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Research Article

Development of an agricultural learning activity package on native chicken raising for high school students

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Abstract

This study aimed to develop an agricultural learning activity package on native chicken raising for Grade 9 students, compare students' learning achievement before and after using the package, and investigate their satisfaction with the learning experience. A developmental research approach incorporating a one-group pretest–posttest design was employed. The participants were 30 Grade 9 students enrolled in an elective agriculture course at Phraibueng Wittayakom School during the second semester of the 2023 academic year. The learning activities were conducted at the school's Living Agricultural Learning Center. The research instruments comprised the agricultural learning activity package, a 15-item multiple-choice achievement test, and a 12-item satisfaction questionnaire. The package and research instruments were reviewed by three experts before implementation. Data were analyzed using frequency, percentage, mean, standard deviation, and a paired-samples t-test. The results showed that the students' mean posttest score ($\bar{x}$ = 10.77, S.D. = 1.33) was significantly higher than their mean pretest score ($\bar{x}$ = 7.53, S.D. = 1.96), $t(29) = -9.38$, $p < .001$. Their overall satisfaction with the learning experience was at a high level ($\bar{x}$ = 4.29, S.D. = 0.41). The findings indicate that the developed package provided a useful structure for connecting knowledge of native chicken raising with active and practical learning and was associated with improved learning achievement among the participating students. The package may be used as supplementary instructional material for lower-secondary agricultural education, with appropriate adaptation to local contexts and available learning resources.

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Introduction

Agricultural education plays an important role in equipping students with the knowledge, practical skills, attitudes, and decision-making abilities required for daily life, further education, and future occupations. At the secondary-school level, agricultural learning should extend beyond the acquisition of theoretical knowledge by providing learners with opportunities to engage in practical activities, solve authentic problems, work collaboratively, and apply what they have learned in real-life situations. Thailand's Basic Education Core Curriculum emphasizes learner-centered instruction, learning through practice, systematic work processes, responsible use of resources, and the application of occupational knowledge in everyday life (Ministry of Education, 2008). Agricultural education can therefore serve as an important context for integrating scientific knowledge, vocational skills, responsibility, and awareness of local resources.

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Native chicken raising is a relevant agricultural topic for secondary education because it is closely connected with household food production, local livelihoods, biodiversity, and Thai cultural heritage. Thai native chickens possess valuable characteristics, including adaptability to local environmental conditions, tolerance of relatively extensive production systems, distinctive meat quality, and genetic diversity. They are commonly raised by smallholder farmers and can contribute to food security, supplementary household income, and the sustainable use of local animal genetic resources (Loengbudnark et al., 2024; Sopa, 2021). Moreover, the phenotypic diversity of Thai native chickens represents an important biological and cultural resource that should be conserved and transmitted to younger generations (Yaemkong et al., 2024). Providing students with fundamental knowledge of native chicken breeds, housing, feeding, health management, vaccination, waste management, and the benefits of native chicken production can consequently strengthen both agricultural literacy and appreciation of locally significant livestock resources.

The practical nature of animal production makes it particularly suitable for experiential and activity-based learning. Experiential learning enables learners to construct knowledge by connecting concrete experience, reflection, conceptual understanding, and the application of knowledge to new situations. Within agricultural education, experiential learning is regarded as a central approach because it connects classroom instruction with authentic agricultural practices (Baker et al., 2012). Studies in secondary agricultural education have indicated that well-designed experiences, reflection, and active participation can support learners' understanding and their ability to apply agricultural knowledge (DiBenedetto et al., 2017). Similarly, integrating poultry science into structured learning activities can provide a meaningful context for developing agricultural literacy and linking scientific concepts with animal management practices (Erickson et al., 2020).

