmental conservation (scores)								
Experimental group	4.67 (0.89)	4.98 (0.74)	5.11 (0.80)	44.31	2.00	22.16	17.28	0.001**
Control group	4.34 (0.95)	4.67 (0.83)	4.77 (0.77)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	-0.31/ [-0.55, -0.07]	-0.44/ [-0.68, -0.20]	-0.13/ [-0.37, 0.11]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: p < .05	Pre-test vs Follow-up: p < .01	Post-test vs Follow-up: p > .05					
Note: SS = Sum of Square, df = Degree of freedom, MS = Mean Square, MD = Mean difference, p-value < .05 when comparing the average scores within groups using the Bonferroni post hoc method.								

The research findings corresponding to Objective 3, which aimed to expand the implementation of the training package for enhancing positive attitudes towards environmental conservation among Thai youth, are presented in Table 4. The analysis of mean scores and standard deviations for evaluative knowledge towards

environmental conservation revealed that the experimental group demonstrated a continuous increase in mean scores from 5.14 (SD = 0.55) to 5.21 (SD = 0.67) and 5.28 (SD = 0.88). In contrast, the control group showed only a slight increase from 4.54 (SD = 0.61) to 4.67 (SD = 0.55) and 4.78 (SD = 0.63), respectively. The ANOVA results indicated an F-value of 22.34 with statistical significance at $p < 0.001$, confirming that the difference between the experimental and control groups was statistically significant, with the experimental group achieving clearly higher scores. This finding reflects that the implemented activities effectively enhanced evaluative knowledge towards environmental conservation.

Regarding the affective dimension towards environmental conservation, the experimental group demonstrated an increase in mean scores from 5.11 (SD = 0.56) to 5.25 (SD = 0.58) and 5.30 (SD = 0.59), whereas the control group showed an increase from 4.11 (SD = 0.67) to 4.23 (SD = 0.58) and 4.55 (SD = 0.71). The ANOVA test yielded an F-value of 21.78 with statistical significance at $p = 0.001$, indicating a statistically significant difference between the experimental and control groups, with the experimental group consistently obtaining higher scores. This result demonstrates that the implemented activities clearly contributed to the development of positive attitudes and emotional engagement towards environmental conservation. For the dimension of commitment to action towards environmental conservation, the experimental group exhibited an increase in mean scores from 5.16 (SD = 0.77) to 5.24 (SD = 0.78) and 5.33 (SD = 0.82), while the control group showed increases from 4.29 (SD = 0.68) to 4.46 (SD = 0.72) and 4.87 (SD = 0.69). The ANOVA results revealed an F-value of 10.89 with statistical significance at $p < 0.003$, confirming that the difference between the experimental and control groups was statistically significant, with the experimental group achieving clearly higher scores. This finding reflects that the activities employed were genuinely capable of stimulating positive behavioral commitment towards environmental conservation.

Overall, the analysis revealed that the experimental group achieved higher mean scores than the control group across all dimensions, including evaluative knowledge, affective attitudes, and commitment to action towards environmental conservation. The ANOVA results confirmed that these differences were statistically significant ($p < 0.01$). At the same time, the Post Hoc analysis demonstrated that post-training and follow-up scores were significantly higher than pre-training scores, while no significant difference was found between post-training and follow-up scores. This finding reflects that the effects of the training program remained continuous and stable over time.

These research findings indicate that the activities or intervention employed in this study were effective in promoting knowledge, attitudes, and behaviors related to environmental conservation. The observed changes were not limited to immediate post-training effects but continued throughout the follow-up period, providing important evidence of the sustainability of learning outcomes and behavioral transformation. Therefore, this type of activity can be applied as a guideline for curriculum development as well as environmental conservation promotion activities at both educational and community levels in order to cultivate youth who possess knowledge, awareness, and practical engagement in environmental preservation.

Table 4: Comparison of Mean Scores of the Studied Variables during the Pre-test, Post-test, and Follow-up Phases of the Expansion Group between the Experimental Group (N=40) and the Control Group (N=40).