Nevertheless, agricultural instruction in schools may be constrained when learning content is presented mainly through teacher explanations or general textbooks. Such approaches may not provide sufficient guidance for students to study independently, follow production procedures systematically, or participate actively in practical learning. A learning activity package can help address these constraints by organizing objectives, subject matter, learning materials, practical tasks, worksheets, and assessment activities into a coherent instructional sequence. When appropriately designed, such a package allows students to progress through clearly structured activities, connect theoretical knowledge with practice, review the content at their own pace, and receive feedback on their learning. More broadly, active-learning research has demonstrated that instructional approaches requiring learners to participate actively in the learning process can produce better learning outcomes than reliance on conventional lecture-based instruction alone (Freeman et al., 2014).

In the context of Phraibueng Wittayakom School, agriculture was offered as an elective subject for Grade 9 students. However, an organized learning activity package specifically addressing native chicken raising was not available to support the integration of subject knowledge and practical activities. Consequently, students required learning materials that presented native chicken production in an understandable and systematic manner while also providing opportunities for active participation and practical application. Developing a context-specific learning activity package was therefore considered an appropriate approach to improving agricultural instruction and promoting students' interest in native chicken raising.

Accordingly, this study developed an agricultural learning activity package on native chicken raising for Grade 9 students at Phraibueng Wittayakom School, Sisaket Province, Thailand. The package incorporated content and activities related to native chicken breeds, housing preparation, production management, feeding, disease prevention, vaccination, waste management, and the benefits of native chicken raising. The study further examined students' learning achievement before and after participating in the learning activities and investigated their satisfaction with the developed package. The findings are expected to provide practical evidence regarding the use of structured learning activity packages in secondary agricultural education and offer guidance for teachers seeking to connect agricultural knowledge with meaningful, locally relevant learning experiences.

Objectives

This study developed a learning activity package that connected knowledge of native chicken raising with practical learning experiences. Accordingly, the study aimed to:

- Develop an agricultural learning activity package on native chicken raising for Grade 9 students at Phraibueng Wittayakom School
- Compare students' learning achievement before and after learning through the developed agricultural learning activity package; and
- Investigate students' satisfaction with learning through the developed agricultural learning activity package.

Method

Research Design

This study employed a developmental research approach incorporating a pre-experimental one-group pretest–posttest design. This design involves measuring the same group of participants before and after an intervention to determine whether the observed outcomes change following the intervention (Campbell & Stanley, 1963). The research was conducted in two main phases.

In the first phase, an agricultural learning activity package on native chicken raising was developed for Grade 9 students. The content and learning activities were designed in accordance with the relevant curriculum, learning objectives, and principles of activity-based agricultural education. The developed package was reviewed by three experts in terms of content accuracy, appropriateness of learning activities, language, and suitability for the learners. It was subsequently revised according to the experts' recommendations.

In the second phase, the developed learning activity package was implemented with one group of Grade 9 students. The students completed a learning achievement test before participating in the learning activities, learned through the developed package, and completed the achievement test again after the intervention. Their satisfaction with learning through the package was assessed after the completion of all learning activities.

The research design is represented as follows:

$$O_1\text{: Pretest} \rightarrow \text{X: Intervention} \rightarrow O_2\text{: Posttest}$$

Note. O_1 represents the pretest measurement of students' learning achievement, X represents instruction using the learning activity package on native chicken raising, and O_2 represents the posttest measurement of students' learning achievement. Adapted from Campbell and Stanley (1963).

Because the study involved only one group and did not include a control group or random assignment, alternative explanations for changes between the pretest and posttest could not be completely excluded (Campbell & Stanley, 1963). Therefore, the findings were interpreted as evidence of changes in students' learning achievement following the implementation of the package within the context studied, rather than as definitive evidence of a causal effect.

Research Setting

The study was conducted at the Living Agricultural Learning Center at Phraibueng Wittayakom School, Phraibueng District, Sisaket Province, Thailand. The center served as a school-based agricultural learning environment where students could connect classroom knowledge with practical agricultural activities. Its facilities and learning resources supported the implementation of the learning activity package, particularly activities related to native chicken housing, feeding, production management, disease prevention, waste management, and routine animal care.