Variables	Pre-test M(SD)	Post-test M(SD)	Follow-up M(SD)	SS	df	MS	F	p-value
Knowledge of environmental conservation assessment (scores)								
Experimental group	5.14 (0.55)	5.21 (0.67)	5.28 (0.88)	89.34	2.00	44.67	22.34	0.001**
Control group	4.54 (0.61)	4.67 (0.55)	4.78 (0.63)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	0.07,[-0.21, 0.35]	0.14,[-0.19, 0.47]	0.07,[-0.28, 0.42]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: $p < .05$	Pre-test vs Follow-up: $p < .01$	Post-test vs Follow-up: $p > .05$					
Affective dimension on environmental conservation (scores)								
Experimental group	5.11 (0.56)	5.25 (0.58)	5.30 (0.59)	87.11	2.00	43.56	21.78	0.001**
Control group	4.11 (0.67)	4.23 (0.58)	4.55 (0.71)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	0.14,[-0.12, 0.40]	0.19,[-0.07, 0.45]	0.05,[-0.21, 0.31]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: $p < .05$	Pre-test vs Follow-up: $p < .01$	Post-test vs Follow-up: $p > .05$					
Commitment to Action on environmental conservation (scores)								
Experimental group	5.16 (0.77)	5.24 (0.78)	5.33 (0.82)	65.36	2.00	32.68	10.89	0.003**
Control group	4.29 (0.68)	4.46 (0.72)	4.87 (0.69)					
	MD/95 CI	MD/95 CI	MD/95 CI					
	0.08,[-0.22, 0.38]	0.17,[-0.13, 0.47]	0.09,[-0.21, 0.39]					
Post Hoc (Bonferroni)	Pre-test vs Post-test: $p < .05$	Pre-test vs Follow-up: $p < .01$	Post-test vs Follow-up: $p > .05$					
Note: SS = Sum of Square, df = Degree of freedom, MS = Mean Square, MD = Mean difference, p-value < .05 when comparing the average scores within groups using the Bonferroni post hoc method.								

4. Conclusion and Discussion

Based on Objective 1, the findings revealed that the experimental group achieved higher mean scores than the control group across all dimensions, including evaluative knowledge, affective attitudes towards environmental conservation, and commitment to environmental conservation actions. The ANOVA results confirmed that these differences were statistically significant ($p < 0.01$). At the same time, the Post Hoc analysis demonstrated that post-training and follow-up scores were significantly higher than pre-test scores, while no significant difference was found between post-test and follow-up scores. This finding reflects that the effects of the training program remained continuous and stable over time.

These findings are consistent with the concept of evaluative knowledge, which emphasizes learning that integrates scientific information with awareness of ethical, social, and cultural values. Training programs based on this concept therefore do not merely transmit academic knowledge, but also create meaning and value that youth can genuinely connect with in their daily lives. International studies, such as that of Restović and Bulic (2024), found that research-based conservation learning can influence students' attitudes and environmental responsibility. Similarly, Sabo et al. (2025) emphasized the necessity of linking academic knowledge with practical implementation, which corresponds to the design of the present training program that allowed youth to engage directly in hands-on activities, thereby fostering sustainable attitudinal change. Furthermore, Drew and Henne (2006) confirmed that the most successful conservation

efforts are those integrating academic knowledge with local values and community participation. This aligns with the present findings showing that youth demonstrated improved attitudes after participating in the training program because the program connected knowledge with the social and cultural contexts of the community. Within the Thai context, studies by Thai scholars such as Wongkongdech et al. (2025), Kaewpanya et al. (2025), as well as Kaewprasert (2022), consistently confirmed that value-based knowledge and its integration into educational instruction or community activities can effectively foster positive attitudes and increase responsibility toward conservation. The findings of this study are therefore consistent with these trends, demonstrating that youth who participated in the training program developed more positive attitudes and were able to maintain those attitudes even after a two-month period.