Participants

The participants consisted of 30 Grade 9 students enrolled in an elective agriculture course at Phraibueng Wittayakom School, Phraibueng District, Sisaket Province, Thailand, during the second semester of the 2023 academic year. The participants comprised 14 male students (46.67%) and 16 female students (53.33%).

An intact class was selected through purposive sampling because all students in the selected class had enrolled in the agriculture course and participated in the learning activities on native chicken raising. All 30 students completed the

pretest, participated in the instructional activities using the developed learning activity package, completed the posttest, and responded to the satisfaction questionnaire. Therefore, data from all participants were included in the analysis.

Data Collection Tools

Three instruments were used in this study.

Agricultural learning activity package on native chicken raising. The package was developed for Grade 9 students and comprised instructional content, worksheets, review exercises, and practical activities. Its content covered native chicken breeds, housing preparation, feeding and production management, disease prevention and vaccination, waste management, and the benefits of native chicken raising.

Learning achievement test. A researcher-developed achievement test was used to measure students' knowledge before and after learning through the package. It consisted of 15 multiple-choice items with four response options and a maximum score of 15 points. The items covered the principal content and learning objectives of the package. The same test was administered as the pretest and posttest.

Student satisfaction questionnaire. The questionnaire was adapted from an existing instrument and administered after the completion of the learning activities. It consisted of 12 items and an open-ended section for additional comments. The items assessed students' perceptions of the content and practical procedures, instructional language, learning materials, teaching methods, opportunities for participation, alignment between instruction and learning objectives, feedback, and the overall learning experience. Responses were recorded on a five-point Likert-type scale ranging from 1 (lowest satisfaction) to 5 (highest satisfaction).

Instrument Validation

Before implementation, the learning activity package and research instruments were reviewed by three experts in agricultural education, instructional content, and learning assessment. The review considered content accuracy and relevance, alignment with the learning objectives, appropriateness of the activities and assessment items, clarity of language and instructions, and suitability for Grade 9 students. The researchers revised the package, achievement test, and satisfaction questionnaire in accordance with the experts' recommendations before finalizing them for data collection. Only validation evidence documented in the retained research report is presented in this article.

Procedure

The study was conducted during the second semester of the 2023 academic year through the following stages:

Permission and preparation: The Department of Agricultural Education, Faculty of Industrial Education and Technology, King Mongkut's Institute of Technology Ladkrabang, submitted an official letter to the director of Phraibueng Wittayakom School requesting permission to conduct the study. The instructional materials and data collection instruments were then prepared, and the learning procedures were explained to the participants.

Pretest administration: Before instruction, the 30 participating students completed the 15-item learning achievement test to establish their baseline knowledge of native chicken raising.

Implementation of the learning activity package: The researcher conducted the instruction using the developed package and its accompanying lesson plan. The learning and practical activities were implemented at the Living Agricultural Learning Center at Phraibueng Wittayakom School. Students studied the instructional content and participated in activities related to native chicken raising, while the researcher provided guidance, facilitated the activities, and monitored students' participation throughout the learning process.

Posttest administration: After completing the learning activities, the students completed the same 15-item achievement test. Their posttest scores were subsequently compared with their pretest scores.

Satisfaction assessment: After the posttest, the students completed the 12-item satisfaction questionnaire and provided additional comments about their learning experiences.

Data preparation: The completeness of the collected data was checked, and the responses were coded and prepared for statistical analysis.

Data Analysis

The data were analyzed using descriptive and inferential statistics. Students' demographic characteristics were summarized using frequency and percentage. Pretest and posttest scores were analyzed using the mean and standard deviation. Because the same students completed both assessments, a paired-samples *t*-test was used to compare their learning achievement before and after instruction through the agricultural learning activity package. Statistical significance was determined at the .01 level.