Regarding the affective dimension towards environmental conservation, the findings further reflect that environmental conservation is not solely dependent upon scientific reasoning or legal enforcement, but also upon the emotional and affective dimensions of human relationships with nature. Positive emotions such as happiness, pride, appreciation, and emotional attachment to the environment constitute powerful driving forces in fostering positive attitudes and encouraging practical conservation behaviors. International studies, such as Andrews and Wolfe (2025), indicated that emotions are an often-overlooked dimension in conservation science, yet they play a crucial role in promoting marine sustainability. Linking emotions with learning processes can enhance people's motivation to protect the environment. Likewise, O'Halloran (2025) found that positive emotions are strong predictors of environmentally friendly behaviors, while Marušić Jablanović et al. (2025) emphasized the affective dimension of learning as a mechanism capable of generating sustainable outcomes and strengthening learners' environmental responsibility. In Thailand, the study conducted by Sakdapat et al. (2025b) found that local residents who felt emotionally attached to their communities and wildlife demonstrated more positive attitudes and participated more actively in conservation activities. Similarly, Praneetham, Leekancha and Phichaiwongphakdee (2022) reported that happiness and positive impressions derived from ecotourism influenced conservation behaviors within households and hotels. In addition, Kaewprasert (2022) found that integrating affective activities into classroom instruction helped foster positive conservation attitudes among secondary school students. The findings of the present study are therefore consistent with these trends, demonstrating that youth who participated in the training program developed more positive attitudes and were able to maintain those attitudes during the follow-up phase.

Regarding commitment to action towards environmental conservation, the findings of this study are consistent with the concept that environmental conservation depends not only on knowledge or feelings, but also on readiness and commitment to action, which refer to the level of intention and capability an individual possesses in taking concrete actions for the environment. Such readiness emerges from the integration of multiple factors, including knowledge, beliefs, values, and intrinsic motivation. When youth receive training that integrates these components, they develop clear intentions and commitments to engage in practical environmental conservation behaviors. International studies also support these findings. Kotyza et al. (2024) confirmed that environmental concern, perceived behavioral control, and social norms are significant predictors of conservation intentions, which corresponds with the present findings showing that youth who completed the training program demonstrated increased intention and readiness to

participate in conservation activities. Furthermore, Ajzen (1991) proposed the Theory of Planned Behavior, which identifies intention as the strongest predictor of conservation behavior. Similarly, Bamberg and Möser (2007) confirmed that intention and psychological readiness significantly influence actual behavior. These findings are consistent with the present study, which demonstrated that youth who developed readiness and positive intentions following the training program were more likely to engage in practical conservation activities. Research conducted in Thailand reflects similar trends. Supanee Sonthirat (2021) found that employees with greater readiness and positive motivation demonstrated higher levels of conservation attitudes and behaviors. Praneetham (2020) reported that intention and readiness influenced conservation attitudes and behaviors within households and hotels, while Ballard and Belsky (2010) found that participatory environmental learning enhanced readiness and positive attitudes toward sustainable environmental management. The findings of this study therefore align with these trends, demonstrating that youth who participated in the training program developed greater readiness and more positive intentions, and were able to maintain positive attitudes towards environmental conservation even during the follow-up phase.

Regarding the conclusion and discussion based on Objective 2, the analysis revealed that the experimental group achieved higher mean scores than the control group across all dimensions, including evaluative knowledge, affective attitudes, and commitment to action toward environmental conservation. The ANOVA results confirmed that these differences were statistically significant ($p < 0.01$). At the same time, the Post Hoc analysis demonstrated that post-test and follow-up scores were significantly higher than pre-test scores, while no significant difference was found between post-test and follow-up scores. This finding reflects that the effects of the training program remained continuous and stable over time.

These findings are consistent with the Theory of Planned Behavior proposed by Ajzen (1991), which suggests that intention is the strongest predictor of actual behavior. The improvement in youths' attitudes following participation in the training program reflects that the training package was capable of fostering intention and psychological readiness for practical action. Furthermore, Bamberg and Möser (2007) conducted a meta-analysis and found that psychosocial factors, such as beliefs and values, significantly influence conservation behavior. This supports the findings of the present study, which demonstrated that the training package was capable of promoting positive attitudes across multiple settings.