Students' satisfaction ratings were analyzed using the mean and standard deviation. The mean scores were interpreted according to the following criteria: 4.50–5.00 indicated the highest level of satisfaction, 3.50–4.49 indicated a high level, 2.50–3.49 indicated a moderate level, 1.50–2.49 indicated a low level, and 1.00–1.49 indicated the lowest level. Responses to the open-ended question were summarized descriptively to provide supplementary information concerning students' perceptions of the learning activity package.

Results

The results are presented in accordance with the research objectives: (1) the development of the agricultural learning activity package, (2) the comparison of students' learning achievement before and after instruction, and (3) students' satisfaction with learning through the developed package.

Development of the Agricultural Learning Activity Package

The agricultural learning activity package on native chicken raising was developed for Grade 9 students based on the Basic Education Core Curriculum, relevant learning objectives, agricultural subject content, and principles of activity-based learning. The package consisted of learning objectives, instructional content, practical activities, learning materials, review exercises, and an achievement test. Its principal content covered native chicken breeds, housing preparation, feeding and production management, disease prevention and vaccination, waste management, and the benefits of native chicken raising.

The package was reviewed by three experts for content accuracy, alignment with the learning objectives, appropriateness of the learning activities, language clarity, and suitability for Grade 9 students. The IOC values reported for the package ranged from 0.60 to 1.00. Revisions were made according to the experts' recommendations before the package was implemented with the participants.

Participant Characteristics

The participants consisted of 30 Grade 9 students. As shown in Table 1, 16 students (53.33%) were female and 14 students (46.67%) were male.

Table 1 Demographic characteristics of the participants

Gender	Frequency	Percentage
Male	14	46.67
Female	16	53.33
Total	**30**	**100.00**

Students' Learning Achievement

Table 2 presents the comparison of students' learning achievement before and after instruction through the agricultural learning activity package. Before instruction, the students obtained a mean score of 7.53 out of 15 points (SD = 1.96). After instruction, their mean score increased to 10.77 (SD = 1.33).

The paired-samples *t*-test indicated that the students' posttest scores were significantly higher than their pretest scores, $t(29) = -9.38$, $p < .001$. The mean score increased by 3.24 points. The findings therefore demonstrated a statistically significant improvement in learning achievement following instruction through the developed package.

Table 2 Comparison of pretest and posttest learning achievement scores

Measurement	n	Max	$\bar{x}$	S.D.	t	df	p
Pretest	30	15	7.53	1.96	−9.38	29	< .001
Posttest	30	15	10.77	1.33			

Note. The negative *t* value resulted from calculating the difference in the order of pretest minus posttest. The difference was statistically significant at the .01 level.

Students' Satisfaction

The students' overall satisfaction with learning through the agricultural learning activity package was at a high level ($\bar{x}$ = 4.29, *SD* = 0.41). As shown in Table 3, the highest-rated items were the continuity and relationship between the content and practical procedures ($\bar{x}$ = 4.80, *SD* = 0.16) and the instructor's appropriate personality ($\bar{x}$ = 4.80, *SD* = 0.16). These were followed by the use of appropriate and understandable instructional language ($\bar{x}$ = 4.56, *SD* = 0.25). The students also expressed high satisfaction with the availability of instructional materials that facilitated content comprehension and the opportunity to express opinions, ask questions, and participate in classroom discussions (both $\bar{x}$ = 4.43). Although the item concerning the instructor's commitment and regularity received the lowest mean score ($\bar{x}$ = 3.80, *SD* = 0.64), it remained within the high satisfaction category.

Table 3 Students' satisfaction with learning through the agricultural learning activity package

Item	$\bar{x}$	*SD*	Interpretation
1. Clear and continuous explanation of the content and practical procedures	4.80	0.16	Highest
2. Appropriate and understandable instructional language	4.56	0.25	Highest
3. Instructional materials facilitated content comprehension	4.43	0.46	High
4. The teaching methods maintained students' interest.	4.40	0.38	High
5. The instructor answered questions clearly	4.36	0.37	High
6. Opportunities to express opinions, ask questions, and discuss conclusions	4.43	0.25	High
7. Opportunities to ask questions	3.93	0.75	High
8. Punctual commencement and completion of instruction	3.83	0.62	High
9. The instructor demonstrated commitment and taught regularly	3.80	0.64	High
10. Instruction covered the content specified in the course outline	4.03	0.37	High
11. The instructor assessed students' work and provided useful feedback	4.13	0.46	High
12. The instructor demonstrated an appropriate personality	4.80	0.16	Highest
Overall	**4.29**	**0.41**	**High**

The students' additional comments indicated that the package was interesting, increased their knowledge of native chicken raising, and provided information that could be useful for their future study. Overall, the findings indicated that the developed package was associated with improved learning achievement and a high level of student satisfaction.

Discussion

The findings of this study demonstrate that the agricultural learning activity package on native chicken raising was appropriate for implementation with Grade 9 students in the context studied. The package was systematically developed by analyzing the Basic Education Core Curriculum, relevant learning objectives, agricultural content, and the characteristics of the target learners. It integrated instructional content, learning materials, review exercises, and practical activities within a structured learning sequence. The expert evaluation, with IOC values ranging from 0.60 to 1.00, provided evidence that the package components were sufficiently aligned with the intended learning objectives. The subsequent revision based on expert recommendations also helped improve the accuracy, clarity, and age appropriateness of the materials before implementation.

The structure of the package reflects a central principle of agricultural education: learners should have opportunities to connect subject knowledge with meaningful agricultural activities. Agricultural knowledge is more likely to become meaningful when learners interact with relevant content, participate in practical tasks, reflect on their experiences, and connect their learning with authentic situations. Coleman et al. (2024) explained that experiential learning in agricultural education involves the interaction between learning processes and their contexts rather than practical activity alone. Similarly, Saduak et al. (2023) found that agricultural learning packages incorporating participation, practice, discussion, and collective learning supported the development of agricultural knowledge. The present package

therefore provided more than a collection of information; it organized knowledge and activities related to native chicken raising into a coherent instructional experience.

The second major finding was that students' posttest achievement scores were significantly higher than their pretest scores. The mean score increased from 7.53 to 10.77 out of 15 points, representing an improvement of 3.24 points. This result suggests that the package supported students' acquisition and organization of knowledge about native chicken raising. Several features of the package may help explain this improvement. First, its content was organized according to clearly defined learning objectives. Second, information about breeds, housing, feeding, production management, disease prevention, vaccination, waste management, and the benefits of native chicken raising was connected with learning and practical activities. Third, the inclusion of review exercises and assessments provided students with opportunities to revisit and consolidate their knowledge.

This finding is consistent with research conducted in Thai agricultural education contexts. Saduak et al. (2023) reported increased learning achievement after participants learned through an organic agriculture learning and practice package that emphasized participation and learning through practice. Pengchawat and Kongnavang (2024) similarly found that secondary students' achievement in an agricultural subject was significantly higher after inquiry-based learning integrated with concept mapping. In another Thai agricultural education study, Panyakom et al. (2025) reported significantly higher post-instruction achievement after students used a learning set incorporating animal injection training tools. Collectively, these findings indicate that structured instructional materials combined with active or practice-oriented learning can support the development of agricultural knowledge and skills.

The present findings are also consistent with international studies in agricultural and animal science education. Erickson et al. (2020) found significant increases in high school students' knowledge after completing instructional modules integrating poultry science with contextualized and interactive learning. Scott et al. (2023) observed that students who participated in experiential animal science activities tended to perform better on average than those who did not receive those learning experiences. Such findings support the view that agricultural and animal science content can be learned more effectively when abstract information is connected with structured activities and relevant production contexts.

Nevertheless, the significant difference between the pretest and posttest should be interpreted cautiously. Because the present study used a one-group pretest–posttest design without a control group, the observed improvement cannot be attributed exclusively to the learning activity package. Other factors, including familiarity with the test, students' prior experiences, teacher support, and learning that may have occurred during the study, could also have contributed to the difference. Therefore, the findings provide evidence of improvement following the implementation of the package within this particular classroom, but they do not establish an unequivocal causal effect.