The study by Steg and Vlek (2009) further proposed that promoting conservation behavior requires the integration of both intrinsic and extrinsic motivation, which corresponds with the design of the training package in this study that combined academic knowledge with value-based activities and youth participation within the community. At the same time, Gifford, Lacroix and Chen (2018) highlighted psychological barriers that prevent intentions from being translated into actual behavior such as convenience-oriented habits or structural limitations. The findings of this study therefore suggest that the training package was able to reduce such barriers by fostering clear motivation and readiness among participants.

Within the Thai context, several studies support these findings. Kruglanski et al. (2014) found that employees with greater readiness and positive motivation demonstrated higher conservation attitudes and behaviors. Praneetham (2020) reported that intention and readiness influenced conservation attitudes and behaviors

within households and hotels, while Ballard and Belsky (2010) found that participatory environmental learning enhanced readiness and positive attitudes toward sustainable environmental management. In addition, Rojanasaeng (2001), as well as Al Amin et al. (2021), confirmed that community knowledge and readiness significantly influence attitudes and participation in conservation activities.

Therefore, the findings of this study clearly demonstrate that the training package developed in this research was effective in fostering knowledge, attitudes, and intentions that led to actual environmental conservation practices. Moreover, the program helped reduce psychological barriers that often hinder behavioral change, thereby enhancing youths' readiness and motivation to actively engage in conservation practices within their daily lives and communities.

Through this experimental research on strengthening the psychological characteristics of positive attitudes toward environmental conservation among Thai youth, the researchers not only discovered the statistically significant effectiveness of the training package in improving attitude levels, but also synthesized important insights into the psychological dynamics emerging from the interaction between learning processes and social contexts (Funder & Fast, 2010).

The innovative training package, which was systematically designed according to academic principles and validated by experts, functioned as an important mechanism for systematically transforming the cognitive and affective structures of youth participants. This process led to the emergence of a new body of knowledge that differs substantially from conventional information-based educational approaches. Such knowledge contributes not only to the academic fields of psychology and environmental education, but also plays a crucial role in generating momentum for concrete and sustainable changes within society, communities, and local contexts, as detailed below.

1. This research not only verified the effectiveness of the training package, but also generated new knowledge in the fields of environmental education and behavioral psychology across three significant dimensions, as follows:

1.1 The study proposes that the most effective learning process for Thai youth is not solely based on cognitive or scientific information transfer, but rather on contextual meaning-making that integrates social values and local cultural practices with conservation principles. This process transforms youth from passive observers into active stakeholders, enabling academic knowledge to become embedded within their real-life experiences and ways of living.

1.2 The research discovered that positive emotions, such as a sense of belonging, pride in local identity, and appreciation of nature, function as important mediators that transform knowledge into practical action. These emotional dimensions were found to be more powerful in motivating conservation behavior than fear-based awareness or coercive approaches.

1.3 The findings highlight the importance of psychological readiness as a key component explaining the long-term retention of conservation behavior. The study confirmed that training programs emphasizing commitment to action in a systematic manner can establish a form of cognitive resilience, enabling youth to maintain their conservation intentions even after the completion of the experimental intervention.

2. Social and Community Impact

2.1 This research serves as a guiding framework for cultivating green citizenship characterized by social responsibility and environmental awareness. The findings

indicate that structural transformation at the national level must begin with the development of citizens' psychological traits and values. The results can therefore be utilized as a framework for developing core curricula and environmental education policies that prioritize behavioral outcomes rather than solely academic achievement.

2.2 The implementation of local value-based learning processes encourages the development of social capital through collaboration between younger and older generations within communities. The resulting pride in local natural resources can evolve into a form of community self-defense mechanism for protecting forests, water resources, and local ecosystems. This process contributes to reducing resource-use conflicts while strengthening grassroots conservation networks.

2.3 The training package was designed as a flexible and practical prototypical model that can be adapted for use in schools and local administrative organizations. It supports sustainable circular economy initiatives and eco-tourism development by fostering environmentally knowledgeable youth volunteers and local conservation guides. These individuals can become important drivers for attracting environmentally conscious tourism and generating sustainable local income while preserving ecological integrity.