The third major finding was that students' overall satisfaction with the learning activity package was at a high level. Students expressed particularly high satisfaction with the continuity between the content and practical procedures, the use of understandable instructional language, the availability of materials that facilitated comprehension, and opportunities to express opinions and ask questions. These findings suggest that students valued both the organization of the learning materials and the supportive instructional environment in which the package was implemented. Clear explanations and systematic activity sequencing may have reduced the difficulty of learning technical animal-production content, while opportunities for questioning and participation may have encouraged students to take a more active role in the learning process.

The high level of satisfaction is consistent with the findings of Pengchawat and Kongnavang (2024), who reported that secondary students were highly satisfied with active learning in an agricultural subject. Panyakom et al. (2025) also found a high level of satisfaction among students using an animal-science learning set, particularly in relation to instructional media, understandable explanations, and engaging teaching methods. Internationally, Erickson et al. (2020) found that contextualization and interactive features in poultry-science modules supported students' learning and interest. These findings collectively suggest that students respond positively when agricultural learning materials are clearly organized, relevant to authentic agricultural contexts, and accompanied by opportunities for active involvement.

However, the satisfaction results should also be considered in relation to the content of the questionnaire. Several items assessed the instructor's explanations, personality, punctuality, feedback, and opportunities provided to students rather than the learning package alone. Consequently, the overall satisfaction score may reflect students' combined perceptions of the package, the instructional process, and the instructor. Future evaluations should separate these dimensions into distinct sections, such as satisfaction with the content, learning activities, instructional materials, practical experience, and instructor, to provide a more precise assessment of the package itself.

Overall, the results indicate that a locally relevant agricultural learning activity package can provide a useful structure for teaching native chicken raising at the lower-secondary level. The package connected curriculum-based agricultural knowledge with a livestock topic associated with local livelihoods, food production, and animal genetic resources. Its use was followed by improved learning achievement and high student satisfaction. Nevertheless, the findings are context-specific because the participants comprised only 30 students from one school, selected from an intact elective class. Further studies should employ larger and more diverse samples, include a comparison or control group, assess practical skills in addition to knowledge, and investigate the retention and application of learning over time.

Recommendations

Based on the findings and limitations of this study, the following recommendations are proposed.

Recommendations for Educational Practice

- Agricultural teachers may use the developed learning activity package as supplementary instructional material for teaching native chicken raising at the lower-secondary level. However, its content and activities should be adapted to students' prior knowledge, available facilities, local production conditions, and instructional time.
- The package should be implemented in combination with practical activities, demonstrations, group discussions, and opportunities for students to reflect on their learning. Teachers should provide close supervision during activities involving live animals, equipment, vaccines, or farm facilities to ensure animal welfare, biosecurity, and student safety.
- Schools may integrate the package with school agricultural learning centers, livestock units, local farms, native chicken farmer groups, and relevant livestock agencies. Such collaboration can provide students with authentic learning experiences and connect classroom knowledge with local occupations and community resources.
- Teachers should use formative assessment throughout the learning process, including observation, questioning, worksheets, practical assignments, and feedback, rather than relying exclusively on pretest and posttest scores. This approach would provide more comprehensive evidence of students' knowledge, practical skills, responsibility, and ability to apply what they have learned.
- The package should be reviewed and updated periodically to incorporate current knowledge concerning native chicken production, disease prevention, biosecurity, animal welfare, environmental management, and sustainable livestock production.

Recommendations for Further Research

- Future studies should employ larger and more diverse samples from multiple schools and include a comparison or control group to strengthen the validity and generalizability of the findings.
- Future research should assess students' practical competencies in native chicken raising through performance-based assessment, observation forms, or rubrics, in addition to measuring learning achievement and satisfaction.
- Follow-up studies should investigate students' retention and application of knowledge and practical skills over time and examine the effects of integrating digital resources or blended learning into the activity package.

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