4.1. Recommendations

Based on the research findings and conclusions obtained from this study, the researchers propose the following important recommendations for youth development and environmental management as follows:

1. Practical Recommendations

1.1 Educational institutions and organizations involved in youth development should adopt an integrated psychological approach in designing training programs. Such programs should not focus solely on cognitive knowledge transfer, but should also emphasize the affective dimension and the development of both intrinsic and extrinsic motivation in order to foster psychological readiness, which can lead to strong intentions and sustainable behavioral change in daily life.

1.2 When expanding the implementation of the training package to other areas, relevant stakeholders should adapt activities and instructional media to align with the social, cultural, and local identity contexts of each community. This adaptation will enable youth to connect conservation values with their own lifestyles and local ecosystems, thereby reducing the gap between theory and practice while strengthening a genuine sense of ownership toward natural resources.

1.3 Government agencies and local administrative organizations should collaborate to incorporate this training model into local environmental strategic plans. Support in terms of funding and resources should be provided to develop youth environmental volunteers who can serve as a key driving force in creating sustainable and concrete community participation over the long term.

2. Recommendations for Future Research

2.1 Future studies should compare the effects of the training package among youth of different age groups or among populations with varying environmental attitudes in order to evaluate the flexibility and applicability of the training instrument across diverse target groups.

2.2 Further research should examine additional factors influencing the retention of environmental attitudes, such as peer influence, family environment, and exposure to

information through social media. Such investigations would help improve the training package to better address changing social conditions and contemporary behavioral contexts.

2.3 Future studies should incorporate qualitative research methods, such as in-depth interviews or focus group discussions during the follow-up phase, in order to gain a deeper understanding of the internal psychological processes and the practical obstacles youth encounter when applying conservation attitudes in real-life situations.

4.2. Research Constraints

Although this study was systematically designed according to experimental research methodology and underwent rigorous instrument quality validation processes to ensure the highest possible level of accuracy and reliability, the researchers recognize that certain factors and contextual conditions may still affect the scope of interpretation and the generalizability of the findings to broader contexts. To ensure the appropriate and effective application of the knowledge derived from this study, the researchers present the following important limitations that should be taken into consideration as follows:

1. This study focused specifically on youth aged 13–15 years in Ban Khok District and Laplae District, Uttaradit Province. Consequently, the findings primarily reflect the social and environmental contexts of these local communities. Therefore, the results may have limitations when generalized to youth living in large urban areas or in regions with significantly different cultural contexts and environmental issues.

2. The follow-up assessment in this study was conducted two months after the completion of the intervention. Although the findings demonstrated the retention of positive attitudes during this period, it cannot yet be confirmed whether these attitudes and commitments towards environmental conservation would remain stable over a longer period of time (e.g., one year or more) without ongoing reinforcement activities.

3. During both the experimental and follow-up periods, participants may have received environmental information from other external sources, such as social media, regular school instruction, or widely publicized environmental events and news. These factors represent intervening variables that are difficult to fully control and may have contributed to the improvement in attitude scores beyond the effects of the training package alone.

4. The assessment of attitudes, particularly in the dimensions of affective responses and commitment to action, relied on participants' self-report measures. As a result, responses may have been influenced by social desirability bias, in which participants attempted to provide socially favorable answers or responded in ways they believed were expected by teachers or researchers, rather than reflecting their genuine attitudes or actual behaviors in independent situations.

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strengthening environmental conservation awareness among Thai youth.

The research team is firmly committed to applying the knowledge, empirical findings, and innovative training package developed through this study into practical implementation at the policy, educational, and community levels. The researchers aspire for this training package to serve as an innovative prototype for systematically developing the psychological characteristics, attitudes, and environmental conservation behaviors of Thai youth. Ultimately, this initiative aims to cultivate socially and environmentally responsible citizens who are capable of participating in the conservation, restoration, and sustainable management of natural resources and ecosystems in a balanced and sustainable manner, while also contributing to the long-term advancement of the country's Sustainable Development Goals.

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